



EUROPEAN CENTRAL BANK

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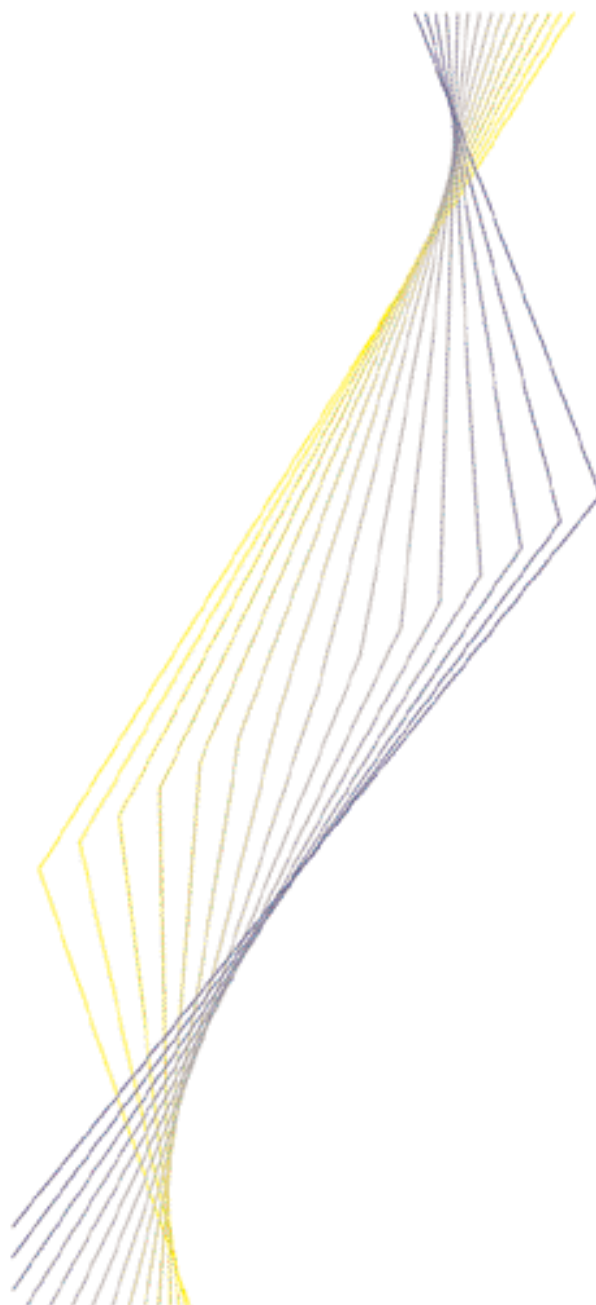
# BLUE BOOK

**PAYMENT AND SECURITIES  
SETTLEMENT SYSTEMS IN  
THE EUROPEAN UNION**

June 2001



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In accordance with Community practice, countries are listed in the Blue Book using the alphabetical order of the national languages.

In general, systems are described as of November 2000, although for some systems more recent information has been used. Data used in the Blue Book are as of end-1999 unless otherwise indicated.

**Conventions used in the statistical tables:**

- Not applicable or not available;
- . Not yet available; and
- ... Nil or negligible.

**Country tables (1995-99):**

For the 11 Member States which adopted the euro on 1 January 1999, figures have been converted into euro using the fixed conversion rates for all years, with the exception of Table 4 which is given in national currency.

For the other Member States, figures are represented in national currency.

**Comparative tables (1998-99):**

Figures have been converted into euro for all countries using the exchange rate shown in Table 1 of the respective country tables.



## Foreword

This report on “Payment and securities settlement systems in the European Union” is the third edition of what has come to be known as the “Blue Book”. The Blue Book dates back to September 1992 when the Committee of Governors of the Central Banks of the Member States of the European Economic Community published a descriptive guide to the payment systems of the then 12 Member States of the European Community (EC). The second edition, which contained information on the 15 European Union (EU) Member States, was published by the European Monetary Institute (EMI) in April 1996. This third edition contains revised texts and data for all 15 EU Member States, taking into account the fundamental changes which have taken place in the period from 1996 to 2000.

In the institutional context, the most important changes were the establishment of the European Central Bank (ECB) and the European System of Central Banks (ESCB) in June 1998 and the introduction of the single currency – the euro – on 1 January 1999. Within the euro area (i.e. those countries which have adopted the single currency), the euro has replaced the legacy currencies in all central bank operations and in wholesale market activities.

Payment and settlement systems have been growing in importance over the past two decades. The introduction of the euro has fostered the integration of these systems within the EU and, in particular, the euro area. This is a result of an escalation in both the volume and the value of transactions stemming from money and foreign exchange markets and from financial markets in general.

Within its currency area, the ECB, like any central bank, has a direct interest in the prudent design and management of the payment and settlement systems processing its currency. The smooth functioning of payment and settlement systems is a crucial aspect of a sound currency and is essential to the conduct of monetary policy. These systems also have a significant bearing on the functioning of financial markets. Moreover,

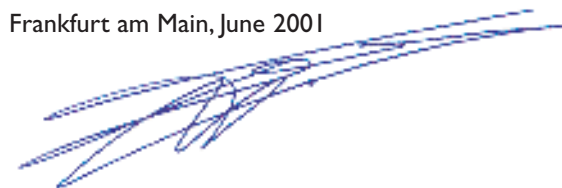
reliable and efficient payment systems are crucial to the maintenance of banking and financial stability. In this context, great attention is paid to the smooth functioning of payment and settlement systems and instruments, as well as to reducing the potential risks associated therewith.

In the light of the introduction of the euro and other developments which have triggered an advanced level of integration of EU payment systems, the need for a comprehensive description of payment and securities settlement systems in the European Union is of even greater importance today than it was previously. However, the Blue Book is not designed solely for the use of central banks. Other institutions which are involved either in discussing payment systems issues or in establishing or using payment systems infrastructures may also benefit from the information which it contains.

Payment and settlement systems are not static in nature. They are dynamic systems which have evolved over time and which will continue to do so. Euro banknotes and coins will be introduced in January 2002 in the Member States which have adopted the euro. This will lead to even greater integration on account of increased demand from the public for faster, safer and cheaper services. It is thus expected that the integration of payment and settlement systems witnessed in the area of wholesale activities will rapidly spread to retail banking.

I would like to thank all the EU central banks for drafting their respective country chapters. Their contribution to and assistance in the preparation of this publication has been invaluable.

Frankfurt am Main, June 2001



Willem F. Duisenberg  
President



# Introduction

The aim of the Blue Book is to provide a comprehensive description of the main payment and securities settlement systems in the Member States of the European Union (EU). These descriptions cover both the domestic and cross-border aspects of the systems. The range of schemes covered is not exhaustive and the selection is not intended to indicate their relative importance.

For historical reasons and on account of differences in the legal, regulatory and institutional environment, the variety and structure of payment systems differ from country to country. Similarities do, however, exist, and the introduction of the euro has triggered further harmonisation. For this reason the current edition of the Blue Book introduces a euro area chapter which describes aspects and features of payment and securities settlement systems which are common to, or are relevant to, the Eurosystem as a whole. This chapter also describes the common legal and regulatory framework, focusing, in particular, on the role of the European Central Bank and the Eurosystem. The country chapters deal with individual domestic features which are not common to the Eurosystem.

In order to allow a direct comparison of the various payment systems, the euro area chapter and the 15 country chapters follow a commonly agreed outline. Each chapter is divided into four sections: the first section provides an overview of the institutional aspects which have an impact on payment systems and briefly describes the major parties involved. The second section deals with the payment media used by non-banks and with recent developments in the area of retail payments. The third section focuses on interbank transfer and settlement systems. The fourth section describes the various securities settlement systems.

This edition of the Blue Book, unlike the previous edition, contains a brief description of the role of the NCBs/ECB in the area of oversight. This reflects the growing importance which central banks are attaching to the sound and efficient functioning of payment systems.

In addition, the third section of each country chapter has been expanded. There are two reasons for this. First, when the last edition of the Blue Book was published, most countries did not have an RTGS system, so this section included a description of the form which their respective RTGS system was going to take, whereas the current edition of the Blue Book describes RTGS systems which have been operational for at least two years. The second reason is that the section on retail payment systems has been expanded in order to include e-money and card-based schemes, thus reflecting the effect that advances in technology have had on payment systems.

The fourth section, which deals with securities settlement systems, has also been expanded in order to include a description of the trading structures and the clearing houses in each country. This section therefore follows a security from when it is traded through to the settlement process.

Each country chapter includes a list of abbreviations. At the end of the last country chapter, a glossary is presented.

Finally, the annexes include an account of the methodology used for the statistical data, cross-border comparative tables and a set of statistical data for each country. The latter are presented as a time series in order to facilitate the analysis of recent developments.



# General terms and acronyms

## Countries

BE	Belgium
DK	Denmark
DE	Germany
GR	Greece
ES	Spain
FR	France
IE	Ireland
IT	Italy
LU	Luxembourg
NL	Netherlands
AT	Austria
PT	Portugal
FI	Finland
SE	Sweden
UK	United Kingdom

## Currencies

€ or EUR euro

BEF	Belgian franc
DKK	Danish krone
DEM	Deutsche Mark
GRD	drachma
ESP	peseta
FRF	French franc
IEP	Irish pound
ITL	lira
LUF	Luxembourg franc
NLG	guilder
ATS	schilling
PTE	escudo
FIM	Finnish markka
SEK	Swedish krona
GBP	pound sterling
USD	US dollar

## Others

ACH	automated clearing house
ATM	automated teller machine
BAS	Business Administration System
BIS	Bank for International Settlements
CAD	Capital Adequacy Directive
CBF	Clearstream Banking Frankfurt
CBL	Clearstream Banking Luxembourg
C.E.T.	Central European Time
CCB	correspondent central bank
CCBM	correspondent central banking model
CCP	central counterparty

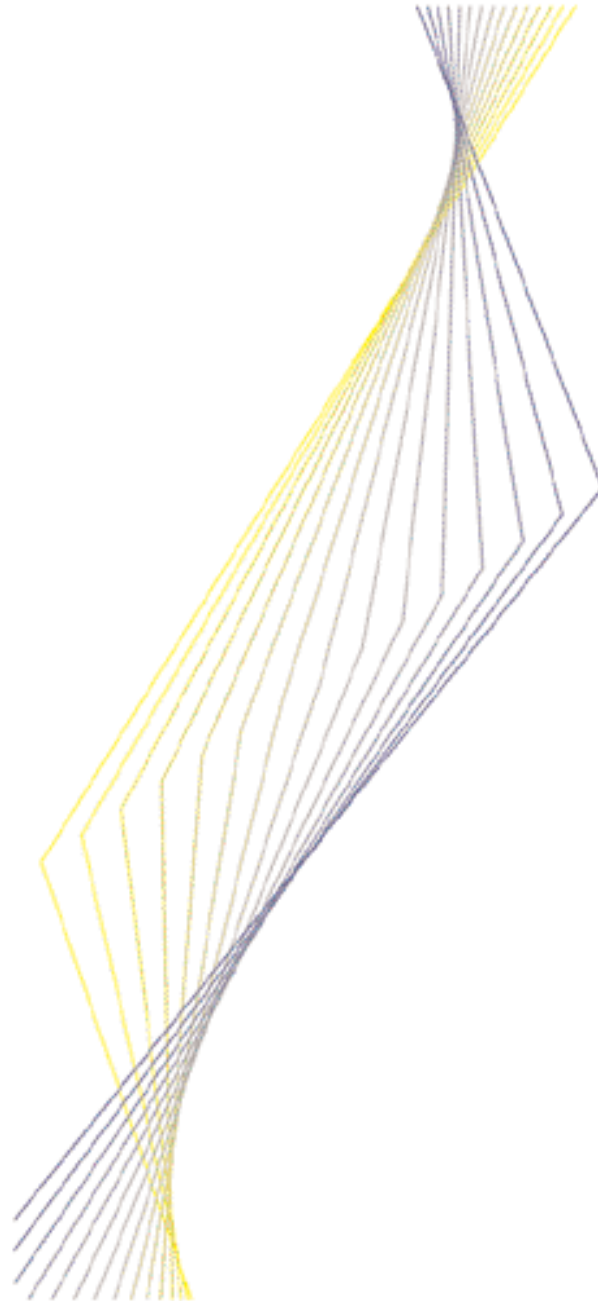
CDs	certificates of deposit
Cedel	former Luxembourg-based European clearing house – <i>Centrale de Livraisons de Valeurs Mobilières</i>
CEPS	common electronic purse specifications
CLFI	Consolidated Law on Financial Intermediation
CLS	continuous linked settlement
CP	commercial paper
CPSS	Committee on Payment and Settlement Systems
CRD	cash ratio deposit
CSD	central securities depository
DVD	delivery versus delivery
DVP	delivery versus payment
EACH	European Association of Central Counterparty Clearing Houses
EAF	Euro Access Frankfurt
EBA	Euro Banking Association
EBP	electronic bill presentment
EBPP	electronic bill presentment and payment
ECB	European Central Bank
ECBS	European Committee for Banking Standards
ECN	electronic communications network
ECS	Euro Clearing System
ECSDA	European Central Securities Depository Association
edc	European debit card
EDI	electronic data interchange
EDIFACT	Electronic Data Interchange for Administration, Commerce and Transport
EDP	electronic data processing
EEA	European Economic Area
EFTPOS	electronic funds transfer at point of sale
ELMI	electronic money institution
EMI	European Monetary Institute
EMU	Economic and Monetary Union
EMV	standard for integrated circuit cards established by Europay, MasterCard and Visa
EPM	ECB payment mechanism
EPSS	European Payment Systems Services SA
ERP	Euro Retail Payment
ESCB	European System of Central Banks
ESCC	European Securities Clearing Corporation
EU	European Union

Eurex	European Exchange (common futures market of the German and Swiss stock exchanges)		<i>Marché à Terme International de France</i>
Euro 1	EU-wide payment system of the EBA	MEFF	Spanish Futures and Options Market (fixed income) – <i>Mercado Español de Futuros Financieros (renta fija)</i>
Euro-giro	European network for postal giro systems	MoU	Memorandum of Understanding
EuroMTS	electronic bond trading platform for European benchmark bonds	MT100, MT102, MT103	SWIFT message formats for transferring payments
Euronext	single stock exchange created by the merger between the Amsterdam, Brussels and Paris stock exchanges	NBRLs	net bilateral receiver limits
FAFO	first available first out	NCB	national central bank
FESCO	Forum of European Securities Commissions	Necigef	the Dutch CSD
FESE	Federation of European Securities Exchanges	NOREX Alliance	common Nordic securities market created by the merger between the Stockholm, Copenhagen and Reykjavik stock exchanges
FIFO	first in first out	NSLs	net sender limits
FIN	store and forward messaging service for financial institutions on the SWIFT network	OTC	over the counter
FIN Copy	function of the SWIFT network whereby instructions may be copied and optionally authorised by a third party before being released to the beneficiary	PACE	Purse Application for Cross-border use in Euro
FOP	free of payment	PIN	personal identification number
FRA	forward rate agreement	PKI	public key infrastructure
GAAP	US Generally Accepted Accounting Principles	PNB	Potential Net Balance
GNP	gross national product	PNS	Paris Net Settlement system
GSCC	United States Government Securities Clearing Corporation	POS	point of sale
GUI	graphical user interface	repo	repurchase agreement
HCB	home central bank	RTGS	real-time gross settlement
IASC	International Accounting Standards Committee	SWIFT	Society for Worldwide Interbank Financial Telecommunications
IBAN	International Bank Account Number	SWIFT-NetFIN	store and forward messaging service for financial institutions on the new SWIFTNet platform
ICSD	international central securities depository	SET	secure electronic transaction
IGFs	Investment Guarantee Funds	SFD	Settlement Finality Directive
IOSCO	International Organization of Securities Commissions	Sicovam SA	French CSD and clearing authority – <i>Société Interprofessionnelle pour la Compensation des Valeurs Mobilières SA</i>
ISD	Investment Services Directive	SMEs	small and medium-sized enterprises
ISFs	Investment Services Firms	SMS	Short Message Standard
ISIN	International Securities Identification Number	SOS	Single Obligation Structure
ISMA	International Securities Markets Association	SSS	securities settlement system
IST	Information Society Technologies programme	STP	straight-through processing
LCH	London Clearing House	TARGET	Trans-European Automated Real-time Gross settlement Express Transfer system
Matif	French financial futures market –	TfT	Trade-for-Trade
		WAP	Wireless Application Protocol





EUROPEAN CENTRAL BANK



**Euro area**

**June 2001**

Euro area

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Euro area

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Euro area

## Introduction

Payment and securities settlement systems in the EU were originally created with the aim of meeting domestic requirements. They were rather diverse in nature and not necessarily suited to the needs of a single currency area, where an infrastructure is needed which enables the quick and smooth flow of payments and securities at a low cost in the whole area. Against this background, the financial infrastructure in the EU has undergone rapid changes both in the run-up to and following the introduction of the euro. The launch of the euro and developments in technology led to an overhaul and re-shaping of the infrastructure for effecting payments and for the trading, clearing and settlement of securities. In addition, the advent of the single currency has also accelerated efforts to harmonise and consolidate payment and securities settlement systems.

Some payment and securities settlement systems are common to, or relevant for, all the EU Member States which have adopted the euro as their single currency. The aim of the chapter on the euro area is to describe these systems and to depict the legal and regulatory environment in which they operate. Major emphasis has been placed on the role of the Eurosystem, which comprises the European Central Bank and the NCBs of the euro area. Last, but not least, the chapter on the euro area also endeavours to describe aspects and features of payment and securities settlement systems which are common to all EU Member States. The reason for this is that, with regard to the legal and banking environment in which payment and securities settlement systems operate, the EU Member States which have not yet adopted the euro share a great deal with those which have adopted the euro.

The re-shaping of the infrastructure and accelerated efforts to harmonise and consolidate payment and securities settlement systems have been particularly prevalent in large-value payment systems. The creation of TARGET has established an EU-wide RTGS system which is used for the settlement of

central bank operations, cross-border and domestic interbank transfers as well as other large-value euro payments. TARGET is an essential vehicle for the implementation of the monetary policy for the Eurosystem, and has helped to create a single money market within the euro area.

The only privately owned and operated EU-wide payment system is the Euro 1 system of the Euro Banking Association (EBA). Euro 1 processes interbank payments as well as commercial payments.

In addition to TARGET and the EBA's Euro 1, there are four large-value net settlement systems in operation: Euro Access Frankfurt (EAF) which is run by the Deutsche Bundesbank, *Pankkien On-line Pikasiirrot ja Sekitjärjestelmä* (POPS system) operating in Finland, Servicio de pagos interbancarios (SPI) in Spain and the Paris Net Settlement system (PNS) in France. More detailed information on these systems can be found in the relevant country chapters.

With regard to correspondent banking, it has generally been noted that its former role of being one of the main ways of making cross-border payments has diminished in the euro area since the launch of the euro. There are signs that this development will also continue in future.

The situation with regard to cross-border retail payment systems within the euro area is not yet as developed as is the case for cross-border large-value payment systems. Despite the introduction of the euro, cross-border retail payment services have not yet reached the service levels of domestic retail payment services. Significant differences in quality, efficiency and price between domestic and cross-border services are still preventing people from reaping the benefits of the single currency. Correspondent banking relationships and enhanced correspondent banking relationships in the form of networks have experienced a remarkable concentration



of business in some major correspondent banks. In addition, large-value payment systems are also used for cross-border retail business. The only retail payment system which covers the whole of the euro area and which is open to all banks is the EBA's STEP I arrangement (see Section 3.3.3). In order to foster an improvement in the situation for cross-border retail payments, the Eurosystem published a report entitled "Improving Cross-border Retail Payment Services – the Eurosystem's view" in September 1999. This report identified the issues to be tackled and drew up a list of objectives to be fulfilled by the beginning of 2002. A progress report was published in September 2000 describing the achievements which the banking community has made and highlighting areas where further work is necessary.

In the area of securities, the introduction of the euro has eliminated currency segmentation, which was one of the main reasons for the fragmentation of listing, trading and settlement in the countries of the euro area. The increased homogeneity of the securities markets within the euro area has encouraged investors to regard the euro area securities markets as a single entity. Trading, clearing and settlement institutions are trying to respond to this change in the market by increasing their cross-

border operations. Moreover, an integrated euro area-wide money market has emerged and the need in part to collateralise money market transactions has provided an incentive for the cross-border use of securities in the euro area. Another factor pushing in the same direction was the requirement for all collateral eligible for monetary policy operations of the central banks of the euro area to be equally usable by all monetary policy counterparties. As no suitable facilities for the cross-border transfer of securities existed at the beginning of Monetary Union, the central banks set up the correspondent central banking model (CCBM). In the CCBM, central banks act as correspondents for each other, thus enabling the cross-border transfer of securities used for the Eurosystem's monetary policy operations and the intraday credit operations of the ESCB. In response to the increasing need for cross-border transfers in euro, including for commercial purposes, SSSs within the EU have provided facilities for the cross-border transfer of securities, i.e. links between SSSs.

In response to the demands of the securities markets for effective economies of scale and of scope, the securities settlement industry is also in the process of consolidating its cross-border activities. The consolidation process covers trading, clearing and settlement structures.

## **I Institutional aspects**

### **I.1 The general institutional background**

Most of the provisions of the Treaty establishing the European Community (the Treaty) which relate to Monetary Union and most of the provisions of the Statute of the European System of Central Banks and of the European Central Bank (the Statute of the ESCB) apply only to EU Member States which have adopted the euro and/or their central banks and to the European Central Bank. In order to clarify which central banks are meant

in which context, the name "Eurosystem" was coined at the beginning of Stage Three. The Eurosystem comprises the ECB and the NCBs of those EU Member States which have adopted the euro. The decision-making bodies of the Eurosystem are the Executive Board of the ECB and the Governing Council of the ECB. The NCBs of Denmark, Sweden and the United Kingdom, i.e. those EU Member States which are not yet participating in Monetary Union and continue to conduct an independent monetary policy, are not part of the Eurosystem. When reference is made to the

ECB and the central banks of all EU Member States, the more general term “European System of Central Banks” (ESCB) is used. The third decision-making body of the ECB, the General Council, comes into play when matters relating to the ESCB are involved.

One of the basic tasks of the Eurosystem is to promote the smooth functioning of payment systems. The relevant provisions are enshrined in the Treaty and the Statute of the ESCB. The Statute of the ESCB is annexed to the Treaty as a Protocol and thus forms an integral part of the Treaty.

The following legal provisions in the Treaty and the Statute of the ESCB are of particular importance with regard to payment and settlement systems:

- Article 105 (2) of the Treaty (reiterated in Article 3.1 of the Statute of the ESCB) which defines as a basic task of the Eurosystem the promotion of the smooth operation of payment systems;
- Article 22 of the Statute of the ESCB which states that the ECB and NCBs may provide facilities, and the ECB may make regulations, to ensure efficient and sound clearing and payment systems within the Community and with other countries. Such ECB regulations are directly applicable in the Member States which have adopted the euro.

The Treaty assigns to the ECB the regulatory powers to adopt any legal acts which are necessary to implement the basic tasks assigned to the Eurosystem. A distinction can be made between two different kinds of ECB legislation. First, there are legal acts addressed to third parties (other than the NCBs of the Eurosystem). These legal acts are ECB Regulations, Decisions, Recommendations and Opinions. Second, there are internal legal acts which take the form of ECB Guidelines, ECB Instructions and internal ECB Decisions.

In addition, the EU Council and the European Parliament are empowered by the Treaty to

adopt legal instruments. These legal instruments, which are applicable in all Member States, include rules relating to the banking industry and the provision of financial services. Thus they also affect the framework for payment and securities settlement systems. The main legal instruments used by the EU Council and the European Parliament are Directives, which have to be implemented at the national level. They are used to harmonise existing rules at the national level or to establish new legislation where national rules do not exist but are deemed necessary. Some of the main Directives which have an impact on payment and securities settlement systems are the following:

#### *The Settlement Finality Directive*

The main objective of Directive 98/26/EC of 19 May 1998 on settlement finality in payment and securities settlement systems is to (1) eliminate the main legal risks to which payment and securities settlement systems are exposed, taking into account the significant systemic risk inherent in such systems – both net and gross; (2) ensure that the smooth functioning of a system cannot be compromised by the application of a foreign insolvency law in the event of the participation of a foreign entity; and (3) enhance the legal certainty of collateral (also to the benefit of the credit operations of the ESCB). The provisions of the SFD apply to (a) systems, (b) participants in systems, and (c) collateral security provided in connection with participation in a system or in the framework of the operations of the ESCB.

#### *The Cross-Border Credit Transfers Directive*

Directive 97/5/EC of 27 January 1997 on cross-border credit transfers is concerned with enabling individuals and businesses, especially small and medium-sized enterprises, to make credit transfers in euro rapidly, reliably and cheaply from one part of the Community to another. The Directive only applies to cross-border credit transfers up to a value of €50,000. It lays down minimum requirements needed to ensure an adequate level of customer information both before and after

the execution of a cross-border credit transfer and it sets forth minimum execution requirements. In this respect, it provides that:

- customers be given, in advance, prices which they can understand clearly for any type of credit transfer;
- a transfer should be credited to the beneficiary's account within a clearly defined timescale (not exceeding 6 days);
- transfers for which the originator pays all the costs ("OUR" mode) will be the rule, unless otherwise stipulated. An intermediary or receiving bank may not make any further charges, in particular not to the beneficiary; and
- when a transfer goes astray, a "money-back" guarantee up to €12,500 is provided.

The Cross-Border Credit Transfers Directive assists the ECB in its task of promoting efficient cross-border payments in the third stage of EMU.

#### *The E-Money Directive*

Directive 2000/46/EC of 18 September 2000 on the taking up, pursuit of and prudential supervision of the business of electronic money institutions is aimed at fostering the Single Market in financial services by introducing a minimum set of harmonised prudential rules for electronic money issuance and by applying the arrangements for the mutual recognition of home supervision provided for in Directive 2000/12/EC<sup>1</sup> to electronic money institutions (ELMIs). This includes the safeguarding of the financial integrity and the operations of ELMIs by, on the one hand, ensuring the stability and soundness of ELMIs and, on the other hand, ensuring that the failure of any one individual ELMI does not result in loss of confidence in this new means of payment. The E-money Directive further creates a level playing-field for the issuance of electronic money by both traditional credit institutions and ELMIs, thus ensuring that all issuers of electronic money are subject to an appropriate form of prudential supervision.

The amendment, introduced by Directive 2000/28/EC of 18 September 2000, to the definition of credit institution in Article 1, paragraph 1, first subparagraph of Directive 2000/12/EC of 20 March 2000 relating to the taking up and pursuit of the business of credit institutions, obliges institutions that do not intend to enter into the full range of banking operations to issue electronic money in accordance with the fundamental rules governing all credit institutions. Such an amendment promotes the harmonious development of the issuance of electronic money throughout the Community and avoids any distortion of competition between electronic money issuers, including with regard to the application of monetary policy measures.

#### *The Investment Services Directive*

Directive 93/22/EEC of 10 May 1993 on investment services in the securities field is also important in the context of payment and securities settlement systems as it abolishes (see Article 15) i) restrictions on access to regulated markets in EU Member States, and ii) restrictions on access to, and membership of, bodies performing clearing and settlement functions for regulated markets. The abolition of these restrictions on access benefits both investment firms and credit institutions (see Article 2.1).

## **1.2 The role of the Eurosystem**

The smooth functioning of payment systems is of particular concern to central banks for three main reasons: i) a major malfunction in a payment system could undermine the stability of financial institutions and markets; ii) the soundness and efficiency of payment systems and the security of payment instruments affect the confidence of users and, ultimately, public confidence in the currency; iii) payment systems represent essential vehicles for the

<sup>1</sup> Directive 2000/12/EC of the European Parliament and of the Council of 20 March 2000 relating to the taking up and pursuit of the business of credit institutions (includes the former First Banking Co-ordination Directive and the Second Banking Co-ordination Directive, which were essential in achieving the Single Market for banking services in the EU).

implementation of monetary policy. The payment systems policies of central banks are aimed at ensuring the efficiency and soundness of payment systems. In order to achieve these policy objectives the payment and settlement services offered by the private sector are overseen by central banks (for further details on the oversight of payment systems see Section 1.2.1). Central banks also offer settlement services themselves and sometimes assume an operational role in payment systems. For the Eurosystem, this dual role of regulator (“overseer”) and service provider is emphasised, in particular, in Article 22 of the Statute of the ESCB.

In addition, the Eurosystem acts as a catalyst for changes in the field of payment systems.

Central banks’ payment systems function and prudential banking supervision share the objective of financial stability, i.e. they are both aimed at reducing the risk of financial crisis. However, while prudential supervision looks at institutions, central banks focus on the oversight of systems. The Eurosystem considers close co-operation between payment system overseers and banking supervisors essential. Therefore, EU payment systems overseers and banking supervisors have agreed on a Memorandum of Understanding (MoU). The MoU is aimed at promoting co-operation between payment systems overseers and banking supervisors in relation to large-value interbank fund transfer systems (IFTs).

With regard to securities clearing and settlement systems, the Treaty contains no explicit reference to the role of the Eurosystem. Nevertheless, the interest of the Eurosystem goes beyond the limited perspective of a user of collateral in the context of its monetary policy and intraday credit operations. With its general responsibility for financial stability, the Eurosystem, like any central bank in the developed world, has a general interest in the smooth functioning of securities clearing and settlement systems with a view to ensuring the smooth implementation of monetary policy and the smooth functioning of payment systems.

In pursuing the above-mentioned objectives, the Eurosystem also co-operates with other bodies and institutions which are active in the field of payment and securities settlement systems (see Section 1.2.4).

### **1.2.1 Payment systems oversight**

As part of their payment systems function, central banks monitor developments in the field of payment and settlement systems in order to assess the nature and scale of the risks inherent in these and to ensure the transparency of the arrangements concerning payment instruments and services. Where necessary they define principles and standards for the promotion of safe, sound and efficient payment and settlement systems. They ensure that the systems, whether these are operated by the central banks themselves or by private operators, comply with these principles and standards.

The oversight role of the Eurosystem – which is recognised in the Treaty (Article 105 (2)) and the Statute of the ESCB (Articles 3 and 22) – covers both large-value interbank funds transfer systems and retail payment systems. With regard to the systems managed by the Eurosystem, standards are applied which are at least equivalent to those applied to privately operated payment systems.

The Eurosystem has clarified its payment systems oversight policy in a statement entitled “Role of the Eurosystem in payment systems oversight” which was published in June 2000. Accordingly, within the Eurosystem, oversight activities are performed in the following manner:

In line with the provisions of the Treaty and the Statute of the ESCB, the Governing Council of the ECB formulates the common policy stance by determining the objectives and setting the standards for payment systems whose functioning may affect the implementation of monetary policy, systemic stability, the establishment of a level playing-field between market participants and cross-border payments within the EU and with other countries.

In areas not specifically covered by the common oversight policy, policies defined at the NCB level apply within the framework of the general common policy stance defined at the Eurosystem level, in relation to which the Governing Council can always take initiatives where necessary. An appropriate level of co-ordination between the ECB and the NCBs of the Eurosystem is ensured for any proposed policy or action in the field of oversight which an individual NCB may wish to pursue at the national level.

The Eurosystem may also formulate a policy concerning the security of payment instruments in order to maintain user confidence. An example of the latter is the "Report on electronic money", published in August 1998.

In line with the principle of decentralisation, implementation of the common oversight policy stance is ensured by the NCBs in relation to domestic payment systems. For systems which have no clear national base, the body entrusted with the oversight responsibility is the NCB of the country in which the system is legally incorporated, unless the Governing Council of the ECB decides otherwise on the basis of features of the system and entrusts oversight responsibility to the ECB. This is the case for the Euro System of the EBA Clearing Company (Euro 1) and for the Continuous Linked Settlement Bank (CLS Bank).<sup>2</sup> In view of increasing cross-border participation in payment systems within the euro area, the Eurosystem favours a co-operative approach towards the implementation of the oversight policy stance, with the local NCB acting as lead overseer, and being responsible for liaising with other relevant NCBs whenever this is required.

The common oversight policy stance can also be legally ensured by ECB legislation in accordance with Article 22 of the Statute. So far, however, only more traditional, informal tools (e.g. moral suasion) are used. Where applicable, implementation can, however, also be enforced by legal instruments available to an NCB.

The ECB and the NCBs of the Eurosystem ensure consistency in the implementation of the oversight policy stance and, in particular, that standards are applied in the same way for all the payment systems concerned. To this end, these oversight activities are co-ordinated at the level of the Eurosystem, through appropriate committees and working groups.

As outlined above, the ECB or the NCB concerned will ensure the management of emergency situations in their capacity as overseers of the different systems. Appropriate information and co-ordination channels have been established within the Eurosystem to ensure timely communication between the overseers.

In carrying out its oversight role the Eurosystem applies general principles, standards, requirements and objectives which are largely defined in the following reports:

In 1993 the Committee of Governors of the Central Banks of the Member States of the EC endorsed the Report entitled "Minimum common features for domestic payment systems", which contained the guiding principles for the preparation of payment systems for Monetary Union. The report underlined the importance of RTGS systems through which as many large-value payments as possible should be channelled in order to maximise the containment of systemic risk. Other large-value systems may continue to operate in parallel with RTGS systems if they fully comply with the minimum standards set out in the "Report of the Committee on Interbank Netting Schemes of the central banks of the Group of Ten countries", published by the Bank for International Settlements (BIS) in November 1990 ("Lamfalussy report"), and if they settle on the same day at a central bank. The 1993 report

<sup>2</sup> It should be noted in this respect that the ECB is the primary overseer for Euro 1, while the ECB is involved in the oversight of CLS as the overseer in respect of the settlement of the euro, in the framework of co-operative oversight set out in the Lamfalussy report. NCBs of participating countries are associated with the oversight activity of the ECB as members of the Eurosystem – the central bank of issue of the euro – and as NCBs of the banks which act as settlement members of CLS Bank.

also elaborated on access criteria, specifying the requirements set out in the Lamfalussy report in this respect within the context of EU legislation. The common oversight policy of the Eurosystem for large-value interbank funds transfer systems (IFTSS) is based, in particular, on these principles. Moreover, in order to provide further guidance for the implementation of Lamfalussy standard I, which requires all systems to have a well-founded legal basis under all relevant jurisdictions, the Eurosystem has developed harmonised “terms of reference” for legal opinions (i.e. a list of issues which have to be addressed in the legal opinion) for foreign participants in large-value payment systems.

The guiding principles of the Eurosystem’s oversight policy in the field of electronic money are the requirements set out in the ECB’s “Report on electronic money” (1998).

In January 2001, the Governing Council of the ECB also adopted the GIO report on “Core Principles for Systemically Important Payment Systems” as one of the standards the Eurosystem must apply when performing its oversight role.

The co-operation between payment systems overseers and banking supervisors contributes to an overall strategy of risk reduction in the financial system. Co-operation between these authorities is necessary since the stability of the financial system may be affected by the risks borne by credit institutions arising from their participation in payment systems or by their provision of settlement services. In early 2001 the ECB, the NCBs of the Eurosystem and the NCBs of EU Member States which have not adopted the single currency, in their capacity as overseers of payment systems, and the EU banking supervisory authorities agreed to a Memorandum of Understanding to set out a framework for their co-operation. According to the Memorandum of Understanding, overseers will endeavour to ensure that supervisors are made aware of the risks credit institutions run through their participation in payment systems or by being the operator/settlement agent of a payment

system. In turn, supervisors will endeavour to ensure that overseers are made aware of the risks posed to the system they are overseeing by the participation of a credit institution and, where the case arises, from the fact that the operator/settlement agent of a payment system is engaged in other banking activities, insofar as these may have implications for its settlement activities. Both authorities shall endeavour to ensure that either one of them is able to take prompt remedial action in the event of problems in a payment system which stem from, or have an impact on, a participating credit institution.

As a rule, the oversight of retail payment systems will continue to be defined by the relevant NCBs. However, where new developments occur or where retail schemes would have potential cross-border implications, general policy lines are defined at the Eurosystem level. In this context, in September 1999 the Eurosystem concluded that the situation for cross-border retail payments was unsatisfactory (see the report entitled “Improving Cross-border Retail payment Services – The Eurosystem’s view”), in particular by comparison with domestic payments with regard to prices and execution times. Prices for cross-border transactions, particularly for cross-border credit transfers, are substantially higher than for domestic ones despite the introduction of the euro, and the execution time needed for cross-border transactions is substantially longer than for domestic ones. The low volumes by comparison with domestic business, the still predominant use of correspondent banking arrangements involving many intermediaries instead of using a single payment infrastructure as is the case domestically, and the lack of standardisation and automation at the interbank and intrabank levels were identified as some of the main reasons for these deficiencies. The Eurosystem, building on the experience gained in domestic environments, felt that a market-based, co-operative approach with banks was the most appropriate for achieving substantial progress. It set out seven objectives (such as a major price reduction for cross-border credit transfers)

and decided to act as a “catalyst for change”. The progress report, published in September 2000, acknowledges that the banking community in the EU has made progress but observes that the objectives defined in the 1999 report have clearly not yet been achieved. Therefore, the Eurosystem has defined further action points in order to ensure that substantial improvements can be achieved by 2002. The Eurosystem will closely monitor the continued progress of the banks and their compliance with the objectives and action points set out in its reports and will continue to assist banks in achieving the common goal by playing the role of a “catalyst for change”. An assessment report on the level of cross-border retail services will be published in early 2002. If banks fail to deliver efficient cross-border payment services by 2002, the Eurosystem would be forced to reconsider its policy of not becoming operationally active.

### **1.2.2 Activities in the area of securities clearing and settlement systems**

According to the Treaty, the Eurosystem’s monetary policy and intraday credit operations should be collateralised. The Eurosystem therefore has a keen interest in ensuring that the transfer, settlement and custody of collateral is safe and efficient. In order to ensure a level playing field within the euro area, the Eurosystem has developed and endorsed nine standards to be met by EU SSSs used for ESCB credit operations.<sup>3</sup> Individual SSSs have been assessed against these standards in order to qualify for use by the Eurosystem. The first assessment was completed before the start of phase three and 29 SSSs qualified. The assessment is carried out on a regular basis in order to monitor major changes in individual SSSs. The Eurosystem also regularly assesses the links established by SSSs for the cross-border transfer of securities.

### **1.2.3 Operational role of the Eurosystem**

One way for central banks to promote the safe and efficient functioning of payment systems is to operate their own payment systems. The main operational role of the Eurosystem lies in

the provision of the TARGET system. However, TARGET is not run by the central banks of the Eurosystem alone. All central banks of the ESCB are connected to TARGET. TARGET is the real-time gross settlement system for the euro. It provides facilities for settlement in central bank money. A more detailed description of TARGET can be found in Section 3.1.

The ECB and NCBs also offer their settlement services to other payment and settlement systems – e.g. the balances of large-value net settlement systems are settled at the central bank.

Some NCBs also run retail payment systems and operate in-house SSSs. More detailed descriptions of the respective systems can be found in the relevant country chapters.

The ESCB is also operationally involved in the cross-border transfer of securities which can be used as collateral to obtain intraday credit from NCBs and for monetary policy operations. For this purpose, the correspondent central banking model (CCBM) was established in order to facilitate the cross-border use of collateral in the Eurosystem’s monetary policy operations and the intraday credit operations of the ESCB. Within the CCBM the NCBs act as correspondents for each other and thereby enable counterparties to use all their eligible assets to obtain credit from their NCBs. Counterparties to the monetary policy operations of the Eurosystem and participants in TARGET in the EU area can only obtain credit from the central bank of the country in which they are established – their home central bank. However, through the CCBM, they can use collateral held in other countries. A more detailed description of the CCBM can be found in Section 4.3.1.

### **1.2.4 Co-operation with other institutions**

In addition to defining principles, etc. on its own, the Eurosystem also actively co-operates with other bodies and institutions which are

<sup>3</sup> “Standards for the use of EU securities settlement systems”, January 1998.

active in the area of payment and settlement systems.

First, there is the co-operation with the EU Commission, which regularly participates in meetings with the central banks on issues related to payment and securities settlement. In turn, the central banks participate in meetings at the EU Commission, thus ensuring that co-operation is as close as possible (see also Section 1.3.1 below).

The ECB and several NCBs of the ESCB participate in the Committee on Payment and Settlement Systems (CPSS) of the G10 central banks. The CPSS operates under the auspices of the Bank for International Settlements (BIS) based in Basel. The CPSS monitors and analyses developments in payment and securities settlement systems. Its activities are generally more analytical than policy-oriented in nature. Nevertheless, its reports on many different issues have often had a strong influence on practical developments worldwide (for further information visit the BIS website at [www.bis.org](http://www.bis.org)).

The ECB and several NCBs are participating in a joint task force of the CPSS and the International Organization of Securities Commissions (IOSCO) in the field of SSSs. The task force has already published a consultative draft report on "Recommendations for Securities Settlement Systems" aimed at developing recommendations for the design, operation and oversight of SSSs. The purpose of these recommendations is to reduce systemic risk, increase efficiency and provide adequate safeguards for investors.

The Eurosystem also co-operates closely with banking supervisors. Such co-operation and co-ordination contribute to achieving the overall objective of reducing risk in the financial system and help to promote stability.

Furthermore, the Eurosystem actively promotes the further harmonisation of codes and operational standards which would enable the straight-through processing (STP) of payments. This is crucial for achieving greater

security and efficiency in payment and settlement systems.

Last, but not least, the Eurosystem regularly meets with market participants in order to maintain close contact with the market, to convey its ideas to the market and to obtain feedback from market participants on how the work of the Eurosystem in the area of payment and securities settlement systems is perceived.

### **1.3 The role of other private and public sector bodies**

#### **1.3.1 The Commission of the European Communities, the Council of the European Union and the European Parliament**

The promotion of the smooth operation of payment systems is mentioned in the Treaty as one of the basic tasks of the Eurosystem. Nevertheless, the Commission of the European Communities (the Commission), in its function as the executive body of the EU, and the Council of the European Union (EU Council) and the European Parliament in their function as the legislative bodies of the EU continue to concern themselves with issues related to payment and securities settlement systems.

One of the tasks of the Commission is to strive for further harmonisation of the laws within the Union, including those which have an impact on payment systems, by issuing Directives which have to be implemented in national law by the Member States. One of the principal aims is to create a single market with a level playing-field and equal opportunities throughout the EU. Consumer protection is another area in which the Commission is active. A recent example can be found in the field of cross-border retail payment systems, where the Cross-Border Credit Transfers Directive of the EU Council and the European Parliament (see Section 1.1) complements the initiatives of the Eurosystem and is pushing the industry to improve the situation quickly. The Commission has also launched an initiative to explore how fraud and counterfeiting in payment systems can be prevented. Another



area in which the Commission has recently been active is in the cross-border use of collateral. A draft directive proposing a harmonised framework for the use of collateral is to be submitted to the EU Council in 2001.

### **1.3.2 Banking federations and associations**

Most banks in the EU are organised into national federations or associations in order to represent their interests as a group towards public and private institutions. The national federations and associations also co-operate at the European level in the European Association of Co-operative Banks, the European Savings Banks Group and the European Banking Federation. These European organisations act as platforms for exchanges of views, for reaching agreement on common business policies and for other matters which require a common understanding at the European level. Such activities take place both within the organisations and between the organisations and their bodies. In some countries the banking federations and associations play an important role in negotiating with third parties and agreeing on matters (including payment systems issues) on behalf of their members.

### **1.3.3 Other federations and associations**

There are other relevant federations and organisations in the field of securities clearing and settlement systems which act as platforms to promote the interests of their members, to facilitate exchanges of views and to develop common standards and practices. The most significant organisations are the European Central Securities Depositories Association (ECSDA), the European Association of Central Counterparty Clearing Houses (EACH) and the Federation of European Securities Exchanges (FESE).

### **1.3.4 SWIFT**

#### *1.3.4.1 SWIFT organisation*

The Society for Worldwide Interbank Financial Telecommunication (SWIFT) is an industry-owned co-operative set up under Belgian law

and controlled by its member banks (including central banks) and other financial institutions. SWIFT's business is to supply secure messaging services and interface software, to contribute to greater automation of the financial transaction processes and to provide a forum for financial institutions to address issues of common concern in the area of financial communications services.

SWIFT was founded in 1973 by 239 banks from 15 countries. By June 2000, more than 7,000 financial institutions from 192 countries were connected to the SWIFT network. The figures provided by SWIFT in its 1999 Annual Report show that the number of shareholding members decreased from 3,052 in 1998 to 2,230 in 1999. However, this was due to the fact that a new category of participant had been created, whereby banks which were entitled to fewer than five shares were given the option of becoming "non-shareholding banks". Therefore, the number of institutions connected to the SWIFT network may be said to have grown continuously since 1995. Since that date the number of sub-members (i.e. subsidiaries of members) has increased from 2,107 to 2,852 and the number of participants (such as securities brokers and dealers, investment management institutions and various other institutions, mainly from within the securities business) increased from 277 to 1,936. The number of institutions and countries from which participants come has also been rising over the past five years.

SWIFT has an Executive Board of up to 25 directors which is responsible for governing the company. The Board has four committees: Audit and Finance, Compensation, Operations, and Policy. In addition, Board task forces provide guidance and direction to the Executive Board on important business matters. At present, there are four Board task forces for e-Commerce, Next Generation, Pricing, and Standards. There is also a Securities Steering Council, whose members represent banks, brokers/dealers and fund managers.

The international dimension of SWIFT's activities is reflected in the oversight

arrangements which are set up. As SWIFT is located in Belgium, the National Bank of Belgium acts as lead overseer and is supported in this task by the other G10 central banks, including the ECB. The practical co-ordination takes place in the Committee on Payment and Settlement Systems (CPSS), on which all G10 central banks are represented.

#### *1.3.4.2 Recent developments*

In 1997 SWIFT announced plans for its “next generation” of products and services running on a secure internet protocol (IP) network. The first phase of this project was realised in 1999 when the “next generation” concept, SWIFTNet, went into operation, offering add-on services such as real-time information.

In July 1999 SWIFT published a “white paper” entitled “Building for tomorrow”, describing the new range of SWIFTNet services and related products, the phases of their introduction and the continuing role of the current network and services during the roll-out of the new environment.

SWIFTNet services have been introduced with the objective of offering the financial industry a standard platform for financial communication and messaging and a package of interactive capabilities. SWIFTNet complements the FIN service in supporting real-time financial operations. The FIN services provided by SWIFT enable financial institutions in more than 190 countries to exchange financial data in a secure and reliable manner.

Current SWIFTNet capabilities range from interactive query/response and transaction inputting to http-based browsing and file transfer.

SWIFT’s plan to allow access to FIN via SWIFTNet and to dismantle the existing X.25 network infrastructure by the end of 2004 has been endorsed by its Board of Directors.

SWIFTNet FIN will provide customers with single-window access to both SWIFTNet services and FIN. This will eliminate the necessity of managing two separate technical

infrastructures in order to access SWIFT services, thereby reducing costs.

#### *1.3.4.3 Payments infrastructure*

SWIFT provides the interlinking messaging service for the 15 central banks participating in TARGET. In the EU, SWIFT also provides the messaging infrastructure for the Euro I system of the Euro Banking Association, ELLIPS (Belgium), DEBES (Denmark), BOF-RTGS (Finland), TBF/PNS (France), HERMES (Greece), IRIS (Ireland), LIPS (Luxembourg), SPI (Spain), RIX (Sweden), CHAPS Euro (United Kingdom) and remote access for EAF and ELS (Germany). In Italy, FIN has been used since November 2000 to allow banks from abroad to access the BIREL system and to offer domestic banks an alternative for TARGET-related transactions. The Deutsche Bundesbank and CHAPS have also recently signed agreements with SWIFT and the Oesterreichische Nationalbank is in discussions with SWIFT regarding enhanced SWIFT facilities to access their payment system ARTIS.

Looking at the situation outside the euro area, by the end of 1999 SWIFT was providing the network infrastructure for payments clearing systems in Australia (PDS), Canada (LVTS), Croatia (HSVP), Hungary (VIBER), New Zealand (SCP), Norway (NICS), Slovenia (SIPS), South Africa (SAMOS) and Venezuela (PIBC). Another 12 systems are currently under discussion or in the process of being implemented.

The involvement of SWIFT in CLS, a single industry facility for reducing settlement risk in the foreign currency markets, is related to the provision of the network infrastructure.

Four pilot banks have been using SWIFTNet InterAct, SWIFT’s interactive communication service, which supports the exchange of request and response messages between two parties and allows users to browse remote data sources and to communicate with CLS Services in the testing phase of the CLS programme. The CLS network uses both SWIFT’s current FIN messaging service and

SWIFTNet InterAct. CLS members can input transactions using the standard SWIFT treasury confirmation message, which is copied to CLS Bank for settlement. Alternatively, they will be able to use SWIFT's Accord service to match confirmations prior to their submission to CLS Bank. CLS Bank will provide real-time operational information via SWIFT's new private IP network.

#### *1.3.4.4 SWIFT messaging*

SWIFT is the most widely used payment service provider worldwide. As the main carrier for payment information, its message types, formats and technical infrastructure set a kind of benchmark for the processing of payments.

In order to support the provisions of Directive 97/5/EC on cross-border credit transfers and to accommodate customer requirements to have a better credit transfer message, MT 103 (Single Customer Credit Transfer) was implemented and came into general use on 18 November 2000. Since then, all authorised SWIFT users have to be able to receive and process MT 103.

With regard to the future of MT 100, countries were invited to express their preferences during the second quarter of 2000. The SWIFT Board acknowledged their vote at its June meeting, confirming that the MT 100 will be removed from the FIN network with the

Standards Release 2003. This means that, in addition to receiving MT 103, all users will also have to be able to transmit MT 103 as of Standards Release 2003.

The precise date of the Standards Release 2003 will be announced at the end of 2002. SWIFT also recommends that all users which regularly have the opportunity to batch one-off or repetitive payments consider registering for and implementing MT 102 (Multiple Customer Credit Transfer.)

#### *1.3.4.5 SWIFT statistics*

The 1999 SWIFT Annual Report revealed that message traffic increased during 1999. The area covering Europe, the Middle East and Africa processed 60% of the total number of messages (1.05 billion). The total number of messages increased by 13.3% compared with 1998. Rapid growth in securities and infrastructure messaging was also maintained.

SWIFT's largest market, i.e. payment messages, grew by 10% compared with 1998 (669 million payment messages in 1999). Securities is currently the second largest market and also the fastest growing, with an increase of 50% compared with 1998 (224 million messages in 1999). Finally, trade finance messages showed growth of 3% (40 million messages in 1999).

## **2 Payment media used by non-banks (aggregated euro area description)**

### **2.1 Cash payments**

The euro was introduced as a currency in its own right on 1 January 1999, although euro banknotes and coins will only be brought into circulation on 1 January 2002. Until then, the legacy currencies of the euro area countries, which are national sub-divisions of the euro,

will continue to be used for cash transactions in the euro area. In 1999, the amount of notes and coins in circulation outside credit institutions in the euro area reached €351.4 billion. The growth rate of cash in circulation varied widely across the euro area, with the highest, double-digit increases usually found in the fastest-growing economies.

Owing to their anonymous nature, there is no precise data on the value and number of cash payments conducted in the euro area. Taking as an indicator the amount of cash in circulation as a percentage of GDP in 1999, cash payments seemed to be in least demand in Finland (2.3%) and France (3.4%). The highest ratios were found in Spain (9.7%), Austria (6.7%), Germany (6.6%) and Italy (6.0%), indicating a higher use of cash for payments. However, any comparison is made difficult by the fact that for some of the legacy currencies there is a substantial though not precisely measurable amount of cash in circulation outside the country of origin.

## 2.2 Non-cash payments

Credit transfers are the most widely used means of non-cash payment in the euro area, followed by direct debits, as these means of payment offer the most convenience to their users. Also on the rise are card-based payments, with debit cards being preferred to credit cards in most countries.

Although traditionally a very important payment instrument, in many countries of the euro area cheques have been replaced to a large extent by other payment instruments. Even in countries where the actual number of cheque payments is still rising (Ireland, Italy), their importance relative to other payment instruments is declining.

### 2.2.1 Cheques

In 1998, almost 70% of all cheques in the euro area, or 4.8 billion, were used in France, while in the rest of the euro area approximately 2.1 billion cheques were used. Following the trend of recent years, cheque use declined further in 1999.

In Ireland and France, cheques are still the most widely used payment instrument, accounting for almost half of all non-cash transactions. Cheques were also quite popular in Portugal (34% of total non-cash transactions in 1999) and Italy (28%). Although in Spain cheques made up only 11% of all non-cash transactions in terms of volume, they

accounted for 39% of transactions in terms of value, indicating the still high importance of this payment instrument for the economy. In Finland, on the other hand, the use of cheques was very marginal, representing just 0.2% of total non-cash transactions performed in 1999. Cheques also accounted for a smaller percentage of non-cash transactions than the euro area average in Belgium (6%), Germany (4%), Austria (2%) and the Netherlands (1%).

### 2.2.2 Credit transfers

Credit transfers are the most widely used means of non-cash payment in the euro area. In 1999 they accounted for close to half of all non-cash transactions in the euro area.

Credit transfers are the preferred non-cash payment instrument in more than half of the euro area countries. In Finland they made up 59% of all non-cash transactions in 1999, in Austria 58%, in Belgium 52%, in Germany 50%, in Italy 42% and in the Netherlands 41%. Estimates suggest that credit transfers are also the most commonly used non-cash payment instrument in Luxembourg. Only in Ireland (20%), Spain (14%), Portugal (6%) and France (18% in 1998) do consumers favour other payment instruments over credit transfers.

### 2.2.3 Direct debits

The importance of direct debits in the euro area has grown in recent years because of an increased tendency for utility and retail companies to offer this service. In 1999 direct debits accounted for about one-third of non-cash transactions in the euro area.

The use of direct debits ranged from 4% of total non-cash transactions in Finland to 51% in Spain. Direct debits were the second most frequently used non-cash payment instrument in Germany (40%), Austria (29%) and the Netherlands (28.9%). In the other euro area countries direct debits played a significantly smaller role, with their share in total non-cash transactions in 1999 ranging between 10% and 14%.

### 2.2.4 Payment cards

Though still outweighed in most euro area countries by credit transfers or direct debits, the use of credit and debit cards has increased throughout the euro area as a result of a growing acceptance of card-based payments by retailers. In 1999 about one-sixth of all non-cash transactions in the euro area were completed using some form of payment card.

Debit cards are more widely held than credit cards in most countries of the euro area, outweighing the latter on average 4:1 in terms of the number of cards in circulation in 1999. Although there are more terminals which accept credit cards than debit cards in the euro area (more than 14,000 per 1,000,000 inhabitants as compared with 9,274), debit cards are used on average almost four times as often as credit cards.

Payment cards dominated non-cash payments in Portugal, where in 1999 some 47% of transactions were completed using credit or debit cards. They were the second most important payment instrument in Finland (37%), Belgium (29%), Spain (24%), Ireland (20%) and France (24% in 1998), and were just marginally outnumbered by direct debits in the Netherlands (28.6%). According to estimates, the use of credit and debit cards is also quite significant in Luxembourg. At the other end of the scale, a mere 5% of total non-cash transactions in Germany were conducted using credit or debit cards. In Italy (19%) and Austria (11%) payment cards were also relatively less important than in the rest of the euro area.

#### 2.2.4.1 Credit cards

The number of credit cards in circulation in the euro area reached 209 per 1,000 inhabitants in 1999. They were used for an average of 5 transactions per person per year.

In 1999, the most cards per 1,000 inhabitants were found in Luxembourg (691), which at the same time had the most credit card transactions per person per year (29.1). Also well above the euro area average in usage were

Portugal (14.3 transactions per person per year and 258 cards per 1,000 inhabitants), Ireland (12.6 and 304) and Finland (11.6 and 575). Although in Spain there were 400 credit cards per 1,000 inhabitants in circulation, they were used rarely – just 5.6 transactions per person per year. There was also less demand for credit cards in the other euro area countries, with cards in circulation ranging between 200 and 300 per 1,000 inhabitants and usage below the euro area average. Trailing in the number of credit cards in circulation was France with a mere 20 cards per 1,000 inhabitants.

#### 2.2.4.2 Debit cards

Debit cards are the most widely held kind of payment card in the euro area. There were 818 debit cards per 1,000 inhabitants in circulation in the euro area in 1999, which were used for an average of 19.3 transactions per person per year.

The leading country in the circulation of debit cards in 1999 was the Netherlands with 1,272 cards per 1,000 inhabitants and 44.3 transactions per person per year. Debit cards were also frequently used in Finland (51.1 transactions per person per year and 647 cards per 1,000 inhabitants), France (48.6 and 552), Portugal (37.1 and 1,084), Belgium (34.7 and 1,182) and Luxembourg (23.2 and 619). Despite a large number of debit cards in circulation, Germany (1,099 cards per 1,000 inhabitants) and Spain (1,085) recorded only between 5 and 7 transactions per person per year, which was the same range of usage observed in Austria (with 731 cards per 1,000 inhabitants in circulation), Italy (351) and Ireland (154).

## 2.3 Recent developments

The most notable recent development in the usage of payment instruments by non-banks is the increased tendency for consumers to issue and transmit payment instructions electronically to their banks. Banks in the euro area are actively taking advantage of recent advances in technology and are increasingly offering internet-based and mobile phone-

based banking to complement established forms of remote banking, like self-service banking, home banking and phone banking. Acceptance of those new media by consumers for payment purposes depends on the availability and cost structure of the underlying technology, which vary quite significantly between individual countries. Recent initiatives by the banking sector to standardise and simplify the use and enhance the security features of internet banking, electronic bill presentment and payment (EBPP) and e-money schemes (see 3.4) should facilitate this process.

Although there has been a lot of discussion about the use of e-money and its importance, it is still not a widely used medium. In 1999 only 0.3% of transactions were conducted using e-money, which nevertheless represents a doubling of the 1998 figure. A number of national e-money and prepaid card schemes are preparing or currently testing the adaptation of their cards for use in internet transactions, either through an online verification procedure or through a plug-in terminal for personal computers. Such an

expansion in the features of those cards could eventually lead to a stronger demand from the consumer side, and growing familiarity with this means of payment could stimulate its use.

While within any given euro area country the level of standardisation of retail payment instruments is high, there is a notable lack of standardisation across countries. Cross-border retail payments are often presented in formats unsuitable for efficient straight-through processing and therefore require costly manual intervention. The Eurosystem is currently engaged in efforts to facilitate the efficient processing of cross-border retail credit transfers within the euro area by, among other things, encouraging the banking sector to implement international standards, such as the International Bank Account Number (IBAN) and the International Payment Instruction (IPI). The banking sector is also engaged in efforts to create interoperability between card networks and direct debit schemes in different countries in order to enhance their cross-border usability (see Section 3.4).

### 3 Interbank exchange and settlement systems

#### 3.1 The real-time gross settlement system: TARGET

The Trans-European Automated Real-time Gross settlement Express Transfer (TARGET) system is the real-time gross settlement system for the euro. It is a decentralised system consisting of 15 national RTGS systems, the ECB payment mechanism (EPM) and the Interlinking system. The latter is a telecommunications network linking the national RTGS systems and the EPM. The system successfully commenced live operations on 4 January 1999 with some 5,000 participants throughout the EU.

The decision to construct the TARGET system was taken by the Council of the European Monetary Institute (EMI) in March 1995.

TARGET was developed to meet three main objectives: first and foremost, to facilitate the integration of the euro money market in order to allow for the smooth implementation of the single monetary policy; second, to improve the soundness and efficiency of payments in euro; and third, to provide a safe and reliable mechanism for the settlement of payments on an RTGS basis, thus contributing to a minimisation of risks in making payments. In order to achieve these objectives, TARGET offers the possibility of transferring central bank money on a cross-border basis as smoothly as in the domestic market, making it possible to re-use these funds several times a day.

In order to minimise the time required and the costs to the central banks and credit institutions of establishing TARGET, it was

agreed to harmonise national RTGS systems only to the extent necessary to ensure both uniformity in the implementation of the monetary policy of the ECB and a level playing-field for credit institutions. Although several technical and organisational features continue to differ between NCBs, TARGET has been set up in such a way that the use of the system is very similar for participants, whether in domestic or in cross-border mode.

A unique feature of TARGET is that its euro payment services are available throughout the EU, which is a wider area than that in which the single currency has been adopted. Indeed, three EU countries which have not yet adopted the euro (Denmark, Sweden and the United Kingdom) are connected to TARGET. Since it is necessary for all countries adopting the euro to participate in TARGET, and as the time that was available to set up the system was limited, all EU NCBs had to start investing money in TARGET before they knew whether they would be part of the euro area. Thus, in 1995, the EMI Council agreed that all current EU NCBs should be ready to connect to TARGET by 1999. It was pointed out, however, that for those countries which did not adopt the euro from the outset, the connection would be subject to certain conditions which were subsequently decided by the Governing Council of the ECB.

### 3.1.1 Operating rules

The rules governing TARGET and its operation can be found in the Guideline of the European Central Bank on a Trans-European Automated Real-time Gross settlement Express Transfer system ("TARGET Guideline") and the sets of rules and procedures contained in the national regulations and/or contractual provisions ("national RTGS rules") applying to each of the national RTGS systems and the EPM which are the component parts of TARGET. The TARGET Guideline came into effect on 1 January 1999, i.e. the starting date of Stage Three of EMU.

The TARGET Guideline applies to the ECB and the NCBs participating in the Eurosystem. It includes provisions on, inter alia, a number of

minimum common features with which each national RTGS system participating or connected to TARGET shall comply (e.g. access criteria, currency unit, pricing rules, time of operation, rules referring to what kind of payments may be processed through TARGET, when a payment order should be processed or when a payment order is considered to be irrevocable, and intraday credit); arrangements for cross-border payments through the Interlinking system; security strategy and security requirements for TARGET; provisions establishing the framework for the audit of TARGET; and the management of TARGET.

An agreement has been entered into by the Eurosystem and the NCBs of the Member States which did not adopt the single currency on 1 January 1999. It provides a mechanism through which the NCBs of Member States outside the euro area are able to connect to TARGET and adhere to the rules and procedures referred to above. Some modifications and refinements have been made to these rules and procedures in order to take into account the special situation of the NCBs of Member States outside the euro area.

### 3.1.2 Participation in the system

According to the TARGET Guideline, only supervised credit institutions as defined in the first indent of Article 1 of the First Banking Coordination Directive<sup>4</sup> which are established in the European Economic Area (EEA) can be admitted as direct participants in a national RTGS system. In addition, as an exception, the following entities may also be admitted as participants in a national RTGS system subject to the approval of the relevant NCB:

- treasury departments of central or regional governments of Member States active in money markets;
- public sector bodies of Member States authorised to hold accounts for customers;

<sup>4</sup> This is now incorporated into Directive 2000/12/EC of the European Parliament and of the Council of 20 March 2000 relating to the taking up and pursuit of the business of credit institutions.

- investment firms established in the EEA which are authorised and supervised by a recognised competent authority; and
- organisations providing clearing or settlement services subject to oversight by a competent authority.

The criteria for participation in a national RTGS system are set out in the RTGS rules concerned and are available to the interested parties. RTGS rules require reasoned legal opinions, based on the Eurosystem's harmonised terms of reference for legal opinions, to be requested from applicants and reviewed by the relevant NCB. The harmonised terms of reference are available to interested parties. Capacity opinions (which establish that an applicant is legally able to conclude agreements) are requested for each individual (domestic and foreign) applicant when joining the system, unless such opinion has been received in another context. Country opinions (which establish that there are no foreign legal provisions which could have adverse effects on the agreements concluded) are requested from the jurisdictions of foreign participants, whether they are incorporated in an EEA or a non-EEA country.

All credit institutions participating in national RTGS systems automatically have access to the cross-border TARGET service.

It is also possible for credit institutions to access TARGET remotely. Remote access to settlement facilities in TARGET is defined as the possibility for an institution, established in a country in the EEA, to become a direct participant in an RTGS system in TARGET in another country and, for that purpose, to have a settlement account in euro in its name with the central bank of that country without necessarily having established a branch or subsidiary in that country. Such credit institutions can only participate in TARGET on a positive balance basis as they do not have recourse to intraday credit or to the Eurosystem's marginal lending facility.

### 3.1.3 Types of transaction handled

TARGET can be used for all credit transfers in euro. It processes both interbank and customer payments and there is no upper or lower limit placed on the value of payments. All payments are treated equally, irrespective of their value.

The following types of transaction are handled by TARGET:

- payments directly connected with central bank operations in which the Eurosystem is involved either on the recipient or the sender side;
- the settlement operations of large-value netting systems operating in euro; and
- interbank and commercial payments in euro.

It is mandatory for the first two types of transaction to be settled through TARGET.

TARGET is also used for the handling of transfers made between ESCB central banks.

### 3.1.4 Operation of the transfer system

In order to meet the needs of the financial markets in general and of its customers in particular, TARGET provides long daily operating hours: it opens at 7 a.m. and closes at 6 p.m. ECB time (Central European Time). In order for participants to better manage their end-of-day liquidity, customer payments are subject to a cut-off time set at 5 p.m. Furthermore, common closing days apply to TARGET. From 2002 onwards, TARGET will be closed not only on Saturdays and Sundays, but also on New Year's Day, (Catholic/Protestant) Good Friday, (Catholic/Protestant) Easter Monday, Labour Day (1 May), Christmas Day and 26 December. In 2001, in addition to the aforementioned closing days, TARGET will also be closed on 31 December. TARGET closing days are, in effect, non-settlement days for the money market and the financial markets in euro, as well as for foreign exchange transactions involving the euro. The CCBM for the cross-border use of collateral will be closed on TARGET closing days.



The TARGET set-up can be described as a decentralised system in which payment messages are exchanged on a bilateral basis without a central counterparty. No information on payment orders exchanged is sent to the ECB during the business day. However, in order to ensure the correctness of the processing of the cross-border payments exchanged within the system during the business day and the inter-NCB balance positions resulting from this activity, specific control operations are performed at the end of the day by the End-of-Day Application maintained by the ECB. These operations include a check that all bilateral messages sent by one NCB to another NCB have been received and that the total values of cross-border payments sent and received by the NCBs during the day match. No NCB may close before it has finalised its positions with all bilateral partners.

### **3.1.5 Transaction processing environment**

Cross-border TARGET payments are processed via the national RTGS systems and exchanged directly on a bilateral basis between NCBs. All participants are identified by a Bank Identifier Code (BIC) and are listed in the TARGET Directory, which is available from SWIFT and contains BICs worldwide.

National RTGS systems and the EPM are connected via the Interlinking system which is composed of a telecommunications network linked in each country to a local interface called the national Interlinking component. These components consist of infrastructures and procedures which are used within or in addition to each RTGS system to process cross-border payments. The role of the Interlinking components is to convert the presentation of payment data from the national standard into the Interlinking standard and vice versa.

The technical design of the national RTGS systems and the Interlinking components (RTGS operating systems, hardware and software, development tools, design of links between technical components, etc.) fall under the responsibility of the individual NCBs and

the ECB, subject to some minimum common security features and performance requirements which have been defined for RTGS systems linked to TARGET. Areas which have been subject to harmonisation include operating time, pricing and the provision of intraday credit. Given that TARGET incorporates RTGS systems which have been established under local conditions, the payment services offered to the end-users of different national systems are not fully identical. The Interlinking procedures, however, are the same for all countries.

A test centre is maintained at the ECB so that the NCBs and the ECB can test the compliance of their systems with the Interlinking Specifications. All relevant new or amended software facilities have to be tested before being integrated for multilateral testing and for subsequent live operation in TARGET.

### **3.1.6 Settlement procedures**

TARGET is a real-time gross settlement system. Payment transactions are settled one by one on a continuous basis in central bank money.

In order to initiate a cross-border payment, the ordering credit institution sends a payment order to the local NCB through the local RTGS system. The sending NCB checks the validity of the payment (it has to be presented according to the agreed standards and contain the information needed) and the availability of sufficient funds or overdraft facilities. The sending NCB also checks that the receiving RTGS is operational.

The sending NCB is entrusted with the tasks, if necessary, of converting the payment order into the message standard which is used by the Interlinking system, of including the additional security features used for the communication between NCBs and of sending the message through the Interlinking network to the receiving NCB. Once the sending NCB has checked the validity of a payment message and the availability of funds or sufficient overdraft facilities, the amount of the payment is debited irrevocably and without delay from the RTGS

account of the sending credit institution and credited to the Interlinking account of the receiving NCB.

As soon as the receiving NCB receives the payment message, it checks the security features and verifies that the beneficiary bank, as specified in the payment order, is a participant in the domestic RTGS system. If this is the case, the receiving NCB converts, where appropriate, the message from the Interlinking standard into the domestic standard, debits the Interlinking account of the sending NCB, credits the beneficiary's RTGS account and delivers a positive acknowledgement to the sending NCB/ECB. Finally, the receiving NCB sends the payment message, through the local RTGS system, to the beneficiary credit institution. If the receiving bank is not a participant in the RTGS system, the receiving NCB rejects the payment message and asks the sending NCB to re-credit the amount to the sending bank's account.

### 3.1.7 Credit and liquidity risk

TARGET settles payments in central bank money with immediate finality. In TARGET, the account of the receiving institution is never credited before the account of the sending institution has been debited. As a result, there is always the certainty for the receiving institution that funds received through TARGET are unconditional and irrevocable. The receiving institution is therefore not exposed to credit or liquidity risk originating from such payments received.

The availability and cost of liquidity are two crucial issues for the smooth processing of payments in RTGS systems. In TARGET, liquidity can be managed very flexibly and it is available at a low cost, since minimum reserves – which credit institutions are required to hold with their central bank – can be used for settlement purposes during the day and intraday credit is provided free of charge. Moreover, the averaging provisions applied to minimum reserves allow for flexibility in the banks' end-of-day liquidity management. The overnight lending and deposit facilities also allow for "last

minute" reactions to unexpected liquidity situations. In addition, the Eurosystem provides intraday credit free of charge. However, all central bank credit has to be fully collateralised. The range of eligible collateral is very wide. Assets eligible for monetary policy purposes are also eligible for intraday credit.

### 3.1.8 Pricing

The charge for TARGET cross-border payments (excluding VAT) between direct participants is based on the number of transactions sent by a participant within a single RTGS system according to the following degressive scale:

- €1.75 for each of the first 100 transactions per month;
- €1.00 for each of the next 900 transactions per month; and
- €0.80 for each subsequent transaction in excess of 1,000 per month.

The cross-border fee does not depend on the destination or on the value of the payment. Fees are charged only by the sending NCB/ECB to the sending participants in the national RTGS system/EPM. No fees are charged by the receiving NCB/ECB to the receiving participant.

The cross-border TARGET fee structure does not include the costs of the telecommunications link between the sender and the national RTGS system in which the sender is a participant. The fee for this telecommunications link is paid according to domestic rules.

RTGS systems may charge extra fees for any additional services they may provide (e.g. the acceptance of paper-based payment instructions).

The price of domestic RTGS transfers is determined at the national level by the NCBs. When determining the price structure, the NCBs take into account the principles of cost recovery, transparency, an open market economy with free competition and non-discrimination. They must also take into account the fact that the fees for domestic and

cross-border transfers should be in the same range so as not to affect the singleness of the money market. These fee structures are disclosed to interested parties.

### 3.1.9 Statistical data for TARGET

The turnover figures in TARGET have steadily increased since January 1999. In 2000, the daily average of payments processed by the system as a whole (i.e. both cross-border and domestic payments) was 188,157, representing a value of €1,033 billion. TARGET cross-border traffic amounted to 41.8% of the total TARGET value in 2000, compared with 38.9% in 1999, and to 21.2% of the total TARGET volume, compared with 17.6%. Of the cross-border TARGET payments, 96.5% in terms of value and 65.5% in terms of volume were interbank transactions, with the remainder being customer payments. The average value of a cross-border interbank payment was €10.8 million and the average value of a cross-border customer payment was €1.1 million. More detailed statistics can be found in the statistical tables in Annex I.

## 3.2 The Euro I system of the Euro Banking Association

### 3.2.1 Institutional set-up

The Euro Banking Association (EBA) is a co-operative undertaking between EU-based commercial banks and EU branches of non-EU banks. With Euro I, it provides a multilateral large-value EU-wide payment system for euro credit transfers.

The system is governed by three bodies, which have been established under French law. First, there is the Euro Banking Association (EBA), which is an umbrella organisation which is intended to be a forum for exploring and debating all issues of interest to its members, in particular issues related to euro payments and the settlement of transactions in euro. Second, there is the EBA Clearing Company, which operates the Euro I system. It has its registered office in Paris and its shareholders are the clearing banks. The EBA Clearing

Company was set up by the Euro Banking Association (EBA) and incorporated for the purpose of operating and managing the Euro I system. The EBA defines the general principles for the Clearing Company. Third, there is the EBA Administration Company, which was set up to provide administrative services, in particular human, technical and other support to the EBA and the Clearing Company. The relationship between the EBA, the EBA Clearing Company and the EBA Administration Company is governed by a master agreement.

### 3.2.2 Participation and access criteria

Euro I is an international system. As at 31 December 2000 there were 72 clearing banks participating in Euro I. These banks are from all the EU Member States and five non-EU countries (Australia, Japan, Norway, Switzerland and the United States), but all banks concerned are incorporated in the EU or have branches located in the EU. There are three sets of access criteria for Euro I: legal, financial and operational.

The legal criteria stipulate that each participant or applicant shall be a bank with a registered office in a country which belongs to the Organisation for Economic Co-operation and Development (OECD) and is recognised by the EBA Clearing Company as a “qualifying jurisdiction” (see below). Its system office, i.e. its operating branch or, subject to certain preconditions, its operating subsidiary, should be located in the EU, and it should be a member of the EBA. The participant (or applicant) should provide a legal opinion to substantiate its ability to participate in the system (capacity opinion) and to confirm that the Single Obligation Structure (SOS),<sup>5</sup> which is the legal basis of the system, is recognised and enforceable in the country in which the participant is incorporated and/or its system office is located (country opinion). This country opinion need only be provided once. Afterwards the country will be added to the

<sup>5</sup> See also Section 3.2.3 for an explanation of the Single Obligation Structure.

list of jurisdictions which recognise the SOS (“qualifying jurisdiction”).

The financial criteria are that a participant has own funds of at least €1,250 million and a short-term credit rating of at least P2 attributed by Moody’s Investors Service, Inc. or A2 attributed by Standard & Poor’s Rating Services, or any other short-term rating recognised by the EBA Clearing Company.

The main operational criteria are as follows: (i) any participant or applicant must be a direct participant in an EU RTGS system connected to TARGET; (ii) a system office must be designated for participation in Euro I; (iii) adequate technical and operational facilities must be provided which meet the technical specifications laid down by the EBA Clearing Company and their operational reliability and robustness should be certified by the EBA Clearing Company; and (iv) the EBA Clearing Company must be notified of all branches, offices and subsidiaries located in the EU which may participate as indirect members via a clearing bank. The clearing bank would be responsible for the activities of such indirect members and should ensure their proper technical and operational performance in accordance with the Rules. The admission of an applicant is subject to a vote by the shareholders of the Clearing Company, i.e. the clearing banks.

In November 2000, the EBA launched the STEP I initiative for cross-border retail payments. STEP I uses the existing infrastructure of Euro I.<sup>6</sup>

### 3.2.3 Rules of the system

The main features of Euro I are the following:

Euro I operates under the Single Obligation Structure (SOS), a legal structure subject to German law whereby the participants agree to enter into a contractual agreement that on each settlement day, at any given time, each participant will have only one single payment obligation or claim with respect to the community of other participants as joint

creditors/debtors. In accordance with the SOS, the processing of payments in Euro I will entail no bilateral payments, claims or obligations between participants. Nor will there be any form of set-off, novation or netting resulting from the continuous adjustment of the participants’ claim or obligation. The SOS is intended to prevent any unwinding in the event of a participant being unable to honour its single obligation at the end of the day.

### 3.2.4 Types of transaction handled

Euro I processes credit transfers only. Although there are no restrictions as regards the value or the originator of the transactions processed, the EBA intended Euro I as a system which should primarily focus on processing large-value payments made by the EBA participants.

Furthermore, the balances of the EBA’s cross-border retail credit transfer service STEP I are settled via a Euro I participant in the Euro I system. The set-up of STEP I is such that a bank which has joined the EBA’s STEP I arrangement is able to submit and receive low-value payments to or from other STEP I banks and settle the netted balances via a Euro I bank which is acting as its settlement agent. (Detailed information on the STEP I service is provided in 3.3.3.4)

### 3.2.5 Transaction processing environment

The continuous calculation of the single obligation or claim of each participant is carried out by the system computer located at SWIFT, which provides the network and transmission facilities for Euro I and acts as processing agent.

The hardware and software equipment used by the EBA for the management of Euro I – including the EBA monitoring station for the clearing phase and the Business Administration System (BAS) for the settlement phase – is duplicated at a backup site. SWIFT provides

<sup>6</sup> See also Section 3.3.3.4 for a more detailed explanation of the STEP I initiative.

two operation centres for the Euro Clearing System (ECS): one is located in the Netherlands and the other is located in the United States. At both sites, clearing activity is mirrored by a second set of equipment at all times.

### 3.2.6 Settlement procedures

Euro I settles at the end of the day in central bank money at the ECB. The relevant provisions are set out in the Settlement Service Agreement, which has been concluded between the EBA and the ECB. After the cut-off time (i.e. 4 p.m. CET), clearing banks with debit positions will pay their single obligations into the EBA settlement account at the ECB through TARGET. After all amounts due have been received, and upon instruction from the EBA Clearing Company, the ECB will pay the clearing banks with credit positions, also through TARGET.

### 3.2.7 Credit and liquidity risk

As a tool for managing risks, each participant must establish credit lines for all other participants individually (varying from a minimum of €5 million to a maximum of €30 million). On the basis of these bilateral credit lines, the system determines for each participant the multilateral debit cap (sum of limits set for a participant by each other participant) and credit cap (sum of limits set by a participant for each other participant). These multilateral debit and credit limits, which are capped at €1 billion, are binding throughout the operating day. No payment that would cause a breach of any limit is processed by the system at any time. Instead, any payment order which would cause the limit to be exceeded is queued. Participants can change bilateral limits on a daily basis according to their assessment of the creditworthiness of counterparties.

A stand-by liquidity pool, covering the maximum debit position possible in the system, i.e. €1 billion, is held at the ECB. It enables the system to complete settlement in the event that one or more participants fail to settle their single obligation at the end of the day, up

to a total amount not exceeding the balance in the liquidity pool. Each participant contributes to the liquidity pool in equal shares. Each share is assigned or pledged to the benefit of the other participants, so that the amount deposited in the pool can be used to cover the settlement obligations of failing participants. The ECB can only use the cash deposited in the pool to complete settlement if it receives an instruction from the EBA Clearing Company to activate the pool. In the event that the pool is used partially or entirely to complete settlement at the end of the day, the participants must replenish it before the start of processing the following day.

In the event of failures to settle representing an amount in excess of the balance of the liquidity pool, surviving participants will be obliged to provide additional liquidity in order to complete daily settlement. In the event of failures of up to three banks, the amount of liquidity to be provided by each surviving participant shall be proportional to the credit (representing the bilateral limit) granted to the failing participants. If more than three banks fail on the same day, the amount of liquidity to be provided by each participant shall be proportional to their multilateral credit limit (market crisis scenario). Losses are allocated according to the same mechanisms.

The establishment, maintenance and activation of the liquidity pool at the ECB is governed by the Deposit Agreement<sup>7</sup> between the ECB and the EBA for the benefit of the banks participating in Euro I as third party creditors.

### 3.2.8 Pricing

The transaction fee for a Euro I payment is based on the number of payments sent by participants according to the degressive scale below.

<sup>7</sup> The Deposit Agreement is based on §328 (1) of the German Civil Code.

Average daily number of transactions during the invoice period	Charge per transaction (in cent)
less than 800	18
from 800 to 1,499	16
from 1,500 to 2,499	14
from 2,500 to 3,499	13
from 3,500 to 4,499	12
from 4,500 to 5,499	10.5
5,500 and above	9.5

In addition, Euro I clearing banks have to pay an annual fee of €10,000 to the EBA Clearing Company. The annual operating charge of the processing agent (SWIFT) and the operating costs of the EBA Clearing Company are shared quarterly among the clearing banks according to a special distribution key.

### 3.2.9 Statistical data for Euro I

The turnover figures in Euro I have steadily increased since January 1999. The average number of transactions in Euro I in 1999 was 67,895 payments per day with a total value of €170.7 billion. In 2000 the average number of transactions increased to 96,830 payments per day with a total value of €195.0 billion.

## 3.3 Cross-border retail payment systems

### 3.3.1 E-money schemes

So far, only one initiative has been taken to make possible the cross-border use of electronic money schemes in euro. The PACE project (Purse Application for Cross-border Use in euro) was introduced on 5 July 2000 by CETREL (*Centre de Transfers Electroniques*) with miniCASH in Luxembourg, by ZKA (*Zentraler Kreditausschuss*) with GeldKarte in Germany, and by Groupement des Cartes Bancaires and SEME (*Société Européenne de Monnaie Electronique*) with Moneo in France. The electronic purses are interoperable and can be used to make euro-denominated payments in Luxembourg, Germany and France. The three schemes have committed themselves to gradually adopting the Common Electronic Purse Specifications (CEPS). The European Commission is contributing to the financing of

the project within the scope of its IST (Information Society Technologies) programme.

### 3.3.2 Card-based schemes

#### 3.3.2.1 Europay International

##### *The organisation*

Europay International SA was established in Belgium in 1992 and is owned by 9,000 member banks. Europay owns, manages and licences international retail payment product brands as well as managing an international telecommunications network and processing centre. Europay has an international board of directors and the principle members include country associations and individual banking organisations. It is based in Belgium and has ten regional offices providing payment expertise within the context of local banking conditions.

Member institutions market and issue cards to customers and make their own decisions about pricing and marketing (issuing activity). They also sign up and provide services to merchants which accept cards (acquiring activity).

##### *The services*

Europay International offers a range of cashless payment services covering three segments known as “pay later”, “pay now” and “pay before”. In each segment, one or more products are available.

*Pay later:* A range of credit card facilities is available under the Eurocard and MasterCard names. All Eurocard/MasterCard cards are accepted worldwide.

*Pay Now:* Europay International offers the eurocheque and Maestro brands as “pay now” products. The eurocheque can be accompanied by a eurocheque card (ec card) which act as a guarantee. However, Europay and its member banks will completely eliminate the eurocheque guarantee functions for all domestic and cross-border transactions as of 1 January 2002 and will expand the Maestro POS and ATM acceptance networks. Even though

eurocheques and ec cards will still be in circulation and paper eurocheque payments remain possible, eurocheques will no longer be guaranteed in any country, or by any bank, even if they are presented in combination with an ec card.

The Maestro service is a worldwide debit service developed jointly by Europay and MasterCard. There are 166 million Maestro debit cards in issue which can be used at 2.3 million terminals in 41 countries. An agreement with Cirrus (a US-based international ATM network owned by MasterCard) allows European banks to add a worldwide cash access utility to ec-cards and proprietary ATM, electronic debit and cheque guarantee cards. In Europe 253,000 ATMs are available for use with Eurocard/MasterCard and ec card, and 256,000 ATMs are available for use with Maestro and Cirrus.

*Pay before:* Europay International provides traveller's cheques, which are mainly used by customers to obtain cash at (foreign) bank branches, and electronic purses as "pay before" products. The traveller's cheques are accepted at retailers displaying the appropriate logos.

#### *Technical, organisational and clearing aspects*

- Data transmission

Most international transactions made using Europay products are serviced through EPSS (European Payment Systems Services SA, Brussels), which is owned jointly with MasterCard International. EPSS enables data to be exchanged between the acquiring and the issuing bank. Through its telecommunications network, called EPS-Net, Europay provides the following services: data transmission, authorisation, clearing and settlement. National transactions use various national communications networks, which are linked to the international communications networks.

- Authorisation

The issuer of the various Europay products can choose the method of authorisation it wants

for the particular product. This can be the so-called "online to issuer" method or the "stand-in system" method, whereby Europay provides the authorisation. Online authorisation to the acquirer is no longer supported.

- Clearing and settlement procedures

Under the Net Settlement Service, cross-border transactions related to all products are cleared at Europay International, where they are sorted and aggregated for each card-issuing company. Claims (acquired transactions) and liabilities (issued transactions) are then offset and the net balance is calculated for each institution in the currency of its choice (multi-currency, multilateral netting with a single cut-off time each day). Foreign exchange operations are limited to those necessary to settle this net balance. Commerzbank, with which all participants hold an account, acts as the settlement institution.

#### *Future developments*

Europay is actively involved in various initiatives and working groups concerning new technological developments. It is an active member of EMVCo (Europay, MasterCard and Visa co-operation), the smart card standard organisation established in early 1999. In January 2000, EMVCo announced the publication of a jointly developed specification for the use of EMV smart cards for secure payments over the internet. The chip electronic commerce specification was created to develop EMV smart cards and terminal standards for the rapidly evolving virtual world.

The company is also a founding member of the Global Mobile Commerce Team – a group of industry leaders working together to identify issues and propose solutions for the mobile commerce sector in order to facilitate the provision of secure, interoperable mobile payments.

Europay has also been active in launching virtual card programmes as a marketing tool for its member banks. The virtual card programme enables a member to create a

special programme intended for the use in remote payment environments where a physical card is not presented to a retailer. It may be used for any remote environment transaction, such as the internet, mail or telephone orders. Currently more than 40 programmes are live or at the pre-launch stage.

Europay has also been providing digital wallets to its members, as a solution for secure e-commerce and m-commerce (mobile commerce). In this context Europay has launched a server-based wallet programme for its members.

The company has also been active in the education of internet merchants by publishing rules for merchants on how they can add to the security of physical and electronic transactions through the correct protection and storage of cardholder data.

### 3.3.2.2 Visa

#### *The organisation*

Visa International is a non-profit-making membership association owned by 21,000 financial institutions worldwide. It consists of six regional divisions: Asia-Pacific; Canada; Central & Eastern Europe, Middle East & Africa (CEMEA); Latin America & Caribbean; United States; and European Union. The Visa EU region has more than 5,700 member financial institutions from countries in western Europe, Israel and Turkey. The headquarters of the Visa EU region are situated in the United Kingdom. Membership is limited to deposit-taking financial institutions and to bank-owned organisations operating in the bank card sector, such as *Carte Bleue* in France and *Servizi Interbancari* in Italy.

Visa is managed by an international board and by six autonomous regional boards. The international board is responsible for global policy; it provides the operating regulations and by-laws and manages a worldwide electronic system which handles authorisations and the transmission of clearing and settlement data. The regional boards have full autonomy in

defining commercial policies and promoting Visa products within their geographical areas. Member institutions market and issue cards to their customers in accordance with their own decisions. In particular, it is up to Visa members to set and charge fees and interest, to decide on credit and spending limits and to choose which benefits should be offered to their cardholders.

#### *The services*

Visa provides the global platforms, systems and processing services needed by members to develop and run card payment businesses. It also contributes to the establishment of standards for global interoperability and security and new technologies in the card payments industry.

Visa has developed a portfolio of products – from ATM cash cards and electronic purses to debit and credit cards. It includes PLUS, Visa Electron, Visa Classic, Visa Gold, Visa Platinum, Visa Infinite and Visa traveller's cheques. Visa has also created a range of commercial cards like Visa Purchasing for large companies and Visa Business for smaller companies.

For both EU and CEMEA (Central & Eastern Europe, Middle East & Africa), the figures up to the end of September 2000 are set out in the table below.



	EU	CEMEA
Total number of cards (incl. PLUS)	171.7 million	20.9 million
Annual cardholder expenditure	USD 541 billion (€611.8 billion)**	USD 46.4 billion (€52.5 billion)**
Total number of Visa transactions	8.3 billion	13,969 million
Total number of acceptance locations	4.9 million	514,812
Total number of banking offices available to Visa cardholders	164,900	29,559
Cash dispensing machines (ATMs) which can be used by Visa cardholders	238,496	28,329
Cash dispensing machines (ATMs) which can be used by PLUS cardholders	233,744	28,296
Number of members	5,248*	1,462
Traveller's cheque sales volume	not available	

\* As at end of June 2000.

\*\* Exchange rate at end-September 2000: €0.88417.

Source: Visa International.

#### Technical, organisational and clearing aspects

- Data transmission

VisaNet is the computer and telecommunications network which links Visa's member financial institutions worldwide with the two Visa Interchange Centres located in the United Kingdom and the United States. Each of these centres is capable of processing every Visa transaction in order to ensure the regular working of the system should a disaster put one out of action. Two applications are managed through VisaNet: the Base I authorisation service and the Base II clearing and settlement service.

- Authorisation

Before a transaction is finalised, a series of security checks is carried out through VisaNet in order to ensure that the card is valid; has not been lost, stolen or forged; the cardholder's spending limit has not been exceeded and the cardholder's personal

identification number (PIN), if used, is correct. The Visa authorisation service operates 24 hours a day, 7 days a week.

- Clearing and settlement procedures

The Visa International Base II system clears transactions and facilitates settlement. It operates six days a week. To complete such calculations, Visa International supports approximately 180 transaction currencies, including the euro, enabling the processing of international transactions. Members can choose to receive their transaction reports in any of these currencies.

Between the introduction of the euro on 1 January 1999 and September 2000 Visa processed more than 11.3 million transactions in euro, amounting to over €400 million (the bulk of transactions are still processed in the legacy currencies). In August 2000 the number of euro transactions passing through Visa systems exceeded 1 million per month for the first time. The majority of euro transactions takes place in France, the United Kingdom and

Germany, which together account for up to 95% of the total number of euro transactions. Nearly half of all the euro transactions were conducted by Spanish, German and Belgian cardholders. In 1999 transactions related to road tolls and bridge fees constituted the majority of the total volume of euro traffic. However, the share of road toll and bridge fee transactions has been declining throughout 2000 as travel, entertainment, e-commerce, mail and telephone order transactions increase.

26 currencies can be used in the net settlement between Visa International and the participating Members, the choice of currency being decided by each member involved in the settlement. The necessary foreign exchange operations are executed with two banks, one located in London (Barclays) and one in New York (Citibank).

Settlement is not carried out through Base II, Visa merely provides the data to allow settlement to be carried out. For settlement in US dollars, Chase Manhattan Bank, New York, acts as the settlement bank. For multi-currency settlement, Chase Manhattan Bank, London, acts as the settlement bank. All members may hold their own settlement account with any other financial institution, such that all requests for funds or payments are ultimately settled through the correspondent services of domestic clearing and settlement systems.

#### *Some future developments*

The global Visa Secure E-commerce initiative was announced in 2000 to improve the security of cardholder data and guarantee the identity of buyers and sellers on the internet. The initiative includes two major components: the Payment Authentication Program, designed to identify and authenticate buyers and sellers on the Web using the Three Domain Model, and the Global Data Security Program, which establishes standards and best practices for e-commerce merchants, allowing them to ensure the security of cardholder data on their sites. Visa EU will be the first Visa region to introduce the initiative.

The term "Three Domain Model" refers to the

three areas of a payment card transaction flow: i) cardholders and their banks (the issuing domain); ii) merchants and their banks (the acquiring domain); and iii) between the banks themselves (the interoperability domain). This model gives banks a choice in selecting the technology they use to authenticate their cardholders and merchants. Interoperability between the issuer and the acquirer is achieved through the use of a common protocol.

The secure electronic commerce methods currently approved by Visa EU which will be used between the banks within the interoperability domain are:

- Secure Electronic Commerce Transaction as defined in the SET specifications Version 1.0; and
- Chip Electronic Commerce as defined in the Chip Electronic Commerce Specifications Version 1.0, using the chip authentication cryptogram to replace the SET cardholder signature.

In 1998 the Visa EU Board endorsed a seven-year regional chip migration plan to upgrade Europe's card payment transaction environment from a magnetic strip and paper-based platform to an interoperable chip-based one.

Over the next four years a total of USD 150 million will be invested in a financial incentive programme for Visa EU members to support both chip card issuance and terminal development. In addition, Visa EU changed its rules so that as of January 2005, those banks not using chips will be liable for all the fraud losses which chip technology could have prevented. The aim of the initiative is to boost the issuance of chip cards, while ensuring that the deadline of January 2005 is met.

#### **3.3.3 Retail credit transfer systems**

Apart from bilateral correspondent arrangements among banks, some networks have been established between groups of banks for the purpose of enabling customers to make low-value retail payments across borders.

### 3.3.3.1 TIPANET

TIPANET (Transferts Interbancaires de Paiement Automatisés) is a network of member banks from the co-operative banking sector which have set up an arrangement for the execution of cross-border bulk payments. The respective local payment systems can be accessed via the receiving correspondent banks. Co-operative banks from six countries set up an association called TIPA Group, S.C. in 1993. TIPANET is in fact a network of 11 co-operative banks from 8 countries, not only in Europe, but also overseas, namely in Canada. In addition, some banks have established their own international correspondent networks, which apply the TIPANET standards, without being members of the TIPA Group, S.C. For example, the German co-operative banking association has an international clearing network with 25 partners in a total of 18 countries.

Each TIPANET member is free to seek out the most suitable international partners for its business interests, its business tradition and its international trade relations.

TIPANET processes credit transfers, direct debits and cheques, of which credit transfers account for the biggest share of transactions processed. The maximum amount of a transaction that can be transferred corresponds to the balance of payment reporting threshold in the recipient's country. The beneficiary should usually receive TIPANET payments within two business days.

The local correspondent collects all payment instructions and converts them into the TIPANET message format, which complies with the SWIFT MT 102 message. The TIPANET format is sufficiently open to allow for the processing of credit transfers as well as for the processing of cheques. After collecting the payment orders, the local correspondent creates payment batches, which are then sent to the respective foreign correspondent, which will then convert the data into its domestic format and process the payments in the relevant local payment system. The cut-off time

for the exchange of files is 4 p.m. (local time of the receiving bank) on the day before processing. The beneficiary's account will usually be credited two days later.

The settlement of payments takes place via the existing reciprocal accounts, which the correspondents hold for each other (loro and nostro accounts). The conditions for settlement are agreed bilaterally between the banks concerned.

Fees are charged individually by each participant bank. The fees are often differentiated according to the type of customer and the way in which the payment instructions are submitted (paper-based or in electronic form).

The next steps are the increase of the transaction ceiling to €50,000 and the exchange of direct debit files, not only at a cross-border level, but also at the national level.

### 3.3.3.2 Euro-giro

Euro-giro was established in 1989 as a co-operation between the postal and giro organisations to build a network for the exchange of cross-border payments. The participants act as correspondents for each other.

In December 2000, the group consisted of 32 members in 29 countries. All EU countries are covered as well as the United States and Japan. Not all participants belong to the postal bank sector. Some commercial banks also act as access points in some countries.

Euro-giro processes credit transfers and cash-on-delivery orders. The network uses SWIFT message formats for transferring the payment (MT 100, MT 100-20, MT 00-50/60) and achieves a high level of straight-through processing in the interbank chain.

The payments are executed through reciprocal accounts (nostro and loro accounts) which the correspondents hold for each other.

Euro-giro is run by Euro-giro Network A/S, which is based in Denmark. It is a limited company and is owned by 16 European post office banks/postal financial services companies.

Euro-giro has laid down some internal standards, which must be met by participants in order to be able to process payments via the network. The standards address areas such as accessibility and maintenance of the system, formatting of transactions, timescales for the processing of standard payments and key interbank transactions, as well as transparency of customer pricing (no regulation of the pricing in itself).

Euro-giro offers solutions for both large payments and small payment business and stipulates no minimum business size.

#### *Types of transaction handled*

Euro-giro handles any commercial payments. The bulk of its business is in the area of low-value payments (credits and cash payments), but it can also process large-value payments as there is no maximum limit on the amounts that can be transferred.

Credit transfers should usually be credited to the beneficiary's account within three business days. The execution time can be reduced to two days if the "urgent" option is chosen. In addition, cash payment orders can be processed and should be carried out within five business days.

In general transactions are sent directly from member to member in a decentralised way. Euro-giro can also act as a hub and provide add-on services to the members (such as conversion from MT 100 to MT 103). In general, all consistency and validation checks (risk control) are carried by the sending institution, not by Euro-giro centrally.

Transactions are formatted according to SWIFT standards and are then wrapped up in the unique Euro-giro envelopes. Implementation of new services is subject to a two-step test programme.

#### *Settlement procedures*

Euro-giro payments are settled on a gross basis once a day bilaterally between the members concerned. It is normal practice for Euro-giro members to hold accounts with each other and to settle in the currency of the payment. The members agree bilaterally on the terms and conditions of the accounts (statements, interest, minimum deposit, etc.).

Euro-giro is developing a settlement arrangement with a single settlement service provider for euro payments which should be available in early 2002.

#### *Pricing*

In 2001, participants pay:

- a monthly service fee (network licence fee, software service, maintenance of encryption equipment) of between €1,200 and €2,100 (depending on the number of transactions processed); and
- additional costs for extra installation units.

Transaction fees are not dependent on the type of transaction. They are only differentiated according to the number of the transactions sent:

Flat transaction fee	Transaction tiers	Fee per transaction
Minimum	0-8,000	€0.25
monthly fee	8,001-40,000	€0.12
€1,000	40,001-80,000	€0.07
	80,001+	€0.03

A discount for large numbers of payments sent on the same day to the same institution (e.g. pension payments) is available.

#### *Statistical data*

Euro-giro records the number of transactions processed on the network, but not the value of individual transactions. Statistics are issued monthly and the daily averages below are calculated on the basis of the monthly statistics (1 year = 252 days).

Key figures are:

Sent transactions	1998		1999		2000	
	average day	year	average day	year	average day	year*
Credits	18,963	4,778,645	18,104	4,562,273	19,972	3,774,664
Cash	7,821	1,970,784	16,084	4,053,136	28,613	5,407,803
Interbank	68	17,229	123	31,082	239	45,193
Total	26,852	6,766,658	34,311	8,646,491	48,824	9,227,660

\*January to September 2000 (189 days)

A survey in spring 2000 revealed that the average transaction size in Euro-giro was €2,375.

### 3.3.3.3 S-Interpay

S-Interpay was set up in 1994 by the German savings banks and their central institutions, the Landesbanken/Girozentralen, to facilitate cross-border payments. Since then the system has expanded and it now consists of a network of correspondent banks in the EU and beyond. Detailed access criteria are not published. However, participants are mainly from the savings banks sector. The services of S-Interpay are available to all members of the European Savings Bank Group and, in principle, also to other commercial banks.

In general, one bank in each country functions as the central correspondent for that country. However, in larger countries there may be two or more correspondents, which then take care of the relationships with particular foreign countries. The correspondent "collects" all payment orders which are to be transferred abroad from the participants. These payment orders are transferred to the foreign correspondent, which will then convert the data into the domestic format and process the payment within the relevant local payment system. The network only handles cross-border credit transfers for amounts of up to €10,000 (or the equivalent value in the relevant currency). It is planned to increase this limit to €50,000 in the future.

Cross-border payment orders can be submitted up until 2.30 p.m. each day for

processing on the following business day. The payment orders are then sent to the correspondents abroad, which under normal circumstances enter the payment instructions into their domestic clearing systems the following business day.

Processing is automated throughout the interbank chain. Straight-through processing is possible by using the SWIFT MT 102 message format as the standard format. The exchange of payments between correspondents takes place on the basis of file transfers. Payment orders which do not meet the agreed standards are automatically rejected and returned to the sender. No repair work is carried out on the recipient's side.

Cover payments are made in the form of TARGET or Euro I payments to the respective foreign correspondent. If currencies other than the euro are to be settled the settlement takes place via existing accounts which the correspondents hold for each other.

The correspondent banks in the various countries have concluded service level agreements which address issues such as message standards and formatting rules as well as execution time and settlement rules.

Charges for cross-border service are determined by the individual banks participating in the S-Interpay service. Charges are always based on a flat fee.

S-Interpay has already reached a high level of straight-through processing with the implementation of the IBAN and SWIFT MT 103 message types. There are plans to develop a new software which is capable of settling domestic as well as cross-border payments.

### 3.3.3.4 STEP I initiative of the Euro Banking Association

The STEP I initiative of the EBA entered into operation on 20 November 2000. The main aims of STEP I are to enable a reduction in the execution time of cross-border retail payment

instructions, to foster the use of industry standards for messaging in order to enhance straight-through processing (STP) within banks, and to develop and encourage the adoption of European business practises in the execution of cross-border retail payment instructions.

STEP 1 uses the existing infrastructure of the EBA's Euro 1 system for large-value payments without being subject to the risk management requirements of the large-value segment, and allows access to a greater number of banks. In fact, STEP 1 has a two-tier membership: the Euro 1 clearing members and, in addition, any other bank which is not a member of Euro 1 but acquires the status of a STEP 1 bank and uses a Euro 1 clearing bank as a "settlement bank" for its low-value payments.

#### *Participation in the system*

The EBA's STEP 1 arrangement is open to all banks which have a system office (i.e. an office from where they are connected to STEP 1) located in a Member State of the EU and are either Euro 1 banks or have appointed a Euro 1 bank to act as their settlement agent within Euro 1.

#### *Types of transaction handled*

STEP 1 can be used for the processing of credit transfers, which should be below €50,000, although there is no actual limit.

#### *Operation of the transfer system*

STEP 1 is set up in such a way that a bank which has joined the STEP 1 arrangement with the EBA and which is not at the same time a participant in the Euro 1 system (a STEP 1 bank) is able to submit and receive low-value payments to or from other STEP 1 banks and settle the netted balances via a Euro 1 bank (its "settlement bank"). The balance which is calculated for a STEP 1 bank for a particular value date is settled by its settlement bank within the Euro 1 system.

#### *Transaction processing environment*

STEP 1 uses the technical platform of Euro 1 for the processing of low-value payments.

In order to distinguish STEP 1 payments from Euro 1 payments, the former carry a specific three-letter tag in field 103 of the SWIFT message ("ERP" for Euro Retail Payment). A payment with an "ERP" tag is automatically captured by SWIFT, which forwards a partial copy to the Euro 1 platform.

The processing of STEP 1 retail payments is carried out on the Euro 1 platform according to the same technical processing principles as for Euro 1, but in a separate "ERP cycle" on the day of settlement.

The same SWIFT message types as in Euro 1 can also be sent in STEP 1. In particular, the following STEP 1 messages can be sent: SWIFT MT 100, MT 102 and MT 103 messages with the tag "ERP" in field 103. SWIFT MT 202 messages are used for transfers between a STEP 1 bank and its settlement agent.

STEP 1 will not process batch files (other than the MT 102 messages) and does not provide a central sorting function.

Any large-value payments which are sent to or received by a Euro 1 bank, whether for itself or for one of the STEP 1 banks for which it acts as settlement bank, are processed within the credit and debit caps of the Euro 1 bank within the Euro 1 system.

#### *Settlement procedures*

Shortly after 6 p.m. on day D-1 (settlement day minus one), SWIFT informs each STEP 1 bank, and its settlement bank, of its Potential Net Balance (PNB), which is the total value of payments to be received on day D (settlement day) minus the total value of payments to be settled on day D. Settlement of balances within Euro 1 starts at 9 a.m. on the settlement day.

If under exceptional circumstances (e.g. major technical failures or the breach of the credit or

debit cap of one of the settlement banks) STEP I payments cannot be processed by 4 p.m. on day D, they are automatically carried over to the next settlement day.

The balances in STEP I will be recalculated in the event that one participant is not able to settle its balances by 9 a.m. on the settlement day. After recalculation of the balances, the banks are informed by EBA Clearing that processing has started again.

#### *Credit and liquidity risk*

STEP I banks cannot cancel their retail payment orders after 6 p.m. on day D-1. The settlement of Euro I balances takes place at the ECB shortly after 4 p.m. on day D. STEP I messages are irrevocable as soon as they are processed on the settlement day. However, STEP I banks cannot forward and credit incoming STEP I payments to their customers without incurring any credit or liquidity risk until the Euro I balances have been settled on day D.

#### *Pricing*

One SWIFT MT 102 message which can contain several STEP I payments is charged by the system at €0.48. The joining and annual fees for STEP I banks are €5,000 and €1,000 respectively. STEP I banks are entitled to a reduced admission fee to the EBA (€1,000).

### **3.4 Future developments**

#### **3.4.1 Electronic banking**

The overall trend seems to be that financial institutions are increasing their efforts to move towards electronic banking, i.e. online PC banking and internet banking. Online PC banking enables customers to execute bank transactions from a personal computer via a modem, using a financial software programme supplied by the bank. Internet banking uses the internet as the medium through which customers can manage their financial affairs. The internet banking software is not stored on the user's personal computer (as with online

PC banking) but on the bank's server. Internet banking is expected to have the highest growth potential as users are becoming more familiar with the internet and the ability to access bank activities from different locations may gain in importance. Recent developments in mobile phone technology and digital television, enhancing customer access to internet banking services, may even further increase the use of internet banking. The same applies to accessing banking services, including access to payment systems, via mobile phones. The growth potential in these areas seems to be significant.

Besides providing an online overview of account balances and facilities for the payment of domestic bills and the transfer of funds between domestic accounts, some banks already offer facilities for making cross-border payments via the internet. In the near future, financial institutions are expected to offer more sophisticated services, such as loans, investment products and cross-border retail payments.

The creation of a legal framework for electronic signatures was of great importance for the development of electronic banking. Electronic signatures, which use technologies such as cryptography, allow individuals which receive data over the internet or other online networks to determine the origin of the data and to check whether or not it has been altered. Directive 1999/93/EC of the European Parliament and of the EU Council on a Community framework for electronic signatures was published in December 1999. This Directive aims to ensure that electronic signatures, which are subject to certification procedures by third parties, are considered legally equivalent to hand-written signatures. Member States will bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by 19 July 2001.

At present, the public and the private sector in Europe are setting up certification institutions and infrastructures for the creation and use of digital signatures. These certification institutions, which may be public authorities,

chambers of commerce, federations of notaries or selling agents, credit institutions or issuers of payment cards, act as management and approval centres for the certificates. The banking industry in particular is very active in designing the services which can be used by them to provide secure and efficient financial services to their customers. However, public authorities are also beginning to get involved. In Spain, for example, it is possible for citizens to fill in their tax return forms electronically. Furthermore, in January 2000 the Finnish Population Centre launched a national digital identity card (HST-card) with a digital signature, which can also be used in place of the conventional personal identity card. The latest developments are intended for mobile commerce solutions. The Finnish Sonera SmartTrust (former Finnish Telecom), for example, has developed an authentication solution for mobile telephones. The technology allows transferred data to be encrypted and signed with digital signatures.

All of these private and public service providers operate on a domestic basis. Additional information may be found in the relevant country chapters. However, some have started to sign agreements with certification agencies in other countries, such as the Agencia de Certificación Electrónica in Spain, in order to guarantee mutual recognition of certificates. In future, there is expected to be not only a clear growth in the number of national certification agencies offering services on a domestic level, but also an increasing internationalisation of their services.

### 3.4.2 E-money

An initiative was announced on 12 September 2000 by Banksys SA, CEPSCO Española, Europay International, Interpay Nederland B.V., Proton World and Visa International to launch a pilot project for international interoperable electronic purse smart cards based on CEPS as of January 2001. The pilot project includes schemes in Belgium (PROTON), the Netherlands (Chipknip), Spain (Visa Cash and Monedero 4B). In addition to the existing domestic e-purse brands, the cards are also

branded either Clip (Europay International's e-purse brand) or Visa Cash (Visa's international e-purse brand). Domestic transactions are cleared through the existing clearing networks and international transactions are cleared through either the VisaNet network (for Visa Cash-branded cards) or the EPS-Net network (for Clip-branded cards).

The pilot project will run from January 2001 until the end of 2001 and will be divided into two phases. The first phase will run from January to March 2001, and will involve approximately 400 cards issued to members of staff. The second phase will run from April and will involve around 1,000 cards. A roll-out of the new e-purse under the Clip brand name is expected to take place in the last quarter of 2001 or early 2002.

### 3.4.3 Card-based payments over the internet

Payment cards are currently the most popular means of making payments over the internet. Credit cards in particular are widely accepted and easy to use, as only the card numbers are sent over the internet. However, there is always a trade-off between ease of use and security, as the unprotected flow of data over the internet could lead to the misuse of credit cards. Secure Electronic Transaction (SET) may be a solution to this problem. SET is an open technical standard to facilitate secure credit card transactions over the internet. The standard is based on digital certificates, which create a chain of trust throughout the transaction by verifying cardholder and merchant. SETCo is the organisation which manages the SET specification, oversees compliance testing (for obtaining digital SET certificates) and coordinates work to encourage the adoption of SET. SETCo was set up and is supported by MasterCard and Visa.

In the near future, SET will provide support for all payment cards which can be used for making payments over the internet, including credit, debit and chip cards. Originally, when SET transactions were made using a credit or debit



card, the customer had to download and use an e-wallet (a virtual wallet on the customer's PC) that included a digital certificate. SET-enabled chip cards will eliminate the need for this procedure on the part of the customer as the digital certificate is embedded in the chip. SETCo foresees a wider adoption of SET-enabled chip cards or the extension of the SET protocol on existing chip cards in the years to come.

#### **3.4.4 Correspondent banking**

The impact of Monetary Union on the correspondent banking business in the euro area has been substantial, as there is a trend towards a reduction in the number of correspondent banking accounts and a concentration among a few major banks. Immediately after the start of Stage Three of Monetary Union developments were still at

a preliminary stage. Since then, the trend towards concentration has accelerated. The driving factors behind this trend are new payment systems initiatives (e.g. in the field of retail payment systems and CLS), technological innovation and financial sector consolidation. Each of these forces is expected to continue to foster ongoing trends. As a result of the increasing concentration, the nature of "traditional" correspondent banking business is already changing. Some banks have become the settlement institutions of "quasi systems" or run innovative payment arrangements which combine the features of correspondent banking and funds transfer systems. A further step towards greater concentration is expected to occur in 2002, after the introduction of euro banknotes and coins, since the correspondent banking relations which currently exist in respect of payments in legacy currencies will no longer be needed.

## **4 Securities clearing and settlement systems**

The introduction of the euro has accelerated the process of consolidation in securities markets infrastructures in the euro area, which had been initiated by the harmonisation of European domestic securities markets and new developments in technology. This is reshaping the entire landscape of the trading, clearing and settlement industries.

Consolidation in the securities market infrastructure is noticeable both from a vertical and from a horizontal perspective. Vertical consolidation is the process of consolidating different activities which take place at various points in the securities transaction chain, such as the integration of trading, clearing, settlement and custody services within a single institution. Horizontal consolidation includes mergers or alliances between systems providing similar services, such as the merger of two SSSs.

This chapter describes recent developments in trading, clearing and settlement, which have a mainly euro area dimension. Detailed information concerning domestic institutions can be found in the country chapters.

### **4.1 Trading**

The introduction of the euro has eliminated currency segmentation, which was one of the main reasons for the fragmented listing and trading environment in the euro area. This has permitted investors to adjust their portfolios and look beyond their national markets. This is also true for investors from outside the euro area, which see the euro area securities markets as a single market. Increased cross-border trading has put pressure on stock exchanges to integrate their trading platforms in order to provide cost-efficient euro area-wide mechanisms. As a response to market demand,

increased integration between stock exchanges has taken place in the form of cross-border co-operation and mergers.

In addition to traditional stock exchanges, several “alternative trading systems” such as new electronic communication networks (ECNs) offering similar functionality and services to traditional exchanges have been introduced in the euro area.

In September 1999, eight stock exchanges (London, Frankfurt, Paris, Milan, Madrid, Amsterdam, Brussels and Zurich) signed an agreement to create a “virtual common market” for the most liquid European equities with one electronic interface, common functionality and supported by harmonised rule books. The agreement will allow users of each exchange to have access to stocks listed on the other exchanges by using the existing technology.

In September 2000 the Amsterdam Stock Exchange, the Brussels Stock Exchange and the Paris Bourse were merged into a single stock exchange called Euronext. It is incorporated as a Dutch limited company and offers trading in equities, bonds, derivatives and commodities. Euronext is maintaining its presence in the three countries by having subsidiaries in each of them. Trading in blue chip equities will be offered in Paris, derivatives in Amsterdam and trading in small/medium-sized companies in Brussels. A unified order-driven trading platform will be based on the French NSC trading system. Clearnet (already operating in the French market) acts as central counterparty for the clearing and netting of all trades on Euronext. Euroclear provides a unified settlement and custody platform.

In May 2000 the London Stock Exchange and Deutsche Börse announced plans for a merger to create a new company, to be called iX International, which was to operate Europe’s largest stock market and, through Eurex, the world’s largest derivatives market. However, for a variety of reasons the project did not go ahead.

Trading in fixed-interest instruments has traditionally been dominated by over-the-counter (OTC) trading, whereby deals may be made via telephone. The introduction of the euro has highlighted the need to have facilities for cross-border trading. Alternative electronic trading platforms have emerged offering services ranging from simple order transmission to fully-fledged trade execution facilities like EuroMTS, Coredeal, Tradepoint, Brokertec and Instinet. Most of these systems are located outside the euro area but have a high proportion of euro area-based institutions as owners and participants.

## 4.2 Clearing

The clearing landscape in the euro area has remained relatively fragmented since the introduction of the euro. In the derivatives markets, in most cases, the clearing house acts as a central counterparty for instruments traded on recognised exchanges, while in the cash markets the use of a central counterparty is not widespread and is mainly limited to equities.

Nevertheless, there is widespread consensus among market participants that clearing with a central counterparty will play an increasingly important role in reshaping the securities markets. This is due to the increasing use of electronic order-driven trading platforms with trader anonymity.

When a clearing house acts as central counterparty it interposes itself as legal counterparty to both sides of a securities transaction. As such, it provides a number of benefits to market participants. For instance, it simplifies the management of counterparty risk by providing a single counterparty instead of many. Even though a central counterparty does not in itself eliminate credit risk in a market, it can redistribute the risk to those which are better able and more willing to bear it. Moreover, a central counterparty increases the liquidity of the market-place through netting. Finally, it reduces the number of settlements and therefore the associated risks and operational costs.

Market participants have a strong preference for integration in the clearing industry in Europe because this will enable them to take full advantage of clearing facilities. There is even some concern that, in combination with any existing inefficiencies in post-trade processing, the widely-expected increase in trading in European securities, especially in equities, could lead to serious disruptions in European capital markets.

Initiatives among service providers to establish a pan-European central counterparty during 2001 are progressing. For instance, the clearing functions of the three Euronext exchanges (Amsterdam, Brussels and Paris) have legally merged since the beginning of 2001 into Clearnet SBF as the central counterparty for all the transactions carried out on Euronext. For technical reasons, the national clearing systems will remain in operation until a single clearing system has been implemented. Furthermore, Clearnet SBF, Eurex Clearing, and the London Clearing House have repeatedly explored the possibilities of various merger combinations.

Discussions on the integration of clearing activities within the market focus on issues related to governance, jurisdiction, legal status and types of products. In particular, it is not clear at this stage whether the central counterparty will provide a single entity across product lines and markets, multi-currency capability, and whether it will operate only in a single jurisdiction.

Integration in terms of international joint ventures has also been visible. An example is the establishment of the European Securities Clearing Corporation (ESCC) as a pan-European clearing house which was set up by Euroclear and the United States Government Securities Clearing Corporation (GSCC) to provide trade comparison and netting services for European government debt securities. The London Clearing House (LCH) has recently joined this partnership.

### 4.3 Settlement

Three different solutions have emerged in response to securities market demands for the rationalisation of the securities settlement industry:

- cross-border links, which are bilateral networks between SSSs, where a national SSS provides a single point of entry which allows its customers to hold securities issued in any other SSS and to use these securities within its own country;
- mergers and joint ventures between SSSs. At present, two mergers are effectively in place: Clearstream International and Euroclear; and
- the “relayed links” solution – currently being considered by several SSSs – whereby one SSS acts as an intermediary on behalf of another SSS for the settlement of international business.

#### *Cross-border links*

Links between SSSs have been established in order to facilitate cross-border transfers of securities. These links are used for the transfer of collateral for the Eurosystem’s credit operations as well as for all interbank operations. In order to be eligible for use in the Eurosystem’s credit operations, the links are assessed according to the Eurosystem’s standards. The links which have been assessed so far allow the cross-border transfer of securities on a free-of-payment basis.

During the course of 1999 and 2000, the Eurosystem assessed and approved a total of 64 links for the transfer of collateral for the Eurosystem’s credit operations. As a result of consolidation, the number of SSSs and, subsequently, the number of links was reduced. By the end of December 2000 the total number of eligible links had decreased to 62. So far the use of links has been more modest than expected. In fact frequent and significant use is made of only 29 of the 62 eligible links. Although the links cover several countries,

their activities are concentrated on a few countries and are dominated by the two ICSDs – Clearstream International and Euroclear. The implementation of new models, such as DVP links or relayed links, could lead to an increased use of links in the future.

#### *Clearstream International*

Clearstream International was formed in January 2000 through the merger of Cedel International (ICSD Luxembourg) and Deutsche Börse Clearing (CSD Germany). It is a leading international clearing and settlement organisation with extensive services for equities and bonds for both domestic and international business. The holding company, which is incorporated in Luxembourg, has three main subsidiaries: Clearstream Banking Luxembourg (CBL), Clearstream Banking Frankfurt (CBF) and Clearstream Services Luxembourg. Joint regional offices are used for representation in the major financial centres.

CBF will continue to offer clearing and settlement facilities for the German securities markets. CBL also operates LuxClear, which is the CSD of Luxembourg.

Clearstream Services Luxembourg provides the single IT platform, called Creation, for clearing, settlement and custody. Since CBF's international business was successfully migrated to the platform in February 2001, both CBL and CBF have been using it for international transactions in commercial bank money. The next stage will be for the platform to be used for the settlement of domestic German transactions in central bank money. The service will also be offered to other financial intermediaries. Settlement currently takes place in several night-time and daytime processing cycles (for further details see Sections 4.3.2 of the German chapter and 4.3 and 4.4 of the Luxembourg chapter).

#### *Euroclear*

The merger of Euroclear Bank (ICSD Belgium) and Sicovam SA (CSD France) took effect in January 2001. As a result of the merger,

Sicovam SA has been renamed Euroclear France and is now an integral part of the Euroclear group. Euroclear Bank was created in December 2000 and has taken over the Euroclear operating and banking roles.

A common, dual platform for batch and real-time settlement in both central bank and commercial bank money will be available to customers of Euroclear Bank and Euroclear France via single interface. The respective technology platforms will be rationalised gradually, ultimately leading to a single settlement process.

On 6 September 2000, the Euroclear Board and the boards of the Brussels Stock Exchange (BXS) and the Amsterdam Stock Exchange (AEX) signed a memorandum of understanding (MoU) which will ultimately lead to the absorption of CIK and Necigef, the CSDs of Belgium and the Netherlands respectively, into the Euroclear group. As an interim step, Euroclear Bank will take 51% ownership stakes in CIK and Necigef. The settlement services supporting all three exchanges forming Euronext – the Paris Bourse, BXS and AEX – will thus be consolidated as part of the Euroclear group. The MoU commits all the parties to integrate the clearance and settlement functions of CIK and Necigef onto a single platform, in a single entity and in a single legal jurisdiction. A merger agreement should be finalised between the parties in the first half of 2001.

In December 2000 all Irish government bond settlement activity previously carried out by the Central Bank of Ireland was transferred to the Euroclear System. This insourcing arrangement will allow financial institutions to hold Irish government bonds and settle domestic and cross-border transactions in a single settlement location. Consequently, the Central Bank of Ireland's own settlement system, CBISSO, ceased operations. However, the Central Bank of Ireland will continue to act as Registrar for Irish government bonds.

#### 4.3.1 The correspondent central banking model

The correspondent central banking model (CCBM) came into operation on 4 January 1999. It was established in order to facilitate the cross-border use of collateral in the Eurosystem's monetary policy operations and intraday credit operations. The Eurosystem's counterparties and TARGET participants in the EU can only obtain credit from the central bank of the country in which they are incorporated. However, within the CCBM the NCBs act as securities correspondents for each other, thus enabling counterparties to use all of their eligible assets to obtain credit from their own NCB regardless of where the securities are located (see Chart 1). For the

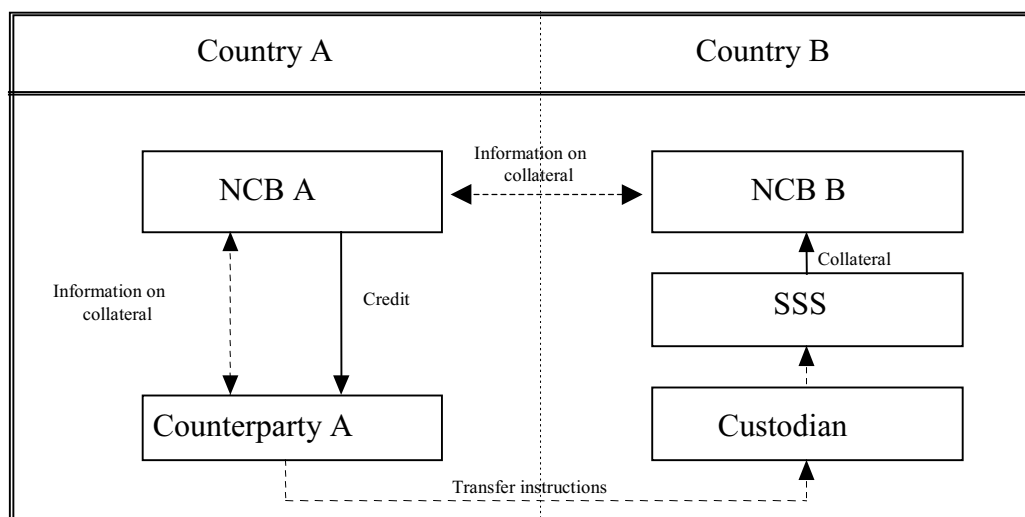
functioning of the CCBM, market participants must make arrangements with the SSSs where the collateral is deposited for the delivery of the securities intended to serve as collateral to an account at the local NCB. Acting as correspondent central bank (CCB), the local NCB will then hold the collateral on behalf of the central bank granting the credit (the home central bank; HCB).

The CCB is responsible for providing the necessary information on the delivery and eligibility of the securities, while the HCB is responsible for processing that information, as well as for conducting the valuation process and for providing liquidity (i.e. cash payment or extending debit cap).

#### Chart 1

##### The correspondent central banking model

The use of eligible assets deposited in country B by a counterparty established in country A in order to obtain credit from the NCB of country A.



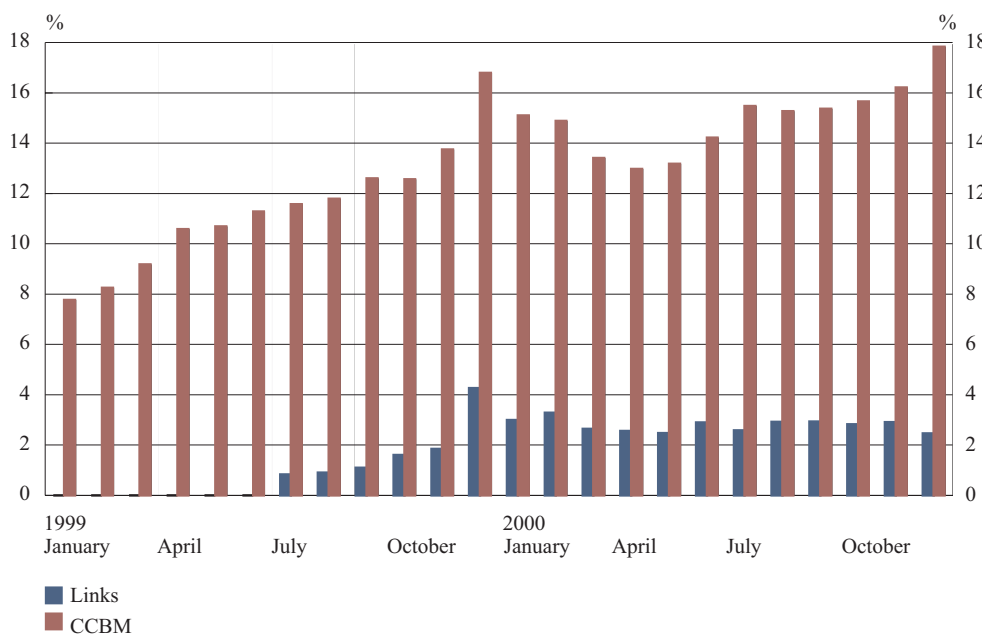
In 2000, collateral submitted to the Eurosystem via the CCBM represented 15 % on average of the total collateral provided. This figure is remarkable when compared with the 3 % of collateral held in custody through link

arrangements between SSSs, the only alternative to the CCBM for transferring cross-border collateral (see Chart 2). The remaining 82 % are held domestically.

## Chart 2

### Evolution of cross-border collateral as a percentage of total collateral provided to the Eurosystem

The total collateral provided to the Eurosystem refers to the sum of domestic collateral, cross-border collateral held via the CCBM and cross-border collateral held via the links between SSSs. Please note that the first wave of links was approved in May 1999.



Throughout the year, assets held in custody through the CCBM averaged €100 billion. The main collateral provider (acting as correspondent central bank) was Italy with 36% of the total assets held through the CCBM, followed by Germany with 17%, and Luxembourg and Belgium with 15% each. The high proportion of collateral provided by Luxembourg and Belgium is due to the fact that Clearstream Luxembourg and Euroclear, the two international CSDs, are located in those countries.

The main users of collateral (acting as HCB) were Germany (with 42% of the collateral held

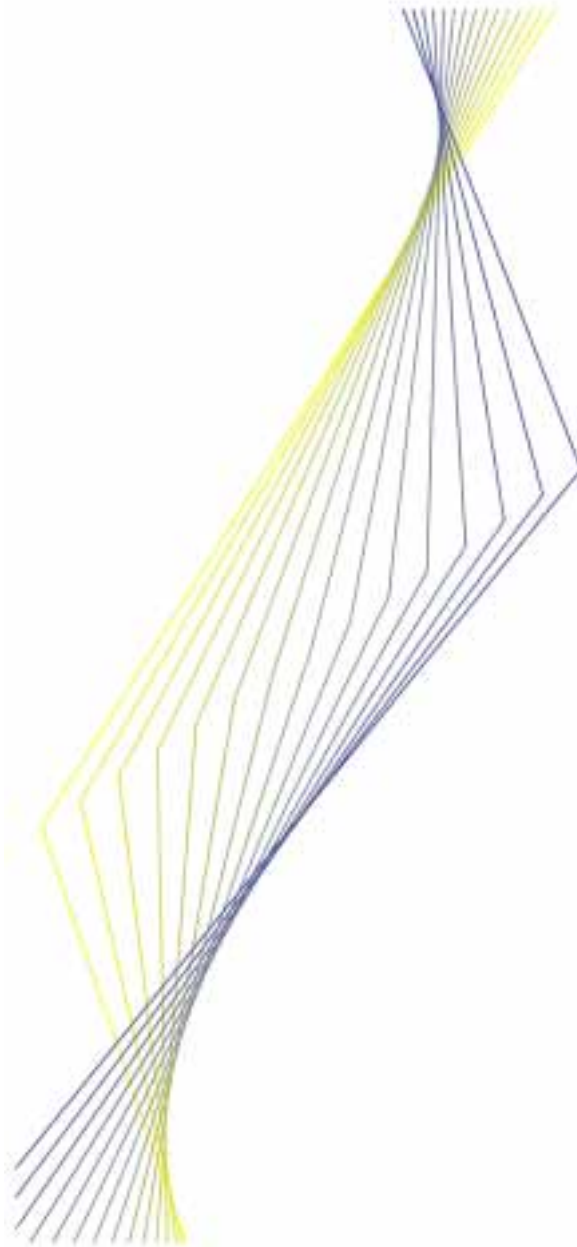
through the CCBM), Luxembourg (16%), the Netherlands (15%) and France (11%). Owing to the relative scarcity of domestic collateral in Luxembourg and Ireland, foreign collateral held via the CCBM on a cross-border basis amounted to 54% of all collateral held in Luxembourg by counterparties and to 63% of that held in Ireland.

Of the two categories of assets eligible for the credit operations of the Eurosystem (also referred to as “tier one” and “tier two” assets), the cross-border use of collateral mainly involves tier one assets.

Euro area



EUROPEAN CENTRAL BANK



**Belgium**

**June 2001**



Belgium

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## List of abbreviations

<b>BCC</b>	Bank Card Company
<b>BELARFI</b>	Belgian Financial Architecture
<b>BELFOX</b>	Belgium Futures and Options Exchange
<b>BFC</b>	Banking and Finance Commission – <i>Commission bancaire et financière (CBF)/</i> <i>Commissie voor het Bank- en Financiewezen (CBF)</i>
<b>BXS</b>	Brussels Exchanges
<b>CEC</b>	Centre for Exchange and Clearing – <i>Centre d’Echange et de Compensation</i> <i>(CEC)/Uitwisselingscentrum en Verrekening (UCV)</i>
<b>CIK</b>	Inter professional securities depository trust – <i>Caisse Interprofessionnelle de</i> <i>Dépôts et de Virements de Titres S.A./Interprofessionele Effectendeposito- en</i> <i>Girokas N.V.</i>
<b>CVH - TCE</b>	Centralised processing of commercial bills – <i>Centrale Verwerking Handelspapier/</i> <i>Traitement Centralisé d'Effets de Commerce</i>
<b>ELLIPS</b>	Electronic large-value interbank payment system
<b>EMSS</b>	Electronic matching and securities settlement
<b>FMS system</b>	Forward market settlement system
<b>NBB</b>	National Bank of Belgium – <i>Banque Nationale de Belgique (BNB)/Nationale Bank van</i> <i>België (NBB)</i>
<b>POM</b>	Public order member
<b>PPS</b>	Protected payment system

## Introduction

Belgian payment systems are characterised by a very high level of automation. This particular situation is the result of efforts made by the credit institutions since the early 1970s, with a view to rationalising the processing of payment operations. Very early on, interbank co-operation led to several standardisation agreements, on which the entire process of automation is based. The first fundamental step was the establishment in 1974 of the Centre for Exchange and Clearing (CEC), after which retail payments began to be processed on an automated basis. The second important step towards the complete automation of the national payment systems was the launch in 1996 of the Electronic Large-value Interbank Payment System (ELLIPS), an RTGS system for large-value payments.

The National Bank of Belgium (NBB) has been very closely involved in these efforts. In addition to its more traditional role as settlement agent, it assumes the operational management of the interbank settlement systems, which, since 1 January 1999, have no longer operated in Belgian francs but only in euro.

Credit transfers and related instruments are still predominant among the means of payment. However, the use of cheques has been declining steadily for several years. This instrument is tending to be replaced by card payments. The latest developments include the expansion of internet banking as well as new electronic money instruments, notably the nationwide expansion of a multi-purpose prepaid card scheme.

## I Institutional aspects

### I.1 The general institutional framework

#### *Financial intermediaries which provide payment services*

Distinctions in the legal status and supervisory framework between commercial banks, savings banks and public credit institutions have disappeared completely since the new Law on the status and supervision of credit institutions came into force in 1993. Furthermore, most of the former public credit institutions are currently in the midst of a privatisation process and are selling the public shares to the private sector. By the end of December 1999 there were 119 credit institutions, of which 75 under Belgian law and 44 under foreign law (30 from Member States of the EU). The number of credit institutions has dropped significantly in the last few years as a result of a wave of mergers and acquisitions.

These credit institutions include the Bank of the Post, a subsidiary jointly owned by the Post and the largest Belgian private bank. The Bank of the Post, which has the status of a credit institution, markets – under the Bank of the Post logo – banking products such as current accounts, payment cards and savings products through its branch network. The Post, which does not have the status of a credit institution, also carries out most of the government's payments.

The credit institutions and the Post are represented by 8,361 branches, i.e. one branch for every 1,222 inhabitants.

Non-bank institutions are also represented in the payment media market, in particular companies issuing in-house cards, luncheon vouchers and traveller's cheques (see Sections 2.2.4 and 2.2.7).

#### *Legal aspects*

To begin with, it should be pointed out that Belgium does not have a general legal and

regulatory framework relating to payment systems, payment service providers or payment instruments. These areas are mainly governed by specific legislation or regulations, which are in part an implementation of EC Directives and are often aimed at consumer protection.

Second, the legal and regulatory framework applicable to payment systems, payment service providers and payment instruments has improved significantly in recent years with regard to various aspects of these topics.

The main texts governing payment systems and payment service providers are:

- a. The Law on the legal status and supervision of credit institutions (22 March 1993), which aims to protect the savings of the public and to safeguard the smooth functioning of the credit system by laying down rules for the establishment and the operation of the credit institutions as well as for the supervision of the latter. This Law also implements the provisions of the Second Banking Co-ordination Directive.

Furthermore, the Law on the legal status and supervision of credit institutions contains a chapter on netting between credit institutions. The Law seeks to guarantee the legal certainty of offsetting agreements for debts between two or more credit institutions, where one of these institutions is involved in bankruptcy or in any other case involving concurrent claims governed by Belgian law.

Before this Law was adopted, the effectiveness of netting arrangements could be challenged under Belgian law with regard to two principles of bankruptcy law: a) the prohibition of any offsetting after bankruptcy, except between related debts; and b) the principle that the bankruptcy decision of

the court has a retroactive effect, starting from the first hour of the day on which it was made (“zero-hour rule”).

These principles were likely to prevent the participation of the Belgian banks in international interbank netting systems, thereby depriving them of the advantages which might result from the consequent reduction in settlement costs and in credit and solvency risks involved in international financial operations. Moreover, the uncertainties which existed in Belgian law with regard to the possibility of relying upon netting agreements against third parties reduced the attraction of locating the centre of an international netting system in Brussels.

This is why express recognition is given, through Article 157 of the Law on the legal status and supervision of credit institutions, to the legal validity of bilateral or multilateral offsetting agreements for claims between credit institutions themselves and between credit institutions and a clearing house, as well as to “close-out” agreements (express termination clauses in the event of bankruptcy or other default situations). These agreements are legally binding and enforceable against third parties (including a liquidator), subject to the conditions defined in this provision. In particular, it is clear that the claims to be offset no longer need to be related. The article also states that payments made by or to a credit institution on the date on which it has been declared bankrupt will be valid if they preceded the time of the bankruptcy decision or if they were made without knowledge of the fact that the credit institution was bankrupt.

The scope of Article 157 has been extended by a Royal Decree dated 28 January 1998 in such a way as to include, henceforth, most financial

institutions (and is thus no longer limited to credit institutions).

- b. The Law on the settlement finality in payments (Law on “finality”, 28 April 1999) which transposes Directive 98/26/EC. Moreover, Article 9 of this Law introduces a concept foreign to the Directive, stating that cash settlement accounts held with an operator or a settlement agent of a settlement system may not be blocked by any means by a participant (other than the operator or the settlement agent of the system), a counterparty or a third party.
- c. Article 8 of the Organic Law of the NBB (22 February 1998), which entrusts the NBB with a supervisory power with regard to clearing, payment and securities settlement systems (see Section 1.2).

Few texts relating specifically to payment instruments exist under Belgian law. The most significant texts relating specifically to this topic are as follows:

- Law on cheques (1 March 1961);
- Royal Decree on the indication of homogeneous financial service tariffs (23 March 1995);
- Law on the value date of bank operations (10 July 1997);
- Law on the accountability for interest due on accounts opened by credit institutions or other legal entities (14 July 1998); and
- Law on cross-border retail payments (9 January 2000), which transposes the provisions of Directive 97/5/EC of the European Parliament and of the Council of 27 January 1997 concerning cross-border retail payments.

In the near future, the Belgian legislator is also expected to adopt:

- a law on electronic payment instruments which will transpose an EU Recommendation dated 30 July 1997;
- legislation regarding the electronic signature which will implement in Belgian law Directive 1999/93/EC of the European Parliament and of the Council of 13 December 1999 on a European framework for electronic signatures.

In addition to these texts, relations between credit institutions, consumers and retailers are mainly governed by contracts.

## 1.2 The role of the central bank

### 1.2.1 General responsibilities

The NBB is closely involved in the Belgian interbank clearing mechanisms: it runs and assumes the daily management of the CEC and of ELLIPS. The CEC is an ACH and is designed for retail payments; ELLIPS is an RTGS system and is part of the TARGET system. Furthermore, the NBB also operates the dematerialised SSS for government bonds.

Since 1 January 1999 the NBB has been legally entrusted with the oversight of payment and clearing systems established in Belgium.

### 1.2.2 Oversight

The NBB's oversight responsibility has an explicit legal basis in Article 8 of its new Organic Law, which reads as follows: *"The Bank shall ensure that the clearing and payment systems operate properly and shall make certain that they are efficient and sound. It may carry out all transactions or provide facilities for these purposes. It shall provide for the enforcement of the regulations adopted by the ECB in order to ensure the efficiency and the soundness of the clearing and payment systems within the European Community and with other countries."* As is stipulated in the

Explanatory Notes to this Organic Law, this responsibility covers both cash and SSSs.

In line with the task assignment which was agreed at the Eurosystem level with regard to cash payment systems, the NBB performs the oversight of the following retail payment systems established in Belgium: Banksys (see Section 1.3) and Europay.

The NBB also oversees the SSSs established in Belgium: Euroclear, BXS-Clearing and BXS-CIK.

Finally, the NBB also oversees SWIFT. A special arrangement was made in this respect by the Committee on Payment and Settlement Systems (CPSS), under which the NBB acts as leading overseer of SWIFT, and is supported by the central banks of the G10.

### 1.2.3 Supervision and audit

The NBB is not responsible for the supervision of individual credit institutions (microprudential supervision). This task is undertaken by a legally autonomous institution, the Banking and Finance Commission (BFC). The NBB is, however, concerned with the safety and stability of the financial system as a whole (macroprudential supervision).

Moreover, the NBB also contributes to the supervision exercised by the BFC. One Director of the NBB has a seat on the Board of the BFC as of right. The NBB collects the periodic and annual prudential reports from the credit institutions and sends them to the BFC. The BFC must consult the NBB before publishing regulations concerning solvency and liquidity. All the Belgian credit institutions are supervised by the BFC.

The NBB and the BFC each has its own specific role to play. Essentially, this means that oversight activities focus mainly on systems, while prudential activities focus mainly on institutions. The NBB and the BFC have a long tradition of co-operation.

The audit department of the NBB is concerned with the various clearing systems operated by the NBB (the CEC, ELLIPS and the Securities Clearing System) to the extent that the NBB is de facto responsible for the operational organisation of these systems.

#### 1.2.4 Establishment of standards

Since the beginning of the 1970s Belgian credit institutions have concluded various co-operative agreements in the field of information processing in order to facilitate interbank transactions. The NBB performs the administration of the Secretariat of Protocols. It is also actively involved in preparing and writing the agreements. The first so-called interbank protocol, signed on 8 July 1970, affected credit institution identification by establishing a uniform structure for account numbers, according to which the first three figures identify the institution.

14 other agreements concerning, inter alia, the standardisation of the most commonly used payment instruments (i.e. credit transfers, cheques and direct debits) and the establishment of an ACH have since been signed.

### 1.3 The role of other private and public sector bodies

The main interbank organisations operating in the field of payment and securities systems are:

- the CEC, founded in 1974 by the banking sector as a whole in order to automate the exchange of payment transactions;

- ELLIPS, founded in 1995 as a non-profit association in order to manage the ELLIPS system;
- the BFC, which is the prudential authority (see Section 1.2.3);
- the Belgian Bankers' Association, a professional organisation which aims to promote its members' professional interests, mainly through economic studies, fiscal, legal and technical advice, and training;
- the Market Authority for the Brussels Stock Exchange (Euronext Belgium), the Market Authority for the Easdaq market and the Committee of the Securities Regulation Fund are the three market authorities in Belgium. They organise and regulate their markets and exercise first-level supervision. The BFC supervises the way in which the market authorities carry out their duties. This construction is currently under revision and could be subject to change in 2001; and
- Banksys, a company which operates, inter alia, the national ATMs, the POS network, and the electronic purse scheme, and the Bank Card Company (BCC), which is entrusted with the administration of two of the main credit card schemes (i.e. Visa and Eurocard/MasterCard).<sup>1</sup>

<sup>1</sup> At the end of 1999 Banksys took over a large share of the activities of the BCC.



## 2 Payment media used by non-banks

### 2.1 Cash payments

Cash comprises banknotes in denominations of BEF 100, 200, 500, 1,000, 2,000 and 10,000 and coins in denominations of BEF 0.50, 1, 5, 20, 50, 250 and 500. Among the banknotes, the BEF 10,000 denomination represents the largest share of the total stock of banknotes in circulation (50% by value by the end of 1999), despite the success of ATMs, which deliver banknotes of BEF 1,000 (accounting for 13% of the value of notes in circulation on 31 December 1999) and BEF 2,000 (accounting for 31% of the value of notes in circulation on 31 December 1999). Banknotes constitute 96% of total cash in circulation and coins the remaining 4%. The issue of coins is legally restricted to BEF 20 billion (€0.5 billion). Coins are legal tender only up to a certain amount, which varies for each denomination.

It is not possible to estimate the value or number of cash payments. The only indication available lies in the share of cash in M1, which has recorded a marked decline over a number of years. It amounted to 23.8% by the end of 1998,<sup>2</sup> compared with 43.7% at the end of 1980. The total stock of cash in circulation on 31 December 1999 amounted to BEF 566 billion (€14 billion).

### 2.2 Non-cash payments

Deposit money comprises sight deposits held by non-financial economic agents with financial intermediaries legally entitled to receive such deposits (credit institutions and the Post).

There is no statutory definition of current accounts. According to the regulation<sup>3</sup> governing the financial data which the banks have to submit to the central bank and to the BFC on a monthly basis, current accounts are those on which deposited money can be immediately withdrawn.

Royal Decree No. 56 of 10 November 1967 obliges businesses to hold an account to which credit transfers can be made by their customers. These are generally current accounts.

For credit transfers, the Law on value dates (10 July 1997) imposes a maximum of one working day between the debiting of the principal's account and the crediting of the payee's account.

For other payment instruments, there are no formal regulations governing the practices regarding value dates, and maximum time limits for crediting counterparties are not statutory. Credit institutions must execute payment orders promptly, on the basis of the general law of contract. The standard practice regarding value dates in respect of "ordinary" customers is that accounts are debited one working day before the settlement date and credited one working day after. In the case of cheques which are in the process of being collected, the credit is temporarily revocable.

The principle of allowing providers of payment services to charge current account holders for such services was adopted in 1990.

Deposit money is rather heavily concentrated: the five largest credit institutions account for 73% of deposits by value.

#### 2.2.1 Credit transfers

The most commonly used payment medium in Belgium is the credit transfer. The order is given by the customer making the payment to its bank either in paper form – handed in at its branch or sent by post – or in automated form (self-service banking, telephone and internet banking, magnetic media). An estimated 723 million credit transfers (including standing

<sup>2</sup> A change in the definition of transferable deposits included in M1 means that data for 1999 is not comparable with the data of previous years.

<sup>3</sup> Royal Decree of 24 November 1937.

orders and inpayment transfers; see below and Section 2.2.5) were made in 1999, for a total value of BEF 612,608 billion (€15,186 billion).

The standing order is a form of credit transfer created in order to rationalise the system for recurring payments (payment of rent, etc.). An estimated total of 75.6 million payments of this kind were made in 1999 for a total value of BEF 886.7 billion (€21.9 billion).

A significant development can be seen in the growing popularity of electronic forms of payment orders made by customers in parallel with the growing popularity of self-service banking and home banking products. More and more firms are communicating their payment orders via magnetic media or telecommunications, which obviates the need to capture the data within the financial system. In 1999 it is estimated that 253.6 million payment orders – 35% of all credit transfers – were submitted in paperless form against 158 million – 31.5% – in 1990.

### 2.2.2 Cheques

The use of cheques, which until 1992 were the second most frequently used cashless payment instrument after the credit transfer, has tended to diminish by an average of 10% per year since 1995 in line with the increasing use of electronic money and debit and credit cards and the effect of introducing charges on sight accounts, which discourages customers from using manual means of payment.

By supplying creditworthy customers with cheque guarantee cards, credit institutions promoted the acceptability of the cheque to creditors. These cards serve as a guarantee that any cheque drawn will be honoured up to an amount of BEF 7,000, or €200, irrespective of whether the drawer's current account has sufficient cover. In order to make the guarantee effective, the number of the cheque guarantee card must be written on the reverse of the cheque. It is the duty of the payee to check the validity of the card and to see whether the information on the card corresponds with that

written on the cheque. The cheque guarantee card generally has an automatic overdraft facility of BEF 25,000 (€620) or BEF 50,000 (€1,240) on which interest is charged. The only restriction is that a permanent debit balance is not allowed for more than three consecutive months.

In addition to cheques issued by individual credit institutions and postal cheques, the eurocheque is commonly used within Belgium. For this type of cheque, the guarantee is to be completely phased out by 1 January 2002.

Unlike other cashless payment instruments, cheques can be used for several successive payments, by means of endorsement. However, this practice is limited.

On 31 December 1999 there were 4.45 million cheque guarantee cards in circulation (3.96 million of which were eurocheque cards), equivalent to a theoretical average of 33 cards for every 100 current accounts. In 1999 80.2 million cheques were issued for a total value of BEF 3,963 billion (€98 billion).

### 2.2.3 Direct debits

The direct debit mechanism was created in 1980. Its purpose, like that of the standing order, is to simplify the execution of regular payments. In 1999 it was estimated that 142.3 million payments were executed under direct debit agreements (against 104.5 million in 1995). Direct debits are mainly used for public utility bills.

Direct debit is based on a contract in accordance with which the payer authorises the payee to debit its account for specified claims. All signatories of the contract (payer, payee, debtor and bank of the payer) may repeal it. The revocation comes into effect no later than ten days after the payer's bank has been informed.

## 2.2.4 Payment cards

### Debit cards

Debit cards, issued by the credit institutions under their own logo in association with the logos of Bancontact and Mister Cash,<sup>4</sup> can be used at ATM and POS terminals. The debit and cheque guarantee card functions are generally packed on the same support together with an e-money function. These cards are hybrid cards having both a magnetic strip, which is used for online operations requiring the use of a PIN before the services can be accessed (POS payments, cash withdrawals at ATMs, loading of e-purse, etc.), and a chip, which is used for off-line operations (e-money payments).

Banksys (see Section 1.3) is entrusted with the management of the ATM-POS network. Its duties include the monitoring of bank-issued cards and the PIN mailer production for all bank cards. Banksys participates directly in the ACH (see Section 3.3) and exchanges all the ATM and POS operations to be cleared in this system.

On 31 December 1999 there were some 10.5 million debit cards in circulation, all of which provided access to both ATM and POS terminals, thus representing a ratio of 77 cards to every 100 current accounts.

The cost to the consumer of using debit cards at ATM and POS terminals in theory consists only of an annual fee, which is generally included in a package made up of current account management and operations. A small minority of retail outlets charge for POS transactions.

Over the last few years, the use of debit cards has gradually become internationalised. Within the framework of the European community, holders of Banksys cards also have access to ATMs in an increasing number of European countries, with reciprocity for foreign eurocheque card holders. Similar interconnections have been established on a bilateral basis between Banksys and other

foreign networks. Since 1998 holders of Banksys cards have also been able to pay abroad at Maestro POS.

### Credit cards

Credit cards (American Express, Diners Club, Eurocard and Visa) are widely accepted in Belgium. As a result of vigorous promotional efforts by the companies concerned, the number of cards in circulation has shown a considerable increase in recent years: from some 326,000 at end-1985 to around 2,883,000 at end-1999. In 1999 48.65 million transactions were effected in Belgium for a total of BEF 198.37 billion (€4.9 billion), 14.65 million of which were payments effected using foreign cards, for a total of BEF 62.05 billion (€1.54 billion).

BCC, in which the credit institutions are the shareholders, accounts for the distribution of the majority of Visa and Eurocard cards. Banksys is entrusted with the processing and authorisation of transactions executed using these cards on behalf of BCC.

Payment procedures are automated in most cases. At the point of sale, authorisation takes place online, details of the transaction are immediately recorded by the issuing company's computer system and a slip showing the transaction is printed out. The nationwide ATM network can also be accessed using credit cards (except for Diners Club cards).

Fixed liability tariffs for the loss of a credit card are laid down in the law.<sup>5</sup>

### Retailer cards

Retailer cards issued by petrol companies and large retailers can, by their nature, only be used at points of sale controlled by their issuers. A

<sup>4</sup> Bancontact and Mister Cash are the two former ATM-POS networks which merged to form Banksys in 1987.

<sup>5</sup> Royal Decree of 24 February 1992, based on the Law on consumer credit of 12 June 1991, was published in the Belgian Law Gazette on 4 April 1992.

distinction can be made between in-house cards meant for the issuers' own infrastructure and those which are in fact managed at the operational level by another commercial card issuer (interbank network or credit card issuer). The latter category comprises cards issued by petrol companies. Moreover, some of these retailer cards are linked with POS terminals, whereas others can only be used manually. One of the best-known cards, issued by a large retailer, can be used either as a debit card (in which case direct debit of the customer's bank account is initiated by the retailer) or as a credit card, the choice being made by the cardholder upon purchase. 1,591,000 cards were in circulation on 31 December 1999; 27.19 million transactions were recorded to the value of BEF 54.82 billion (€1.36 billion) in 1999.

#### *Electronic money*

There is no software-based electronic money in Belgium. A multi-purpose prepaid card scheme, called PROTON, was launched by Banksys in February 1995. Nationwide expansion was achieved at the beginning of 1998.

PROTON is a microprocessor card which stores monetary value as opposed to tokens or units of service (as a phonecard does). It is designed to be a substitute for cash (and small-value cheques) and is targeted at payments below BEF 500 (€12.39) at local retail outlets, vending machines, car parks, ticket machines, payphones and on public transport. It can be loaded with amounts ranging from BEF 100 (€2.48) to BEF 5,000 (€123.95). Card-to-card payments are not possible.

PROTON is a monocurrency system, the payments being made either in Belgian francs or, as from July 1999, in euro. The choice between these two currencies is made by the holder when loading/reloading the purse.<sup>6</sup> The loading transaction is processed with the verification of a PIN and of the funds available on the account. The cards can be reloaded at ATMs or at public telephone booths. A "smartphone", which

enables the user to reload the card at home and to use the card to make payments to a service provider over the telephone, has also been available since the end of 1997. Furthermore, card-based payments can be made via the internet by means of a plug-in terminal for personal computers.

During a transaction, money is transferred from the PROTON card to the retailer's terminal (off-line terminals or vending machines). As only small amounts are involved, and for the sake of speed and convenience, these payments are made without using a PIN. The retailer can transfer the money to its bank account simply by making a telephone call from its terminal (using the modem). The cardholder can consult the balance on its PROTON card at an ATM, public telephone booth, service provider's terminal or by means of a small personal pocket device.

Electronic purses are issued only by credit institutions. It is up to each institution to set the fees (if any) that it charges to cardholders. The annual fees charged to the cardholders range from BEF 0 to BEF 200 (from €0 to €4.96). Using or downloading the cards must remain free of charge. Banksys is responsible for the tariff policy applied to the retailers. The retailers have to pay a percentage of the amount stored in their terminals plus a fixed fee (depending on the contract) per collect. At the end of December 1999 more than 7 million cards with the e-money facility had been issued; the total amount outstanding was around BEF 1.52 billion (€37.7 million). A daily average of 149,261 purchase transactions were made in December 1999 for an average amount of BEF 156 (€3.87).

The PROTON technology has already been adopted by a large number of countries, making it a de facto international standard. In July 1998 Visa, Amexco and ERG, an Australian smartcard group, decided to undertake a venture with Banksys. Interpay, a Dutch

<sup>6</sup> Belgian francs by default. If loading/reloading occurs in euro, the choice of currency becomes irreversible.

processing centre of electronic payments, joined this venture in October 1998. The venture, Proton World International, aims to establish a global standard and infrastructure for electronic purses. A pilot scheme testing the inter-operability between PROTON and other European e-purse schemes is to be launched in 2001.

#### *Single-purpose prepaid cards*

Single-purpose prepaid cards are mainly used in the telephone industry. In Belgium the first cards of this kind, launched in 1979 with the RTT-Telecard, were magnetic strip-type cards which enabled users to make national and international telephone calls from payphones. Although PROTON can now be used in payphones, such cards (now called Belgacom-Telecard) still exist and are now chip-based. All telephone operators also offer prepaid cards.

Other service providers, such as urban transport companies, make use of similar cards, albeit on a smaller scale.

#### *POS network*

Banksys manages the POS network and terminals online on behalf of the issuing credit institutions which are the only shareholders in the company. These terminals are accessible by means of magnetic strip cards and secret PIN codes. Since 1999 the Post has ceased issuing its own debit cards and instead makes use of Banksys' POS network.

Each transaction triggers various immediate checks:

- the blacklist (stolen cards, etc.);
- the balance on the current account, either on the basis of the balance at the previous day's close, taking into account the total of the operations effected on that day by means of the card, or on the basis of the actual balance (depending on the card holder's institution); and

- the amount of the daily and weekly transactions caps.

This online authorisation procedure eliminates fraud and unauthorised overdrafts.

By 31 December 1999 99,624 POS terminals had been installed.

Whereas the POS terminals installed at petrol stations and large retail outlets are heavyweight terminals linked via rented lines to the network's computer centres, those installed at small retail outlets and in other sectors involve the use of the switched telephone network (STN).

The interbank network can be accessed not only using bank debit cards but also by means of credit cards and a range of in-house cards mainly issued by petrol companies which can be used exclusively at petrol stations selling their brand. These companies make use of the infrastructure of the interbank network, but offer additional advantages, such as discounts, the possibility of using the card abroad, etc. These services are specifically aimed at attracting corporate customers with fleets of vehicles.

#### *ATM networks*

Banksys manages the ATM network and terminals online on behalf of the issuing credit institutions. ATMs are accessible by means of magnetic strip cards and secret PIN codes.

Transactions supported by Banksys ATMs (open access ATMs) are cash withdrawals, the checking of balances on current accounts, the alteration of PIN codes and the loading of PROTON cards. Each transaction triggers various immediate checks (see the section entitled "POS network").

In addition, several credit institutions offer ATM facilities (limited access ATMs) to their own customers within the framework of self-service banking units. These ATMs allow other types of

transaction, such as the ordering of documents (cheques or credit transfer forms) and transfers from current accounts to savings accounts.

By 31 December 1999 1,161 Banksys ATMs and 5,038 self-service banking units had been installed.

### 2.2.5 Postal instruments

The inpayment transfer is a hybrid payment instrument offered chiefly by the Post, which enables a payment to be made to a holder of a (bank or postal) current account on the basis of a cash inpayment at a post office. This instrument is primarily intended for payers which do not have a current account. In 1999 73.8 million inpayment transfers were made to a total value of BEF 1,908 billion (€47.3 billion), giving an average of BEF 25,854 (€641) per transaction. There is now a real move to discourage the use of this instrument, which requires lengthy manual procedures, by applying a high fee of BEF 17 (€0.42) per transaction.

The Post issues a special category of cheque, known as the postal draft. This is a payment order, sent by post, which the recipient can cash at a credit institution where it holds an account or at a post office. This payment medium enables a payment to be made to a payee which does not hold a current account or whose current account number is not known by the initiator of the transaction. The draft is drawn on a postal current account, possibly with a financial institution as intermediary. The government and its various agencies make extensive use of the postal draft system, for instance for the payment of social security benefits (e.g. pensions, family allowances). In 1999 13.8 million postal drafts were issued to the value of BEF 284 billion (€7.04 billion).

### 2.2.6 Commercial bills

Since the end of 1997 the system for the centralised processing of commercial bills (CPCB), operated and managed by the NBB, has eliminated the physical circulation of

commercial bills in the interbank circuit, replacing it with an automated data exchange through the CEC. To this end, the CPCB system automatically centralises, retains and presents for cash processing all commercial bills domiciled at financial institutions represented in the Clearing House of Belgium. In the case of non-payment of commercial bills, the CPCB system carries out the complementary function, assigned to it by law, of central depository of bills of protest. It carries out the majority of administrative tasks relating to the preparation, recording and publication of bills of protest. This publication takes the form of a list, which is transmitted each month to the registries of the Trade Tribunals. The CPCB system also ensures the distribution to third parties of information concerning published protests.

The use of the commercial bill<sup>7</sup> and its variants has tended to decrease over recent years, although some specific sectors of the economy still use it frequently. In 1999 some 700,000 commercial bills were processed on behalf of 60 financial institutions. Around 30,000 bills of protest were established, half of which were published, the other half having been settled prior to publication.

### 2.2.7 Other payment instruments

Other instruments are also used in Belgium, the main ones being:

- the traveller's cheque; and
- the luncheon voucher.

Luncheon vouchers are issued by two French-owned companies ("Le Chèque-Repas" and "Ticket Restaurant") to any firm wishing to distribute them to its employees as part of their remuneration package. Since 1 April 1994 their validity has been limited to three months and

<sup>7</sup> It could be argued that the commercial bill and its variants are not payment instruments as such, because settlement of the transaction underlying the bill has to be in the form of another payment medium (cash or deposit money). The commercial bill can, however, be passed to a third party by means of endorsement.

they may only be used for the payment of a restaurant bill or for the purchase of food products. Despite these strict limitations and the reduction in the tax advantages for the employer and the employee under the system, this instrument is still popular as an additional method of remuneration: 133.83 million luncheon vouchers were issued in 1999 (as compared with 95.03 million in 1990) for a total value of BEF 26.22 billion (€650 million), (as compared with BEF 15.90 billion (€394 million) in 1990).

## **2.3 Recent developments**

### **2.3.1 Internet**

Home banking and, in particular, internet banking are becoming increasingly successful. Most banks have a website which allows their customers not only to carry out various common operations such as credit transfers, standing orders and balance checking, but also to manage their asset portfolio.

There is no specific payment instrument or system (internet cheques or electronic bill presentment, for example) currently available, but various projects are under way in this field and major developments are expected to take place in the next few years.

### **2.3.2 Standardisation of payment instruments**

Great efforts are still being made to standardise payment instruments in order to facilitate their automated processing. In this respect, several working groups have been created by the Belgian Bankers' Association. The NBB collaborates actively with these groups. The means of payment for which a manual exchange in the clearing house remains compulsory (0.5% of the volume of all interbank transactions) are progressively being replaced by standardised instruments (e.g. the postal draft will become subject to truncation).

### **2.3.3 Security of e-payments**

Banksys already offers the option of paying with the PROTON card via the internet by means of a plug-in terminal for personal computers (see Section 2.2.4). Working in close co-operation with the credit card companies, Banksys has developed a system of hardware authentication for online transactions and is now working on an application which will allow end-to-end secure electronic transactions (SETs) from the customer, through the Banksys infrastructure, to the supplier. The system could also be extended to Wireless Application Protocol (WAP) and Interactive Television (iTV) applications.

### 3 Interbank exchange and settlements systems

#### 3.1 General overview

There are three domestic interbank payment systems in Belgium: ELLIPS, the CEC and the Clearing House of Belgium.

ELLIPS is an RTGS system designed to process large-value credit transfers. The CEC is the Belgian ACH for retail payments; it handles both credit and debit orders. These automated systems are the two pillars of the interbank payments system in Belgium. Together they

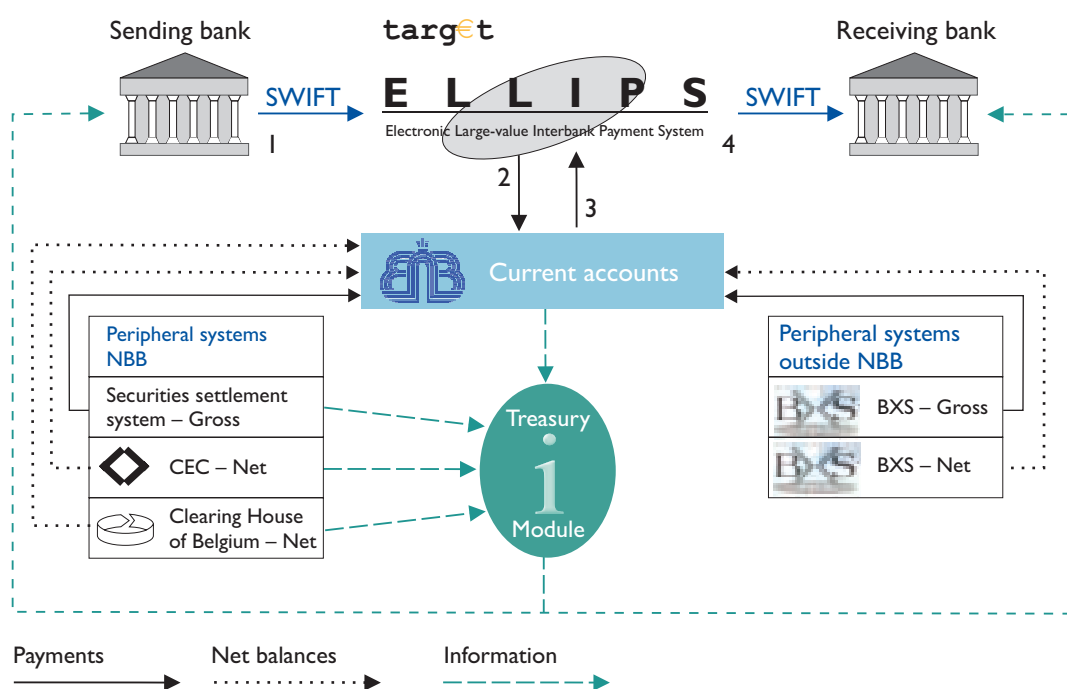
process more than 99.5% of interbank payments (99.4% of the total value).

The remaining interbank payments are processed by the Clearing House of Belgium, a paper-based system which operates from Brussels and from nine other cities in Belgium. This system handles the payments which are not yet accepted by the CEC.

Since 1 January 1999 all these systems have operated solely in euro.

**Figure 1**

**Interbank exchange and settlement**





## 3.2 The RTGS system: ELLIPS

### 3.2.1 Operating rules

ELLIPS is a non-profit-making association which has its registered office in the NBB in Brussels. Its operating rules were established by its General Assembly. The system has been operational since 24 September 1996.

The decision-making bodies are the Board of Directors and the General Assembly, both of which are composed of representatives of the members. The NBB acts as Chairman of the Board. It runs the system and assumes the daily management on a contractual basis between the NBB and ELLIPS. It is also a participant in the system.

### 3.2.2 Participation in the system

In ELLIPS, a two-tier system has been chosen. Direct participation in ELLIPS is confined to the Post, the credit institutions authorised in Belgium and the credit institutions operating on the Belgian market within the scope of the freedom of establishment and freedom to provide services within the EEA. The latter implies the possibility of remote participation. The NBB is a participant by right.

Direct participants must hold an account with the NBB and meet several conditions as described in the rules regarding operational capacity, solvency and legal guarantees.

The direct participants provide a representation service for other credit institutions (indirect participants). The payment orders of an indirect participant are processed in ELLIPS through its direct participant, which will also be responsible for the settlement of the operations.

ELLIPS is also the Belgian component of the European RTGS system in euro (TARGET). Thus, participating in ELLIPS implies access to the TARGET system.

By the end of 1999, ELLIPS had 18 direct participants and 84 indirect participants.

### 3.2.3 Types of transaction handled

ELLIPS processes credit transfers in euro only, for both interbank (MT 202) and customer payments (MT 100/103). ELLIPS processes both domestic and cross-border payments. Cross-border payments can be made to banks in any of the EU Member States participating in TARGET, even those which are not participating in Economic and Monetary Union.

The use of TARGET is compulsory for transactions directly related to the monetary policy of the ECB.

### 3.2.4 Operation of the transfer system

Transfers received by ELLIPS are checked immediately for validation. When a payment is rejected, a SWIFT message is sent to the initiator. Accepted orders are recorded in a file and treated individually and chronologically by the system according to the FIFO principle (first in first out). If there is no waiting queue for the sender, ELLIPS treats the transaction as follows:

- the necessary information to settle the transaction is extracted from the payment instruction and is sent to the NBB current accounts application;
- if sufficient funds are available on the settlement account held by the sending ELLIPS participant with the NBB, the payment is settled (sender debited, beneficiary credited) and is immediately finalised. ELLIPS is informed and instantly sends the relevant detailed messages to the beneficiary. If insufficient funds are available, the current accounts application informs ELLIPS of this event, and ELLIPS puts the payment instruction in the waiting queue until sufficient funds are available to execute it.

In order to ensure the smooth flow of payments, a bypass FIFO waiting queue mechanism exists. If a waiting queue already exists for the sender, the amount of the new accepted payment will be

compared with that of payments in the waiting queue with the same priority. If the amount of the new payment turns out to be smaller than that of all other payments in the waiting queue, and if no payment with a higher priority appears in the waiting queue, the new payment will be processed as if no waiting queue existed. Otherwise the new payment will be placed in the waiting queue. Certain payments may be given preferential treatment, and a higher priority code is entered for such payment messages. An increase in the sender's available funds triggers the processing of the payment messages in the waiting queue. Payment messages with a higher priority code are always treated first.

After 5 p.m. ELLIPS no longer accepts customer payments (SWIFT MT 100/MT103), with the exception of cross-border payments from TARGET. At 5.05 p.m. it tries to process the payments which are still in the waiting queue. In this case ELLIPS carries out a collective deblocking procedure.

At 6 p.m. ELLIPS no longer accepts interbank payments (MT 202), with the exception of cross-border payments from TARGET. Again, at 6.05 p.m. a collective deblocking procedure is initiated for interbank payments.

If the deblocking of both types of messages, cannot result in the execution of all payments still remaining in the waiting queue at that moment, all cross-border payments are deleted from the waiting queue.

Payments related to monetary policy (orders in favour of the deposit account and/or monetary reserves account) may be presented until 6.30 p.m.

All domestic payments still in the waiting queue at the closure of ELLIPS will be deleted at that time. Under normal circumstances, ELLIPS closes at 7 p.m.

**Table I**

**ELLIPS time schedule**

Operations	Schedule
• ELLIPS opening time	6.30 a.m.
• Payment orders validation controls	6.30 a.m. - 7 a.m.
• Start of payments settlement	7 a.m.
• Cut-off time for transfers agreed on day J-n	9.30 a.m.
• Cut-off time for customer payment orders (MT 100/103)	5 p.m.
• Cut-off time for interbank payment orders (MT 202)	6 p.m.
• Cut-off time for orders in favour of the deposit account and/or the monetary reserve account	6.30 p.m.
• ELLIPS normal closing time	7 p.m.
• Treasury module closing time	7.30 p.m.

### 3.2.5 Transaction processing environment

Data exchanges between ELLIPS and its members take place exclusively via telecommunications links through the SWIFT network.

ELLIPS has two different types of business continuity environments. The first continuity environment (secondary site) is located in Brussels near the “live system” (first site). It can take on processing in the event of a failure of the primary system by using a mirrored database and fully redundant public utilities. The second continuity environment (third site) is located 35km from the main centre in Brussels. The database in the second continuity environment is rebuilt on the basis of database D-1, to which the DB2 logging of D, which is continuously sent to this site, is applied.

### 3.2.6 Settlement procedures

Each transfer is settled individually by debiting the sender’s current account with the NBB and crediting the beneficiary’s account. The payments become final immediately (see Section 3.2.4).

### 3.2.7 Credit and liquidity risk

As ELLIPS is an RTGS system, the payments are settled one by one on the settlement accounts held by the participants with the NBB. If sufficient funds are available on the account of the sending participant, the individual transactions are booked instantly, thus becoming final immediately. Several instruments contribute to ensuring sufficient liquidity: the monetary reserves, free intraday credit guaranteed by collateral, the marginal lending facility and the deposit facility.

### 3.2.8 Pricing

For domestic payments, each participant pays an annual contribution to cover the fixed costs. The variable costs are shared on the basis of the number and characteristics of the payments. The costs of investments, which are not explicitly necessary within the framework of the link between ELLIPS and TARGET, are shared

evenly between the participants. Every new participant joining ELLIPS pays an entry fee determined by the Board and based on historical investment costs.

For cross-border payments (TARGET), costs are recovered on the basis of one single tariff per payment, billed to the initiator and based on the number of transactions made by this participant within a single system, according to a digressive scale.

The costs of the treasury module are distributed on the basis of the size of the computer resources used by different types of queries.

### 3.2.9 The treasury module

An online treasury module provides the participants with a range of information on what has been happening in the payment systems throughout the day. The participant can systematically obtain information on:

- the possibilities of credit with the NBB;
- the situation of its current account with the NBB;
- the transactions on its current account with the NBB and, more specifically, the ELLIPS payments;
- the operations from and intended for other RTGS systems participating in TARGET;
- the situation of the peripheral systems;
- the waiting queue with transactions to be carried out; and
- the waiting queue with transactions addressed to it.

### 3.3 The retail payment system: CEC

#### 3.3.1 Operating rules

The CEC is a non-profit-making organisation which was created in 1974. As in the case of ELLIPS, the Board of Directors, made up of representatives of the most important members and chaired by the NBB, takes the decisions on new rules.

The NBB also acts as operational manager of the system.

#### 3.3.2 Participation in the system

According to the organisation's statutes, all credit institutions legally entitled to operate in Belgium as well as the Post, the NBB and some payment organisations (e.g. Banksys) may make use of the services of the CEC either directly, as members, or through another participant, as sub-members. Direct members must fulfil some financial (minimum risk-asset ratio), operational (technical ability to operate), juridical (legal opinion for members established under a foreign legislation) and volume criteria. All the institutions operating in the CEC must be direct or indirect members of the Clearing House of Belgium.

On 31 December 1999 the CEC comprised 46 members and 58 sub-members.

#### 3.3.3 Types of transaction handled

The CEC is used only for exchanging retail payments. The main categories of operation include credit transfers for up to €500,000, truncated cheques for up to €10,000, unpaid cheques, direct debits, unpaid direct debits, bills of exchange, loading operations of e-purses and ATM/POS transactions. The latter category represents approximately 38% of the total number of operations.

In 1999 the CEC processed a daily average of 3.7 million operations (with a maximum of 9.6 million) for an average amount of €1.9 billion. The six largest participants accounted for almost 84% of the total number of transactions handled by the system.

#### 3.3.4 Operation of the transfer system

The CEC system operates on a round-the-clock basis, five days a week, and on Saturday from 9 a.m. to 5 p.m. without cut-off. The remitting institution generates files of messages to be sent under different application codes, according to their type. Data are transferred to the CEC via telecommunication, or via magnetic media in backup situations. There is no exchange of paper payment documents (including cheques), as these are retained (truncated) by the institution which receives them from the customer. Following certain checks, the messages are sorted by addressee and then sent. The participants may inquire about their treasury position via telecommunication throughout the day. Participants cannot revoke their operations once they have confirmed them.

**Table 2****CEC time schedule for settlement on D-Day***(Teleprocessing users)*

Operations	Cut-off times
Direct debits and unpaid direct debits	D: 10.30 a.m.
Credit transfers	D: 1.30 p.m.
Bills of exchange	D: 1.30 p.m.
Cheques and unpaid cheques	D: 2.15 p.m.
Higher-value* or urgent credit transfers	D: 3 p.m.
Daily cut-off	D: 3.15 p.m.

\*Value between €125,000 and €500,000

The settlement of the data exchanged after these deadlines takes place on the next value date.

**3.3.5 Transaction processing environment**

Data exchange between the CEC and its members takes place via telecommunication with compulsory encryption. Data are handled via teleprocessing, and magnetic media are only used as backup. The CEC operates with a very high degree of reliability. Immediate contingency facilities exist both within the NBB and in an external backup centre.

**3.3.6 Settlement procedures**

The settlement of the CEC balances is net and multilateral. The amounts to be cleared as a result of the exchanges are calculated for each member and settled on a current account at the NBB. This account can be either that of a settlement bank (i.e. an ELLIPS participant) or the member's own account. All exchanged payments are settled on the same day, provided they have been remitted before the cut-off time.

**3.3.7 Credit and liquidity risk**

The CEC multilateral net balances are settled through ELLIPS participants. Risks are also limited on account of the participation criteria (see Section 3.3.2) and a maximum unit value per type of operation.

**3.3.8 Pricing**

The cost of the CEC system is shared between its members on the basis of transaction volumes and the means of exchange used, so that the NBB's costs are fully covered. The direct members also have to pay a fixed annual fee. In addition to these system costs, an interbank pricing system exists according to which every receiving bank pays a certain sum to compensate for the remitter's data exchange costs.

**3.3.9 Main projects and policies being implemented**

In the future, the CEC is to process all retail transactions, including those which are still exchanged in the manual clearing house. This goal should be reached by modernising some

paper-based payment instruments and by using new technologies, such as those which allow the processing of images.

### 3.4 The paper-based system: Clearing House of Belgium

#### 3.4.1 Operating rules

The Clearing House of Belgium (an association without a specific legal structure) is governed by a Board of Directors composed of representatives of the most important member institutions and chaired by the NBB, which also acts as system operator. The Board determines the operating rules. The statutes of the association require the approval of the General Assembly in which each participant has a voting right.

#### 3.4.2 Participation in the system

Membership of the Clearing House of Belgium is granted by a decision of its General Assembly. All credit institutions (plus the Post and the NBB) legally active in Belgium may participate.

As at 31 December 1999 the Clearing House comprised 44 direct participants and 57 indirect participants.

#### 3.4.3 Types of transaction handled

The Clearing House of Belgium only handles paper-based payment instruments which cannot be exchanged automatically in ELLIPS or in the CEC, i.e. mainly cheques of more than €10,000, postal drafts and corrections of CEC operations. The clearing house no longer processes credit operations.

The total value of these operations is marginal compared with that of the ELLIPS transactions. In 1999 their daily average value amounted to approximately €450 million for a volume of 19,800 payments.

#### 3.4.4 Operation of the transfer system

The Clearing House processes paper-based transfer orders within and between its various branches (by post or courier service). The announcement and remittance of operations are accepted from 8 a.m. to 11.45 a.m.; the sorting of envelopes by the staff of the Clearing House ends at 12.15 p.m., and the withdrawal and confirmation of operations take place between 12.15 p.m. and the system cut-off time at 3 p.m. Operations cannot be revoked unless there is a bilateral agreement in place. Payments become final on the same day.

**Table 3**

#### Time schedule of the Clearing House of Belgium

Operations	
Opening	9 a.m.
Announcement and remittance	11.45 a.m.
Sorting	12.15 p.m.
Withdrawal and confirmation	3 p.m.
Daily cut-off	3 p.m.

### 3.4.5 Transaction processing environment

The operating rules of the Clearing House were modified considerably following the launch of the ELLIPS system. The few remaining paper-based operations are physically exchanged using mailboxes installed on the premises of the NBB, without the compulsory presence of the credit institutions' representatives, while the related financial data are announced via telecommunication either in the clearing house or at the member banks' head offices. Operations are confirmed electronically by the addressee on receipt of the payment documents.

### 3.4.6 Settlement procedures

At the end of the day, the net balances of each participant are automatically settled on a current account at the NBB. This account can be either that of a clearing bank (i.e. an ELLIPS participant) or the participant's own account. All exchanged operations are settled on the same day.

### 3.4.7 Credit and liquidity risk

Since the Clearing House of Belgium is a peripheral system like the CEC, the multilateral net balances are settled through ELLIPS participants. Risk is also limited on account of the participation criteria (see Section 3.4.2).

### 3.4.8 Pricing

The cost of the Clearing House of Belgium is borne by the participants, which pay a fixed fee per remitted envelope as well as a fee for the use of the computer application and courier services.

### 3.4.9 Main projects and policies being implemented

In order for the interbank exchanges to become fully automated, the few thousand daily transactions which continue to be handled by the Clearing House will have to be eliminated. Several initiatives have already been taken in order to introduce new types of operation in the CEC and replace the payment instruments regarded as obsolete by more modern ones.

## 4 Securities settlement systems

### 4.1 Trading

#### 4.1.1 Off-exchange market in linear bonds, strips and Treasury certificates

The off-exchange market in linear bonds, strips and Treasury certificates was established as a regulated market in the sense of the EC Directive on investment services by the Royal Decree of 22 December 1995. The Royal Decree delimits the market, regulates access to it, grants certain categories of legal persons the exclusive right to act as professional intermediaries, determines regulatory and supervisory tasks and, finally, regulates the provision of information to the public. The Committee of the Securities Regulation Fund is the first-level market authority. The BFC is

responsible for the second-level control of the Belgian market authorities.

The majority of the secondary market transactions are OTC transactions. This market is sustained by a team of primary dealer market-makers (around 15) appointed by the Belgian Treasury with an obligation to act as market-makers.

Since September 1999 some Belgian long-term dematerialised public debt securities have also been traded on EuroMTS, a pan-European electronic trading system for euro-denominated benchmark government bonds. EuroMTS works through the Telematico system, an electronic trading platform of Italian origin launched in 1988. This system only handles the most liquid

domestically-issued instruments on a real-time and price-driven basis.

Following the example of Italy, France, the Netherlands and Portugal, Belgium has also decided to adopt the MTS technology for its domestic market as from May 2000, through a new purpose-made entity called MTS Belgium. (75% of the shareholding's structure is in the hands of the primary dealers in Belgian public securities.) The technology used by MTS Belgium is the same as that of EuroMTS, but with a domestic scope in terms of the securities treated (including all long-term and short-term bonds).

The bulk of OTC transactions, including EuroMTS and MTS Belgium transactions, are settled through the NBB's SSS (see Section 4.3 entitled NBB-SSS).

#### 4.1.2 Euronext Brussels

##### *Legal and institutional aspects*

On 22 September 2000 the exchanges of Paris (Bourse de Paris), Amsterdam (AEX) and Brussels (BXS) merged, becoming wholly-owned subsidiaries of Euronext NV, a Dutch incorporated *structuur regime* holding company. Euronext is creating a fully integrated cross-border stock and derivatives trading market, with one trading system, one central order book and a single set of trading rules. By mid-2001 cash market transactions will be traded on a single trading platform, the *Nouveau Système de Cotation* (NSC) which is already being used in Paris. Furthermore, clearing and settlement will be integrated (see below).

From a regulatory point of view, the three exchanges will still be regulated markets recognised in their national jurisdictions, but national rules (e.g. listing requirements, membership, enforcement trading and surveillance) will be harmonised. In the case of Belgium, the main legislation for the cash markets is currently stipulated in the Law of 6 April 1995 relating to secondary markets, the

Royal Decree of 16 February 1996 establishing the regulations of the Brussels Stock Exchange, and the market rules as approved by the Minister for Finance. The Royal Decree of 9 June 1999 recognised Euronext Brussels (BXS) and authorised it to organise the derivatives market. Exchange rules and market rules for the derivatives market are in the form of ministerial decrees. The admission criteria for members of the cash and derivatives markets are stipulated in those texts. The "Euronext" Law of 12 August 2000 implemented a framework for the adjustment of the existing legislation.

The Belgian BFC acts as a second supervisory body of the market authority for Euronext Brussels.

The Euronext merger has created a single organisation with one line of command for the three exchanges. Euronext has a two-tier board structure consisting of a Managing Board and a Supervisory Board. The three members of the Managing Board are appointed by the Supervisory Board. The Managing Board is responsible for the company's general policy and for making decisions on the principles for the organisation of the markets and the clearing and settlement of transactions.

##### *Operational aspects*

- Cash markets

Most securities are traded on the *primary market*, where shares, bonds, loans and rights offered by listed companies are quoted. The primary market is subdivided into the continuous market (the market for "large" companies) and the fixing market. The most liquid securities are grouped on the continuous market. The fixing market was previously called the cash market and the continuous market was called the forward market, referring to its settlement modality. This "forward" market settlement on a fortnightly basis (known as the *quinzaine* system) was superseded altogether by a rolling settlement on a T+3 basis as from 1 December 2000. Double listings, i.e. a listing



on both the continuous and the fixing market, are impossible. Price fixing on the “continuous market” takes place on a continuous or semi-continuous basis, whereas on the fixing market, price fixing takes place once or twice a day. The markets are order-driven, and pre-trading takes place on an anonymous basis.

The *secondary market* is mainly a market for real estate certificates, primarily operating as the Fixing Market. The *EURO.NM Belgium*, an initiative of the stock exchanges of Paris, Frankfurt, Amsterdam and Brussels, aims at the financing of innovative companies with a high growth potential.

All these markets are regulated markets in the sense of the EC Directive on investment services. Broker “market members” dispose of direct access to the market and can trade on their own account or act for specified member categories. Some act as specialists, with obligations regarding orders and price spreads in selected stocks, thus providing liquidity.

Trading hours are currently from 9 a.m. to 5 p.m. but these are expected to be extended. As an automated electronic trading and support system is used, trade matching between direct market participants takes place by T+0. The stock trades are cleared through BXS-Clearing (see Section 4.2).

- Derivatives markets

Euronext Brussels Derivatives (formerly BELFOX) is a regulated market which trades futures, options and index participation units. There are three different types of membership:

- the public order member (POM) which is authorised to collect customer orders or to generate its own orders, but does not have direct access to the market;
- the broker which benefits from direct access to the market, trades orders collected and/or generated by POMs in addition to orders generated for its own account; and

- the market-maker which is only authorised to trade on its own account and which is subject to the obligation to provide buy-sell quotes in accordance with market regulations. The market-maker has direct access to the market.

Trading takes place on a fully automated market. Brokers can introduce various single-order or spread-order types into the system. They are able to see the best bid at all times, ask about the prices available on the market and check the market depth. The trades are cleared through BXS-Clearing (see 4.2).

#### 4.1.3 Easdaq

Since its establishment in 1996, Easdaq has aimed to be a pan-European stock market, operating independently of any national market. Easdaq listings primarily include companies in the telecommunications, information technology, software and biotechnology sectors. Share prices for listed companies are quoted in the currency chosen by the company at the time it applies for admission.

The basic legislation for the organisation and functioning of the market is laid down in the Law of 6 April 1995 and in the Ministerial Decrees of 6 and 21 January 2000. It is a regulated market in the sense of the EC Directive on investment services. The Belgian BFC acts as a market authority.

Members assist companies in preparing for admission to a listing on Easdaq and may also act as brokers or market-makers.

Easdaq is a screen-based, price-driven market which uses a multiple market-maker system, similar to that used by Nasdaq in the United States, to support continuous trading and ensure liquidity. It has its own dedicated trading platform.

The market is open between 9 a.m. and 5 p.m. C.E.T. Only market-makers registered for a particular security may enter price and size

quotations for that security. A market-maker must purchase and sell securities on its own account and on a continuous basis during normal business hours, entering and maintaining two-sided quotations regardless of business conditions. The quotations must be at least the minimum quotation size. Market-makers' quotations must be reasonably in line with prevailing market prices.

On-screen quotations are managed and transactions matched and confirmed using TRAX, a global communications network which is operated by the International Securities Market Association (ISMA). Every transaction executed on Easdaq must be reported to the central system within three minutes.

Easdaq transactions are settled through Euroclear or Clearstream.

## 4.2 Clearing

### 4.2.1 BXS-Clearing

#### *Institutional and legal aspects*

BXS-Clearing is appointed by the Board of Directors of the Brussels Stock Exchange (Euronext Brussels since October 2000) to clear all transactions concluded on both its continuous cash markets and its derivatives markets (since June 1999), and on its fixing cash markets (since March 2000).

BXS-Clearing is a Belgian limited company and a fully owned subsidiary of Euronext Brussels. The members of the Board of Directors and the Executive Committee of BXS-Clearing are appointed by Euronext Brussels. The Executive Committee of Euronext Brussels assumes the management responsibilities for the clearing house.

The requirements and principles for the functioning of the clearing house were established by the Royal Decree of 18 August 1999. Furthermore, the clearing rules require the prior approval of the Minister for Finance.

The BFC is responsible for the prudential supervision of BXS-Clearing. The NBB has general responsibility as an oversight authority.

The three clearing houses of the Euronext exchanges merged as from 1 January 2001. Trades executed on the Euronext platform are cleared through a single central counterpart, Clearnet, the clearing house of Euronext Paris. Clearnet will have branches in Amsterdam and Brussels. From an operational viewpoint, a single clearing system (Clearing 21) should be operational by the end of 2001.

#### *Operational aspects*

- Instruments cleared

BXS-Clearing clears cash market instruments (Belgian and foreign stocks) and derivatives (futures, options and index participation units).

- Clearing members

The main admission criteria for becoming a clearing member include having an adequate financial structure, meeting solvency and quality requirements established by the clearing house and having the required professional experience. Clearing members subscribe to the clearing regulations and procedures through the membership procedure, typically on a contractual basis. De facto, only credit institutions or brokers are members of BXS-Clearing. For clearing members involved in derivatives clearing, BXS-Clearing imposes capital requirements, with the level depending on the clearing member type.

Not all trading members are automatically clearing members. There are two types of clearing member:

- individual clearing members are authorised to act as a counterparty of the clearing house in trades executed for their own account or for the account of their own customers (including other non-trading-member professional inter-mediaries); and

- general clearing members have additional authorisation to act as a counterparty of the clearing house in trades executed for the account of other trading members or for the account of customers in the books of other trading members.
- Central counterparty

BXS-Clearing guarantees the final settlement of all positions in stocks and derivatives which it clears. It acts as a central counterparty for the trades, having a principal-to-principal relation with its clearing members. As soon as a trade has been matched and enters the clearing system, BXS-Clearing becomes the buyer with regard to the seller and the seller with regard to the buyer. In this way, the counterparty risk of either market participant is standardised. BXS-Clearing undertakes to meet the obligations of the defaulting counterparty, i.e. if a clearing member either cannot pay the security it has bought or cannot deliver a security it has sold. In the latter case, the obligation can be met with an offsetting cash payment.

- Positions accounts structure

Derivative clearing members are required to separate their customers' accounts from their own, as well as separating their own accounts from the customers' account of the trading members for which they execute clearing transactions. Furthermore, netting between individual customers' accounts is not allowed.

Cash general clearing members are required to separate the accounts of each trading member for which they execute clearing transactions.

- Position monitoring and margining

BXS-Clearing monitors the positions of the clearing members and their customers progressively throughout the day. Derivatives positions are updated in real time from matched trade reports and are available for re-margining at any time on the basis of the latest prices.

Position limits are imposed per contract and per clearing member. Cash market transactions are downloaded in the clearing application four times a day.

Margins are required from clearing members with regard to their own and their customers' accounts. Furthermore, and notwithstanding the fact that there is no legal relationship between the clearing house and the clearing members' customers, the derivatives clearing rules stipulate that clearing members ask for minimum margins from their customers.

Normally, margin requirements are calculated at the end of each day and are to be settled the following morning before 9.45 a.m. In order to ensure an adequate and timely clearing process in volatile markets, BXS-Clearing can either increase margin requirements or impose intraday margining.

For cash market positions, both an initial margin and a variation margin are calculated on the basis of the closing price of the underlying stocks. The initial margin is calculated as a percentage (depending on the nature of the underlying security) of the stock value. The variation margin consists of the sum total of the "realised" profits and losses which are determined via marking-to-market, this compensation taking place as per settlement date.

BXS-Clearing establishes an initial margin for each futures contract. A fixed percentage of the contract value is determined with reference to the maximum anticipated price movement in one day. Option margins are also calculated on a daily basis, taking into account market volatility.

- Collateral

Collateral is to be deposited with BXS-Clearing by the clearing members in order to cover the risks associated with the open positions held by the clearing house and resulting from transactions on one of the markets run by

Euronext Brussels. Accepted collateral includes cash and bank guarantees, Belgian Treasury bills, Belgian government bonds, stocks underlying options contracts, stocks from the BEL 20 index, the B-Gold index and a selection of European stocks from European indices. A weighting factor is applied to each category for haircut purposes. The required collateral has to be deposited by the clearing members on an account of BXS-Clearing held with the NBB or with the inter-professional securities depository trust (CIK).

The clearing members can replace the deposited collateral with other forms of accepted collateral. The deposited collateral is returned at the request of the clearing member once there are no longer any open positions requiring a collateral deposit.

BXS-Clearing has a legal privilege with regard to the deposited collateral. This legal privilege is governed by Article 41, paragraph 2, of the Law of 6 April 1995 on secondary markets, the legal status and supervision of investment firms, and intermediaries and investment advisors and by the Royal Decree of 9 June 1995 on the simplified procedure for realising collateral.

- Settlement

Futures are marked-to-market daily at the end of each trading day and subject to daily settlement. The credit margin which appears may give rise to withdrawals on the part of the clearing member. Debit margins cause cash payments to be made on the following day before 9.45 a.m.

Option premiums are payable in full on T+1.

Both cash stock market transactions and stock options exercises and assignments at expiry are settled in the FMS system of BXS CIK (see Section 4.3).

Cash call payments to and from BXS-Clearing can be made either in central bank money or in commercial bank money through the protected payment system (PPS). When using the PPS, the clearing member has to open its own accounts and

customer accounts with one of the four private banks participating in the PPS in order to register in-house and customer transactions respectively. If there is no intraday margin call, settlement normally occurs once a day, before 9.45 a.m., with regard to positions at the end of the previous day. Payments are final upon entry in the books of the settlement banks at 9.45 a.m. Upon the request of BXS-Clearing, the PPS bank guarantees each morning the unconditional crediting of BXS-Clearing's accounts, unless it reacts before 9.45 a.m.

- Default procedures

The clearing procedures describe given situations in the event of a default.

If a clearing member cannot deliver the specified stocks, BXS-Clearing starts a specific procedure to buy that stock (buy-in procedure). It should be noted that with the replacement of the Brussels forward market by a T+3 rolling settlement (for all cash trades as from 1 December 2000), Euronext Brussels will install a centralised stock lending and borrowing (L&B) pool, thus minimising the delivery defaults and the need to apply buying-in procedures. BXS-Clearing will manage the L&B system. It will interpose itself between the lender and the borrower and act as guarantor of the obligations of the borrower vis-à-vis the lender.

When a clearing member is no longer creditworthy (e.g. bankruptcy, default on payment of margin calls), all or part of its own positions are closed in accordance with market practices. In emergency conditions, BXS-Clearing may close all open positions at a price fixed by the Board of Directors. The customer positions with a defaulting clearing member are transferred to other members.

In the event of default, BXS-Clearing is entitled to liquidate all collateral deposited by the defaulting clearing member on an account of BXS-Clearing. The simplified procedure for exercising its legal privilege allows BXS-Clearing to realise the collateral immediately, without

prior notice to the defaulting clearing member and without prior authorisation by a Belgian court.

Various sanctions may be imposed on defaulting members, ranging from a warning to the withdrawal of the clearing licence.

### 4.3 Settlement

#### 4.3.1 NBB-SSS

##### *Institutional and legal aspects*

Articles 3 and 12a (and the subsequent amendments thereof) of the Law of 2 January 1991 relating to public securities and the instruments of monetary policy established the dematerialised form of public debt as well as the SSS managed by the NBB (NBB-SSS). This settlement system is thus fully owned by the NBB and operated within its Financial Markets Department. These articles were inspired by the general philosophy of Royal Decree No. 62 of 10 November 1967, which defined the rules applicable to fungible securities under Belgian law.

Legal measures have also been taken in order to protect the investors' interests, particularly against the default of the holder of a dematerialised securities account, e.g. the segregation of assets. In this respect, the owners of securities held with the NBB-SSS have co-ownership rights to these securities, and this also applies in the very hypothetical case of insolvency of the NBB. The protection of security holders with regard to the irrevocability and the finality of settled transactions (including the event of insolvency on the part of the counterparty) had already been ensured by Article 157 of the Banking Law of 22 March 1993 (as extended by a Royal Decree of 28 January 1998), and was further enhanced by the incorporation of the EC Directive on settlement finality into Belgian law (Law of 28 April 1999, amended by the Royal Decree of 18 August 1999).

The Law of 6 August 1993, governing transactions on certain securities, introduces a new tax system for fixed income securities deposited in a settlement system; it also assigns the Treasury the responsibility for the collection and payment of the withholding tax due from certain beneficiaries of securities income.

The Securities Regulation Fund (SRF) is responsible for the supervision of the holding of the accounts of dematerialised public debt securities.

The NBB-SSS has a single category of members, the direct participants, encompassing a very wide range of institutions entitled to apply for membership: credit institutions established in the EU, stockbroking firms established in the EU, the Treasury administration, the NBB, Clearstream Luxembourg, Euroclear, Sicovam and other SSSs.

##### *Operational aspects*

Each participant joining the system has different accounts for the securities held on its own account, those held on behalf of third parties and those pledged for collateralisation purposes.

The settlement of the cash leg of DVP transactions takes place in central bank money on the participant's current account in the books of the NBB. Participants thus benefit from very close integration of the cash and securities dimensions within one single entity.

Repo transactions in Belgian dematerialised public securities traded either on the Repoclear or on the EuroMTS platforms are cleared within Repoclear, a service provided by the London Clearing House (LCH). Acting as a central counterparty, Repoclear performs a multilateral netting process once a day, taking into consideration all the trades concluded between counterparties which have been sent for clearing. The settlement of the netted movements stemming from Repoclear is subsequently ensured within the NBB-SSS settlement process.

During the course of the day incoming notifications are entered into the system as quickly as possible. As soon as a notification has been registered, the system tries to match it. To this end, the notification of the counterparty must already exist. When both notifications have been entered into the system, all details are compared and the match is successful if no discrepancies are found.

The bulk of the orders, sent to the system via the SWIFT network, are automatically authenticated, subject to an exchange of SWIFT keys between the NBB and the participant involved.

Participants located in Belgium can also use a secured IT communications network (developed by the Belgian banking community) to send their orders to the settlement system.

In order to reduce the risks relating to errors or omissions on the part of the counterparties, the system regularly updates the status details of participants' notifications. The participants can verify the status of their instructions online and react in the event of mismatched instructions.

Several definitive batches (about ten batches a day) are run throughout the working day. Each of these batches performs gross settlement of the eligible notifications, meaning that each transaction gives rise to the simultaneous settlement of one cash and one securities movement (BIS DVP model 1). In other words, the process checks the effective provision of cash (for the buyer) and of securities (for the seller) before settling the relevant transaction.

The batches are run between 8 a.m. and 4.15 p.m. for FOP and DVP transactions; additional batches may occur between 4.15 p.m. and 6 p.m., but only on an FOP basis and for the sake of collateral transactions involving one NCB of the Eurosystem.

Each of these batches starts at a predetermined time and tries to settle the selected transactions, provided there is sufficient cash and security

provision. Those transactions not selected (owing to a lack of securities/cash or to other selection criteria) remain in the queue and are examined again when the next batch is run.

The admission requirements with regard to the successive batches are determined in such a way that the criteria become increasingly broader throughout the day.

The option of an automatic securities lending facility is offered to the direct participants. This facility enables holders of securities which have no immediate need for them to lend them to other participants. The lent securities are covered by a pledge of securities taken by the system from the borrower's own holdings (full collateralisation basis). These loans are granted without direct intervention of the lenders and borrowers. The automatic securities lending process is undertaken at the end of the last DVP settlement batch of the day, scheduled to be completed at 4.30 p.m. The repayment procedure is also automated.

The system operates according to the pooling principle whereby a number of lenders make securities available to participants which need them to settle their planned transactions. This process is fully confidential, with the identity of the lenders not being revealed to the borrowers and vice versa. The automatic securities lending works in such a way as to guarantee fair distribution of the loans in the long run in terms of amounts offered by each potential lender.

The fee structure includes the following elements:

- a monthly flat-rate fee as well as a monthly custody fee per participant identification number in the system;
- a half-yearly lump-sum to cover the cost of consultation facilities; and
- a notification/movement fee per sent order.

The international holding and trading of Belgian public debt securities have also been simplified as a result of the links established between the NBB-SSS and other SSSs, i.e. Clearstream Luxembourg, Euroclear (since 1991) and Sicovam (since 1999).

#### 4.3.2 BXS CIK

##### *Institutional and legal aspects*

The CIK is a limited liability company in public law, established under the terms of Royal Decree No. 62 of 10 November 1967, facilitating circulation of securities. It is located in Brussels, Belgium. The CIK was recognised and its articles of association recently modified and approved by the Royal Decree of 3 September 2000. Its general rules were approved by the Minister for Finance on the same date. The CIK is managed by its Board of Directors.

In 1999 the CIK became a wholly-owned subsidiary of the former Brussels Stock Exchange. Euroclear Bank, Necigef and the CIK have recently signed a Memorandum of Understanding regarding the future merging of their settlement activities.

The accession rules are laid down in Article 2 of the CIK's by-laws. Any professional authorised to handle stock exchange orders as well as any foreign SSS may become a member (affiliate) of BXS CIK. Issuers are not admitted.

Affiliates can cancel their membership by giving at least one month's notice by registered letter. The affiliate's liabilities to the CIK end when the affiliate has settled all of its accounts. Any affiliate which does not respect the decisions of the General Assembly or the Board of Directors or, more specifically, the terms of the by-laws, or which, in particular, issues transfer or withdrawal orders for which its account has insufficient funds, may be excluded by the Board of Directors following a summons by registered letter or a hearing. The affiliate shall be notified of the decision of exclusion by registered letter

at least 15 days before the decision becomes effective.

The Minister for Finance is represented by a government commissioner which attends board meetings in an advisory capacity. The NBB's oversight responsibilities also cover the activities of the CIK.

##### *Operational aspects*

The CIK acts as a central depository for Belgian private sector securities. As a custodian, it also provides safekeeping for bearer certificates and other related services: payment of principal, interest and dividend in direct participants' accounts, as well as notification of corporate actions. The CIK is also the Belgian National Numbering Agency.

The CIK operates a settlement system in which both stock exchange (Euronext Brussels) transactions and OTC trades are settled.

- Eligible securities

Eligible securities for custody services and transfers must be fungible. This covers listed Belgian shares, warrants, bonds and rights as well as foreign listed bonds and shares. Dematerialised private corporate bonds are also eligible. Any unlisted fungible instruments can be eligible upon the agreement of the Board of Directors. Instruments eligible in the CIK are either in dematerialised form (money market instruments and private corporate bonds) or in bearer form (corporate bonds, shares, etc.), of which approximately 50% are issued as global certificates, while another 40% are immobilised. Since the implementation of the Law on the Belgian financial architecture (BELARFI) in 1998, the CIK can no longer hold positions on accounts for securities issued by the Belgian public sector.

- Settlement

Both cash and forward market on-exchange transactions are settled through the CIK's FMS system. OTC transactions are settled through

the electronic matching and securities settlement (EMSS) system.

Notifications in the CIK system are SWIFT-based messages and are exchanged via the SWIFT network. A CIK-dedicated workstation (Satelit/Elit) can also be used.

- Default procedures

In the event of default (e.g. bankruptcy), the defaulting participant will be disconnected and will not be allowed to enter into new transactions. Other participants will be informed by official notification.

In the event of bankruptcy, transactions will be settled up to the moment of declaration or official notification by the administrator. The Law of 28 April 1999 transposed into Belgian law Directive 98/26/EC on settlement finality in payment and securities settlement systems. Transfer orders and netting are enforceable and, even in the event of insolvency proceedings against a participant, are binding on third parties, provided that transfer orders were entered into a system before any such insolvency proceedings were initiated.

- Settlement asset

The CIK does not maintain cash accounts for its participants. The cash accounts are held at the NBB. The cash leg of the transaction is settled in central bank money. Cash settlement is carried out in euro.

- Forward market settlement

Since 1 December 2000 (settlement date), all cash transactions on Euronext Brussels have been settled in a rolling settlement cycle on T+3. Before this date, settlement on the Brussels forward market segment took place fortnightly in what is known as the *quinzaine* system.

For on-exchange transactions the Clearing House of Belgium interposes itself between the buyer and the seller.

The CIK organises a DVP settlement based on the DVP Model 1 according to the 1992 BIS report on "Delivery versus payment in securities settlement systems". Settlement in the FMS system takes place by means of a batch process for securities and cash, seven times a day between 6 a.m. and 2 p.m. The FMS system settles the securities on the basis of a balance per value and per clearing member. The cash settlement is based on a balance per clearing member (identified by its BIC code) per settlement processing cycle. The payment instructions received are processed in real time in the cash accounts of the clearing members held at the NBB. If, and only if, the cash payment is executed, the securities positions of the buyer which were previously blocked are immediately released.

- Stock lending and borrowing pool

With the replacement of the Brussels forward market by a T+3 rolling settlement, Euronext Brussels will install a centralised stock lending and borrowing system. The facility aims at reducing the probability of delivery defaults on the settlement date, thus enhancing settlement efficiency. Lending and borrowing will take place anonymously. BXS-Clearing will manage the system. It will interpose itself between the lender and the borrower and will act as guarantor of the borrower's obligations vis-à-vis the lender. The CIK will act as system operator. An important issue with regard to this project is the need to obtain fiscal neutrality for the lenders.

- The EMSS

#### Matching module

The EMSS provides a real-time matching module, where both buyer and seller introduce the details of their OTC trade. When the trade is fully matched, the transaction is ready for settlement. When the instructions do not match, participants receive a message informing them that the transactions are either unmatched or mismatched.



### Settlement module

The EMSS module settles OTC transactions on a trade-by-trade (gross) basis. It settles DVP transactions on a daily basis from 6 a.m. to 3.30 p.m. The EMSS also processes FOP transfers of securities. The latter can take place from 6 a.m. to 4 p.m.

The EMSS-DVP system is a DVP Model I system according to the 1992 BIS report on “Delivery versus payment in securities settlement systems”. Securities transfers are processed in the CIK, cash transfers are processed in the NBB, with the two systems being linked in accordance with an agreement between the CIK and the NBB. The cash delivery instruction sent to the NBB will only be initiated by the reservation of the securities involved in the transaction on a blocked account. The process of cash delivery cannot be initiated in the event of failure on the seller’s side. The reciprocity of the cash and securities transfers is guaranteed, as the release of reserved securities is only effected upon receipt of the confirmation of payment sent by the NBB. In other words, the buyer is never able to use the securities reserved on its account. The release and the irrevocable and final transfer of these reserved securities to the buyer’s account are guaranteed by the payment confirmation from the central bank.

Since October 1999 transfers have been performed on a continuous real-time basis, both for securities in the CIK and for the payment instruction in the NBB’s payment system. The transactions which are not processed at the end of the day are recycled for settlement on the following day.

- Custody

Royal Decree No. 62 of 10 November 1967 introduced the circulation of securities through book entry transfers and provided for the fungibility of all securities admitted to operations within the CIK. It stipulates a specific custody regime. The CIK has no

ownership rights over the securities deposited. There is no possibility of overdrafts on a CIK participant’s securities account. The holder of a security held with the CIK is granted co-ownership rights to this security. In this respect, the BELARFI Law of 15 July 1998 explicitly provides for the right of recovery in the event of insolvency of the CIK. Furthermore, the separation of own accounts from customer accounts is mandatory for the accounts held with the CIK by its participants. Failure to respect the separation obligation as such does not nullify the property rights of the securities owners. The same custody regime applies in the relationship between a CIK participant and its customers.

- Links

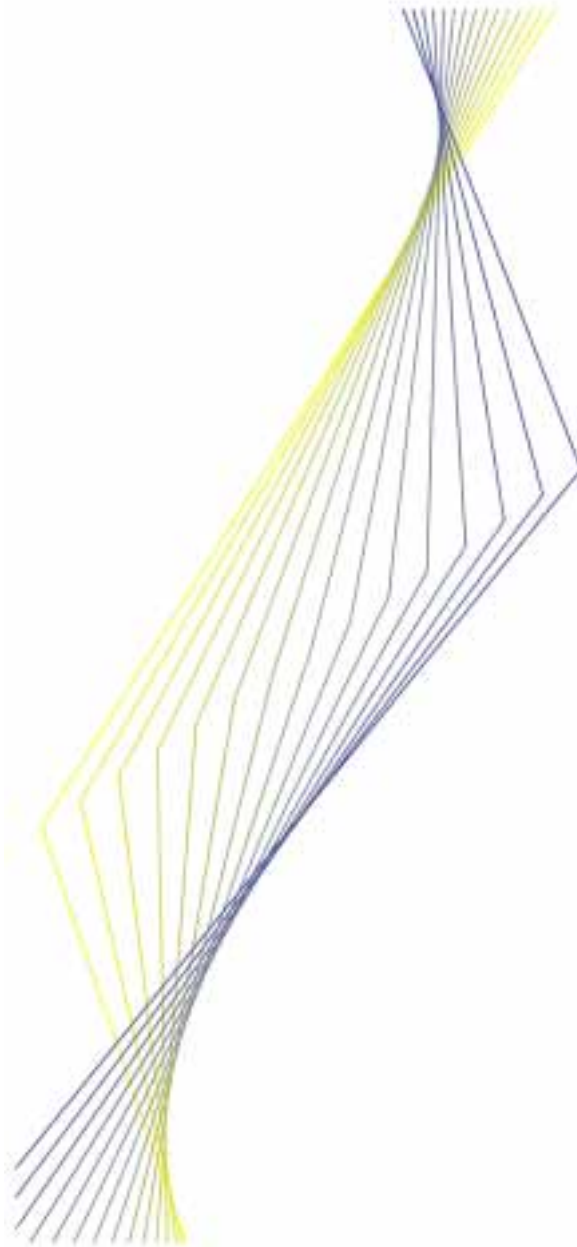
With regard to the links, the CIK has signed an agreement with SEGA (Switzerland’s CSD), stipulating that the CIK is a participant in SEGA. The CIK has also signed agreements with three other foreign CSDs, namely with DBC (Germany), SICOVAM (France) and Necigef (the Netherlands), as well as an agreement with Euroclear in which both parties are reciprocal participants. These links with the CSDs are established for FOP transfers of securities (equities) listed on Euronext Brussels. The Euroclear link can be operated as a DVP link.

#### 4.4 The use of the securities infrastructure by the central bank

Generally speaking, the NBB makes use of the SSSs located in Belgium for two main purposes: the holding and management of its own securities portfolio on the one hand, and the management of the collateral offered to it by counterparties for the sake of monetary policy operations or the coverage of intraday credit facilities on the other.



EUROPEAN CENTRAL BANK



**Denmark**

**June 2001**

Denmark

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## List of abbreviations

BEC	Computer centre used by Danmarks Nationalbank – <i>Bankernes EDB-Central</i>
CSE	Copenhagen Stock Exchange – <i>Københavns Fondsbørs</i>
Dankort	Joint Danish debit card scheme
Danmønt	Prepaid card scheme
DN	<i>Danmarks Nationalbank</i>
FUTOP	Clearing centre for listed futures and options
KFX	Danish Stock Index – <i>Københavns Fondsbørs Index</i>
PBS	Danish Payment Systems Ltd. – <i>Pengeinstitutternes Betalings Systemer A/S</i>
VP	Danish Securities Centre – <i>Værdipapircentralen</i>

## Useful links

Danmarks Nationalbank	<a href="http://www.nationalbanken.dk">www.nationalbanken.dk</a>
Danish Financial Supervisory Authority	<a href="http://www.ftnet.dk">www.ftnet.dk</a>
Danish Bankers' Association	<a href="http://www.finansraadet.dk">www.finansraadet.dk</a>
PBS	<a href="http://www.pbs.dk">www.pbs.dk</a>
Danmønt	<a href="http://www.danmont.dk">www.danmont.dk</a>
Danish Securities Centre	<a href="http://www.vp.dk">www.vp.dk</a>
Copenhagen Stock Exchange	<a href="http://www.xcse.dk">www.xcse.dk</a>
Danish Competition Authority	<a href="http://www.ks.dk">www.ks.dk</a>

## Introduction

A key feature of the Danish payments infrastructure is the high degree of co-operation within the financial sector in relation to the technical infrastructure. This co-operation has resulted in unified systems handling all types of retail payments (cheques, card payments, direct debit and credit facilities). Another important result of this co-operation is the advanced and unified system for handling securities in book-entry form.

Another key feature of the Danish payments infrastructure is that it is largely based on agreements between participants, system providers and Danmarks Nationalbank. Most agreements are entered into under the auspices of the Danish Bankers' Association.

Danmarks Nationalbank plays a key role in the Danish payments infrastructure, since payments between credit institutions to a large extent involve transfers between accounts held at the central bank. Danmarks Nationalbank's operational role in this infrastructure is not subject to specific legal obligations.

Danmarks Nationalbank has an obvious interest in the smooth functioning of the payments infrastructure in Denmark. Besides developing and running the RTGS systems DN Inquiry and Transfer Service (in Danish kroner) and DEBES (in euro), Danmarks Nationalbank also provides settlement facilities for the three privately operated systems, namely the Danish Securities Centre, the clearing centre for listed futures and options (FUTOP) and the retail clearing system. The oversight role of Danmarks Nationalbank has traditionally been founded upon agreements with participants and service providers.

The Danish Bankers' Association is the trade organisation for the Danish banking sector, and its members include all Danish commercial banks, savings banks, co-operative banks and subsidiaries and branches of foreign banks. The Danish Bankers' Association co-ordinates any work on

further developing the payments infrastructure and the wide range of mutual agreements behind this infrastructure. Apart from this role, the Danish Bankers' Association is the systems owner of the retail clearing system, through which nearly all retail payments are cleared and settled.

The banks have established a joint centre, Danish Payment Systems Ltd. (PBS), which operates the retail clearing system and, inter alia, the nationwide payment card scheme and other payment instruments, such as direct debit and credit facilities and the prepaid card scheme, Danmønt. PBS is jointly owned by almost all the Danish banks.

The Danish securities systems are interlinked, even though trading, clearing and settlement systems are not integrated. The market's institutions, the Copenhagen Stock Exchange (CSE), the Danish Securities Centre (VP) and FUTOP are linked electronically.

Trading in listed securities in all market segments can be performed either via the CSE or directly between participants. The settlement of securities transactions is carried out by the VP, which is also responsible for the book entry of securities ownership. Unlisted Danish securities and foreign securities may also be registered with the VP. Guaranteed contracts on options and futures are registered with, guaranteed by and settled with FUTOP.

The settlement systems are integral parts of both the VP and FUTOP, with Danmarks Nationalbank providing cash settlement facilities for both systems.

Even though Denmark chose to opt out of participating in EMU in 1992 (reaffirmed by the result of a national referendum on 28 September 2000), Denmark participates in TARGET through its RTGS system, DEBES. Thus, Danmarks Nationalbank and the financial sector in Denmark have extended the existing infrastructure in order to handle payments and securities trades in euro.

## I Institutional aspects

### I.1 The general institutional framework

#### I.1.1 The general legal framework

The Danish payments infrastructure is only to a limited extent regulated by laws. The general principles for the use of banknotes, coins, cheques and payment cards are stipulated in legislation.

The Cheque Act of 1932 is based on the Geneva Convention of 1931 and covers rules on the issuing and design of cheques as well as legal issues in relation to the transfer of cheques.

The Act on certain payment instruments of 1 July 2000 (formerly the Payment Cards Act) is primarily concerned with the protection of the cardholder (debit, credit or prepaid cards).<sup>1</sup> The Act governs, among other things, the sharing of responsibility between the card issuer and cardholder in cases of misuse. The Act follows the general principles laid down in the EC Recommendation on boosting consumer confidence in electronic payment instruments (COM/97/353). The Consumer Ombudsman monitors compliance with the Act, as well as compliance of the payment system as a whole with legislation on marketing.

Until the revision of the Payment Cards Act in April 1999 (now the Act on certain payment instruments), it was prohibited for card issuers to impose fees on retailers for the costs of operating payment systems, e.g. for the use of payment cards at retail outlets. Following this revision, card issuers may charge retailers in the case of non-physical trade (i.e. trade that does not require the physical presence of the cardholder and the payee).<sup>2</sup> If, by November 2001, the preconditions for competition in the payment card market are present, this prohibition will be lifted for physical trade. The following preconditions apply:

- there must be several, independent issuers of payment cards;

- there must be several service providers offering the acquisition of card payments;
- there must be no technical requirements demanded by acquiring agents of Dankort which prevent other payment cards from being used at terminals; and
- no technical requirements must be demanded by acquiring agents of Dankort which prevent terminals from being connected to other acquiring agents.

The Danish Competition Authority is responsible for monitoring developments in the payment card market.

Together with the Act on commercial banks and savings banks (1991), the Act on mortgage credit institutions (1989) and the Act on investment firms (1997), the Danish Securities Trading Act (1995) constitutes the general legislative framework for financial markets. The provisions of EU Council Directives on both investment services and capital adequacy were incorporated into these Acts with effect from 1 January 1996.

The Danish Securities Trading Act governs, inter alia, exchange, clearing and settlement organisations and the registration activities of CSDs, which, according to the provisions of the Act, are subject both to authorisation and supervision by the Danish Financial Supervisory Authority. As of April 2000, the Act was amended to implement the Settlement Finality Directive.

Issuers of prepaid cards are regulated by the Act on savings companies and issuers of prepaid cards (1996). They do not necessarily have to be credit institutions, but they are all under the supervision of the Danish Financial Supervisory Authority.

<sup>1</sup> The Act also covers payment instruments which employ other ways of identifying the user, e.g. other physical means of identification and codes and biometric values to identify the user.

<sup>2</sup> Non-physical trade includes e-trade, mail order sales and other forms of remote marketing.

The Directive on cross-border credit transfers was implemented in the Act on the cross-border transfer of money with effect from August 1999.

The Act contains provisions regulating the rights and obligations in the relationship between a credit institution and its customer(s) before and after the completion of a cross-border credit transfer, as well as the relationship between the credit institutions in the event that a transfer cannot be made as agreed. The Act covers transfers up to the equivalent of approximately DKK 370,000 (€50,000).

There are no specific laws governing the organisational and technical aspects of handling payments. The payments infrastructure is to a large extent based on agreements between members of the Danish Bankers' Association, some of which also involve Danmarks Nationalbank.

## 1.2 The role of the central bank

### 1.2.1 General responsibilities

Danmarks Nationalbank is the central bank of Denmark and is a self-governing institution. However, the Bank's profits, after allocation to the reserves, are transferred to the Government. The legal framework for the Bank is laid down in the National Bank of Denmark Act of 1936.

Issuing banknotes and coins is one of the key tasks of Danmarks Nationalbank. The latter's exclusive right to issue banknotes is stipulated in the National Bank of Denmark Act, while, in accordance with the Coinage Act, the Government (the Ministry of Economic Affairs) holds overall responsibility for the coinage system. Since 1975, Danmarks Nationalbank has been in charge of the production and administration side of the issuance of coins. Coins are legal tender up to a maximum of 25 of each denomination in circulation in connection with a single payment transaction.

The Royal Bank Commissioner, who is the Minister of Economic Affairs, constitutes the formal link between Danmarks Nationalbank and the Government, and monitors the Bank's compliance

with its obligations under the Act. However, the Board of Governors is in charge of formulating and implementing monetary policy. Thus, Danmarks Nationalbank is independent of the Government.

According to the Act, the overall objectives of Danmarks Nationalbank are to maintain a safe and secure currency and to facilitate and regulate the circulation of money and the extending of credit. Danmarks Nationalbank has implemented this in one of the objectives, which serves as the guideline for the Bank in its day-to-day work, namely "to contribute to efficiency and stability in payment and clearing systems and in the financial market".

Danmarks Nationalbank performs the banking functions of the central government. Traditionally, payments to and from the Government's accounts with Danmarks Nationalbank have passed through the Postgiro. Following the conversion of the Postgiro into GiroBank Ltd., this system was revised. In 2000, the handling of government payments in the government combined payment system (*Statens KoncernBetaling*; SKB) was put out to tender. The tender was won by Jyske Bank, which, as from early 2001, has been handling government payments.

Some large-value transfers by the central government have always been handled by Danmarks Nationalbank. In addition, it also handles a small part of the central government's payments to and from other countries.

In terms of audit and supervision, Danmarks Nationalbank's functions are limited to the systems operated by the Bank, including credit institutions' current accounts and the agreements between Danmarks Nationalbank and banks. Danmarks Nationalbank has no supervisory or auditing function with regard to the Danish Securities Centre, PBS or banks' computer centres. The general supervision of the Danish financial sector is the responsibility of the Danish Financial Supervisory Authority.



**1.2.2 The provision of processing and settlement facilities**

One of the key functions of Danmarks Nationalbank in the payments infrastructure is the provision of settlement facilities and funds transfer services for banks. Of particular relevance to

Danmarks Nationalbank's role in the payments infrastructure is the Act's stipulation that one of its functions is the taking of deposits on current accounts. Thus, apart from a general objective and an obligation to receive deposits from banks, Danmarks Nationalbank has no specific statutory responsibility for the payments infrastructure. As a consequence of the general objective, however, Danmarks Nationalbank has an obvious interest in the smooth functioning of the system. Furthermore, since Danmarks Nationalbank is the only institution with which all Danish banks hold accounts, it is natural for Danmarks Nationalbank to accept the role of settlement agent for banks in the clearing systems. There is no fee for holding a current account with Danmarks Nationalbank.

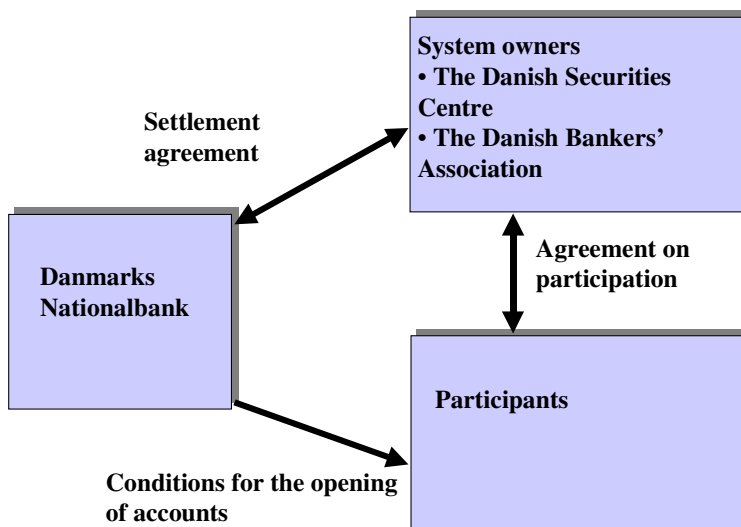
The set of agreements behind Danmarks Nationalbank's role as settlement bank can be represented by a triangle, see Figure 1. The

Settlement Agreement regulates the conditions for the systems' (the VP and the retail clearing system) admittance to settle on accounts with Danmarks Nationalbank. The Agreement on participation regulates the terms of the individual participants' admittance to the systems settling through Danmarks Nationalbank. The third leg in the triangle is the Bank's conditions for the opening of accounts.

Although not legally empowered to issue regulations, Danmarks Nationalbank has, by virtue of its general responsibilities, a de facto role as overseer of payment and securities settlement systems which settle through accounts with the Bank. The oversight of Danmarks Nationalbank has traditionally been based on agreements with market participants and on moral suasion. However, Danmarks Nationalbank has the possibility of imposing specific requirements on the systems settling through the Bank in the Settlement Agreement. Currently, for example, Danmarks Nationalbank requires all systems wishing to settle through the Bank to have a netting agreement which is valid in all relevant jurisdictions, and that the systems allow for fair and open access. The oversight role, including relations with the Danish Financial Supervisory Authority, is currently under revision.

**Figure 1**

**The set of agreements**



### 1.3 The role of other private and public sector bodies

#### 1.3.1 The Danish Bankers' Association

All agreements concerning the payment infrastructure are entered into under the auspices of the Danish Bankers' Association. The Association is the owner of the retail clearing system. All independent banks and subsidiaries and branches of foreign banks operating in Denmark may join the Association.

#### 1.3.2 PBS

Except for home and office banking systems, nearly all electronically-based payment media available to Danish bank customers, i.e. direct debit and credit facilities and card systems, are operated by one company, PBS. PBS also operates the retail clearing system. PBS is jointly owned by almost all Danish banks (commercial and savings banks).

The development of PBS started in the late 1960s when banks formed a joint company for the purpose of developing and operating a common computer-based wage payment system for banks' corporate customers. In the early 1970s, a new jointly owned company was established, creating an interbank transfer centre to develop direct debit systems for all bank customers. This was followed in the late 1970s and early 1980s by the formation of jointly owned companies to develop and maintain a common debit card system, including ATMs and EFTPOS terminals. In 1986, all of these companies were merged into one company, PBS. Today, PBS is also responsible for the prepaid card scheme, Danmønt, and for Eurocards in Denmark.

#### 1.3.3 The Postgiro

In June 1991 the Postgiro, an independent enterprise within the wholly state-owned National Postal and Telegraphic Services Group, was converted into GiroBank Ltd. The main function of the Postgiro was the handling of payments via postgiro deposit accounts. Until 1991 the Postgiro also handled the majority of

payments to and from central government institutions. However, with the transformation of the Postgiro into Girobank in 1991, there were no longer any legal provisions specifying it as the preferred provider of payment services for the central government. Today, the Girobank (now named BG Bank following a merger) is a full-scale commercial bank, and for all practical purposes the separation of the Postgiro system from the banking system no longer exists. BG Bank still has an exclusive agreement with the Danish postal services, Post Danmark, allowing it to offer banking services through post offices all over the country. This agreement will expire in 2008.

#### 1.3.4 The Danish Financial Supervisory Authority

The Danish Financial Supervisory Authority (Finanstilsynet) is responsible for regulating the Danish financial sector. The Danish Financial Supervisory Authority comes under the responsibility of the Minister for Economic Affairs. Its principal aims are to facilitate the continued smooth operation of the financial sector, to maintain dialogue with organisations and companies and to inform ministers of relevant developments.

The Danish Financial Supervisory Authority is responsible for the authorisation and prudential supervision of market participants, such as credit institutions, investment firms and market institutions (in practice the CSE, FUTOP and the VP).

In the field of payment and settlement systems, the Financial Supervisory Authority is also responsible for, among other things, the supervision of issuers of prepaid cards and the designation of systems under the Settlement Finality Directive.

#### 1.3.5 The Danish Competition Authority

The Danish Competition Authority is responsible for the enforcement of competition law in Denmark. Owing to the centralised structure of the Danish payment system, the Competition Authority's attention has in recent years focused on the rules and agreements on payments handling

established by the Danish Bankers' Association and PBS, including the ongoing revisions of the Act on certain payment instruments (see above).

### **1.3.6 The Consumer Ombudsman**

The Consumer Ombudsman is responsible for enforcing consumer protection laws. Of particular relevance in the field of payment and settlement systems are the Act on marketing, the Act on door-to-door sales and the Act on certain payment instruments.

### **1.3.7 The Danish Securities Council**

The Danish Securities Council was established on 1 January 1996 in accordance with the provisions of the 1995 Securities Trading Act. The Danish Securities Council has overall responsibility for the framework within which the securities market operates and for supervision of the market.

The Danish Securities Council issues rules relating to the general conditions under which the Danish securities market operates, as well as rules which regulate clearing and settlement institutions and CSDs.

The Danish Securities Council is composed of representatives of securities dealers, issuers and investors, including Danmarks Nationalbank.

By contrast with the Danish Financial Supervisory Authority, which is primarily concerned with the supervision of solvency, the main focus of the Danish Securities Council is on market supervision and surveillance.

### **1.3.8 The Copenhagen Stock Exchange**

The Copenhagen Stock Exchange (CSE) is currently Denmark's only stock exchange. Its statutory monopoly was abolished when the 1995 Securities Trading Act came into force. As a consequence, the CSE was converted into a public limited company on 1 May 1996.

The CSE provides a market for listed securities of all kinds, e.g. shares, bonds, futures and options. All

securities dealers, i.e. credit institutions and investment companies from the EU or from countries with which the EU has entered into agreements, are eligible for membership of the CSE.

In January 1998, the stock exchanges of Copenhagen and Stockholm signed an agreement on co-operation to set up a common Nordic securities market, the NOREX Alliance. Currently, the co-operation includes the CSE, the OM Stockholm Exchange and the Reykjavik Stock Exchange. It is anticipated that the Oslo Stock Exchange will sign an agreement on accession in the near future. The Baltic stock exchanges have signed letters of intent with the NOREX Alliance. The vision of the NOREX Alliance is to create a common Nordic securities market with a joint trading system and harmonised rules.

### **1.3.9 The Danish Securities Centre**

The Danish Securities Centre (*Værdipapircentralen*; VP) is a private, limited company authorised as a CSD, i.e. to book-enter, via EDP, the issuance of, ownership of and other rights to dematerialised securities. Virtually all securities listed on the Copenhagen Stock Exchange A/S are book-entered at the VP. Unlisted securities or securities listed on other exchanges can also be book-entered at the VP. All book entries are made on securities accounts held at the VP.

The VP's former statutory monopoly as the CSD was abolished when the 1995 Securities Trading Act came into force. As a consequence, the VP was converted into a public limited company with effect from 1 January 2000.

The VP is also authorised as a clearing centre, allowing it to undertake the clearing and settlement of securities trades (see Section 4.3).

### **1.3.10 The FUTOP clearing centre**

FUTOP is the Danish clearing house for listed futures and options. The company is a wholly-owned subsidiary of the Copenhagen Stock Exchange.

Companies which, pursuant to the Danish Securities Trading Act, are eligible as authorised trading companies may become affiliated members of FUTOP. The minimum capital requirement is € 1 million.

FUTOP becomes the counterparty to each registered contract and assumes all contractual obligations. The other party may be a customer

of an affiliated member or the member itself. The member reports the contracts to FUTOP, which then assumes responsibility for contract performance, subject to its regulations.

FUTOP is a party to the international Information Sharing Memorandum of Understanding and Agreement initiated on 15 March 1996.

## 2 Payment media used by non-banks

### 2.1 Cash payments

Banknotes are printed on the premises of Danmarks Nationalbank, while coins are minted by the Royal Mint. Danish banknotes and coins are also used in Greenland. Danmarks Nationalbank also prints banknotes with the same values as Danish banknotes, but with different designs, for separate circulation in the Faeroes.

Banknotes and coins are circulated by Danmarks Nationalbank via the banks according to public demand. In 2000, banknotes were circulating in denominations of DKK 1,000, 500, 200, 100 and 50 and coins in denominations of DKK 20, 10, 5, 2, 1 and 50 and 25 øre.

At the end of 1999, banknotes and coins in circulation amounted to DKK 46.4 billion.<sup>3</sup> The rate of increase in the late 1990s was approximately 5-6% p.a. The most common banknote in terms of volume is the DKK 100 note (approximately 45% of all banknotes circulating), while the note with the largest value is the DKK 1,000 note (more than half of the total value of banknotes in circulation).

No statistics on the public's use of cash are available.

### 2.2 Non-cash payments

#### 2.2.1 Credit transfers

##### *Paper-initiated credit facilities*

Prior to the development of the direct debit system (see below), most bills in Denmark were paid via paper-initiated credit transfers to the creditor's accounts with the Postgiro. The debtor could pay either in cash or by cheque (and later by payment card) at any post office or by ordering a transfer from its own account with the Postgiro on a pre-printed form.

Following the conversion of the Postgiro to GiroBank in mid-1991, an agreement was reached between the Danish Bankers' Association and the GiroBank. The basic objective was to treat the banks' common standardised paper-initiated crediting order – the in-payment card – and the giro card in the same way. Both types of card can now be used in all banks and at all post offices.

Despite the introduction of direct debit systems, paper-initiated credit transfers are still widely used for non-recurrent payments and for debtors who do not wish to join an automated debit system.

<sup>3</sup> This amount was exceptionally high owing to cash hoarding in anticipation of problems related to the century date change. This factor accounted for approximately DKK 3.4 billion.

*Direct credit*

As early as the 1960s, it became common to pay wages directly into bank accounts. The development of a direct credit scheme was the rationale behind the founding in 1968 of the oldest forerunner of PBS, MultiData. This marked an agreement between banks to co-operate on the technical handling of wage payments.

PBS's direct credit system processes the vast majority of account-to-account transfers relating to recurrent crediting, in particular the payment of wages and pensions.

The wage and pension recipient is free to choose the bank account to be credited.

In the credit system, PBS receives from the debtor, which can be a public or a private sector employer, electronically readable information on the wage and pension transfers to be made. If the employer so desires, PBS also offers services for calculating the net wages to be paid after deduction of tax, etc. In 1999, around 66 million transfers were made within the direct credit system.

Furthermore, some banks offer direct credit services in their own name to employers for use in office banking systems.

**2.2.2 Cheques**

As the cheque was, until the mid-1980s, the main means of payment readily available to bank customers, it has traditionally been the most important non-cash means of payment in Denmark. Since the mid-1980s however, the use of direct credit and debit facilities and card-based payments have cut the volume of cheques issued by more than two-thirds. During most of the 1980s, the number of cheques issued was stable, at around 210 million, which is equivalent to approximately 40 cheques per capita. Since 1986 the use of cheques has fallen year-by-year – to 61 million in 1999 – reflecting the rapid development of other electronic payment media, e.g. Dankort and direct credits.

A landmark in the intensive co-operation between banks on technological development was the implementation of complete cheque truncation in Denmark in the early 1980s. Since then all cheques have been retained by the bank which collected them, with clearing and bookkeeping being carried out electronically. Prior to this, all cheques were physically exchanged between banks.

The cheque system is regulated by several agreements within the banking sector, e.g. agreements on the opening of accounts with cheques and/or Dankort, agreements on the cashing of cheques and on clearing, etc.

Sight deposit accounts generally bear near-zero rates of interest. A fee is generally charged to the customer each time a cheque is used.

In cases where there is no reason to believe that a cheque is forged when a cheque payment or withdrawal is made, the drawee bank must always honour the cheque if it is below DKK 1,000 (approximately €134), whether or not there are funds in the customer's account. Cheques above DKK 1,000 are received by retailers or banks at the recipient's own risk if they turn out to be uncovered.

**2.2.3 Direct debit**

Since 1974, the banks have operated a system of pre-authorised direct debits by the name of Payment Service (*BetalingsService*). The system is now operated by PBS. The system is designed for private customers who make frequent and recurrent payments. A creditor joins the scheme by instructing PBS to arrange for automated payments. PBS then links up with the creditor and provides it with a creditor's code. The creditor then advises its debtors that it is possible for them to have all payments automatically transferred from their respective bank accounts if they wish to join the scheme. When a debtor joins the scheme, it must issue payment authorisation to its bank allowing the transfers in question to be made. Accordingly, the bank will register it as a debtor in the system.

Each month debtors will receive a list of payments to be made during the subsequent month together with a list of creditors, the time of payment and the amounts in question. The debtor is entitled to cancel the payment at any time before the seventh banking day of the following month.

The provision of regular information to debtors and creditors as well as data on account transfers to the banks is handled by PBS.

The direct debit scheme is free of charge for debtors, whereas creditors are charged according to the number of transactions. There are no formal rules limiting the types of payment which can be handled in the scheme.

The direct debit scheme has become the most widely used means of paying bills in Denmark. Almost 90% of all Danish households are connected to the scheme, and 119 million transactions with a total value of just over DKK 248 billion were effected in 1999. This amounts to an increase of more than 100% during the last decade.

PBS operates a very similar system of pre-authorised direct debits for corporate customers under the name Supplier Service (*LeverandørService*). The account of the recipient is automatically debited when goods are received, subject to permission from the debtor. Unlike the monthly notification in the case of private customers, notifications are circulated prior to each payment. Notification is given by the creditor or, on its behalf, by PBS.

In 1999, 2.6 million transfers were made within this system, with a total value of DKK 74.5 billion.

#### 2.2.4 Payment cards

##### *Debit cards, ATM and EFTPOS networks*

Despite the highly developed system for truncation, cheques were expensive for banks to handle. As part of their technological co-operation, banks founded a company (the

Banks' Payment and Credit Card Company) in 1979 in order to develop and market a debit card system. This led to the introduction in 1983 of the common debit card, the Dankort. At first, it was only possible to use the card on a paper docket basis, but in late 1984 the first transaction was made via the EFTPOS network.

It took some years for the Dankort to become widely accepted and to obtain critical mass, in particular on account of some disagreement between retailers and banks over the sharing of costs, etc. Since 1987, the year which is considered to be the turning point for the Dankort, the annual use of the card has grown significantly, resulting in the aforementioned reduction in the use of cheques.

The Dankort is issued by individual banks, as it is always linked to the cardholder's account. The banks are free to fix the charges and terms applicable to both the account to which the card is linked and the card itself.

While the card is standardised in terms of the magnetic stripe and the Dankort logo on the reverse, the drawee bank is identifiable by its logo on the front of the card. The retailer is responsible for checking the ID and whether the card is blocked when an imprinter is used. When the card is used at ATMs and EFTPOS terminals, identification is based on PIN codes. There is no online check of the availability of funds, but the amount is debited from the cardholder's account on the morning of the next banking day. Imprinter vouchers are sent to PBS by retailers and are truncated in the same way as cheques.

The rules applicable to the Dankort are somewhat more attractive to retailers (or the bank providing cash) than those for cheques. The maximum guarantee provided by the drawee bank is DKK 1,000 (€134) for imprinter transactions, DKK 2,000 for withdrawals at banks or ATMs, and DKK 3,000 for payments at EFTPOS terminals. Furthermore, compared with cheques, the maximum amount remains covered by the drawee bank in the case of payments above the maximum. Thus, for example, for a payment of

DKK 4,000 at an EFTPOS terminal, the retailer's maximum risk is DKK 1,000. If the same payment is made using a cheque, the retailer's risk is the whole amount, i.e. DKK 4,000 if there is no cover on the customer's account.

Usually there is no limit to the number of payment transactions made free of charge with a Dankort. However, cash withdrawals at ATMs which are managed by banks other than the cardholder's, or cash withdrawals at the issuing bank outside bank opening hours, are usually subject to a small fee. As in the case of cheques, any overdraft facility is subject to negotiation between the cardholder and the bank.

By the end of 1999, 2.8 million Dankort cards had been issued for use at about 2,641 ATMs and 70,000 EFTPOS terminals. All ATMs are owned and managed by the banks.

Use of the Dankort has developed very rapidly. In 1986, only 3 million payment transactions were made with the Dankort. In 1999, this number grew to 371 million, of which 97.5% were effected at EFTPOS terminals and the rest by way of imprinters. This is more than five times the volume of cheques issued. Since 1992, the use of the Dankort has overtaken the use of cheques.

As is the case with cheques, the Dankort system is regulated by several agreements, including agreements for guarantee (see above), clearing and settlement, interbank fees and the use of the Dankort for cash withdrawals at other banks. The latter agreement ensures that the Dankort can be used to withdraw cash from any bank or cash dispenser up to a maximum of DKK 2,000 a day.

#### *Credit cards, travel and entertainment cards and retailer cards*

Through PBS, the banks offer customers the possibility of attaching a Visa facility to the Dankort, thus making it possible to use the card as a debit card abroad. Among the 2.8 million Dankort in issue at the end of 1999, 1.5 million were combined Visa/Dankort cards. Foreign Visa cards, Eurocards/MasterCards and several other

foreign debit or credit cards can be used at ATMs and EFTPOS terminals.

PBS also offers separate Eurocards. Furthermore, around ten banks offer their customers MasterCards with the respective bank's own logo.

Generally, the market for cards in Denmark is dominated by the systems operated by the banks via PBS. Of the major international card systems, Diners Club and American Express are also active in Denmark. In addition, Danish department stores and oil companies, etc. operate their own retailer card systems.

In 1998, the Dankort had a market share of just over 80%. Retailer cards accounted for approximately 8% of the market, while Diners Club and American Express together covered around 2%. The rest is covered by various finance companies.

#### *Prepaid cards*

In June 1991, a company called Danmønt (Dancoin) was established to develop and implement the prepaid card system. KTAS, now TeleDanmark (the then public telephone company) and PBS each contributed half of the share capital. On 1 January 1997, PBS acquired TeleDanmark's share interest in Danmønt, which then became a wholly-owned subsidiary of PBS.

The Danmønt scheme was tested in the town of Næstved from 1 September 1992 to 1 March 1993. The trial period was successful, and after it ended the scheme was extended nationwide as from 1993, making it the first of its kind in the world. At the end of 1999, the Danmønt system was available in 143 towns and can be used for a range of individual services, e.g. parking meters, launderettes, canteens, railway stations, copying machines and different kinds of vending machine. The card was accepted by a total of 7,876 terminals.

In 1999, a total of approximately 1 million cards were in circulation with a total nominal value of DKK 20 million. The volume of transactions was approximately 7.86 million, with a total value of

DKK 69 million. Even though growth in the value and volume of transactions in the Danmønt scheme has been large, the total nominal value for Danmønt is only approximately 1% of coin circulation in Denmark and less than 1/500 per thousand of the money supply.

The nominal values available at the moment are DKK 100 (€ 13.43), 200, 250 and 300. So far, all cards have been non-rechargeable chip cards, but Danmønt is currently running several trials with rechargeable cards.

The Act on certain payment instruments contains provisions which make the redeemability of expired prepaid cards mandatory; however, the Danmønt scheme already offered redeemability before the Act came into force in May 2000.

Danmønt cards are distributed by commercial banks, savings banks, post offices, some service stations and some retailers. However, the float is held by Danmønt, which, in this respect, has the role of issuer. The Danmønt scheme is under the supervision of the Danish Financial Supervisory Authority.

The system operator, Danmønt, is responsible for the functionality of the overall Danmønt system, including monitoring system security – which is of a high standard – and clearing and settlement between card issuers and service providers.

Besides the Danmønt scheme, several limited-purpose prepaid card schemes for use in closed systems are widely used in Denmark, e.g. phone cards, cards for public transport and cards for use in launderettes.

### 2.2.5 Postal instruments

For all practical purposes, specific postal instruments no longer exist in Denmark.

### 2.2.6 Other payment instruments

No other payment instruments play an important role in the Danish payment system infrastructure.

## 2.3 Recent developments

### 2.3.1 Euro products

Even though Denmark does not participate in EMU, Danish banks decided in the run-up to the launch of the euro that, in order to keep the Danish banking sector competitive, Danish banks should also be able to offer products denominated in euro. The banking sector thus developed, in co-operation with the Danish Securities Centre and Danmarks Nationalbank, an infrastructure for the handling of euro in Denmark. Currently, the banks are able to handle the euro as account money and can thus offer customers accounts denominated in euro. Since May 1999 the banks have offered their customers credit transfers in euro. In view of the low volumes expected, no other payment instruments in euro have as yet been offered. This expectation has been proved correct. During the first half of 2000, only 4,601 credit transactions were carried out in euro, with a total value of € 101 million.

### 2.3.2 E-trade and card payments on the internet

Until the revision of the Act on payment cards in April 1999 (now the Act on certain payment instruments), it was prohibited for card issuers to charge retailers for the use of payment cards (see Section 1.1). The revision was primarily made to support the development of e-trade in Denmark. Before the revision, it was not possible to use the Dankort on the internet, since PBS did not wish to develop this service without being able to charge for it. Considering the wide use of the Dankort, this was proving to be an obvious hindrance to the development of e-trade in Denmark.

In April 1999, PBS made it possible to use the Dankort on the internet. After a somewhat slow start, the use of the Dankort grew considerably in the 18 months following its introduction. However, Denmark is still one of the EU countries in which only a very small proportion of the population trades on the internet.



### 2.3.3 Main project and policies being implemented

On 1 May 2000, the Danish Bankers' Association published a plan for the liberalisation of the payment card market in Denmark (see Section 1.1). The plan includes a relaxation of PBS's

central role in the handling of card payments in Denmark, e.g. a decentralisation of the acquiring service. The plan also entails the replacement of the current magnetic stripe cards with chip cards and the consequent upgrade or replacement of all EFTPOS terminals.

## 3 Interbank exchange and settlement systems

### 3.1 General overview

All transfers of funds between credit institutions in Denmark take place via their accounts with Danmarks Nationalbank. The interbank exchange and settlement landscape in Denmark is characterised by a high degree of centralisation. All payments are handled by the RTGS system and the retail clearing system.

All credit institutions have the option of linking up to the RTGS system, through which they can make real-time funds transfers from their current account with Danmarks Nationalbank to that of any other credit institution via a terminal at their own premises. The DN Inquiry and Transfer Service<sup>4</sup> (*DN-Forespørgselsservice*) RTGS system is used for most large-value funds transfers between credit institutions during the day, including the settlement of the netting systems (the retail clearing system, the Danish Securities Centre and FUTOP), which settle through accounts with Danmarks Nationalbank. Some large-value transfers are initiated via the SWIFT network (approximately 40% of all RTGS transfers in 1999). Danmarks Nationalbank does not distinguish between these and ordinary RTGS transfers, as they are all settled in real time. Transfers on the basis of SWIFT instructions are therefore not described separately. The DN Inquiry and Transfer Service is described in Section 3.2.1 below.

Since the introduction of the euro in 11 Member States on 1 January 1999, Danmarks Nationalbank has also operated an RTGS system in euro, called DEBES. DEBES is the Danish link to TARGET. Participants in TARGET from non-euro area countries participate on terms that differ from those for participants within the euro area. DEBES is used for most large-value funds transfers in euro between credit institutions within Denmark and across the EU, including the settlement of the retail clearing system and securities clearing in euro. Payments in DEBES are handled entirely by the SWIFT network. DEBES is described in Section 3.2.2 below.

All retail payments in Denmark, including those described in Section 2.2, are cleared and settled through the retail clearing system and its two underlying clearing systems, the PBS clearing system and the electronic clearing and truncation system (*dokumentløse clearing* – clearing without documents). In the PBS clearing system, all PBS products are cleared (Dankort transactions at EFTPOS terminals, direct debits, etc.). In the electronic clearing and truncation system, transactions initiated by the banks themselves (e.g. cheques drawn on other banks or cash withdrawals at other banks) are cleared.

<sup>4</sup> The DN Inquiry and Transfer Service in this context means the payments part of the system. The DN Inquiry and Transfer Service also offers a number of other functions, e.g. trading in certificates of deposit, etc.

The retail clearing system is the final clearing and settlement system of the net positions from the two aforementioned clearing systems.

The retail clearing system is owned by the Danish Bankers' Association and operated by PBS. The retail clearing system is a multilateral netting system. The calculation of the net amounts (i.e. the final net credit or debit position for each direct participant) is handled by PBS. The final settlement takes place through accounts at Danmarks Nationalbank. The retail clearing system is described in Section 3.4.1.

## 3.2 Real-time gross settlement systems

### 3.2.1 The DN Inquiry and Transfer Service

In 1978 the three largest banks in Denmark asked Danmarks Nationalbank if it would be possible for them to have access to provisional statements of account via their own terminals on the grounds that this facility would help the banks when monitoring their current accounts during the day, and thereby reduce the need for telephone contact between the banks and Danmarks Nationalbank. The inquiry facility was implemented in 1979.

Following implementation of the inquiry facility, some banks suggested that the established network between the banks and Danmarks Nationalbank could also be used to transfer funds between the banks' current accounts. In the spring of 1981 Danmarks Nationalbank discussed the possibility of a transfer facility with the banks. In the light of these discussions, Danmarks Nationalbank decided to develop such a facility within the existing inquiry facility. The transfer facility was put into operation in September 1981.

With the implementation of the transfer facility, the Danish banks were linked up to one of the world's very first RTGS systems.

#### *Operating rules*

The DN Inquiry and Transfer Service is owned and managed by Danmarks Nationalbank and is

operated by the latter's computer centre, BEC (*Bankernes EDB-Central*).

There is no legal framework governing the RTGS system. Before being linked up to the system a participant has to sign an agreement with Danmarks Nationalbank. Guidelines for the use of the system are described in the "Handbook for the DN Inquiry and Transfer Service". Danmarks Nationalbank is responsible for defining the rules and guidelines for the participants, but traditionally this is only done after the participants have been consulted.

#### *Participation in the system*

There are no specific access criteria for participating in the DN Inquiry and Transfer Service. However, since having an account with Danmarks Nationalbank is the prerequisite for participation, participants must meet the access criteria for opening an account. Thus, all account holders with Danmarks Nationalbank are in principle potential participants in the system.

Current accounts with Danmarks Nationalbank can be held by credit institutions (banks, mortgage institutions and other credit institutions) and investment companies. Danmarks Nationalbank permits remote access to a current account, provided that the account holder is domiciled in another EU or EEA country. Besides credit institutions, several government agencies hold accounts with Danmarks Nationalbank.

Danmarks Nationalbank has the right to close any account held with it. If an account is closed, the account holder will consequently no longer be entitled to participate in the RTGS system.

The DN Inquiry and Transfer Service is a one-tier system with no indirect participants.

Currently, 101 account holders participate in the system, six of which are branches of banks from other EU countries and one of which is a branch of an EEA bank. Furthermore, some participants are investment companies and some are public agencies. All the investment

companies are supervised by the Danish Financial Supervisory Authority. There are no remote participants.

#### *Types of transaction handled*

The DN Inquiry and Transfer Service is not used exclusively for specific types of payments. In practice, almost all large-value transactions (and other urgent transactions) are handled by the system, because using the system is the only way to achieve same-day value. It is only possible to make credit transfers within the system. There are no limitations with regard to the transactions handled. Money market transactions, the DKK leg of foreign exchange transactions and large payments on behalf of corporate customers are examples of the transactions handled by the system.

In 1999, the average daily volume of payments processed via the DN Inquiry and Transfer Service was about 1,400, with a value of DKK 100 billion (€13.3 billion). This corresponds to an average transaction value of DKK 70 million (€9.3 million).

#### *Operation of the system*

The DN Inquiry and Transfer Service is a screen-based online system which enables participants to make balance inquiries and to transfer funds from their own accounts with Danmarks Nationalbank via a terminal situated at their own headquarters.

The DN Inquiry and Transfer Service is developed and operated by BEC, which is a privately owned company. However, Danmarks Nationalbank is the owner of the system.

All participants must have a direct line to BEC, normally via their own computer centre. For each participant, a number of users are authorised to make transfers and/or inquiries.

The system is open for balance inquiries between 7 a.m. and 6 p.m. on Danish banking days. Transfers can be made between 8 a.m. and 3.30 p.m.

#### *Transaction processing environment*

From a technical point of view, the DN Inquiry and Transfer Service is a link to Danmarks Nationalbank's real-time accounting system. Transfers made via the system may also be made manually by Danmarks Nationalbank at the request of account holders, e.g. in the event of an emergency.

A participant in the system must enter the transfer orders manually, since automated input from internal systems is not possible. Thus, the system does not support STP.

A transfer order only contains information which is absolutely necessary for bookkeeping at Danmarks Nationalbank, i.e. the account number of the receiving bank, the amount of the transfer and an eight-digit identification number. All other information concerning the transfer must be exchanged bilaterally outside the system. The exchange of this information is normally done via SWIFT (for the larger banks) or by telephone.

#### *Settlement procedures*

All transfers between accounts are final and irrevocable when settled.

The debit and credit transactions are carried out simultaneously with no time-lag. The duration of the end-to-end process does not normally exceed one second.

There is no queuing mechanism in the system. If there is insufficient cover for a transfer order, the transfer is rejected.

#### *Credit and liquidity risk*

Until 1995, the banks had access to uncollateralised daylight credit on their current accounts with Danmarks Nationalbank, up to 100% of each bank's own funds. In order to reduce its credit risk, Danmarks Nationalbank chose to gradually phase out this access over a period of four years. The last remaining

elements of the uncollateralised credit facility were removed at the end of September 1998. All kinds of credit extended by Danmarks Nationalbank (for payment systems or monetary policy purposes) must now be fully collateralised.

Credit transfers within the DN Inquiry and Transfer Service are automatically suspended if they result in an overdraft beyond the participants' collateralised daylight credit limit.

The intraday overdraft facility is available between 8 a.m. and 3.30 p.m. Participants with a debit position at 3.30 p.m. are contacted by Danmarks Nationalbank, and have until 4 p.m. to cover their overdraft. The participants must pay a penalty fee of 0.002% of the amount, with a minimum of DKK 1,000 (€133.3).

#### *Pricing*

The initial development costs and the costs of later improvements to the DN Inquiry and Transfer Service have all been borne by Danmarks Nationalbank and have not been recovered from the participants.

The running costs are covered by different fees, which are all paid by the participants directly to BEC.

The main fees paid by the participants are an entry fee of DKK 1,500 (€200), a quarterly fee per account of DKK 1,200 (€160), a quarterly fee per user of DKK 140 (€18.7) and a fee per transaction of DKK 1.10 (€0.15). Besides these costs, the participants must pay for the required hardware and links to BEC themselves.

#### *Main projects and policies being implemented*

The DN Inquiry and Transfer Service dates from 1981, and is thus not up to date in certain areas. Danmarks Nationalbank is therefore currently developing a replacement for the DN Inquiry and Transfer Service, called KRONOS. KRONOS will also replace DEBES, and the Danish banks will thus have a common, advanced RTGS system for both kroner and euro.

KRONOS will, among other things, incorporate a modern interactive GUI for participants, which will be based on browser technology. Information will be exchanged via an IP-based network. Payment instructions can be entered either through the SWIFT network, allowing for STP, or directly from the GUI, by way of which smaller credit institutions may enjoy direct access without incurring the relatively high costs of SWIFT membership. The system will incorporate advanced features for managing liquidity, including an advanced queuing mechanism and gridlock resolution. The TARGET interface will re-use DEBES's Interlinking module. Finally, KRONOS will comply with the standards required for participation in CLS, opening up the possibility for Danish kroner to join the CLS system.

The pricing of KRONOS will be based on cost recovery, along the same lines as the pricing of DEBES (see below).

It is planned that the system will go live in the second half of 2001 for both kroner and euro.

#### **3.2.2 DEBES**

EU countries which, like Denmark, have not introduced the euro, are also allowed to participate in TARGET. Danmarks Nationalbank thus developed DEBES as a Danish RTGS system in euro and the Danish connection to TARGET. The design of DEBES was the subject of prolonged discussions with the financial sector in Denmark, including the TARGET working group of the Danish Bankers' Association. DEBES was introduced on 4 January 1999 to coincide with the launch of the euro in the euro area and the introduction of TARGET.

#### *Operating rules*

DEBES is owned and managed by Danmarks Nationalbank and is operated by BEC, the computer centre of Danmarks Nationalbank.

There is no legal framework governing the RTGS system. Before being linked up to the system, a participant must sign an agreement with Danmarks Nationalbank. Guidelines for the use of

the system are described in the “DEBES user’s manual”. Danmarks Nationalbank defines the rules and guidelines for the participants, but traditionally this is only done after the participants have been consulted. The overall conditions of access to TARGET for non-euro area countries are regulated by the TARGET agreement (see the chapter on the euro area).

#### *Participation in the system*

There are no specific access requirements for direct participation in DEBES (see the access criteria for the DN Inquiry and Transfer Service above). DEBES members must have a euro-denominated current account with Danmarks Nationalbank. Since DEBES is SWIFT-based, SWIFT membership is a de facto access requirement.

DEBES is a two-tier system with direct and indirect participants. An indirect participant does not hold a euro-denominated account with Danmarks Nationalbank, but may send and receive payments via a direct DEBES member.

There are currently 34 direct participants in DEBES, and 77 indirect participants. Of the direct participants, four are branches of other EU banks and one a branch of an EEA bank.

#### *Types of transaction handled*

DEBES is not used for any particular type of payment. The system may be used for large-value interbank payments as well as for customer payments in euro within Denmark or to TARGET participants in other countries. There are no limits on transaction types or sizes.

#### *Operation of the transfer system*

The participants are linked to DEBES via a SWIFT interface and a terminal-based access system. Payments can only be made via SWIFT, but the participants may choose whether they wish to use the terminal or SWIFT for service functions (payment statements, queue function, etc.).

DEBES is open from 7 a.m. to 5 p.m. for customer payments and from 7 a.m. to 6 p.m. for interbank payments, which corresponds to the opening hours of TARGET.

#### *Transaction processing environment*

DEBES payments are made in much the same way as normal SWIFT transfers. DEBES makes use of the SWIFT service known as SWIFT Fin-Y Copy.

For domestic payments, a normal SWIFT message is transmitted to the recipient via a closed part of the SWIFT network (a “Closed User Group”) which consists solely of direct DEBES participants. During the process, part of the payment message (containing the information necessary for bookkeeping) goes to Danmarks Nationalbank, which checks the availability of funds and books the transfer to the accounts of the two participants.

For a cross-border payment, the payment order is transmitted via SWIFT (and the “Closed User Group”) directly to Danmarks Nationalbank. The identity of the recipient is stated in the payment order itself. Danmarks Nationalbank checks the availability of funds, books the transfer and transmits the payment to the recipient’s NCB, which credits the amount in question to the recipient’s account and relays the message in the domestic format.

Transfers made via the system may also be entered manually by Danmarks Nationalbank at the request of the account holders, e.g. in an emergency.

#### *Settlement procedures*

All transfers between accounts are final and irrevocable when settled. Domestic payments are final when credited to the recipient’s account. Cross-border payments are final when debited from the sender’s account by the sending central bank and credited to the recipient central bank’s account.

Under normal circumstances, no more than a few minutes are expected to elapse between the debiting of the account of the sending bank and the crediting of the account of the recipient bank.

DEBES contains a queuing function which is activated automatically when payments are executed without sufficient cover. If there is insufficient cover for a transfer order, the transfer order (and any subsequent transfer orders) is automatically placed in the payment queue. Each participant has constant access to view its own queue and may also change the content of the queue, the order of payments, etc.

Participants in TARGET from non-euro area Member States participate in TARGET on more restrictive terms than the euro area Member States. Whereas the euro area participants have access to unlimited intraday liquidity against collateral, Danmarks Nationalbank may only make liquidity available to the Danish participants in TARGET on the basis of a deposit by Danmarks Nationalbank with a central bank in the euro area. The Danish participants pay for the share of the intraday liquidity they require. The current price is 0.07 percentage point per annum. The deposit was originally €1 billion, but demand for intraday liquidity was only around €500 million to €600 million. As from 1 January 2000, the deposit has been reduced accordingly. If the banks' total liquidity requirement exceeds the size of the deposit, Danmarks Nationalbank distributes the liquidity to the participants according to the same distribution key as is used for the connection fee and the monthly charges.

After 5 p.m., participants from non-euro area Member States may only transact payments on the basis of a positive balance. If an overdraft is not covered by 5 p.m., the participant must pay an interest premium to Danmarks Nationalbank. If the overdraft is not covered by 6 p.m., the participant must pay a further interest premium to the Danmarks Nationalbank and to the ECB.

#### *Credit and liquidity risk*

As is the case with RTGS systems, the participants do not face any credit or direct liquidity risk. As all daylight credit must be fully collateralised, nor does Danmarks Nationalbank.

#### *Pricing*

The fees for using DEBES are fixed in such a way as to cover costs. The fee structure includes a connection fee and a monthly charge, both of which are proportionate to the size of the bank (see Table I), as well as transaction fees, which are the same for all participants.

The connection and monthly fees vary according to the participant's working capital as defined by the Danish Supervisory Authority. Working capital is used as a proxy for the expected use of the system. The participants are divided into three categories. Category 1 is split into two subcategories; category 1a consists of the three largest banks, category 1b consists of the next two banks in terms of size, and category 2 consists of the next 15. The final category consists of non-banks, branches of foreign banks and the remaining Danish banks.

**Table I**

#### **Fees for participation in DEBES**

Category	Connection fee	Monthly fee
1a	€178,253	€4,456
1b	€59,417	€1,485
2	€35,650	€891
Others	€13,368	€334

The fee for cross-border TARGET transactions declines in proportion to the number of transactions. The fee for the first 100 transactions per month is €1.75 per transaction, for the next 900 transactions €1, and for all remaining transactions €0.80. The fee for domestic transactions is €0.4. On top of this, banks have to cover SWIFT costs themselves.

*Main projects and policies being implemented*

DEBES will be replaced by KRONOS (see Section 3.2.)

### **3.3 Large-value payment systems**

There are no large-value payment systems operating in Denmark.

### **3.4 The retail payment system**

#### **3.4.1 The retail clearing**

The retail clearing system is the only Danish system for the clearing and settlement of retail payments. The retail clearing system was originally a system for the manual clearing of cheques, but all types of non-cash retail payments are now cleared through the system. Since the early 1980s, the retail clearing system has been fully automated. Thus all retail payments in Denmark are cleared and settled on a paperless basis.

Since May 1999, there has also been a retail clearing system in euro for a limited number of transaction types. The retail clearing system in euro is described separately below, where applicable.

*Operating rules*

There is no legislation covering the clearing and settlement processes. The system is based entirely on agreements.

The retail clearing system is regulated by the Clearing Agreement between Danmarks Nationalbank and the Danish Bankers' Association, which regulates the terms and conditions for the settlement of the system at Danmarks Nationalbank.

Access to the system requires that participants sign the Agreement on participation in the electronic clearing and truncation system, or have access to the PBS clearing system. All direct participants must furthermore enter into the Agreement on participation in the retail clearing system and on the settlement of this system, which is a bilateral

agreement between the individual participant and the Danish Bankers' Association. All direct participants must hold current and settlement accounts with Danmarks Nationalbank in the relevant currency (Danish kroner or euro) and must participate in the respective RTGS systems (either the DN Inquiry and Transfer Service or DEBES).

*Participation in the system*

The retail clearing system operates with a two-tier system. Indirect participants participate in the PBS clearing and/or the electronic clearing and truncation system, while the final settlement of their net positions from these two clearing systems takes place via a direct member of the retail clearing system. All Danish banks may participate in the retail clearing system, and there are currently 68 direct participants in the retail clearing system, one of which is Danmarks Nationalbank. The remaining 146 (smaller) banks participate indirectly. Four of the direct participants are branches of banks from other EU countries and one direct participant is a branch of an EEA bank.

The Danish Bankers' Association (see above) formulates the criteria for access to the retail clearing system.

*Types of transaction handled*

As the retail clearing system is the only Danish system for handling retail payments, it includes all types of non-cash retail transactions (see Section 2.2).

Participants are themselves responsible for setting limits on the individual amounts which can be drawn on them by other participants. All the systems which PBS operates also have maximum limits on individual transactions.

As regards transactions in euro, only credit transfers are possible at the current juncture.

*Operation of the transfer system*

PBS operates the retail clearing system. The retail clearing system processes payments from different

sources. Some of the payments are entered into the system by individual participants through the electronic clearing and truncation system and some payments are entered by PBS through the PBS clearing system on the basis of standardised agreements.

The clearing and settlement procedures involve only PBS, the computer centres of the participants and Danmarks Nationalbank.

#### *Transaction processing environment*

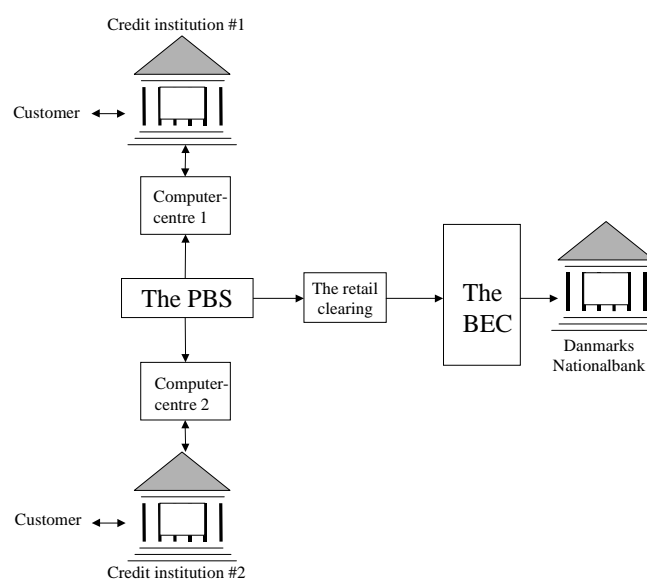
There are essentially two different channels through which retail payments are processed,

both of which result in the same final settlement on the participant's settlement account with Danmarks Nationalbank, PBS clearing and the electronic clearing and truncation system.

PBS clearing is a central clearing system which processes transactions originating from PBS's payment services (Payment Service, card transactions at EFTPOS terminals and direct debits). PBS provides participants' computer centres with detailed information on the transactions, calculates net positions and reports these to the retail clearing system (see Figure 2).

**Figure 2**

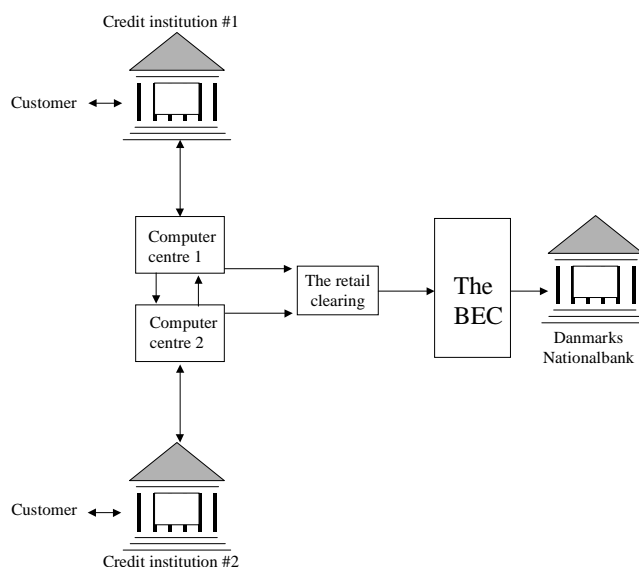
#### The PBS clearing system



The electronic clearing and truncation system is a bilateral clearing system in which each participant reports transactions involving account holders of other participants (e.g. through the cashing of cheques drawn on other banks or cash withdrawals by account holders of other banks) to its computer centre.

Every evening, data are collected in each computer centre and are subsequently exchanged bilaterally with other computer centres. At the same time, the total claims of each participant on each of the other participants (the net positions) are transmitted to the retail clearing system (see Figure 3).



**Figure 3****The electronic clearing and truncation system**

The net positions of both clearing systems are added up and finally settled in the retail clearing system through accounts at Danmarks Nationalbank (see below).

As regards transactions in euro, only the electronic clearing and truncation system has been implemented.

#### *Settlement procedures*

The settlement of the retail clearing system takes place on accounts with Danmarks Nationalbank. The settlement procedure for the Danish Securities Centre follows the same procedure (see Section 4.3).

The settlement of the retail clearing system takes place during the night preceding the day of value in order to ensure, among other things, that funds are settled between participants before the customers are given value. Furthermore, the data centres have more computing capacity during the night.

During the day, participants must transfer funds from their current account to their settlement

account (see Figure 4). This transfer has value the next day. At some stage during the early evening, Danmarks Nationalbank informs the retail clearing system of the credit line for each participant. Thus, the retail clearing system is aware of each participant's maximum drawing right in the clearing system before it starts. It is only possible for participants to transfer funds to – and not from – the settlement account, since Danmarks Nationalbank guarantees to the retail clearing system that the participant has the available funds. Settlement accounts are emptied into the current account just before the opening of the DN Inquiry and Transfer Service.

The retail clearing system compares each participant's credit with the respective net positions. If the net positions can be handled within the credit line, the settlement is concluded. Danmarks Nationalbank subsequently receives information on the net position of each participant, which is booked on the settlement account. If a participant does not have the required funds, the settlement of that participant's net position is postponed to one of the following settlement blocks.

The retail clearing system consists of one normal settlement block and several extraordinary settlement blocks. Most payments are settled in the first settlement block, but the later blocks are used for late transactions or for participants without sufficient funds in earlier blocks.

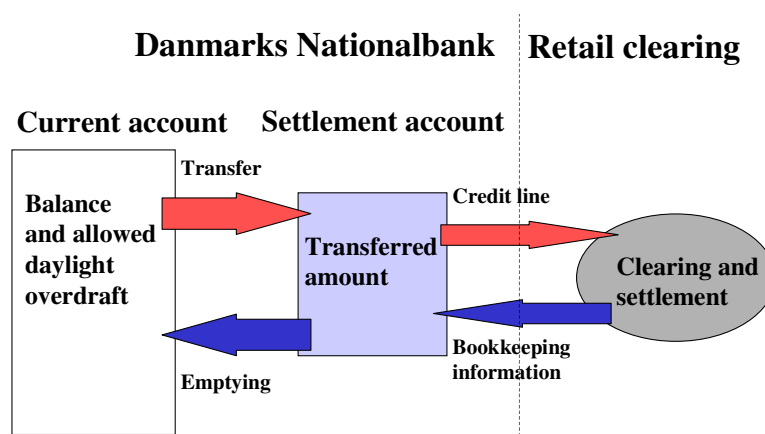
The last settlement block runs in the morning after the opening of the DN Inquiry and Transfer Service. In this way, participants which did not

transfer sufficient funds to complete the settlement during the night have the possibility of transferring additional funds for this block in order to ensure finalisation of clearing.

The settlement of retail clearing in euro follows the same procedure. Since Danmarks Nationalbank cannot provide participants with credit during the night (See Section 3.2.2), retail clearing in euro is settled on the morning of the value day.

**Figure 4**

**The settlement procedure**



*Credit and liquidity risk*

Since customers are only credited after the final settlement of retail clearing, banks do not expose themselves to credit risks as regards customer payments. Since Danmarks Nationalbank only allows each participant a drawing right equal to the amount the participant has transferred to its settlement account, Danmarks Nationalbank is not exposed to any credit risk either.

Participants face liquidity risks, since the transactions of participants without sufficient funds will be postponed (see above). There are no mechanisms to ensure the final settlement of retail clearing in the event that a participant is unable to meet its obligations.

*Pricing*

The fee for participation in the retail clearing system consists of several components and will vary depending on how much of the common infrastructure a participant chooses to subscribe to. No distinction is made below between fees for participation in the payment instruments which are cleared and settled in the retail clearing system and fees for participation in the retail clearing system per se.

Participants must pay a general admission fee of DKK 2.25 million (€300,000; 1999 figures). Furthermore, depending on how many modules the participant wishes to utilise, some other admission fees must be paid (see Table 2).

**Table 2****Admission fees for participation in the common infrastructure**

Module	Products	Fee
Basic infrastructure	Clearing and settlement of, e.g. Payment Service, direct credits, etc.	DKK 2.6 million (€300,000)
Dankort	Issuing and collection of retailer transactions	DKK 4.35 million (€580,000)
International cards	Visa/Dankort, Eurocard and MasterCard	DKK 2.20 million (€290,000)
All modules		DKK 8.05 million (€1.1 million)

Finally, institutions issuing the Dankort pay yearly subscription fees, which in 1999 amounted to DKK 93.8 million (€12.5 million). The fees for individual participants are based on the participant's working capital as defined by the Danish Supervisory Authority, adjusted to make the fee an increasing but degressive function of the participant's size.

The transaction fee for Dankort payments at EFTPOS terminals is DKK 0.36 (€0.05).

*Main projects and policies being implemented*

On 1 May 2000, the Danish Bankers' Association presented a plan for the liberalisation of the payment card market in Denmark (see Section 2.3). The plan entails, among other things, a relaxation of the very central role PBS plays in the Dankort system. This will also have implications for the way in which card payments are cleared. The exact plans are not yet public.

No other major projects or policies are planned at the moment.

#### 4 Securities settlement systems

The Danish system for the registration, trading, clearing and settlement of securities is characterised by a high degree of centralisation. The present infrastructure comprises three institutions: the Copenhagen Stock Exchange (CSE), FUTOP (a fully owned subsidiary of the CSE), and the VP.

Securities listed on the CSE are normally held in book-entry form and registered on accounts with the VP. All listed Danish bonds were dematerialised in 1983, while Danish equities, mutual fund papers, etc. were dematerialised in 1988.

Trades in listed securities may be executed either through the trading systems of the CSE or OTC. Thus there is no obligation to execute trades in the trading systems, but all trades in listed securities entered into by professional investors must be reported to the CSE.

The settlement of securities transactions is effected by, and ownership rights registered on, accounts held with the VP. Trades executed in the trading systems on the CSE as well as OTC are passed on to clearing and settlement in the VP by the back office of both parties to the trade. The settlement system is an integral part

of the VP, with Danmarks Nationalbank acting as the provider of cash settlement accounts to the participants in the system.

FUTOP registers and guarantees transactions in standard derivatives contracts. Contracts entered into outside the CSE must be reported to FUTOP in order to be covered by its guarantee. The trading, clearing and settlement of derivatives was reorganised at the end of December 2000.

The VP's and the CSE's former statutory monopolies as the CSD and the Stock Exchange were abolished with the entry into force of the 1995 Securities Trading Act. Any limited liability company (A/S) which meets the capital and business requirements of the 1995 Securities Trading Act can be authorised as a clearing house, stock exchange or CSD in Denmark.

#### *Basic quantitative aspects*

The Danish securities markets encompass bonds, equities and derivatives. In terms of both outstanding volume and turnover, the bond market is by far the dominant market segment. The different types of bond are government debt instruments, such as Treasury bills, government bonds and mortgage credit bonds.

The market value of outstanding Treasury bills and government bonds was DKK 42 billion (€5.6 billion) and DKK 653 billion (€87.7 billion) respectively at the end of 1999. Turnover during 1999 amounted to DKK 198 billion (€26.6 billion) and DKK 3,683 billion (€494.5 billion) respectively. Repo trading totalled DKK 17,803 billion (€2,390 billion) in 1999.

Outstanding mortgage credit bonds at the end of 1999 amounted to DKK 888 billion (€119.2 billion) at market value, with turnover during the year totalling DKK 3,019 billion (€405.3 billion).

The market for corporate bonds is very limited in Denmark compared with the government and mortgage credit bond market. At the end of

1999 the outstanding amount of corporate bonds was DKK 29.7 billion (€4.0 billion) at market value.

At the end of 1999 the market capitalisation of companies listed on the CSE amounted to DKK 782 billion (€105 billion). The total turnover for the year as a whole was DKK 469 billion (€63 billion).

In 1999 the number of derivatives contracts that were settled and guaranteed by FUTOP totalled 1.74 million. The underlying market value was DKK 67,551 million (€9,069.7 million). Futures based on government debt instruments accounted for the largest share of turnover.

## **4.1 Trading**

### **4.1.1 SAXESS**

SAXESS is the joint trading system of the NOREX Alliance between the CSE and the Stockholm Stock Exchange. SAXESS was introduced on the CSE in June 1999 as a cross-border trading platform with harmonised trading and reporting rules. The CSE has traded the listed equities on SAXESS since then, and in October 2000 bond trading was also transferred to the SAXESS system.

The activities of the CSE are governed by the Danish Securities Trading Act. The Danish Financial Supervisory Authority is responsible for the supervision of the solvency and business of the CSE. The Securities Council supervises the markets on the CSE. Executive orders issued by the Council ensure that participants receive fair and equal treatment, and that investors are provided with adequate protection. Rules for issuing and trading, etc. published by the CSE shall be reported to the Securities Council, which may order the rules to be amended and which may lay down supplementary rules.

All securities dealers, i.e. credit institutions and investment companies from the EU/EEA, can become members of Danish stock exchanges.

At present, 39 securities dealers are members of the CSE, and some of them are remote members.

#### *General operational aspects*

SAXESS is a parameter-controlled trading system with a wide range of functionalities. The system supports several different market structures by using different combinations of continuous/call market trading on the one hand and order/price-driven trading on the other.

The SAXESS system is divided into two markets: the bond market and the stock market.

#### *Stock trading in SAXESS*

The Danish stock market is divided into three sub-markets: sub-markets for stocks and investment certificates, respectively, and a sub-market for bonus and subscription rights. All members have access to the sub-markets, and trading is not anonymous. Transactions concluded outside the trading system are reported to the respective sub-markets. All three sub-markets are organised in the same way.

Continuous order-driven trading is the predominant functionality. During continuous trading, orders in the order book are automatically matched as soon as the bid matches the offer. An order-driven call market is used to open the market. Before the call, all orders are collected in the order book without matching. During the call, the equilibrium price is fixed and the matching of orders at the equilibrium price is performed.

SAXESS is designed with the needs of smaller private investors in mind. The minimum executable order – the trading lot size – has been reduced to DKK 20,000 for blue chip stocks, compared with between DKK 300,000 and DKK 500,000 previously. SAXESS has an automatic order routing facility, which makes it possible for investors to send orders to the trading system electronically via an exchange

member's system. SAXESS also contains a small order facility, which makes it possible to trade as little as one single share directly in the SAXESS system. However, orders for less than one trading lot are ranked lower in the order book than orders for trading lots.

As a consequence of the introduction of SAXESS, the share of stock trades executed in the trading system has risen. Around 50% of the trades in stocks were executed in the system in 2000.

#### *Bond trading in SAXESS*

The Danish bond market is divided into four sub-markets:

1. the ordinary market;
2. the sub-market for issues;
3. the sub-market for bulletin board posting; and
4. the electronic broker sub-market.

All members have access to trade in the ordinary market. Here, all bonds are traded by acceptance matching, and all bond transactions concluded outside the trading system are reported to this sub-market. The small order facility, as described above, is available in the ordinary market. All members can have pre-trade information from the ordinary market, including information on the identification of the participant placing the order. The participants are anonymous in the post-trade information.

Only market-makers have access to trade in the electronic broker sub-market and can receive pre-trade information. In the electronic broker market, trading is anonymous and done by acceptance matching. Transactions must have a minimum nominal value of DKK 25 million.

All members have access to post bids/offers on the bulletin board sub-market. Trades are concluded off-exchange by telephone and afterwards reported to the CSE. All members have access to all posted bulletin board items.

The sub-market for issues is an auction market, where initial issues – and possibly repurchase – auctions of government bonds are held. In this market, Danmarks Nationalbank initiates all bids and offers, on the basis of which a demand/supply curve is formed. On the basis thereof, Danmarks Nationalbank, by entering a sell/buy order, fixes an equilibrium price, at which all buy/sell orders quoted at the equilibrium price – or a higher/lower price – are settled. There is no continuous trading in the sub-market for issues, but all members have access to enter bids. Only Danmarks Nationalbank has access to pre-trade information, but without being able to see the other party to the transaction. Anonymity is preserved post trade.

#### 4.1.2 ELECTRA

The SAXESS trading system replaced the ELECTRA trading system, which was introduced on the CSE in 1987-88. ELECTRA is an electronic system consisting of three trading facilities/systems tailored to the needs of the market participants to trade different types/volumes of securities. ELECTRA also contains a trade-supporting system and a reporting system.

Until October 2000, bonds were traded on ELECTRA. ELECTRA had been closed down by the end of 2000.

#### 4.1.3 Derivatives trading

Turnover in futures and options has decreased markedly over the past few years. Against this background, the trading, clearing and settlement of futures and options have been reorganised. Trading has been transferred to the Swedish derivatives system, which is a fully automated system.

## 4.2 Clearing

There is no independent clearing house offering the clearing of securities or derivatives transactions in Denmark.

### 4.2.1 Securities clearing

The VP offers in-house clearing as part of its normal pre-settlement service.

### 4.2.2 Derivatives clearing

FUTOP clears and settles all contracts registered on clearing accounts. Transactions traded on the electronic system are automatically transferred to the clearing system for registration. Off-exchange transactions are reported to the system and registered on clearing accounts.

Contracts are registered on individually segregated accounts for each customer. The segregation is not only between trades for house account and those for customers, but on an individual basis for each and every customer. A condition for registration is that the customer provide the relevant member of FUTOP with such information as FUTOP may require for its operations, including its name and address.

A customer may trade with any affiliated member and clear and settle through one member. Before this type of trade is entered into, the customer's clearing member must approve.

The margin is calculated at the end of each trading day on the basis of the net position of each clearing account. Collateral must be posted by the affiliated members by 11 a.m. on the next trading day and may be in the form of cash and certain Danish securities.

FUTOP may carry out intraday margin calls in the event of substantial price movements.

## 4.3 Settlement

### 4.3.1 Institutional and legal aspects of securities settlement

The main providers of the Danish financial infrastructure on securities are the VP and the CSE (see Section 1.3). Funds transfers relating to trades in securities are settled on accounts held with Danmarks Nationalbank.

Danmarks Nationalbank participates in the formulation of overall policy guidelines in respect of securities clearing and settlement through its representation on the Executive Board of the VP. Danmarks Nationalbank has no operational functions with regard to the VP, except for providing cash settlement accounts to participants in the VP settlement system.

Danmarks Nationalbank provides account holders with unlimited intraday credit facilities against collateral. Securities accounts are not available at Danmarks Nationalbank.

The VP is currently the only market institution in the Danish market which undertakes the clearing and settlement of securities transactions.

The legal basis for issuance, clearing and settlement of securities transactions in Denmark is governed by the 1995 Danish Securities Trading Act. The Act regulates the business as the CSD and the clearing house and thus provides the legal framework for the VP. The Danish Financial Supervisory Authority is responsible for the supervision of the VP.

In order to safeguard holders of dematerialised securities, the provisions governing the VP stipulate that it shall be liable, within certain limits, for damages in the event of any loss resulting from errors in connection with the registration of securities, even if errors are accidental. A similar provision applies to errors caused by authorised institutions, e.g. institutions holding accounts with the VP on behalf of customers with an entitlement to make registrations on securities accounts with the VP.

All rights to dematerialised securities are transferred by book-entry to the VP. Apart from the VP itself, investment firms, credit institutions, bond issuers and Danmarks Nationalbank can be entitled to book-entry on securities accounts held with the VP.

Investors can have their securities holdings registered either on individual accounts with

the VP or under a nominee registration on a nominee account held by an authorised nominee.

#### *Accession and operating rules*

The VP's Clearing Rules are public rules on access and exit criteria available to all participants. Clearing membership in the VP is open to institutions authorised to deal in securities trading under the 1995 Danish Securities Trading Act or similar foreign institutions.

According to the VP's Clearing Rules, clearing participants can be linked up to the VP clearing and settlement system as *settlement administrators* and/or as *primary cash providers* (see below).

A *settlement administrator* can report trades for clearing and settlement at the VP on the participant's own behalf and may be entitled to report trades on behalf of third parties as well.

A clearing participant which participates as a *settlement administrator* must also be a *primary cash provider* or enter into an agreement with such an entity to have access to payment settlement.

A *primary cash provider* undertakes the payment settlement of cleared trades on behalf of *settlement administrators* and participates in the transfer of payments between issuers and investors.

Participation as a *primary cash provider* requires a cash settlement account with Danmarks Nationalbank. The settlement of the various forms of payment is executed via the cash accounts, which the respective *primary cash providers* have made available to the individual *settlement administrators*. In addition to any credit facility which a *primary cash provider* may have given to a *settlement administrator*, the parties may conclude a bilateral agreement on the use of automatic collateral (see below).

### 4.3.2 Operational aspects of securities settlement

The VP settles and registers transactions in government bonds, Treasury bills, mortgage credit bonds, commercial bonds, equities and mutual fund papers, including securities denominated in foreign currencies.

The VP operates its own securities transfer system. Trade verification (matching) of securities transactions is performed on the basis of information received directly from participants. Securities transfers with payments are processed in real time or in one of five daily settlement cycles. Transfers of funds are effected on settlement accounts with Danmarks Nationalbank based on cash balances calculated by the VP.

The VP operates on the basis of a fully computerised system. During opening hours (which differ among institutions, although most are open between 9 a.m. and 5 p.m.) the authorised institutions have online access to the VP via computer screens, thereby enabling the VP to continuously receive information on executed trades to be settled.

#### *Pre-settlement procedures*

With regard to trade verification, both the seller and buyer must report the trade for settlement in the VP. Reporting can be effected via direct data communication between the back office system of the relevant investment company, or via SWIFT communication or via the VP's screen-based standard system.

Trades can be reported up to 12 months prior to their scheduled settlement. Reporting is carried out in the form of a preliminary notice (pre-advice) and subsequent confirmation (instruction). Immediately upon receipt, the VP will attempt to match reported pre-advice notices with a view to ensuring that the parties agree upon the details of the trade. Only matched trades will be forwarded for clearing and settlement. Matching is executed online

throughout the VP's opening hours. Pre-advice notices and instructions can be reported in one and the same transaction.

Trades can be reported for settlement in one of several settlement blocks (net settlement) or for immediate settlement (RTGS).

The VP's clearing and settlement system facilitates final, irrevocable and unconditional settlement of all trades on a DVP basis and the payment of trades in both DKK and foreign currencies.

In order to support settlement in the NOREX Alliance (see Section 4.1) reported by remote members, the VP and the Swedish CSD (VPC) have developed an automatic data capture system for the common trading system. This permits concluded trades in Danish securities to be automatically transferred for settlement to the VP. A trade in Danish securities, concluded in or notified to SAXESS, is captured by the NOREX data capture system which re-transmits the trade to the VP System, where the trade transaction is automatically converted into the pre-advice format. The automatically generated pre-advice notices are processed in the VP clearing and settlement system in accordance with the same procedures applicable to pre-advice notices reported by other means.

The VP does not offer STP or a trade netting mechanism (central counterparty).

#### *Clearing and settlement procedures*

Trades in securities can be settled via the VP either by means of DVP or FOP. All funds transfers relating to trades in securities are settled on accounts held with Danmarks Nationalbank.

DVP settlement is only effected if securities are available during the settlement cycle and sufficient funds are available on the cash settlement accounts of participants held with Danmarks Nationalbank.



Access to direct participation in the settlement of cash balances at Danmarks Nationalbank are restricted to licensed investment firms and credit institutions.

The daytime settlement cycle is divided into two independent settlement cycles and a real-time gross settlement facility which enables the VP to handle same-day and real-time trades in securities with intraday finality on a DVP basis.

The overnight processing cycle is divided into three independent settlement cycles, all of which are processed during the night leading up to the settlement day and with finality in each cycle. This facilitates the settlement of cross-border trades through a link between the VP and Euroclear and enables settlement of back-to-back trades between the two systems in same-day funds.

The positioning of the settlement blocks within the 24-hour settlement period is illustrated in the time line below.

The VP's 24-hour settlement period starts at 6 p.m.

Trades in securities are usually settled three days after the trading day (T+3), whereas money market trades based on securities, such as repurchase agreements, are settled one and two days after trading day (T+1 and T+2).

Trades can be reported for net settlement with a specification of a settlement day and settlement block within the next 12 months.

The pre-settlement process comprises a check to see whether both the buyer and seller in each individual trade have instructed their respective sides of that trade. If not, the trade in question will be postponed for processing in the subsequent settlement block.

Trades which are ready for settlement will thereafter be checked for cover in terms of both securities and cash. Both checks are executed on a net basis.

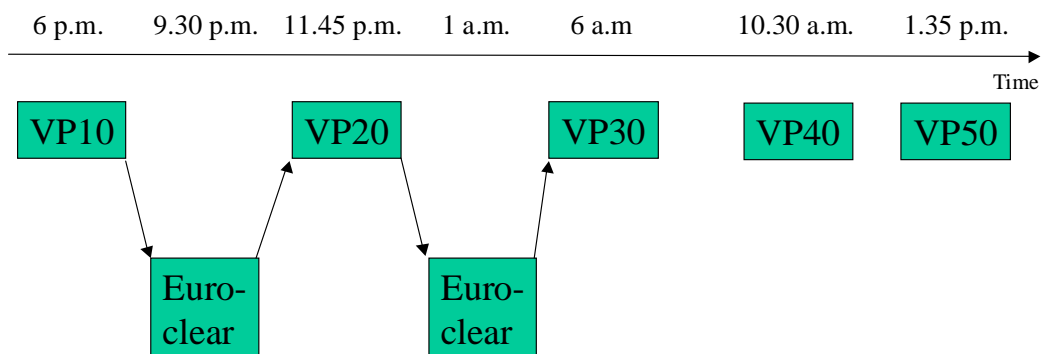
Trades which cannot be settled because of a lack of securities are postponed for renewed clearing in the subsequent settlement block. The VP does not offer securities lending.

Trades which are cleared in a settlement block are updated on the affected VP accounts and cash accounts during the course of that settlement block.

Trades can also be settled in euro in settlement blocks 10, 20 and 30, as well in the special euro settlement block (50). In blocks 10, 20 and 30, payment settlement at Danmarks Nationalbank is based on maximum cash drawing facilities in Danish kroner. Trade amounts relating to trades

**Figure 5**

**The VP's net settlement blocks**



for settlement in euro in blocks 10, 20 and 30 are included in a subsequent block 33, in which Danish kroner are exchanged for euro and vice versa. The payment transfer basis is generated directly in the requested settlement currency.

Trades attain legal effect as of the time of legal effect of the settlement block in which the trade is settled. The settlement of securities transactions in night batches thus becomes final and irrevocable during the night before the settlement day.

#### *DVP arrangements*

The VP's real-time gross settlement of securities transactions is operated in accordance with the DVP model 1 of the 1992 BIS (Parkinson) Report. Trades may be reported for real-time gross settlement on all settlement days between 8 a.m. and 3 p.m.

Trades for real-time gross settlement are reported in the form of RTGS pre-advice notices. The matching process is commenced immediately upon receipt of such pre-advice notices. Once the trade has been matched, a check will be made to see whether cover exists for the securities sold. If this securities check is completed with a positive result, the relevant securities will be reserved on the seller's VP account.

A check will subsequently be made to see whether the buyer has sufficient funds on its cash settlement account with Danmarks Nationalbank. If so, the trade will be settled immediately after the completion of the cash check. Cleared trades for real-time gross settlement are updated individually on the affected VP accounts and cash accounts immediately after completion of the clearing process.

Both the securities and cash check are carried out on a gross basis, i.e. on the basis of actual holdings of securities and cash.

The VP's net settlement system is operated in accordance with DVP model 3 of the 1992 BIS

(Parkinson) Report, e.g. positions in both securities and cash balances are netted before settlement.

Following the initial netting of securities positions, the resulting net cash balances of each individual participant are held up against the availability of funds on cash settlement accounts, which are reported to the VP on the evening before settlement by Danmarks Nationalbank. Funds may consist of cash deposited and credit against collateral.

If the clearing and settlement process results in net debit positions which exceed participants' available funds with Danmarks Nationalbank, the VP will, prior to settlement, exclude transactions to the extent necessary to bring the participants' resulting cash balances within the predetermined credit limits.

#### *Control measures and risk management*

Principal risks are eliminated by means of DVP combined with settlement in cash balances held with Danmarks Nationalbank. On the day preceding settlement day, the VP provides each individual participant with an updated statement containing information on securities and cash positions. This gives the participants the opportunity to cover possible shortages. Also, intraday credit is extended by Danmarks Nationalbank and has to be fully collateralised.

The 1995 Danish Securities Trading Act allows a customer in the VP clearing and settlement system to conclude a liquidity-saving Automatic Collateralisation Agreement. Such an agreement enables the customer to provide collateral for a net purchase in the traded securities or the customer's securities holding in conjunction with a settlement block. The collateral is provided vis-à-vis Danmarks Nationalbank or another *primary cash provider*. The security is calculated as a collateral value, which enables securities to be traded out of the relevant VP account, provided that the remaining securities comprise a sufficient collateral value.

The Automatic Collateralisation Agreement may be concluded as a supplement to any maximum cash drawing facility which the customer may have been given by Danmarks Nationalbank or another *primary cash provider* for use in the settlement of trades. If the customer fails to pay its debt vis-à-vis the lender, the latter can assert its right and execute immediate realisation of the collateral value of the holding which has been provided as collateral.

Securities lending is possible in accordance with Danish law. The VP does not offer a securities lending facility.

#### *Links with other SSSs*

The VP acts as an issuer SSS in a one-way direct link with Euroclear and in an operated (non-genuine direct) link with Clearstream Luxembourg. The Swedish CSD (VPC) and the VP have established a two-way direct link. All links are FOP.

#### **4.3.3 Derivatives settlement**

FUTOP offers the registration, clearing and settlement of transactions in futures and options. The clearing and settlement activities of FUTOP are governed by the Danish Securities Trading Act. FUTOP is under the supervision of the Danish Financial Supervisory Authority.

At the end of 2000, FUTOP was changed. The trading and clearing of derivatives was transferred to the Swedish derivatives systems, while settlement is still taking place via Danmarks Nationalbank.

All cash settlements regarding futures and options (option premiums, variation margins, fees and cash settlement) are made via accounts with Danmarks Nationalbank. Settlement takes place on every banking day. The net positions of the Danish participants in the clearing of derivatives are passed on from the Swedish clearing system to both FUTOP and the participants. The net positions are settled by manual transactions on accounts with Danmarks Nationalbank.

As a party to all transactions, FUTOP guarantees settlement and, in the process, replaces members who are in default.

Securities to be delivered are settled by way of DVP and follow normal securities settlement procedures.

## **4.4 The use of the securities infrastructure by Danmarks Nationalbank**

### **4.4.1 Collateral management**

Danmarks Nationalbank uses the VP system to receive collateral for monetary policy and payment systems credit operations. Collateral held by counterparties for credit operations with Danmarks Nationalbank primarily consists of Danish securities. Eligible collateral is held in a pool for each counterparty. The value of collateral held is adjusted on an ongoing basis. For this purpose, Danmarks Nationalbank uses an in-house valuation service.

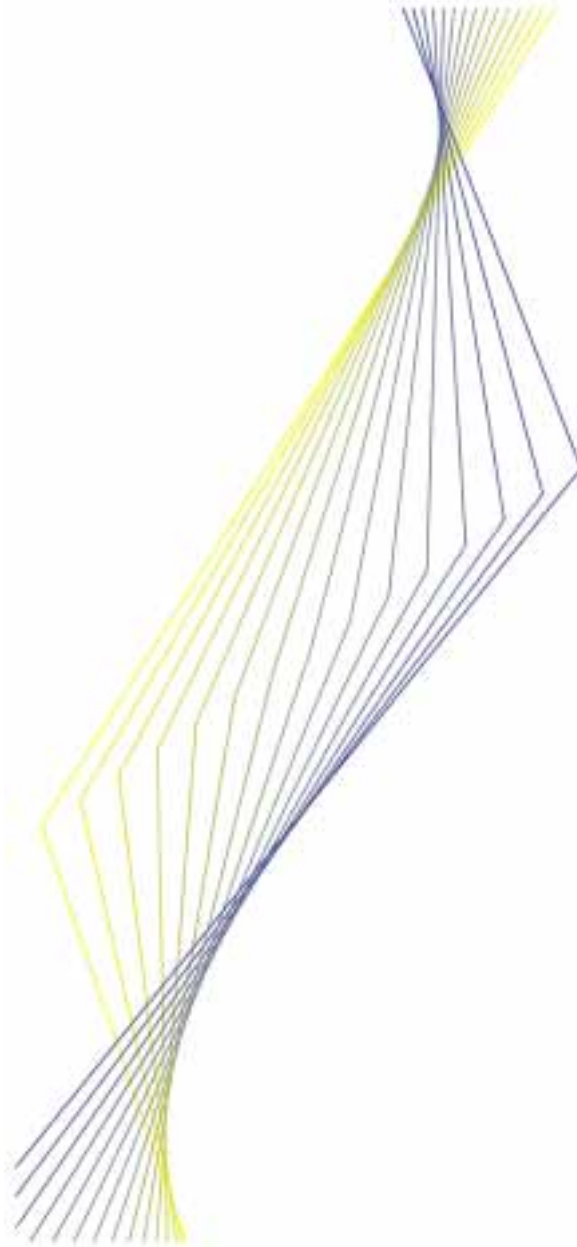
### **4.4.2 Other uses of systems**

Danmarks Nationalbank is a major user of the Danish securities infrastructure in its capacity as fiscal agent for the Kingdom of Denmark with regard to the issuance of government bonds, etc. The market for issues is an auction market, where initial issues – and possibly repurchase – auctions of government bonds are held. In this market, Danmarks Nationalbank initiates all bids and offers.

Danmarks Nationalbank has its holdings of Danish securities registered with the VP and uses the VP for settlement of its outright monetary operations. Danmarks Nationalbank acts as collateral manager for its own assets as well as for certain government assets.



EUROPEAN CENTRAL BANK



**Germany**

**June 2001**

Germany

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## List of acronyms and abbreviations

AGB	General terms and conditions of business – <i>Allgemeine Geschäftsbedingungen</i>
AZV	Cross-border payments procedure (via correspondent banks) – <i>Auslandszahlungsverkehr</i>
BAWe	Federal Securities Supervisory Office – <i>Bundesaufsichtsamt für den Wertpapierhandel</i>
BaKred	Federal Banking Supervisory Office – <i>Bundesaufsichtsamt für das Kreditwesen</i>
BBankG	Bundesbank Act – <i>Bundesbankgesetz</i>
BLZ	Bank sort code – <i>Bankleitzahl</i>
BörsG	Stock Exchange Act – <i>Börsengesetz</i>
BSE	Paperless cheque collection procedure – <i>Belegloser Scheckeinzug</i>
BSI	Federal Agency for Security in Information Technology – <i>Bundesamt für Sicherheit in der Informationstechnik</i>
DEA	Data input and output system – <i>Daten-Eingabe- und -Ausgabe-System</i>
DTA	Paperless exchange of data media – <i>Belegloser Datenträgeraustausch</i>
DTB	German Options and Future Exchange – <i>Deutsche Terminbörse</i>
DWZ	German securities data and service centre – <i>Deutsche Wertpapierdatenzentrale GmbH</i>
EADK	Electronic order placing, data transmission and account information – <i>Elektronische Auftragserteilung, Datenauslieferung und Kontoinformation</i>
EAF	Euro Access Frankfurt – <i>Elektronische Abrechnung Frankfurt</i>
EDI	Electronic data interchange – <i>Elektronischer Datenaustausch</i>
EDIFACT	Electronic Data Interchange for Administration, Commerce and Transport – <i>Standard für den zwischenbetrieblichen Datenaustausch in der Verwaltung, im Handel und im Transportwesen</i>
EDV	Information technology (IT) – <i>Elektronische Datenverarbeitung</i>
ELS	Euro Link System – <i>Elektronischer Schalter</i>
ELV	Electronic direct debit system – <i>Elektronischer Lastschriftverkehr</i>
EMZ	Retail Payment System (see RPS) – <i>Elektronischer Massenzahlungsverkehr</i>
Eurex	European Exchange (common futures market of the German and Swiss stock exchanges) – <i>Gemeinsamer Terminmarkt für Finanzderivate der deutschen und schweizerischen Börse</i>
FWB	Frankfurt Stock Exchange – <i>Frankfurter Wertpapierbörse</i>
GSE	Large-value cheque collection procedure – <i>Großbetrag-Scheckeinzugsverfahren</i>
GZS	<i>Gesellschaft für Zahlungssysteme mbH</i>
HBCI	Home-banking computer interface – <i>Standard für das Homebanking im Internet</i>
HÜST	Trading Supervision Authority – <i>Handelsüberwachungsstelle</i>
HVRZ	High-availability computer centre – <i>Hochverfügbarkeitsrechenzentrum</i>
KTO	Central accounting system of the Deutsche Bundesbank – <i>Zentrales Kontoführungssystem der Deutschen Bundesbank</i> ; also known as <i>Konto</i>
KWG	Banking Act – <i>Kreditwesengesetz</i>
LZB	Land Central Bank – <i>Landeszentralbank</i>
MaH	Minimum requirements for the trading activities of credit institutions – <i>Mindestanforderungen an das Betreiben von Handelsgeschäften</i>
MVS	Multiple virtual storage (mainframe operating system)
NIK	National Interlinking component – <i>Nationale Interlinking Komponente</i>
RPS	Retail Payment System – <i>Elektronischer Massenzahlungsverkehr</i> (see EMZ)
RTGS <sup>plus</sup>	The future enhanced real-time gross settlement system of the Deutsche Bundesbank with liquidity saving elements (and, as such, the future German TARGET component) – <i>Das zukünftige Bruttozahlungssystem der Bundesbank mit liquiditätssparenden Elementen (gleichzeitig zukünftige deutsche TARGET-Komponente)</i>
RTS	Real-time settlement – <i>Echtzeitabwicklung</i>
SDS	Same-day settlement – <i>taggleiche Abwicklung</i>
STD	Standard settlement – <i>Standardabwicklung</i>
WpHG	German Securities Trading Act – <i>Wertpapierhandelsgesetz</i>
XETRA	Exchange Electronic Trading (electronic trading system of the Deutsche Börse AG) – <i>Elektronisches Kassa-Handelssystem der Deutsche Börse AG</i>
ZKA	Central Credit Committee of the German banking associations – <i>Zentraler Kreditausschuss</i>

## I Institutional aspects

### I.1 The general institutional framework

According to Section 1 (9) of the German Banking Act (KWG) of 1961, last amended in 1998, the “provision of cashless payment and clearing operations (giro business)” is a banking activity. As such it requires a licence from the Federal Banking Supervisory Office (Bundesaufsichtsamt für das Kreditwesen; BaKred), provided that the permission to conduct payment transactions is not based on special laws, as is the case for the Deutsche Bundesbank. A bank is a company which conducts banking transactions professionally or to an extent that requires a commercially organised business. Hence, non-banks are not allowed to handle cashless payment transactions.

The responsibilities and powers of the German central bank are laid down in the Bundesbank Act (BBankG) of 1957 (last amended on 1 January 1999). According to Section 3 of the BBankG, the Deutsche Bundesbank shall arrange for the execution of domestic and international payments. In addition, the tasks of the ECB with respect to payment systems are mentioned in Article 105 (2) of the Treaty establishing the European Community (Treaty) as well as in Articles 3 and 22 of the Statute of the European System of Central Banks and of the European Central Bank (Statute of the ESCB).

With the Credit Transfer Act (*Überweisungsgesetz*), which came into effect on 14 August 1999, Directive 97/5/EC on cross-border credit transfers was incorporated into German law and a new legal foundation was created in the German Civil Code (Sections 675 – 676 g) in the form of specific rules for credit transfers, payment and giro agreements. By contrast with cross-border transfers between EU/EMU states, these provisions will not apply to domestic payments until 2002. Until then the general provisions of the mandate law laid down in the German Civil Code will continue to apply. Moreover, the Cheques Act of 1933 must be observed for the collection of cheques.

Within the limits of antitrust law, the German banking sector co-ordinates the organisational and technical procedures through the Working Group of the Central Credit Committee of the German banking industry (Arbeitskreis des Zentralen Kreditausschusses; ZKA) in order to ensure the efficient, fast and secure handling of payment transactions. The handling of payment transactions between banks and networks is contractually regulated in various conventions and agreements.

Of particular importance for electronic payments are the agreements relating to the conversion of paper-based transfers and the processing of electronic transfers (Agreement on credit transfers – which came into force on 1 January 1999), cheques (Agreement on cheque collection of 7 September 1998) and direct debits (Agreement on direct debits of 1 January 1999) which regulate the relationship between banks and the Deutsche Bundesbank.

The relationship between a bank and its customers is based on the General Business Conditions of the banks and/or of the Deutsche Bundesbank.

According to the Act against restraints of competition of 1966 (*Gesetz gegen Wettbewerbsbeschränkungen*), contracts or resolutions on the uniform regulation of the handling of payment transactions are to be reported to the Federal Cartel Office through the BaKred, stating reasons. Both of these offices have the task of ensuring that unwanted developments relating to banking supervision and excessive restraining effects on competition are avoided. In particular, they must ensure that the regulations do not unilaterally disadvantage other parties involved in payment transactions, namely the banks' customers. If no report is made, the relevant agreements or resolutions are invalid.



## 1.2 The role of the central bank

### 1.2.1 Oversight of payment systems

Oversight is an important role assumed by the Bundesbank in the field of payment transactions. This task is implicitly derived from Section 3 of the BBankG and is also recognised by the Treaty and the Statute of the ESCB as a basic task of the Eurosystem. Its aim is to ensure smooth payment transactions and encourage efficiency and security. In practical terms, this function is exercised largely by means of the general agreements on procedures and standards jointly developed with the banking sector and via institutionalised dialogues in various official bodies. Moreover, the Deutsche Bundesbank itself offers services in the field of payments and processing and thus assumes an operational function. In exercising the oversight function, close co-operation between the oversight bodies overseeing payments and the BaKred is of fundamental importance. In the field of electronic money the Deutsche Bundesbank also co-operates with the Federal Agency for Security in Information Technology (BSI) and takes advice from this body, as the systems with electronically stored units of value are subject to a special security test.

The legal foundation for banking supervision is the KWG. The aim of this law is to safeguard the ability of the banking sector to function and protect creditors by monitoring the credit standing and liquidity of banks. The law aims to achieve this objective by respecting the principles of a market economy. Under the KWG, the supervision of banks is primarily the task of the BaKred, which, however, performs this task in co-operation with the Deutsche Bundesbank. The Deutsche Bundesbank is above all involved in the ongoing supervision of banks and in analysing reports and notices from banks. In addition, however, it is involved in quality control in connection with the minimum requirements for the trading activities of credit institutions (MaH) and internal risk models.

### 1.2.2 Payment systems of the Deutsche Bundesbank

Continuing the tradition of the former Reichsbank (i.e. its explicit mandate to handle payment transactions), the Deutsche Bundesbank is actively involved in processing payments, with the aim of achieving the following goals:

- an adequate share of cashless payments in general;
- the promotion of large-value payments in particular;
- an adequate share of retail payments;
- the provision of a payment system which is neutral with respect to competition;
- the promotion of safe and efficient procedures; and
- contributing to a reduction in processing times.

The Deutsche Bundesbank fulfils its statutory task of ensuring the processing of domestic and international payments by providing a neutral giro network available to the banks in the various banking groups and offering its services in the area of cashless payment transactions to holders of Deutsche Bundesbank accounts in 129 branches, 7 computer centres and 2 payment transaction points (as at November 2000). Banks have the option of using the Deutsche Bundesbank's facilities instead of private giro networks or groups of banks.

Against the backdrop of the close connection between the implementation of monetary policy and the processing of payments through the central bank, the Bundesbank pays particular attention to the encouragement of large-value payments. Large-value payments are processed through the Euro Link System (ELS),<sup>1</sup> which at the same time provides a connection to the TARGET system, and the liquidity-saving hybrid system, Euro Access Frankfurt (*Elektronische Abrechnung Frankfurt*; EAF). In order to limit liquidity and systemic risks, typical gross elements were added to the previous netting system. Both have been a means of gaining

<sup>1</sup> Known as EIL-ZV until the end of 1998.

electronic access to the Deutsche Bundesbank since 1990.

Together with the banking sector, the Deutsche Bundesbank has developed the new liquidity-saving large-value euro payment system RTGS<sup>plus</sup>, combining the two existing large-value payment procedures, the ELS and the EAF, to form one single euro payment system, which will be able to be used for both domestic and cross-border payments. Its launch is planned for 3 September 2001.

In addition, the Bundesbank also offers an electronic procedure intended specifically for the handling of mass payments (credit transfers, cheques and direct debits), namely the Retail Payment System (RPS).

(The principal features of the above-mentioned payment systems of the Deutsche Bundesbank are described in Section 3.)

Apart from operating national payment systems, the Bundesbank also processes cross-border payments (*Auslandszahlungsverkehr*; AZV). For this reason it holds bilateral accounts with credit institutions abroad. Since March 1995 banks have also been able to process incoming and outgoing cross-border payments via the correspondent banks of the Deutsche Bundesbank using data telecommunications and floppy disks. In Germany cross-border payments are processed using the same technical components as the ELS.

### 1.2.3 Settlement

A prerequisite for using the facilities offered by the Bundesbank for cashless payments is a current account with the Bundesbank. The Bundesbank manages current accounts for banks and public authorities and, in exceptional cases – with a limited range of services – also for companies and private individuals. Apart from the minimum reserve balances, current accounts with the Deutsche Bundesbank do not bear interest and are run on a credit basis only. In accordance with the cover principle laid

down in the BBankG, payment orders are only executed if sufficient cover is available.

In order to avoid a delay in the processing of payments in the course of the day, the current accounts may be overdrawn up to the amount of collateral existing within the framework of the marginal lending facility; in addition, cover for outgoing transfers may be provided through the crediting of credit notes for the collection of both cheques and direct debits.

Debit balances at the end of a business day (resulting from intraday credit granted by the Deutsche Bundesbank) are not admissible and must therefore be settled by paying in the corresponding amounts using overnight facilities.

In addition to the settlement of payments processed through the Deutsche Bundesbank's payment systems, the accounts are also used for settling balances originating from clearing arrangements outside the Bundesbank, such as "garage clearing" (see also Section 1.3). Such settlement transactions are processed via the ELS.

### 1.2.4 Pricing policy

Like all resolutions on business policy passed by the Deutsche Bundesbank, the principles for cashless payments are laid down by the Central Bank Council of the Deutsche Bundesbank to the extent set out in ECB Guidelines and Instructions.

Pricing is based on the cost covering principle. The Deutsche Bundesbank supports efficient procedures, for example by charging higher fees for the more complex exchange of data media than for submissions by data telecommunication. Non-banks are charged DEM 30 per month for account management (for further information on prices see Section 3). The current accounts of banks are managed free of charge.

Through its General Terms and Conditions of Business, its processing procedures, its debit and credit conditions and pricing, the central

bank controls the extent to which its cashless payment systems are used. In addition, it exerts a certain influence on the terms and conditions applied by banks.

### 1.3 The role of other private and public institutions

In the Federal Republic of Germany, both banks and the Deutsche Bundesbank supply the economy and the public with cash and process cashless payments. At the end of 1999 banks maintained a total of 82 million current accounts for domestic non-banks. In addition, credit card companies process payments resulting from credit card transactions via their own networks.

Most of the 3,168 legally independent banks (with 58,546 branches as at the end of 1999, including 14,103 run by Deutsche Postbank AG) are actively involved in processing payments. Within the framework of the existing universal bank system, these banks belong, with a few exceptions, to one of the following four banking groups, each of which provides giro networks<sup>2</sup> specific to each group in the form of co-ordinated bilateral clearing and settlement arrangements:

- large-scale institutions, many of which have established important giro networks between their branch offices;

- 578 savings banks, which form their own giro network together with their 13 central institutions;
- 2,035 credit co-operatives which form their own giro network together with their three central institutions; and
- Deutsche Postbank AG, which operates its own giro network.

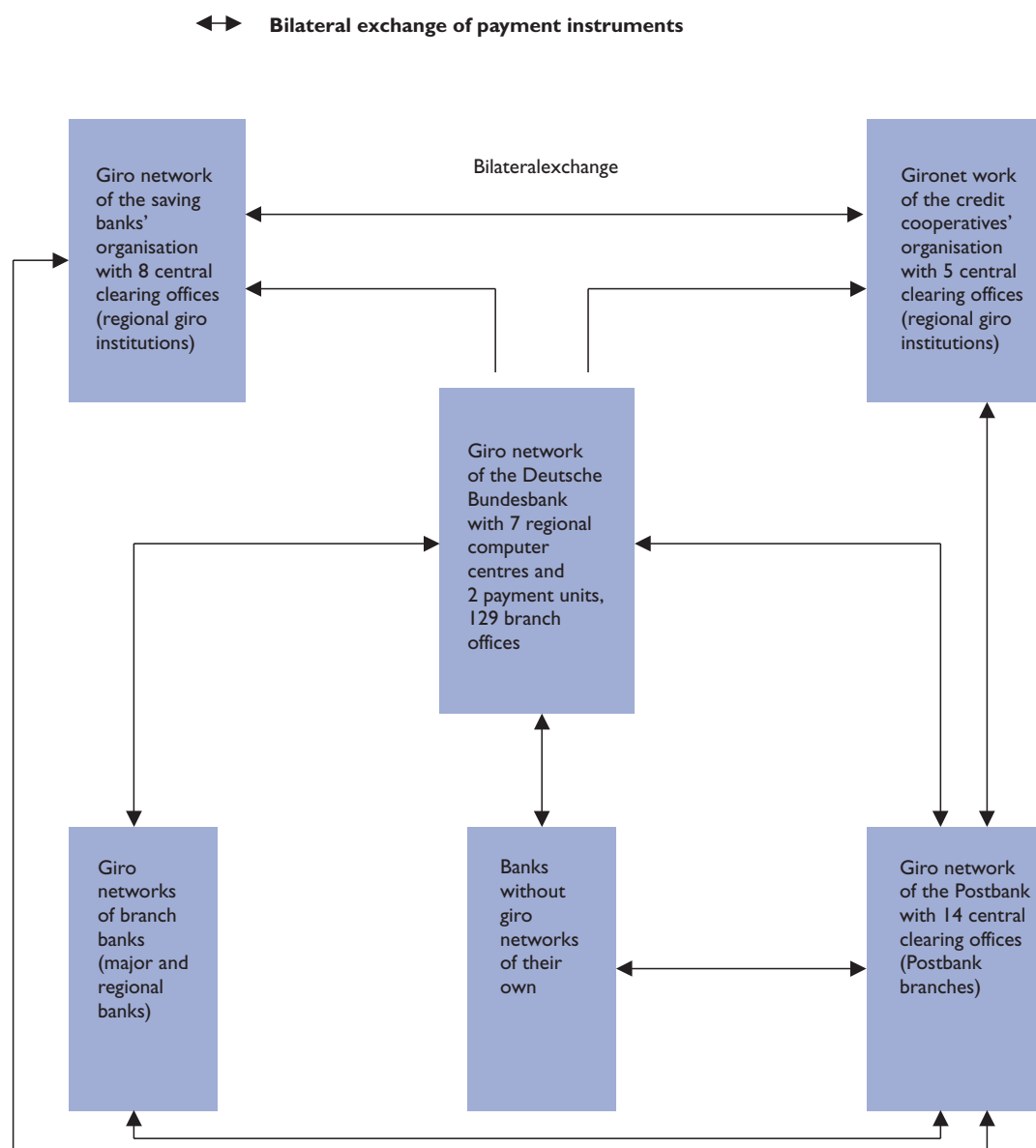
The Bundesbank is in practice the only means – other than relying on their competitors – for smaller private banks without a giro network of their own to execute payments intended for other banks on behalf of their customers.

Since 1982 a combined private national payment transaction company has existed for the German banking sector, Gesellschaft für Zahlungssysteme mbH (GZS). This is an independent processing company which ensures the low-cost handling of card-protected payments and develops new electronic payment systems. The main card systems involved are Eurocard, Visa and eurocheque cards. GZS customers are banks and trading firms, with commercial banks and savings banks each holding 40%, and co-operative banks 20%, of the equity capital of GZS.

<sup>2</sup> The term "giro network" refers to payment procedures which are used within one banking group or within a bank's branch network. Settlements are effected by one or more of the banking group's central institutions.

## Giro networks in the Federal Republic of Germany

(for credit transfers, cheques and direct debits)



This diagram provides only an overview of the connections between the various giro networks. Not all bilateral relationships are shown.

## 2 Payment media used by non-banks

### 2.1 Cash payments

Since the introduction of the euro, the Deutsche Mark is no longer a currency in its own right but rather a sub-unit of the euro. However, until the end of 2001 the euro will only exist as book money or as electronically stored units of value, with banknotes and coins therefore continuing to be denominated in Deutsche Mark. The German banknotes in circulation are available in eight denominations (DEM 5, 10, 20, 50, 100, 200, 500 and 1,000) as are the coins (1, 2, 5, 10 and 50 Pfennig and DEM 1, 2 and 5). In addition, there are very small quantities of DEM 10 coins, although these are primarily for collectors and therefore rarely used in payment transactions. Banknotes and coins are legal tender, although there is no obligation to accept coins denominated in Deutsche Mark for amounts of more than DEM 20 and coins denominated in Pfennig for amounts above DEM 5. At the end of 1999 total currency in circulation – including cash in bank vaults – amounted to €148.26 billion, of which €140.18 billion was in banknotes (94.5%) and €8.08 billion in coins (5.5%). Cash in bank vaults amounted to €17.2 billion.

Although the share of card-based payments is rising continuously, cash payments still amounted to 73.3% of the value of all retail payments in 1999.

### 2.2 Non-cash payments

In Germany cashless payments are effected by means of credit transfers (51% of the total number of transactions in 1999), cheques (4%) and direct debits (40%; this figure includes withdrawals from cash dispensers and payments at EFTPOS terminals using ec/debit cards and bank customer cards). Other types of payment, such as special payment instructions via Deutsche Postbank AG, but also payments made with credit cards, retailer cards and prepaid cards, are relatively insignificant (5%).

#### 2.2.1 Credit transfers

In Germany credit transfers have traditionally been the predominant form of payment transaction. However, their share of the total volume of payment transactions has decreased in recent years because more suitable payment instruments, especially direct debits, are used for certain purposes (e.g. for the collection of identical payments due on a regular basis).

However, for payments recurring on a regular basis (e.g. rent to the landlord) the bank customer also has the possibility of giving his bank instructions to set up a standing order; this bank is then responsible for monitoring the timely execution of transfers (e.g. on the last day of the month).

Those customers who instruct their bank to make periodically recurring retail payments (e.g. salaries, wages, social benefits) are requested to submit their orders to the banks via electronic data media (magnetic tape or diskette). Increasingly, these payments are now being handled via data telecommunication, not only between banks but also between banks and their customers.

In 1999 as many as 5.5 billion credit transfers in Germany were submitted by customers in electronic form. 600 million transfers were issued in paper-based form and converted into electronic data records by the sending bank. All interbank transactions are processed in a fully automated and paperless manner.

#### 2.2.2 Cheques

In Germany the cheque has never become as important as it has in many other countries of the western world. In terms of numbers it accounts for a mere 4% of all cashless transactions, in terms of value just 1.7%. It is used for only 1.3% of retail payments. On account of the increase in more efficient debit card payments the importance of

the cheque is steadily decreasing. Most of the cheques in circulation in Germany are eurocheques, which are used in combination with the eurocheque card (providing a guarantee for payments of up to DEM 400) as a medium of payment for consumer goods and services. As the eurocheque guarantee will expire at the end of 2001, a further decline in cheque payments can be expected.

Under the German Cheques Act, the drawee bank may not certify a cheque in such a way as to signify that it undertakes to honour it. The purpose of this prohibition is to prevent cheques acquiring a function similar to that of banknotes. An exception is made for "certified cheques", which are drawn on the Deutsche Bundesbank. On request by an issuer with sufficient cover, the Bundesbank will certify such cheques. The liability arising from the certification lapses if the cheque is not presented for payment within eight days of the date upon which it is drawn.

With the automation of cashless payment transactions, the fact that a cheque is a payment instrument which is payable at sight has proved to be one of its key disadvantages. In other words, cheques must always be collected and presented in paper-based form. In 1985, the central associations of the German banking industry and the Deutsche Bundesbank agreed on a paperless cheque collection procedure (formerly called the BSE Agreement, now part of the Cheque Agreement), while deliberately waiving the statutory obligation to physically present cheques. The handling of BSE cheques (cheques below DEM 5,000 (€2,556)) is fully automated and, in interbank transactions, entirely electronic, whereas GSE cheques (large-value cheques for amounts of DEM 5,000 or more) are still physically presented to the drawee banks.

### 2.2.3 Direct debits

The direct debit, introduced by the banking industry in 1963, has considerably simplified

the collection of periodically payable monetary claims (subscriptions, fees, taxes, etc.). Today around 40% of all cashless payments in Germany are effected by direct debit. Its relative importance compared with other payment instruments is increasing.

Unlike credit transfers, direct debits are initiated by the payee, which thereby ensures that its claim on the payer is fulfilled on time. However, this presupposes that the payer pre-authorises the payee to collect payment (collection authorisation) or, by agreement with the payee, authorises its bank to debit its account in accordance with direct debit requests issued by that particular payee (debit authorisation).

Bank customers who have IT systems are expected to submit their direct debits for collection to the bank in electronic form only, i.e. on magnetic tape or diskette. Any remaining direct debits which are still paper-based – collection of this kind is quite expensive for bank customers – are converted into data records by the first-collecting institution, e.g. by means of inputting via terminals or scanning systems. In November 1993 the direct debit became the first payment instrument to be fully automated as part of the general conversion obligation introduced on the basis of the Direct Debit Agreement, and since then it has been handled in wholly paperless form in interbank transactions.

### 2.2.4 Card payments

The use of cards for retail payments is increasing steadily. Debit card payments account for 16.1% (electronic cash 4.0%, electronic direct debit system (ELV) 9.1% and point of sale without payment guarantee from the banking industry €3.0%), credit cards for 3.8% and retailer cards for 0.9% of the total value of non-cash payments.

#### 2.2.4.1 Debit cards

Debit cards are payment cards issued by banks, with which customers may also draw on their account balances outside their bank (e.g. cashless payments at automatic cash points, withdrawals at cash dispensers).

The most widely used debit card in Germany is the eurocheque card (ec card). Above and beyond its original function (use as a guarantee card for the eurocheque which will cease at the end of 2001) it has been extended to become a debit card by the addition of a magnetic strip and the use of a PIN. This means that it can also be used for payments at the POS and withdrawals at cash dispensers. In the recent past many card issuers have extended the possibilities of the ec card by installing a chip on the card. This makes offline authorisation possible in addition to allowing the ec card to be used as a prepaid card (the *GeldKarte* system of the ZKA).

However, in addition, the banking sector has also created special debit cards issued by a bank or banking association itself (bank customer cards) in order to provide customers who cannot obtain a eurocheque card, for example on account of their credit rating, with a means of accessing electronic self-service media.

As a consequence of the merger between the Europe-wide edc (European debit card) service and the worldwide MAESTRO system, since the beginning of 1998 many POS terminals and cash dispensers throughout the world have been available to holders of ec cards with the MAESTRO logo.

No special system exists for the clearing and settlement of debit card transactions. These payments are handled like direct debits.

##### *Electronic cash with a PIN*

After many years of negotiations, the banking sector concluded the Agreement on an interbank system of cashless payment at

automatic cash points (electronic cash system) in February 1990. This makes it possible to have a uniform POS system on the basis of debit cards. Under this system cardholders can pay for goods and services by debiting their accounts at the corresponding acceptance points using cards issued by the German banking sector (eurocheque card and bank customer card) and the matching, confidential PIN. Once customers have entered their PIN, an authorisation request is directed to the authorisation centre through the network operator. The authorisation centre checks the confidential number, the credit balance and/or credit line and the entries in a blocking file. If the answer is positive, the card-issuing bank gives a payment guarantee for the amount requested. A charge is levied on merchants for these transactions.

The terminal networks of the various and competing network operators (of which there are currently 30) are connected to the banking industry's centres for the authorisation of electronic payment with the ec/debit card in the electronic cash system. By the end of 1999, following a continuous increase, approximately 301,000 electronic cash terminals had been installed – mainly in petrol stations and retail outlets.

##### *Electronic cash offline*

This system, designed in co-operation with the banking industry, is based on chip-card technology and corresponds to the electronic cash system with a PIN. The only difference is the possibility of offline authorisation. An authorisation up to a limit of DEM 1,000 is stored on the eurocheque card chip. This amount decreases with each payment, and, as long as the remaining amount is sufficient, transactions are authorised offline. In order to pay, the customers must enter their PIN, which is validated on the chip. Online authorisation will only take place if the amount remaining on the chip is no longer sufficient or if more than 90 days have elapsed since the last online authorisation. The fees paid to the banking industry are the same as the POS charges,

although in 80% of cases the retailer saves telecommunication costs through offline handling.

#### *Electronic direct debit system*

The retail trade has developed a system (without consulting the banking sector) which makes payments by ec/debit card possible without any authorisation. This system is known as the electronic direct debit system (ELV). The customer's signature on the receipt or an additional document authorises the dealer to collect the cost of the purchase by direct debit. However, the risks of a direct debit being returned on account of an objection or lack of cover or possibly because the card has been blocked are borne solely by the retail outlet. This means that there is no payment guarantee in this system and no extra charges are incurred. The electronic direct debit system is the most frequently used card-based payment system in Germany.

#### *Point of sale without payment guarantee*

In response to the success of the ELV procedure, the banking sector introduced a further system of electronic payment using the ec card at cash terminals in addition to the electronic cash procedure. In this alternative procedure, the customer signs a debit note produced using data from the magnetic strip. In this system the banks do not give a payment guarantee, with the result that the retailer alone bears the risk. This POS system provides retailers with a simple and inexpensive payment system without the need to enter a PIN and with a simple, fee-based online blocking check for amounts of DEM 60 or above.

#### *2.2.4.2 Credit cards*

The use of credit cards<sup>3</sup> has increased significantly in the past few years. The number of cards issued by the major card organisations (American Express, Diners Club, Eurocard in connection with MasterCard, Visa) has grown from approximately 10 million at the end of

1994 to more than 16 million at the end of 1999. At the same time, the number of acceptance points (especially in the retail sector and the hotel business) has increased substantially. In 1999 German cardholders made payments by credit card in an amount of approximately DEM 70.5 billion (€36.05 billion). In spite of this, credit cards are still used far less than other payment instruments (e.g. debit cards) in the Federal Republic of Germany.

Owing to the commission charges (a deduction from the credit card turnover of the acceptor, which is payable by the latter only) and the amount of work involved in the authorisation and processing of payments, credit cards are not always popular in the retail trade. Thus their use tends to be restricted to more "upmarket" retail outlets. In addition, the eurocheque card and customer cards issued by banks provide retailers with a less expensive payment option.

Whereas GZS issued the Eurocard credit card on behalf of banks until 1989, banks now have the possibility of issuing them themselves. More and more banks now also issue Visa cards. This means that banks and credit card organisations are increasingly competing with each other. Banks use credit cards to a greater degree for cross-selling or for developing customer relationships. Various additional services (e.g. insurance) and bonus programmes (e.g. card charges depending on purchase amounts) are aimed at achieving greater customer loyalty and increased card use.

#### *2.2.4.3 Retail cards*

Retail cards with a payment function, which are issued by some major stores with the aim of increasing customer loyalty, are now competing with traditional credit cards. With the largest issuer in Germany, for example, the use of retailer cards is free of charge. Cardholders can

<sup>3</sup> In Germany most "credit cards" offer no possibility of obtaining credit. Periodical unit invoices have to be settled immediately on receipt. Thus, these cards are generally designed as deferred charge cards.



usually take advantage of a payment period of between one and two months or pay in instalments. At present there are around 8 million retailer cards with payment functions in circulation. Retailer cards provide the retail trade with exact information on customer and purchasing profiles.

#### 2.2.4.4 Prepaid cards

At the end of 1996 the first prepaid cards were issued in Germany by the German banking sector (*ZKA-GeldKarte-System*) and tested in a pilot project. Since the successful test phase the number of prepaid *GeldKarte* cards has increased to 61 million. There are cards linked to accounts, where the *GeldKarte* chip is integrated in a eurocheque card, as well as cards which are not linked to an account (“white cards”), which have only an electronic purse function. There are no signs so far of a sustained move to a more widespread use of the German banking industry’s prepaid *GeldKarte* card system. In addition to the *GeldKarte* system developed by the ZKA, there are other prepaid cards which, however, are still relatively insignificant at the present time.

#### 2.2.4.5 Cash dispensers

In Germany, banks offer both their own customers and the customers of other banks the possibility of obtaining cash up to a certain limit from approximately 46,200 cash dispensers nationwide (as at the end of 1999) using the eurocheque card or a bank customer card in combination with a PIN. Credit cards can also be used at cash dispensers. For all transactions at cash dispensers an online connection to the authorisation centre of the bank concerned is established and a block and limit check is made in order to prevent fraudulent or other inadmissible withdrawals. Settlement of the transactions at cash dispensers is effected by direct debit.

#### 2.2.5 Post office services

Deutsche Postbank AG is a privatised company offering both payment services and other services through its own branches and through post offices. In addition to handling credit transfer, cheque and direct debit transactions, Deutsche Postbank AG offers its customers the possibility of sending sums of money to the home of the payee by means of a payment instruction specific to this institution.

## 3 Interbank exchange and settlement systems

### 3.1 General overview

In Germany many of the commercial banks, savings banks, co-operative banks and Deutsche Postbank AG operate their own giro networks. In addition, the Deutsche Bundesbank runs its own payment systems, which are neutral in their effect on competition and available to all banks.

In general, banks keep credit transfers within their own giro network for as long as possible for liquidity control reasons. However, cross-network payments have to be fed into the network of the recipient bank at some point.

For retail payments in particular, a special procedure called “garage clearing” operates among the different giro networks in the banking sector.

This procedure is used for the majority of cross-network payments. With garage clearing, payment transaction data are directly exchanged on a bilateral basis in the main financial centres between large commercial banks and central institutions of groups of banks through data media or data telecommunication. The balances are settled through the Bundesbank’s giro network on the banks’ accounts. Garage clearing comprises the systems described below for processing large-value payments (see Sections 3.2 to 3.4) and retail payments (see Section 3.5 to 3.6).

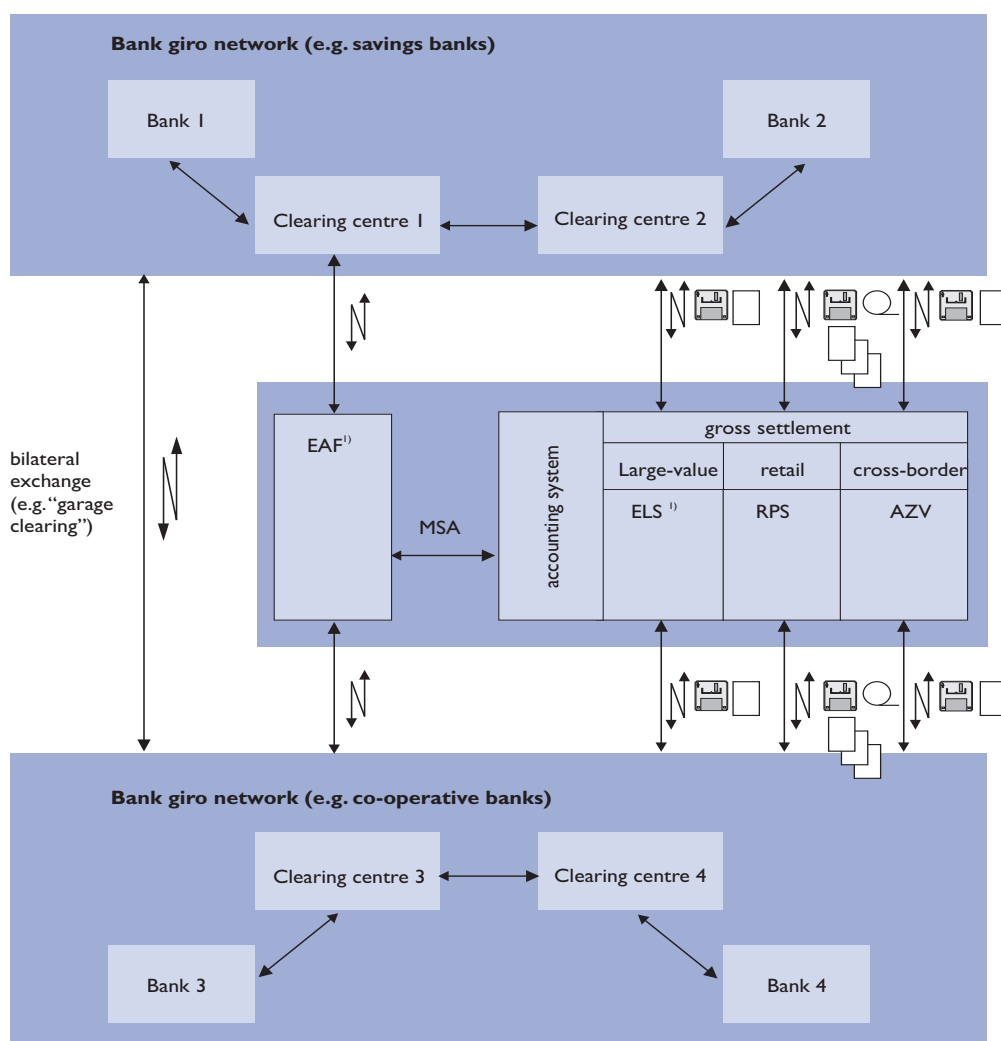
All banks directly involved in payment transactions are identified by eight-digit bank sort codes. Branches of banks either have their own bank sort code (BLZ) or a bank sort code derived from that of their parent institution.

The bank sort code is also the current account number with the Deutsche Bundesbank.

The following provisions apply to all systems operated by the Deutsche Bundesbank: The general provisions of the German Civil Code, the German Commercial Code, the Act governing

general terms and conditions of business (*Gesetz über die Allgemeinen Geschäftsbedingungen*), the General Terms and Conditions of Business of the Deutsche Bundesbank and the various payment agreements concluded between the banking industry and the Deutsche Bundesbank.

### Interbank funds transfer systems in Germany



<sup>1)</sup> RTGS<sup>plus</sup> will be launched in September 2001 as the successor of EAF and (later) ELS.

ELS = Euro Link System

MSA = Maximum sender amounts for EAF

EAF = Electronic Access Frankfurt

## 3.2 The Euro Link System

### 3.2.1 General overview

The ELS is the real-time gross settlement system of the Deutsche Bundesbank. In addition to the above-mentioned general regulations, the “Special terms and conditions of the Deutsche Bundesbank governing electronic order placing, data transmission and account information (EADK)” and the “External Specifications for Electronic Access to the Deutsche Bundesbank” are also applicable to the electronic submission of orders.

### 3.2.2 Participants

As direct participants, all credit institutions with an account at a Deutsche Bundesbank branch, as well as the branches and the central office of the Bundesbank itself, can forward their own payments and their customers’ orders in the ELS. (Non-banks may only participate indirectly.) German and foreign banks which do not have direct access to the ELS can participate in the ELS indirectly through any direct participant. Moreover, foreign participants can also participate via remote access if they are domiciled in a country of the EEA.

Banks make use of the ELS primarily for interbank operations, such as money-market transactions and liquidity management operations. Urgent credit transfers for bank customers are also routed via this system.

### 3.2.3 Types of transaction handled

The ELS handles credit transfers designated by the participants either as a “Prior I payment” (a “telegraphic transfer” until the end of 1998) or as a “Prior 2 payment” (formerly an “urgent transfer”). Prior I payments are processed particularly swiftly and are always executed on the same day, i.e. even in the event of disruptions. The internal processing of the payments delivered is effected on the basis of individual transactions according to the gross principle with immediate finality. If the sender’s account

has sufficient cover, the debit and credit entries in the central accounting system of the Deutsche Bundesbank (KTO) are made immediately. The executed payments are delivered to the receiving participant via telecommunication or to the Deutsche Bundesbank branch which then issues diskette or paper-based transfer documents. Furthermore, the receiving bank is notified separately if it so wishes or if the ordering party requests notification. Such notification, however, is waived only if the payment is delivered via telecommunication.

In principle Prior 2 payments are also executed on the same day on a gross basis and with immediate finality, although they are processed in a batch-oriented procedure whereby the order is not executed until cover is available for the full amount of the submitted file – with a lower priority than for Prior I payments. However, the Deutsche Bundesbank offers guaranteed execution on the same day only if submission and delivery are effected by telecommunication with sufficient cover on the account by 4.30 p.m. The processing time averages around 30 minutes and is thus longer than for Prior I payments.

Cross-border TARGET payments are always processed in the Prior I mode.

In addition to the electronic submission and delivery of credit transfers on diskette or by telecommunication, credit transfer orders can also be submitted on paper. (Banks can submit only Prior I payments in paper-based form. All other payments must be submitted electronically.)

### 3.2.4 Transaction processing environment

The ELS and the KTO operate from the high-availability computer centre (*Hochverfügbarkeits-Rechenzentrum*; HVRZ) in Düsseldorf. The migration from the formerly decentralised technical processing environment (in which transactions were processed by computer systems at the Deutsche Bundesbank branches (*Zweiganstaltenrechner-Systeme*; ZAR systems))

to the present central computer systems was effected in several phases between 1996 and the end of 1998.

### 3.2.5 Operation of the transfer system

Paper-based orders and orders on diskette must be submitted to the Deutsche Bundesbank branches responsible for the participant's account. Orders via telecommunication are forwarded directly to the ELS using a gateway. In the ELS, payments can be processed in the domestic DTA format (slightly adapted to the requirements of electronic access), in SWIFT format or in the EDIFACT record format (FINPAY).

Detailed information on record formats can be obtained from the "External Specifications for Electronic Access to the Deutsche Bundesbank".

### 3.2.6 Credit and liquidity risk

Since each order is only executed if there is sufficient cover, settlement failures or unwinding are ruled out. Thus the recipient bank is not exposed to credit or liquidity risk and can make the received funds available to the final beneficiary unconditionally.

### 3.2.7 Pricing

A transaction fee of DEM 0.50 (€0.26) per transaction is charged for handling a Prior 1 payment where an order is submitted by telecommunication (standard service). Additional fees are charged for additional services. For example, there is an additional conversion fee of DEM 4.00 (€2.05) for paper-based orders. The submission or delivery of payments on diskette incurs an additional fee of DEM 15.00 (€7.67) per diskette.

The transaction fee for Prior 2 payments is DEM 0.30 (€0.15) for the standard service (i.e. delivery by telecommunication). Additional services are billed separately, as for Prior 1 payments.

## 3.3 Euro Access Frankfurt

### 3.3.1 General overview

The first version of the EAF, which was introduced in March 1990 (and known at the time as Electronic Clearing with File Transfer), was an electronic netting system for the settlement of interbank payments in Deutsche Mark. Individual payments were cleared among the participants by way of multilateral netting and only the resulting balances were settled, thus achieving finality only at the end of the day. In order to reduce the credit and systemic risk of this netting procedure from the point of view of compliance with the so-called Lamfalussy standards, the EAF was developed into a hybrid system which commenced operations in March 1996. In the process, by adopting the liquidity-saving elements from the "old" EAF, the advantages of a net settlement system were combined with the benefits of a gross settlement system, namely lower credit risk and the achievement of finality on the same day. Immediately prior to the introduction of the euro certain functions were developed even further and a number of necessary technical adjustments made, in particular to ensure that the liquidity available in the EAF could be used more flexibly.

The EAF is subject to the "Special conditions for the EAF" and the "External Specifications for Electronic Access to the Deutsche Bundesbank" mentioned above.

### 3.3.2 Participants

Credit institutions can participate directly in the EAF if allowed to do so by the Deutsche Bundesbank, the operator of the system. Direct participation in the EAF is possible through the headquarters, office or branch of a participating bank in Germany or via remote access for credit institutions from abroad. In addition, banks (from Germany or abroad) can participate indirectly via a direct participant in the EAF. They do not need a separate Bundesbank account since their payments are channelled into the balances of the

direct participants. The direct participants must have the appropriate technical facilities for telecommunication and adequate backup systems. Moreover, direct EAF participation is dependent on the following access criteria: the direct participant must submit or receive an average of at least 500 payments a day, or its payment turnover must amount to at least DEM 2 billion (€1.02 billion). In addition, direct participants must be able to prove that, on the basis of their transaction structure, they can achieve satisfactory bilateral settlement levels (at least 60% of the transaction volume).

At end-1999, 68 banks were EAF participants. The Bundesbank itself does not participate in the EAF.

### 3.3.3 Types of transaction handled

The EAF is used for the paperless exchange of Deutsche Mark and euro credit transfers among the participants by telecommunication. Payments can be supplied to the EAF in DTA, SWIFT and EDIFACT format in line with the "External Specifications".

The EAF is used primarily for clearing and settling interbank payments (e.g. money market and foreign exchange market transactions) on a same-day basis, as well as for transfer orders received from bank customers and commercial payments arising from correspondent banking business. Overall, foreign exchange-related payments continue to make up the bulk of transactions, as can easily be seen from the fact that EAF turnover declines to about half of the normal level on US bank holidays.

### 3.3.4 Transaction processing environment

Since 14 July 2000 the EAF's technical processing has been performed by the HVRZ in Düsseldorf. Previously this was done using the HVRZ in Frankfurt/Main, the resources of which are now required for the implementation of RTGS<sup>plus</sup> (see 3.4). In technical terms, the computer systems of

the participating banks and the Deutsche Bundesbank's mainframe communicate via an interface on dedicated gateway systems – as in the case of electronic access. As with other electronic access services, the principles and requirements for submitting and delivering data to the EAF by telecommunication are laid down in the "External Specifications for the Electronic Access to the Deutsche Bundesbank".

### 3.3.5 Operation of the transfer system

The EAF is characterised by a two-phase procedure.

*Phase I (bilateral and multilateral clearing of payments)*

In phase I (7 a.m. to 4 p.m.) the EAF resembles a gross settlement system. At the same time, it takes advantage of the high level of two-way payments in bilateral relationships, amounting to more than 70% of the total volume of payments registered. For payments with a lesser degree of compensatory flows, a multilateral clearing system (known as "remainder clearing") was also introduced in phase I. In the successive runs of the bilateral and multilateral clearing algorithm, the bulk of the payments submitted will be cleared in phase I and made available to the receiving participants on a final and irrevocable basis – as in an RTGS system. Participants are free to decide, at their own risk, whether they wish to clear payments vis-à-vis a partner bilaterally or multilaterally. In addition, participants can exert a substantial influence on the clearing sequence of their outgoing payments by setting priorities for their orders. Liquidity is only required to the extent that the amounts of the counterpayments involved in the offsetting procedures do not match, because the corresponding payment blocks are generally not exactly the same size. The amount of liquidity used can be adjusted by the participants both overall and in each bilateral relationship.

Participants decide for themselves how much liquidity they wish to use. Each participant thus

defines maximum sender amounts for each relationship in which it wishes payments to be settled bilaterally. By fixing a maximum sender amount, a participant defines how many payments of its own it is willing to send in excess of those provided by its counterparty, i.e. it limits the liquidity it is willing to invest in a bilateral relationship (the unilateral outflow of liquidity). In addition, each participant defines a multilateral maximum sender amount for remainder clearing. In doing so, each participant determines the amount up to which it is willing to permit a difference for all payments submitted and received in remainder clearing.

Only a proportion of all defined maximum sender amounts (a “multi-cap”) must be backed by underlying liquidity. The amount of the participant’s multi-cap should be in an appropriate proportion to the sum of its defined maximum sender amounts. This sum must be transferred from the Deutsche Bundesbank account to the EAF account (liquidity collective account) before the start of phase I. In order to provide the necessary liquidity, participants from Germany can utilise liquidity in the form of central bank account balances and collateral deposited, while banks with remote access can only use their account balances. During phase I, additional liquidity can be brought into, and surplus liquidity deducted from, the EAF through liquidity operations using the Deutsche Bundesbank current account.

Unlike a conventional gross settlement system, in which payments tend to be held back and submitted only at a relatively late point in time during a business day, bilateral settlement in the EAF has the advantage of offering a built-in incentive to submit payments early and thus to synchronise incoming and outgoing payments. The reason for this is that the payment recipient will only receive a final payment if it, in turn, is itself willing to feed corresponding payments into this bilateral relationship. This incentive is enhanced by the fact that the participants are given an overview of the queue of payments which are destined for them but are not yet final (queue visibility for incoming payments).

#### *Phase 2 (multilateral clearing)*

The payments that cannot be settled during phase I (before 4 p.m.) are included in the first multilateral clearing of phase 2. Where this procedure results – for any participant – in debit balances which are not covered, the maximum volume of payments that can be cleared and settled by resorting to the liquidity of the participant is determined by means of an appropriate algorithm. After the first multilateral clearing, the proportion of final payments amounts to almost 100%. For individual payments which could not be settled during the first multilateral clearing, participants can provide cover until a second clearing takes place. If debit balances should then remain, individual payments will once again be retained for a preliminary period using the algorithm mentioned above. Further attempts will then be made to clear the uncovered payments by multilateral clearing. If there are still unmatched payments owing to insufficient cover at the scheduled completion deadline (approximately 4.30 p.m.), individual payments will ultimately be removed. The payments excluded may be submitted to the ELS on the same day. In excluding payments, the EAF operates in exactly the same way as a gross settlement system, providing for payments without cover to be returned at the end of the operating period (without affecting the finality of payments already executed).

#### **3.3.6 Credit and liquidity risk**

The maximum sender amounts are used to manage credit and liquidity risk in phase I. An advance payment, which can be considered a credit extension to the recipient bank insofar as the sending bank also expects payments due from that recipient, is limited by the maximum sender amount. Maximum sender amounts also control the liquidity risk by limiting the outflow of liquidity during the processing cycles. The recipient can evaluate its liquidity position (queue visibility for incoming payments and releasing of own payments). Unlike the position in a gross settlement system, the sending bank does not need to monitor its liquidity outflow continuously.

The EAF also reduces the credit risk of the recipient bank. Payments from the clearing cycles are immediately final and can therefore be forwarded to the beneficiary without incurring any credit risk.

The systemic risk is eliminated by the fact that, in the event of an uncovered debit balance remaining at the end of Phase 2, no unwinding is necessary. Instead, as in a gross settlement system, only those individual payments which are still uncovered are returned.

### 3.3.7 Pricing

The Bundesbank charges a monthly base fee of DEM 500 (€255.65) for participation in the EAF. In addition, a transaction fee of DEM 0.30 (€0.15) is charged for each payment. Participants are also required to bear the costs of their own IT systems as well as the charges for data transmission to and from the Deutsche Bundesbank.

## 3.4 The new project RTGS<sup>plus</sup>

With the launch of the euro on 1 January 1999, the European payments environment underwent a substantial change, necessitating a reorientation of the range of large-value payment services offered by the Deutsche Bundesbank. As a result of newly established European payment systems (Euro1, TARGET), EAF has suffered significant losses. In these circumstances, a consolidation of the ELS/EAF would appear necessary to improve the cost situation and to benefit from synergies. Moreover, recent developments in the area of communication technology as well as additional requirements, especially on the part of larger banks, call for a modernisation of the Deutsche Bundesbank's current large-value payment systems. Furthermore, the speed and efficiency of the complex German TARGET component (the ELS and the national Interlinking component) are in need of improvement. For these reasons, work to create an integrated, liquidity-saving real-time gross settlement system was recommended in 1999, and the

development of RTGS<sup>plus</sup> was begun. The technical concept behind RTGS<sup>plus</sup>, which was drawn up in close co-operation with banks, has the following main features:

- *European orientation through open access and use of domestic liquidity*  
The system is open to all credit institutions and investment firms registered in the EEA. There are various flexible options for the daily provision and withdrawal of liquidity ("liquidity bridge") – which is held on specific RTGS<sup>plus</sup> accounts – required for settling payments.
- *Gross system with liquidity-saving elements*  
The integration of liquidity-saving elements in the gross settlement procedure of an RTGS system makes it possible for the customer to individually organise its payment processing from the point of view of throughput and liquidity savings.
- *Payment system with extensive options for controlling liquidity*  
Every participant in RTGS<sup>plus</sup> can precisely control the use of the liquidity it makes available in accordance with its needs.
- *Online information and interactive control*  
RTGS<sup>plus</sup> offers comprehensive real-time information and makes it possible to change all control parameters using modern browser technology.
- *Use of SWIFT standards and services*  
RTGS<sup>plus</sup> uses internationally established SWIFT standards for data formats. Moreover, the new, forward-looking SWIFTNet services, based on the latest internet technology, are used for online information and interactive control.

RTGS<sup>plus</sup> will commence operations on 3 September 2001; on this date the EAF will be closed down.

Customers who do not participate in RTGS<sup>plus</sup> immediately can continue to use the ELS, albeit

as a procedure for gaining access to the Deutsche Bundesbank's large-value payment system. However, for the Bundesbank as the operator and for banks as users it is uneconomical to "operate" the ELS as a parallel system in the long term. Thus, within a further three-year period ways will have to be found to make it possible for all ELS users to participate in RTGS<sup>plus</sup> in a cost-effective way.

### 3.5 The retail payment system

#### 3.5.1 General overview

The electronic RPS is used both for the routing of credit transfers and for the collection of cheques and direct debits. Banks and other Deutsche Bundesbank account holders (e.g. public authorities) can participate in the RPS. As a matter of principle, orders, denominated in either euro or Deutsche Mark, must be presented by banks in paperless form. Cheques for amounts of DEM 5,000 (€2,556) or above (so-called "GSE" cheques) are an exception to this rule. In general, retail payments without a need for priority treatment are submitted to the RPS and are batch-processed "overnight". Incoming and outgoing payments can be handled both on electronic media (magnetic tapes or diskettes); since 17 March 2000, this can also be done via data telecommunication. The processing time for RPS payments within the giro network of the Deutsche Bundesbank is one working day. Since 5 February 1999, the booking of entries of credit transfers to the accounts of the submitter and of the receiving credit institution has been effected on the business day after submission; the RPS is therefore float-free – as has already been the case in the Deutsche Bundesbank's collection procedures for some years. The RPS is based on a number of agreements between the central associations of the banking industry and the Deutsche Bundesbank. The content of these agreements relates both to technical requirements and to certain conversion requirements.

In addition to the General Terms and Conditions of Business of the Deutsche Bundesbank, both the "Special terms of the Deutsche Bundesbank

for the Retail Payment System" (RPS conditions) and the "Special terms and conditions of the Deutsche Bundesbank governing electronic order placing, data transmission and account information" (EADK conditions) are applicable with regard to clearing in the RPS procedure; moreover, remote access is subject to the "External specifications for Electronic Access to the Deutsche Bundesbank".

#### 3.5.2 Participants

Each credit institution with an account at a Deutsche Bundesbank branch which meets the technical requirements of the RPS is entitled to submit credit transfers or cheques and direct debits to the Bundesbank on electronic media or by data telecommunication (cf. the special case of the GSE above). The branches and the Central Office of the Deutsche Bundesbank use this system to execute orders of their customers (e.g. public authorities) by paperless transfer.

#### 3.5.3 Types of transaction

The RPS is utilised to process paperless credit transfers and direct debits of any value. By contrast, converted cheques (BSE cheques) can only be submitted if their face value is below DEM 5,000 (€2,556); these are collected on a paperless basis and without presentation of the original cheques. In principle, cheque data need to be recorded by the first collecting institution. However, the conversion can also be effected by a bank instructed or commissioned to do so by the first collecting institution. The first collecting institution must examine the cheques to establish their compliance with formal and legal requirements. Cheques that are formally incorrect must be collected within the GSE procedure. Cheques for amounts of DEM 5,000 and more (GSE cheques) and other collection papers not capable of being processed within the BSE procedure are converted into data records. The GSE procedure is based on a paperless system, but if a large amount is involved or there are formal irregularities the original cheque must be sent to the drawee banks or to the clearing institutions designated



by the latter. The conversion of cheques for the GSE procedure is performed exclusively at the computer centres of the Land Central Banks.

### 3.5.4 Processing environment

The payments are channelled to the central multiple virtual storage (MVS) application (at an HVRZ) via decentralised input/output stations in the computer centres. The payments converted in the branch offices of the Bundesbank using the data input and output (DEA) systems are channelled directly to the central MVS application, where the incoming and outgoing payments by data telecommunication are processed and then executed directly via a central gateway.

The electronic media and GSE cheques must be submitted to the Deutsche Bundesbank branches by 2.30 p.m. or, in the case of direct submissions, to the relevant computer centre by 6.30 p.m. In addition, submissions by remote data telecommunication must also be concluded by 6.30 p.m. Banks have the possibility of joining a service centre or clearing institution and having their submissions and deliveries effected by this institution; in such cases the payments will be settled via the clearing institution. The data records are read in at the computer centres and routed to the central MVS application in Düsseldorf. This is where the actual data processing, i.e. the sorting of payment orders, takes place. The various computer centres receive pre-sorted files to be forwarded to the recipient credit or clearing institution, or to the recipient branches of the Deutsche Bundesbank.

Credit transfers are executed on a gross cumulative basis, with sufficient cover being a vital condition for execution. On the date of submission the level of cover required is ascertained by blocking an amount equivalent in value to the payment orders submitted by the submitting bank in its current account. The value of cheques and direct debits is credited on the business day following submission ("subject to collection") and is also settled on a gross cumulative basis.

### 3.5.5 Credit and liquidity risk

Since each (single or collective) payment is booked on a gross basis and revocation of the transaction with the Deutsche Bundesbank is no longer possible once automatic processing has been launched, there is no credit risk – and generally no liquidity risk – for the recipient bank. The latter can make the incoming funds available to the final beneficiary without reservation.

For cheques and direct debits, there is some credit and liquidity risk as the items are credited "subject to collection".

### 3.5.6 Pricing

Data records submitted on electronic media or by data telecommunication are subject to a transaction fee of DEM 0.01 (€0.0051) per data record and at least DEM 5 (€2.56) per electronic medium. Paper-based credit transfer orders (non-banks only) are subject to a fee of DEM 0.05 (€0.03) and paper-based cheques submitted are billed at DEM 0.10 (€0.05).

### 3.5.7 Future trends

Plans are underway to allow data records to be submitted in EDIFACT format in addition to the current DTA format.

## 3.6 Other retail payment networks

### 3.6.1 General overview

Almost all credit institutions in Germany process payments, either for their own purposes or on behalf of their customers. Some groups of banks and large institutions have established their own giro networks throughout Germany or on a regional basis to process retail payments. In these networks, processing is usually carried out on a bilateral basis. Several institutions now allow their payment transaction divisions to operate independently in the market in order to be able to offer their services to other banks as well.

The structure of giro networks, as described below, has evolved over a period of some years. Giro networks provide cost-efficient paperless processing of credit transfers and direct debits. In addition, they keep the liquidity within the credit institution or the banking groups as long as possible. Below is a description of the main giro networks besides the systems of the Deutsche Bundesbank.

### 3.6.2 *Giro network of Deutsche Postbank AG*

Deutsche Postbank AG is one of the privatised companies which emerged from the former state-owned Deutsche Bundespost. Deutsche Postbank AG now has a banking licence like any other credit institution. The company still uses post offices to sell its products and develops its own banking services.

Deutsche Postbank AG runs a giro network between its branches. A subsidiary is in charge of the technical processing of payments and operates in different computer centres. The bank does not hold accounts bilaterally with other credit institutions, but many other credit institutions hold accounts with Deutsche Postbank AG. Payments are usually processed directly on customers' accounts. There are also clearing accounts, which are held bilaterally with some of the central institutions of other networks. Today debit balances are generally settled via the systems of the Deutsche Bundesbank (the ELS/EAF) at the end of the day.

### 3.6.3 *Giro network of savings banks*

The giro network of the savings bank sector consists of savings banks which operate either locally or regionally as clearing agencies, central savings banks which are the central institutions of the respective savings banks in each region, and the central institution for all German savings banks, the Deutsche Girozentrale – Deutsche Kommunalbank.

Savings banks hold an account with their respective central savings bank and all central

savings banks hold accounts between each other bilaterally. Deutsche Girozentrale – Deutsche Kommunalbank participates with its own payments. Central savings banks or additional computer centres, which are usually run by a central savings bank or by a special service provider under the umbrella of the German Savings Banks and Giro Association (Deutscher Sparkassen- und Giroverband), work as clearing centres for payment processing. Clearing agencies process payments with the respective clearing centre. If possible, the clearing centre tries to process payments with the respective clearing agencies or with other central savings banks within the system. In addition, every central savings bank holds accounts with various other institutions for the purpose of processing cross-network payments. Settlement is effected as described in Sections 3.1 and 3.6.2.

### 3.6.4 *Giro network of co-operative banks*

The co-operative sector also runs a giro network, *Deutscher Genossenschaftsring*. The participants in this network are the central institution of the co-operative banks, DG-Bank Deutsche Genossenschaftsbank AG, regional co-operative central banks and clearing agencies which are local co-operative banks.

Several computer centres have been set up by member banks. They carry out the technical processing of payments. Co-operative banks process payments with the respective regional central co-operative bank. For this reason they hold bilateral accounts. Central co-operative banks also hold bilateral accounts with each other in order to clear payments directly. DG-Bank Deutsche Genossenschaftsbank AG and the regional co-operative central banks are involved in the settlement of debit balances at the end of the day. Central co-operative banks in particular hold accounts with credit institutions which are not members of *Deutscher Genossenschaftsring*. The final bilaterally exchanged data amounts are usually settled through the systems of the Deutsche Bundesbank, as described above in Sections 3.1 and 3.6.2.

The co-operative sector has undergone fundamental changes over the past few years. A process of restructuring has resulted in DG-Bank AG now being both a central institution and a co-operative central bank.

### 3.6.5 *Giro networks of large institutions/ commercial banks*

Large institutions and some regional institutions have branches throughout Germany or throughout a particular region and have established their own giro networks for the processing of payment transactions. These consist of the head office, branch offices and, in some cases, subsidiaries. In many cases special production centres or payment processing offices are also affiliated to these institutions. The number of such centres depends on the number of branches, the organisational structure and, of course, on the volume of payments. The centres are in turn linked with one or more computer centres which carry out the processing between branches, subsidiaries and the head office. They hold bilateral accounts for transactions with other institutions, especially the central institutions of other giro networks. As described in Sections 3.1 and 3.6.2, debit balances are settled through the systems of the Deutsche Bundesbank at the end of the day.

## 3.7 *Innovative payment procedures*

### 3.7.1 *E-banking and e-money*

The German banking sector is currently undergoing a process of fundamental change, caused by, among other things, the possibilities offered by home banking. Here a distinction must be made between electronic banking in closed networks – as offered, for example, by the online service provider T-Online AG (a subsidiary of Deutsche Telekom AG) – and internet banking (open network). In addition to providing payment transaction services, home banking can also be used both for account management and securities transactions and for obtaining information. It was estimated that

there were 11.2 million internet users and 10.2 million online accounts in Germany in 1999 and that at the end of 2000 there would be 18 million internet users. Over the past two years the number of customers conducting stock exchange business online has doubled, and this figure is expected to treble again over the next two years.

Given the rapid increase in internet use, the share of electronic commerce<sup>4</sup> (e-commerce) in the total volume of trade will grow even further. Secure and efficient payment systems are prerequisites for the projected growth of e-commerce, since e-commerce will only be of interest to companies and private individuals if fast, simple and, above all, secure payment systems are available.

It is becoming evident that in e-commerce between companies and private households, debit and credit cards are being used for the payment of larger amounts and e-money is being used for very small to small amounts. Here the borderline between e-money based on hardware and e-money based on software is becoming blurred, as card money can also be used for remote payments via the internet.

Major banks and other institutions working in co-operation with banks have developed e-money schemes besides *GeldKarte*, such as P-Card, PayCard, Cybercash and Ecash. So far none of them has been playing a pivotal role. Indeed, Cybercash has already stopped its business. Nonetheless, with the growth of e-commerce it is expected that at least some of these or other systems will gain in significance.

### 3.7.2 *Other developments*

With EDIFACT a uniform global format for the processing of electronic business and trade was created.

In 1997, in step 1, both the conditions for the exchange of EDI messages between the parties

<sup>4</sup> *E-commerce is the handling of business processes of all kinds via electronic networks.*

named in the contract and the requisite technical accessories were established with a view to handling business transactions between customers and banks via remote data transfer. In the second step, mandatory EDIFACT acceptance was introduced on 7 February 1998. Since then, all banks have had to be in a

position to receive EDIFACT payments. In addition, there is no longer any need to convert EDIFACT messages into a national format. The Deutsche Bundesbank accepts EDIFACT payments both in the EAF and in the ELS within the framework of Electronic Access to the Deutsche Bundesbank.

## 4 Securities settlement systems

### 4.1 Trading

#### 4.1.1 Legal foundations of stock exchange trading

The legal principles governing stock exchange trading are not embodied in a single act dealing with all issues relating to the stock exchange system. The Stock Exchange Act (BörsG) and the German Securities Trading Act (WpHG), the scope of application of which extends to stock exchange trading, provide the public law framework. Moreover, stock exchange trading is based on a further system of legal provisions of varying legal quality. These are based to some extent on public law (e.g. the Stock Exchange Rules), and to some extent on private law (e.g. the terms and conditions of trading on German stock exchanges). These provisions, which are of varying quality, vividly reflect the characteristic legal traits of the stock exchange structure: on the one hand, there are stock exchange organs and supervisory bodies with sovereign powers, and, on the other hand, there are trading activities based on private and public law between licensed stock exchange participants, which include the intermediary services performed by brokers.

#### 4.1.2 Financial intermediaries engaged in the various securities markets

Permission to trade officially on the stock exchange is granted only to representatives of banks and to official exchange and independent brokers.

Third parties not licensed to trade on the stock exchange must utilise the services of banks, since only the latter are allowed to act as brokers for third parties, while intermediary services between banks are performed by official exchange and independent brokers.

#### 4.1.3 Trading segments

The stock exchanges are divided into several segments which are in turn sub-divided into various categories according to the rules and requirements governing the securities being traded. The primary distinction is drawn between official and unofficial trading. The listing requirements and subsequent obligations in relation to securities vary according to the market or trading segment concerned.

In Germany shares are traded on eight stock exchanges using the electronic trading system XETRA. The stock exchanges are located in Berlin, Bremen, Düsseldorf, Frankfurt/Main, Hamburg, Hanover, Munich and Stuttgart. The Frankfurt Stock Exchange (FWB) generates the highest turnover.

##### 4.1.3.1 Official trading

The German stock exchanges' official trading segment is where the lion's share of turnover in shares and bonds is generated. Exchange prices are determined by officially appointed, sworn brokers.

There is a right to the execution of orders placed on an unlimited basis to the extent that turnover actually results.

#### 4.1.3.2 Unofficial trading

Unofficial trading in Germany consists of the regulated market, the unofficial regulated market, and the *Neuer Markt* segments.

##### 4.1.3.2.1 The regulated market

The regulated market is designed to give companies which do not meet the requirements for official trading the opportunity to raise equity capital by listing their shares publicly on a market regulated by law under the supervision of a stock exchange. In addition, fixed interest securities are also traded on the regulated market. The market is characterised by simplified listing requirements and disclosure rules. Prices are fixed by independent brokers commissioned and supervised by the stock exchange management in accordance with the rules for official listing.

##### 4.1.3.2.2 The unofficial regulated market

The unofficial regulated market is an unofficial securities trading segment operating in the stock exchange hall during trading hours. It provides for trading in securities (shares, bonds, warrants) which are not listed either in the official trading segment or on the regulated market. It also serves as a market segment for regional and foreign securities. The listing requirements are limited; there is no obligation to publish a prospectus, but a brief exposé must be prepared for every public offer for sale and approved by the Federal Securities Supervisory Office (Bundesaufsichtsamt für den Wertpapierhandel; BAWe) in accordance with the Securities Prospectus Act. Securities are admitted for listing by the unofficial regulated market Committee. The independent brokers are responsible for trading and for the listings. In the process, prices are freely negotiated. There is no right to the execution of orders, even if placed on an unlimited basis. The fact that companies are not obliged to provide comprehensive

information may be seen as a disadvantage for investors in the unofficial regulated market.

##### 4.1.3.2.3 The *Neuer Markt* segment

The *Neuer Markt* segment was introduced on the FWB in the first quarter of 1997. It was launched by Deutsche Börse AG, the company which runs the FWB, in order to bring together companies with a high level of growth and risk-taking investors. Key features in this context are the high transparency offered by companies to investors in this market, and the strict listing requirements.

The *Neuer Markt* does not constitute a separate segment of the stock exchange. In terms of stock exchange legislation it belongs to the regulated market segment. It co-exists with ongoing unofficial regulated trading as an independent trading segment which, although recognised by the state, is organised under private law.

Access to the *Neuer Markt* is such that permission for a listing must be obtained in the regulated market, while the listing itself is entered in the *Neuer Markt* segment. Owing to its admission to a public law market segment, the *Neuer Markt* is subject to public law monitoring by the Trading Supervision Authority (Handelsüberwachungsstelle) and the Stock Exchange Supervisory Authority (Börsenaufsichtsbehörde) and is subject to the Securities Trading Act (*Wertpapierhandelsgesetz*). Trading is carried out continually via designated sponsors who secure the purchase and sale of securities by providing the bid and offer prices.

#### 4.1.4 XETRA

XETRA is Deutsche Börse AG's electronic trading system for spot trading and co-exists with the floor trading system. XETRA is conceived as an order-driven trading system with automatic transaction-matching which consolidates all orders in a central order book. The order book is open to inspection by all XETRA participants. This is intended to enable all participants to react to market changes in a more focused manner.

#### 4.1.5 Eurex

Eurex was conceived jointly by Deutsche Börse AG and the Swiss Stock Exchange in December 1996 and established in 1998 through a merger between Deutsche Terminbörse (DTB) and SOFFEX. It is thus the common futures market of the German and Swiss stock exchanges. Eurex is an independent, fully electronic market for forward exchange transactions, i.e. both futures contracts and listed options are traded.

Eurex offers a cross-border market featuring a uniform range of standardised and innovative products on the basis of a harmonised body of rules and regulations. A distinction is drawn between participants which transact own-account and customer business and those which also perform market-maker functions. The task of market-makers is to provide binding bid and offer prices for the base instruments which they manage.

The Futures Exchange operates in four phases of daily trading. In the pre-trading period, orders and quotes can be submitted and information retrieved. On the basis of the orders and quotes entered up to this point, a preliminary opening price is displayed in the opening period, which is subject to revision as further orders and quotes are received. A final opening price is determined within the scope of the subsequent compensation process. Trading continues throughout the trading period. Stock market participants can enter orders and quotes in the system for about two hours after the trading period ends, i.e. in the post-trading period.

Moreover, since 27 August 2000 Eurex has been co-operating with the Chicago Board of Trade (CBoT) in the area of electronic derivatives trading on a jointly developed platform based on Eurex technology. The joint venture company a/c/e (alliance/cbot/Eurex), in which each partner holds an equal share, provides access to the products of both stock exchanges via one trading screen.

#### 4.1.6 European Energy Exchange

The European Energy Exchange represents the first integrated spot and futures market for electricity in central Europe. The spot market was launched on 8 August 2000, and the futures market followed in the fourth quarter of 2000.

The European Energy Exchange unites the technology of the XETRA and Eurex stock exchange trading systems. Its aim is to enable European market participants to trade freely in energy.

#### 4.1.7 Recent developments

Eurex's latest project, Eurex Bonds, in which German government bonds can now be traded on Eurex's technological platform along with futures contracts, was launched on 6 October 2000. This connection enables traders to develop favourably priced, risk-free trading strategies in technical terms, making it possible to switch between futures contracts and bonds (so-called basis trades). In a second phase, an electronic repurchase agreement (repo) trading system, a netting procedure and a risk-minimising central counterparty were established.

Off the floor, the supporting organisation and the trading section are organised as an electronic communication network provider. The idea is to achieve, by limiting the circle of participants, more flexibility than the traditional stock exchange structure has been able to provide, which is why the group is to be confined to ten banks with market-maker functions. Of the banks in question, four are from Germany, four are from other European countries and two are from the United States. The Deutsche Bundesbank, with its special status that does not extend to include market-maker functions and a capital holding, participates in Eurex Bonds as the successor to XETRA Bonds for market support.

#### 4.1.8 Stock exchange supervisory organs

The supervision and monitoring of stock exchanges in Germany is the responsibility of the BAWe, the stock market supervisory authorities of those of Germany's *Länder* with registered stock exchanges and the trading supervision authorities of the stock exchanges in question. Moreover, anyone wishing to provide commercial securities services requires a licence from the BaKred.

The supervision of the stock exchange by the BAWe serves to protect stock market participants and investors. Its tasks are as follows:

- surveillance to prevent and detect illegal insider activities;
- monitoring ad hoc disclosure requirements of listed companies;
- monitoring the disclosure requirements in the event of a change in the voting rights held in officially listed companies;
- monitoring compliance with rules of conduct relating to customer transactions;
- depository of prospectuses; and
- international co-operation among stock exchange regulatory and supervisory authorities and all matters relating to the supervision of securities trading.

As a rule, the stock market supervisory authorities of the *Länder* are represented by a commissioner of state. These commissioners of state are responsible for legal and market supervision, i.e.

- supervision of compliance with stock exchange regulations;
- regulation of stock exchange trading and the processing of stock market transactions;
- tasks relating to approval;
- the issuing of ordinances; and
- the appointment and dismissal of official brokers.

The Trading Supervision Authority (Handelsüberwachungsstelle; HÜST) is an independent

organ of the stock exchange and exercises direct market supervision. It systematically and meticulously records all data relating to trading and processing on the stock exchange and checks them for conspicuous features and irregularities. In this manner, it controls pricing and price fixing. In addition, it performs transaction checks among official exchange brokers and independent brokers and investigates suspect cases.

#### 4.2 Clearing

The clearing house for the Eurex exchange is Eurex Clearing AG. Eurex Clearing AG serves as the central counterparty for derivatives traded in Eurex. When a transaction is concluded at Eurex, Eurex Clearing AG will act as the clearing house and central counterparty for both contracting parties, who are members of the central counterparty clearing house. As a central counterparty, the clearing house interposes itself as buyer to every seller and as seller to every buyer (netting by novation). Counterparty risk is reduced since each clearing member will have the clearing house as its counterparty in place of other market participants, which in most cases will not have the same credit quality as Eurex Clearing AG. By consolidating exposures under Eurex Clearing AG as the central counterparty, members receive the maximum benefits arising from the correlation between risk positions and portfolio diversification. A risk-based margining system based on value-at-risk methodologies allows for the maximum benefit to members, while maintaining the clearing house's financial soundness at the levels targeted by the risk-carrying community. Eurex Clearing AG also has plans to expand its central counterparty clearing services to securities. As a first step, it has taken over this role in the Eurex bond trading system, which was launched on 6 October 2000.

In addition, Eurex introduced the remote clearing system on 1 August 2000. This enables participants from each country in the EU or Switzerland not only to participate directly in trading, but also to handle the clearing and settlement themselves.

### 4.3 Settlement

#### 4.3.1 Legal foundations for custody operations by banks

The Safe Custody Act of 1937 constitutes the legal basis for the safe custody and administration of securities by banks. The Safe Custody Act serves to protect the owners of securities who deposit them with banks. In particular, it ensures that purchasers acquire proprietary rights to their securities as soon as possible and that they do not lose these proprietary rights if the depository bank should encounter financial difficulties.

Banks may, in their own names, give custody of their customers' securities to some other (third-party) custodian. This is not a violation of the rights of the depositor since the third-party custodian must assume, in principle, that the securities delivered are the property of the customers of the submitting bank (principle of non-property presumption). In particular, without special permission, no securities of customers may be used to cover the liabilities of the banks involved. Institutions involved in custodian operations are by definition banks pursuant to the Banking Act (KWG) and are thus within the ambit of banking supervision. In particular, this sector of business is subject to a special audit each year.

The Safe Custody Act (a special item of legislation for the banking sector) deals with the custody of securities by banks, as a rule in the form of collective safe custody or – at the request of the owner or if only individual certificates are issued – in the form of individual safe custody. Owing to rationalisation and cost factors and the general benefits of the book-entry system, only collective custody of immobilised or dematerialised securities is of significance today. Dematerialisation of securities is by law restricted to Government issues. Legally dematerialised securities are treated in the same way as securities in collective custody.

In line with the possibilities laid down by the Safe Custody Act for custody of securities, the securities acquired by an investor are as a rule kept and administered, via a bank (intermediate custodian), at Clearstream Banking AG Frankfurt<sup>5</sup> (third-party custody). For dematerialised securities, Clearstream is entered as fiduciary in the collective debt register administered by the Federal (or *Länder*) Debt Administration, or else registration is effected in the individual debt register also administered by the Federal (or *Länder*) Debt Administration.

#### 4.3.2 Germany's central securities depository

##### 4.3.2.1 Legal and organisational framework

Clearstream Banking AG Frankfurt is Germany's *Wertpapiersammelbank* (known informally as the CSD). It received permission from the Federal Banking Supervisory Office to operate a bank in 1949. This banking licence was a restricted one, in line with its past functions as a specialised institution. It is now to be extended. Until end-1999, Clearstream Banking AG Frankfurt – under its former name, Deutsche Börse Clearing AG, Frankfurt – was a wholly-owned subsidiary of Deutsche Börse AG. On 1 January 2000, in the course of a capital increase through a non-cash capital contribution, Deutsche Börse AG transferred its shares in Deutsche Börse Clearing AG to Clearstream International S.A., Luxembourg. In return, Deutsche Börse AG received half of the shares in this newly established holding company. The former Cedel International S.A., Luxembourg, holds the remaining 50%. Clearstream International S.A., in turn, has subsidiaries such as Clearstream Banking AG Frankfurt or Clearstream Banking S.A. Luxembourg. The corporate legal status of Clearstream Banking AG Frankfurt and its function as the German CSD remain unaffected, i.e. German law continues to apply, particularly with regard to safe custody business, and Clearstream is subject to supervision by the

<sup>5</sup> Referred to as Clearstream, unless otherwise specified.



Federal Banking Supervisory Office in accordance with German rules and regulations.

Customers of Clearstream can be domestic or foreign credit and financial service institutions or specialised public institutions. In addition, foreign CSDs and clearing organisations or supranational financial organisations can open securities and cash accounts with Clearstream. A requirement for admission as a customer of Clearstream is, among other things, that the respective institution be subject both to the provisions governing statutory auditing of securities deposits under the KWG and the laws of the country of origin in question, or voluntarily allow its safe custody accounts to be audited. Almost all banks engaged in securities trading or in custody operations maintain accounts with Clearstream. Institutions without a direct link to Clearstream can make use of the services offered by Clearstream indirectly via Clearstream customers.

Unlike many other national CSDs, Clearstream has a long history of establishing links with other countries with regard to the custody of foreign securities, even prior to the launch of European Economic and Monetary Union. Clearstream is one of the founding members of the European Central Securities Depositories Association.

Ownership of securities is transferred by book entry in the case of instruments in collective custody, or by physical delivery of the certificates in question. In the case of collective custody, the standard form of custody in Germany, the investor receives co-ownership – on the basis of the nominal amount or the number of securities it holds – measured in fractions of the collective inventory of a class of securities. Ownership passes once the booking entry has been completed (in the case of FOP settlement) or at the same time the cash settlement procedure between Clearstream and the Deutsche Bundesbank is completed. The settlement system of Clearstream is a “designated securities settlement system” governed by the SFD.

Owing to the vast number of instruments it holds in custody and the number of transactions concluded each day, Clearstream has been providing cost-effective services for years. The transparent price structure is based on the principle that costs are borne by the party which creates them, giving incentives to customers to utilise the automated services available.

#### *4.3.2.2 The settlement procedures of Clearstream Banking AG Frankfurt*

##### *4.3.2.2.1 Settlement of exchange-traded and OTC trades*

All business transacted on stock exchanges, whether on the floor or via the electronic trading system of Deutsche Börse AG, XETRA, is automatically forwarded for processing to Clearstream Banking AG Frankfurt via appropriate IT facilities. On each banking day, the IT system generates a delivery list containing the specific data on the stock market transactions in question for checking purposes. Discrepancies have to be reported before the beginning of the next session of trading. If no discrepancy is reported within a certain time, the underlying transaction will be deemed to have been accepted on a conclusive basis. Accordingly, confirmations among the business partners are not provided for. According to the stock exchange rules and regulations, all transactions have to be settled on the second stock exchange day following the day of trading (T+2). Thereafter, settlement lists are generated by the system as on the day of settlement, reflecting all securities account movements for the day in question along with the respective countervalues.

OTC transactions can be settled free of payment. Transactions against payment are only effected following a prior matching based on certain matching criteria. These transactions are entered by the parties concerned, and the system performs the settlement of the transactions. The settlement day can vary between T + 0 and T + 40. If the settlement day is T + 0, same-day processing and real-time settlement are possible (see below).

#### 4.3.2.2.2 Basic settlement model

At Clearstream, securities transfers against payment are generally effected only on the basis of DVP, i.e. simultaneous delivery of securities and payment of the relevant cash equivalent. A precondition for DVP settlement, therefore, is that Clearstream customers have both adequate securities cover in their custody accounts and cash cover in their Deutsche Bundesbank accounts. In technical terms, using the batch mode described below, the securities transfers are arranged in advance (provisional bookings) but only become final, from a legal point of view, once the Clearstream cash settlement procedure has been successfully concluded. Payments are processed in euro via Clearstream accounts with the Deutsche Bundesbank. The cash clearing for standard settlement (STD) and the first same-day settlement on the settlement day (SDS 1) take place between approximately 10.30 a.m. and 11.30 a.m. The corresponding time of the cash clearing for the second same-day settlement (SDS 2) is roughly between 1.30 p.m. and 2 p.m.

In real-time settlement (RTS), simultaneous processing is also used in order to ensure that the final booking entries relating to the securities and payments are effected at the same time. RTS with DVP functionality takes place between 7 a.m. and 4.30 p.m. The operating times of free-of-payment RTS deliveries, from 6 a.m. to 5.30 p.m., are even slightly longer.

By adhering to the DVP principle, the settlement or principal risk is avoided, i.e. neither of the two trading partners need unilaterally render payment or delivery in advance. If customers do not have an adequate number of securities in their custody accounts, they can utilise Clearstream's automatic securities lending facility. Cash requirements can be covered through the usual central bank facilities, since the amounts are settled via central bank accounts.

#### 4.3.2.2.3 Technical handling of processes (three batch processes, one real-time process)

The settlement of securities transactions within the scope of standard and same-day settlement cycles (STD and SDS) is performed on a gross basis (provisional bookings only). Cash settlement is performed on a net basis. Instructions for the transfer of securities are processed in three batch-mode cycles. The batches are intended to maximise by iteration the number of settlement orders effected on the basis of the securities available in the participants' accounts. Account is taken of the priorities stipulated by customers when placing their orders with regard to the date of settlement (older, outstanding orders being processed first) and the scope of trading (large transfers are dealt with before smaller ones). In the case of simultaneous securities transfers within the scope of batches, the relevant mirror cash accounts of the party liable for payment and the beneficiary are debited and credited respectively. At the end of a batch, each participant will have a single net cash position, since all incoming and outgoing payments are netted against one another.

The first batch, STD, takes place on the evening preceding the settlement day (S-1). The second (SDS 1) is effected on the morning of the settlement day (S). For standard settlement (STD), which as a rule takes place as of 7 p.m., orders must be entered on S-1 by 7 p.m. at the latest. For the same-day settlement cycle, SDS 1, the cut-off time for booking entries is 10 a.m. on S. At the end of each batch run, i.e. at about 9 p.m. and 10.30 a.m. respectively, Clearstream makes both a list of processed transactions (settlement list) and the net cash position (debit or credit balance) arising in the process available to the participants. If no securities are available in the participants' accounts, the instructions for delivery will not be carried out. Orders not executed are automatically transferred to the next processing period (i.e. scheduled either for the next standard or same-day processing run).

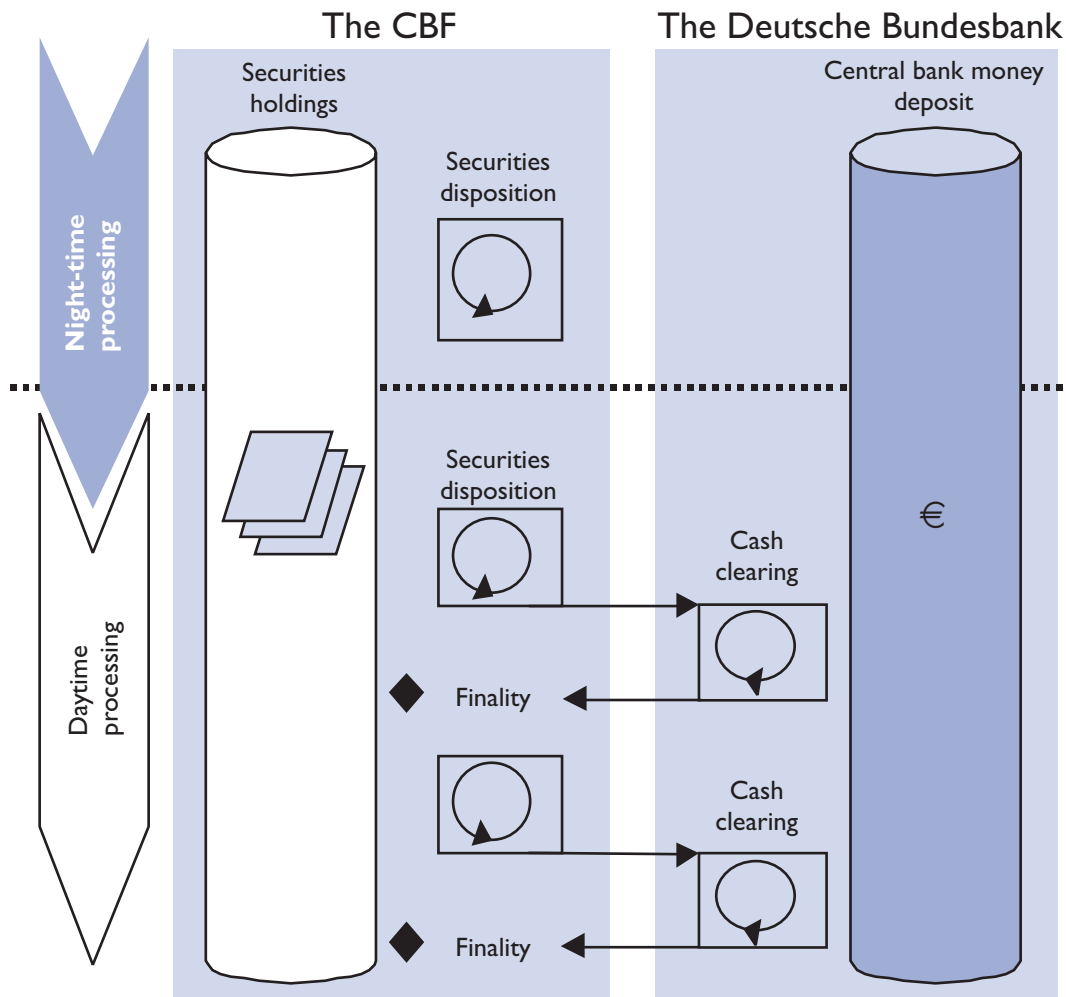
Participants who have a negative net cash position at the end of SDS 1 (which contains the

cash results of the standard settlement cycle) must arrange for the necessary cover to be made available in their Bundesbank accounts in due time. This cover can consist of a credit balance or of available overdraft facilities. At 11 a.m., on the instructions of Clearstream, the Deutsche Bundesbank – via its various branch offices – debits the accounts of all banks with a net debit position. Once all debit balances are covered, Clearstream will disburse the amount in question to those participants who have a positive net position. As a result of this disbursement, the preliminary securities transfers executed in the batches also acquire final status. If a participant with a debit position is unable to provide the necessary cover, the worst-case scenario is that the settlement for that particular day will need to be unwound. However, this has never been necessary in the

past, since Clearstream has additional means in place to contain this risk.

From about 10.45 a.m. to 2 p.m. an SDS 2 takes place, operating along the same principles.

Apart from standard and same-day settlement, Clearstream provides a real-time DVP settlement service. Securities transfer orders can be forwarded to Clearstream onscreen between 6 a.m. and 4.30 p.m. by both parties involved. The Clearstream system matches the orders, blocks the securities to be sold in its own system and electronically instructs the Deutsche Bundesbank to debit the cash account of the buyer. Once the debit entry has been made, ownership of the blocked instruments passes to the buyer, and the seller receives the cash amount in question.



#### 4.3.2.3 Outlook

The migration of the business of Clearstream Banking AG Frankfurt to the common Clearstream IT platform CREATION (see also Section 4.3.6 of the Luxembourg chapter) will be carried out in stages. The first step, the transfer of Clearstream's global business (international bonds and equities), took place in February 2001. The transfer of the German bond and equity business (steps 2 and 3) will conclude the migration process (to be completed by the end of 2002). The migration approach will be connected with a new settlement model. It is a purely technical transfer without legal implications. The main business objectives to be met through this settlement model are the creation of an integrated wholesale clearing and settlement entity for equities and bonds, the pooling of liquidity and hence the provision of greater efficiency in the settlement process. The new settlement model will provide the following specific features:

- continuous, risk-efficient intraday settlement based on continuous settlement finality through genuine DVP and use of internal accounts for both securities and cash, which eliminates unwinding risk;
- internal cash accounts are fully covered by balances with the central bank;
- minimised liquidity requirements, since the CREATION settlement engine optimises rapid batch processing, and customers benefit from technical netting; and
- efficient customer cash and liquidity management, supported through night-time and daytime links to national central banks, such as the Deutsche Bundesbank and the Banque centrale du Luxembourg in the case of Clearstream Banking AG Frankfurt and Clearstream Banking S.A. Luxembourg.

#### 4.4 The use of the securities infrastructure by the Deutsche Bundesbank

Like any commercial bank, the Deutsche Bundesbank uses Clearstream for its customer business, i.e. for securities trading activities for the public sector, foreign central banks and international organisations as well as for associated services in the area of custody accounts.

In addition, Clearstream plays an important role in implementing the monetary policy of the ECB and granting intraday credit for payment system purposes. These credit operations are to be collateralised in accordance with Article 18 of the Statute of the ESCB. To this end, the Deutsche Bundesbank's counterparties hold a pledge pool with the Bundesbank, which consists of four parts:

1. securities in custody accounts kept with the Deutsche Bundesbank and pledged to the latter. (These are known as "operational safe custody accounts" (*Dispositiondepots*));
2. securities in custody accounts held with Clearstream and pledged to the Deutsche Bundesbank (pledge accounts in the collateral management system "Xemac"© of Clearstream Banking AG Frankfurt);
3. securities delivered via correspondent bank accounts with other central banks and pledged to the Deutsche Bundesbank (CCBM; see also Section 4.3.1 of the Euro area chapter); and
4. non-marketable debt instruments (tier two assets; e.g. pledged bank loans) which are directly held by the Deutsche Bundesbank.

In the case of Deutsche Bundesbank operational safe custody accounts, Clearstream assumes the role of delivering agent, and securities are delivered "free of payment" from a custody account of a Bundesbank counterparty with Clearstream to the Bundesbank's custody account with Clearstream for credit to the respective counterparty's custody account with the Bundesbank. The Deutsche Bundesbank

assumes the daily valuation of collateral inventories according to the uniform Eurosystem criteria on its own responsibility. Clearstream has no further tasks; the Deutsche Bundesbank is largely independent of Clearstream in the day-to-day operation of the operational safe custody accounts and does not require an online interface for each single monetary policy operation or each single intraday credit for payment transactions in the course of a business day.

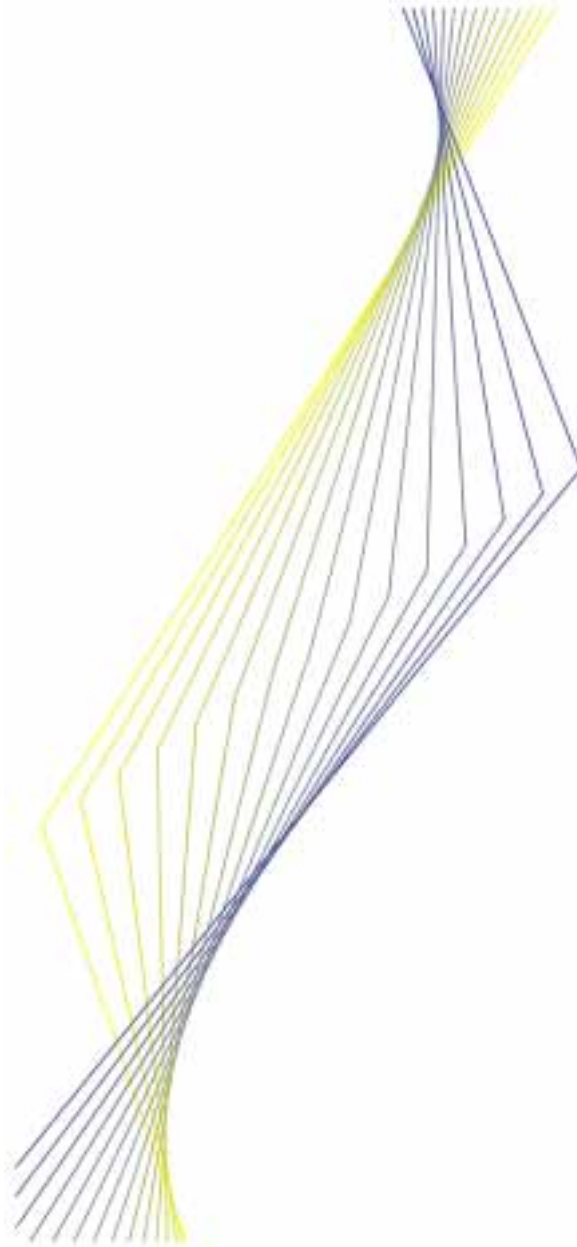
However, Clearstream does assume additional functions within the scope of its “Xemac”<sup>©</sup> pledge account system. In “Xemac”<sup>©</sup>, lump sums determined on a long-term basis are, as a rule, pledged. These are reported to the Bundesbank as an overall total. In addition, any changes to these lump-sum amounts are reported to the Deutsche Bundesbank. By means of the direct links between Clearstream

and other CSDs, French, Spanish, Dutch, Austrian and Finnish government bonds can be pledged via “Xemac”<sup>©</sup> in favour of the Deutsche Bundesbank. Clearstream assumes the daily valuation of the securities in accordance with the Eurosystem criteria and automatically arranges for subsequent deliveries of securities which may be necessary in the event that the lump-sum amount should be undermined due to price fluctuations.

On the whole, “Xemac”<sup>©</sup> is less complicated in technical terms than the collateralisation of loans via repo transactions, which requires online connections for each single intraday credit to be granted. Furthermore, the system has the advantage that the entire liquidity of Deutsche Bundesbank counterparties can be concentrated in one location and can be used for other purposes, e.g. for providing Eurex with collateral.



EUROPEAN CENTRAL BANK



**Greece**

**June 2001**

Greece

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### List of abbreviations

<b>ACO</b>	Athens Clearing Office
<b>ASE</b>	Athens Stock Exchange
<b>BOGS</b>	System for monitoring transactions in securities in book-entry form
<b>CMC</b>	Capital Market Commission
<b>HBA</b>	Hellenic Bank Association
<b>HDAT</b>	Electronic secondary securities market
<b>HERMES</b>	Hellenic Real-time Money transfer Express System
<b>PSB</b>	Postal Savings Bank
<b>SHDO</b>	Automated exchange trading system

### Useful links

Athens Stock Exchange	<a href="http://www.ase.gr">www.ase.gr</a>
Bank of Greece	<a href="http://www.bankofgreece.gr">www.bankofgreece.gr</a>
Hellenic Bank Association	<a href="http://www.hba.gr">www.hba.gr</a>
DIAS S.A.	<a href="http://www.dias-interbank.com.gr">www.dias-interbank.com.gr</a>
Athens Securities Depository S.A.	<a href="http://www.hcsd.gr">www.hcsd.gr</a>

## Introduction

In Greece the banking sector has been changing in recent years as a result of liberalisation measures, the integration of capital and money markets into the global environment, technological innovations and the privatisation of state credit institutions. The adoption of the euro is expected to have a further impact on the dynamic of the financial sector.

Following international trends, there have been a number of mergers and acquisitions, which has resulted in the restructuring of the banking industry. Credit institutions have broadened the range of services offered, becoming more active in the fields of investment services, mutual funds, insurance products, retail banking (consumer mortgage) and real estate.

The developments in the banking sector have occurred at the same time as the expansion of telephone banking and cashless means of payment such as payment via ATMs, while mobile telephone and internet banking are also starting to emerge. As a consequence of these developments as well as the need for efficiency with regard to the operation of money markets and the execution of monetary policy, payment systems have gained importance in terms of reliability, speed and efficiency. In this context, an RTGS system for large-value payments, HERMES, was set up to enable real-time transfers between the accounts held by credit institutions with the Bank of Greece. At the

same time DIAS, a net settlement system for retail payments, has developed several sub-systems for the clearing of different payment instruments (cheques and credit transfers) as well as for ATM interoperability, while further developments are under way (direct debits).

Similarly, the trend towards modernisation has had a major impact on the restructuring of both the equities and the fixed income securities markets. The operational and regulatory framework on both sides of the market, covering both the trading and the settlement functions, has achieved a very satisfactory and advanced level of service provision. The most significant developments include the introduction of electronic trading platforms, the establishment of a derivatives market, the dematerialisation of securities and the provision of a DVP mechanism in intraday gross settlement.

The statutory and legal framework authorises the Bank of Greece to operate and manage clearing and settlement systems, while its other responsibilities include the oversight of payment systems and the supervision of credit institutions and other financial organisations. The Bank of Greece plays a pivotal role in the Greek payment system. It developed and manages the RTGS system, HERMES, the securities settlement system, BOGS, and the electronic secondary securities market, HDAT.

## I Institutional aspects

### I.1 The general institutional background

The framework for the establishment and operation of credit institutions is set out in Banking Law 2076/92, which largely codified the previous banking legislation and incorporated the provisions of the First and Second Banking Co-ordination Directives as codified by Directive 12/2000/EC. Under this Law, only credit institutions are allowed to accept deposits from the public and grant credit. This Law also explicitly states that the Bank of Greece is the competent supervisory authority and it also specifies the context of the Bank of Greece's co-operation with the respective supervisory authorities in the EU.

There are four types of credit institutions: commercial banks, shipping banks, specialised credit institutions and co-operative banks.

Commercial banks may engage in all banking operations and may be involved, either directly or through subsidiaries, in insurance, leasing, factoring, mutual funds, credit card business and investment services. They may also become direct members of the Athens Stock Exchange (ASE). Shipping banks grant loans to shipping companies and accept deposits in foreign currency from non-residents only.

The specialised credit institutions used to grant loans to specific sectors of the economy, but are gradually expanding their activities to cover the whole range of banking services. Two such specialised credit institutions are the Postal Savings Bank, which is supervised by the Ministry of Transport, and to some extent, the Deposits and Loans Fund, which is under the control of the Ministry of Finance; the Deposits and Loans Fund's main function is to hold and manage a special category of deposits (consignation). Co-operative banks, which engage in the same operations as commercial banks and are subject to legislation governing credit institutions with stricter rules as to solvency ratio and large

exposures, carry out transactions exclusively with their members, other credit institutions and the Greek state.

In accordance with Law 1905/90 and the Bank of Greece Governor's Act 2250/93, public limited companies which are not credit institutions may engage in interbank money brokerage, insofar as it is their exclusive activity, once they have obtained the relevant licence from the Bank of Greece. The Bank of Greece may also grant licences to public limited companies established with the exclusive purpose of providing factoring in accordance with Law 1905/90 and the Bank of Greece Governor's Act 2168/93, leasing in accordance with Law 1665/85 as amended, mutual guarantee funds in accordance with Law 2367/95 and bureau de change services in accordance with Law 2515/97 and Bank of Greece Governor's Act 2440/99. According to Law 2076/92, the Bank of Greece is authorised to supervise all the financial institutions mentioned above, in addition to the credit institutions.

Payment services are also provided by companies which are not credit institutions and which act as intermediaries in fund transfers. Such companies fall within the scope of the Ministry of Development and must comply with the general regulation governing fund transfers.

The Hellenic Deposit Guarantee Fund (the Fund) was established by Law 2832/2000 with the aim of safeguarding financial stability. Its purpose is to reimburse depositors in cases where credit institutions are unable to fulfil their obligations. The Bank of Greece contributed 60% of the Fund's initial capital, with the credit institutions contributing the remaining 40% through the Hellenic Bank Association (HBA). The Fund, which is a private legal entity, is supervised by the Minister of National Economy.

The circulation of cheques is governed by Law 5960/33. On the initiative of the HBA, a public

limited company called TEIRESIAS was established for the purpose of collecting information in database form. The data refer to:

- a) persons who have drawn uncovered cheques and bills of exchange;
- b) unilaterally terminated contracts involving loans and credit cards; and
- c) unfavourable court rulings regarding confiscation, mortgages, etc. Access to this information is restricted to credit institutions and individuals with a direct interest.

The competent authority in respect of competition issues is the Ministry of Development. In the context of its interest in consumer protection, the Bank of Greece issued Governor's Act 1969/91 as amended and Circular 21/95 regarding transparency in the payment services provided by credit institutions.

As regards cross-border credit transfers, Directive 97/5/EC of the European Parliament and of the Council of 27 January 1997 was transposed into Greek law by Presidential Decree 33/2000, which was published in the Government Gazette on 16 February 2000. Moreover, Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems was transposed into Greek law by way of Law 2789/2000.

## 1.2 The role of the Bank of Greece

The Bank of Greece was established in 1928 under Law 3424/7 of December 1927 as a public limited company and has 27 branches and 67 agencies throughout the country.

The Statute of the Bank of Greece was amended to meet the requirements of the Treaty establishing the European Community (Treaty) and the Statute of the European System of Central Banks and of the European Central

Bank (Statute of the ESCB) for Stage Three of EMU, which were introduced with Law 2548 of 12 December 1997, which was published in the Government Gazette on 19 December 1997. Law 2548/1997 was incorporated into the Statute of the Bank of Greece by a decision of the Bank's ad hoc meeting of shareholders held on 22 December 1997. In accordance with Article 7 of the Statute of the Bank of Greece, this decision was later ratified by Parliament through Law 2609/1998. The Statute of the Bank of Greece was further amended on 25 April 2000 and was ratified by the Greek Parliament through Law 2832/2000, which was published in Government Gazette 141 on 13 June 2000 and has been in force ever since.

Article 2 of the Statute of the Bank of Greece states that the Bank of Greece is an integral part of the ESCB. Upon adoption of the euro as the national currency of Greece, it shall perform all ESCB-related tasks in accordance with the provisions of the Statute of the ESCB. More specifically, it states that "the Bank of Greece acts in accordance with the Guidelines and Directives of the ECB as stated in Article 105 (2) and (3) of the Treaty and Articles 3 and 14.3 of the Statute of the ESCB".

The Statute of the Bank of Greece states that, in addition to the monetary function which it exercises within the monetary policy framework of the Eurosystem, the Bank of Greece is responsible for the oversight of payment and settlement systems (see Section 1.2.1) in order to safeguard their smooth functioning, and also has the authority to supervise credit institutions and other financial institutions.

### *Supervision and audit*

In its role as supervisor, the Bank of Greece has set out the framework for safeguarding capital adequacy and ensuring a level playing-field for all credit institutions operating in Greece. The Bank of Greece's supervision includes monitoring solvency and liquidity for credit and market risks as well as the concentration of risk by credit institutions. Appropriate circulars are

issued with the aim of preventing and containing money laundering. The Bank of Greece defines general principles to be applied to ensure transparency in procedures and terms and the conditions of transactions. Compliance with these regulations is monitored, inter alia, by means of on-site and off-site inspections.

#### *Pricing policies*

The pricing policy of the Bank of Greece with regard to the RTGS payment system is described in Section 3.2.8. The opening and holding of current accounts with the Bank of Greece is free of charge for credit institutions.

Services provided to the public sector are subject to a charge which is paid in accordance with certain agreements. Operations with credit institutions and the private sector are subject to periodically revised charges.

The banking sector in Greece is characterised by freely negotiable pricing vis-à-vis its customers, although interbank agreements defining charges for several types of interbank transaction do exist.

#### **1.2.1 Payment systems oversight**

Article 55 of its Statute grants the Bank of Greece legal authority for the oversight of payment systems. According to its Statute, the Bank of Greece oversees payment systems and clearing systems for OTC transactions, with the aim of ensuring the effectiveness and reliability of those systems and, moreover, of reducing systemic risk. In addition, the Bank of Greece may operate such systems.

The Bank of Greece is currently developing a framework for the oversight of payment systems managed by third parties. This framework establishes the oversight principles in the context of the Greek financial market, taking into account the objectives and principles defined at the Eurosystem level. It will also focus on the definition of appropriate means of

oversight, taking into account the nature of existing and future payment schemes and their impact on monetary policy operations and financial stability.

The Bank of Greece aims to further promote the initiatives of the private sector by avoiding over-regulation. However, particular emphasis will be placed on the enhancement of risk management measures. Within this framework, the oversight function will focus on the following activities:

- the definition of a set of standards to ensure the sound, efficient, secure and effective functioning of payment systems;
- the enforcement of those standards upon existing and emerging payment systems by means of well-defined methods;
- the periodical collection of statistical data on the activities, participants and particular features of payment systems, as well as extraordinary incidents related to those systems, in order to assess their efficiency on a regular basis;
- the assessment of procedures for the management of emergency situations; and
- the monitoring of developments in the field of payment systems in order to evaluate the nature and scale of the related risks and to react accordingly.

#### **1.2.2 Activities in the area of securities settlement systems**

The Bank of Greece has developed an electronic market (HDAT) and a settlement system (BOGS) for trading and settling Greek government securities in book-entry form. The Bank of Greece acts as manager and operator of these systems. The legal and operational details are presented in Section 4.

Within this context, the Bank of Greece performed the first assessment of its SSS in

1998, using the standards of the EMI, and has continued to carry out such assessments on an annual basis. The system was assessed as eligible for participation in the Eurosystem's credit operations, and it is planned to fulfil all nine standards so as to be unconditionally eligible well ahead of the 2002 deadline. These standards, issued by the EMI in 1998, were formulated with a view to ensuring the minimisation of credit and settlement risks in the Eurosystem's credit operations.

The above-mentioned eligibility concerns the legal soundness of the system, the operational reliability of the settlement platform (including contingency plans and backup facilities), the provision of intraday finality in central bank money, the existence of adequate risk management measures and the opening hours of the system.

In the area of trading, a new risk management framework has been introduced into HDAT, together with the repo market. The possibility of remote access trading was offered to foreign investors in 2000, while the connection of HDAT to the EuroMTS – a screen-based electronic trading platform for government bonds created by seven major euro area issuers – is planned for the beginning of 2001.

### **1.2.3 The operational role of the Bank of Greece**

The Bank of Greece maintains a pivotal role within the Greek financial and money markets in its capacity as owner and operator of HERMES, BOGS and HDAT. All three systems operate from the headquarters of the Bank of Greece. HERMES is described in detail in Section 3, while BOGS and HDAT are covered in Section 4.

Furthermore, as a member of the ESCB and the Eurosystem, the Bank of Greece performs all the relevant assessments for the above-mentioned systems, ensuring that their respective operating structures meet the standards required for the smooth and efficient

implementation of monetary policy, as well as those set by the relevant international bodies.

The Bank of Greece defines and formulates the rules and regulations governing the payment and securities settlement systems it manages. For each of these systems, participants enter into a legally binding membership agreement according to which the system's operating rules shall be respected. Issues relating to payment systems and monetary policy are regulated by means of acts of the Monetary Policy Council of the Bank of Greece.

## **1.3 The role of other private and public sector bodies**

### **1.3.1 The Hellenic Bank Association**

The Hellenic Bank Association (HBA) was established in 1928 and currently has 18 full members and 15 associate members.

In addition to the HBA's founding members, any credit institution having its head office in Greece as well as any foreign credit institution providing banking activities in Greece with the permission of the Bank of Greece may become a full member. Any credit institutions not fulfilling the above conditions, together with leasing and factoring companies and subsidiary companies of credit institutions, may become associate members.

According to its statutes, the HBA, in co-operation with its member banks, aims:

- to represent the Greek banking industry in the activities of local and international organisations;
- to improve the banking system's overall image and to increase public confidence in banking;
- to be involved in activities of common interest to its member banks;
- to promote banking co-operation in all areas of banking activity; and

- to underpin basic and additional training.

Following its tradition of becoming actively engaged in central banking issues, the HBA has been monitoring related developments and offering significant feedback to its members. In particular, its activities include:

- conducting research with regard to the development of new payment systems and

the improvement of existing interbank payment systems in order to identify the related operational requirements; and

- supporting its members in matters related to technology and the standardisation of services and procedures.

The HBA plays an advisory role with regard to issues of a legal, technical or administrative nature.

## 2 Payment media used by non-banks

### 2.1 Cash payments

The Bank of Greece has the exclusive right to issue banknotes in Greece and is responsible for the exchange of banknotes, the replacement of worn banknotes and the retaining of counterfeit banknotes. The Bank of Greece also has the authority to issue coins on behalf of the Treasury. Banknotes are issued in denominations of GRD 10,000, 5,000, 1,000, 500, 200 and 100, and coins in denominations of GRD 100, 50, 20, 10, 5, 2 and 1. Both banknotes and coins are produced at the National Mint.

Cash is still predominant in everyday transactions. The widespread networks of ATMs facilitate cash withdrawals for cardholders. In rural areas, households prefer to use cash for their transactions as they are still not very familiar with cashless instruments. Cash is also used when tax evasion plays a role. Despite the popularity of cash, wages, salaries and pensions are generally not paid in cash, while credit transfers are most frequently used for large-value transactions.

The value of banknotes and coins in circulation increased by 22% from 1998 to 1999, reaching a level of GRD 2.7 trillion (€7.9 billion), or 86% of the total currency issued. The remaining 14%, or GRD 0.45 trillion (€1.3 billion), corresponds to the amount of currency held by credit institutions. This amount increased by 44% over the same period.

### 2.2 Non-cash payments

#### 2.2.1 Credit transfers

Credit transfers have become more attractive as a result of the progressive automation within the banking sector. Two payment systems, HERMES and DIAS, allow for the electronic clearing and settlement of credit transfers, thus enhancing the popularity of this medium. The clearing of credit transfers through the traditional clearing house ceased in March 2000. While the extensive use of credit transfers for interbank transactions was anticipated, the substantial increase in customer credit transfers can be explained by automation (easy access, including via ATMs, reduction of execution times, etc.).

The volume and value of credit transfers increased steadily in the period from 1995 to 1999. In 1999 10.5 million credit transfers were carried out (90% of which were electronic, and 10% paper-based). The value reached a level of GRD 1,000 trillion (€3 trillion), with electronic transfers accounting for 94% of this total.

#### 2.2.2 Cheques

The use of cheques has remained quite stable over the last five years. Personal cheques are used mainly for business purposes and not for everyday retail transactions, where cash tends to prevail. Bank drafts offer the security that

funds are covered. The regulations governing cheques are very strict and the issuing of uncovered cheques is considered a criminal offence.

The clearing of cheques is performed either by the Athens Clearing Office (ACO), the traditional clearing system (see Section 3.4.2) or DIAS S.A. (see Section 3.4.3), the latter system making use of cheque truncation.

The volume of transactions carried out by cheque remained steady at around two million per year in the period from 1997 to 1999, while the value of those transactions increased substantially to reach a level of GRD 26.6 trillion in 1999 (a 50% increase by comparison with 1998).

### 2.2.3 Direct debits

Direct debits are used primarily for the regular payment of public utility bills, subscriptions, etc. Although use of this payment instrument has increased, it cannot be considered widespread. As the direct debit is cost-effective for banks owing to the automated procedures involved, many banks do not charge the payer any fee in order to promote this instrument.

An increase of more than 50% in terms of volume has been observed since 1997, but the value has increased at a lower rate (28%).

### 2.2.4 Payment cards

#### Debit cards

There has been a substantial increase in the popularity of debit cards over the past few years. Only a small number of banks issue debit cards or replace the traditional cash cards with double function (cash and debit) cards. The network of terminals accepting debit cards is still not very extensive, despite the fact that almost all big chain stores and other retail outlets, mainly in urban centres, are equipped with EFTPOS terminals.

The number of debit cards in issue in 1999 reached a level of almost 4 million, having increased by more than 100% since 1998.

#### Credit cards

The use of credit cards is widespread and constantly increasing. Credit cards are issued by credit institutions for their customers, usually through subsidiary companies in association with international organisations (e.g. Visa, MasterCard). In recent years it has become very common for shops to use credit cards automatically to split the purchase amount into equal six-month or twelve-month interest-free instalments, thus boosting the use of credit cards. Cardholders are charged an annual fee and a penalty rate is applied for delayed settlement.

The number of credit cards in issue in 1999 exceeded 2 million, representing an increase of approximately 30% on the previous year.

#### Retailer cards

Retailer cards are issued by retailers or service suppliers and offer several benefits to cardholders in return for their customer loyalty. Statistical data are not available for this payment instrument, but retailer cards should be considered a complement to debit/credit cards rather than an alternative.

#### Prepaid cards

The only kind of prepaid card currently in existence is the telephone card. With regard to multi-purpose prepaid cards, there is one scheme in its pilot phase – operating in the canteen of a credit institution – which has been at the same stage of development for five years. Nevertheless, the Bank of Greece, being responsible for the oversight of e-money schemes, is now drafting the relevant framework for such a scheme, taking into account all the relevant provisions in the context of the ESCB and the European Council.



### *ATMs and POS networks*

ATM networks have spread throughout the country and are all interlinked through DIAS S.A., which performs the switching of all ATM transactions. The DIAS S.A. system provides the capacity for bank customers to withdraw cash from ATMs belonging to any bank connected to the system (currently 24 banks). A transaction fee is charged for cash withdrawals and balance enquiries made via ATMs belonging to banks other than the card issuing bank.

There were more than 3,000 ATM terminals in 1999. The volume of transactions (95 million) increased by 21% in 1999, while the value of those transactions (GRD 6.4 trillion) increased by 47%.

The number of EFTPOS terminals installed increases substantially every year. Nevertheless, with 74,000 stations throughout the country, the network cannot be considered extensive. In view of the fact that the major banks have recently started promoting debit cards and that greater automation is to be achieved in respect of credit cards, it is expected that the EFTPOS network will be subject to gradual expansion.

The volume and value of EFTPOS transactions in 1999 were 16.4 million and GRD 606.6 billion (€1.78 billion) respectively. From 1998 to 1999, the value of these transactions increased by 32.5%.

### **2.2.5 Postal instruments**

Postal money orders are issued through post offices. They are printed payment orders by means of which any individual can remit money to any payee; it is not necessary for either of them to hold a bank account. The slip of the order retained by the payer represents the official receipt of the transaction, as it states the kind of transaction carried out and bears an official stamp. Until recently, pensions from social security pension funds were paid by means of postal orders, but the vast majority are now paid via bank transfer, with postal orders

being used only in remote villages and exceptional cases. Postal orders remain in demand owing to the extensive network of post offices, the limited use of payment cards and, in some cases, the absence of bank accounts.

### **2.3 Recent developments**

In recent years a moderate increase has been observed in the use of cashless means of payment. Payment services via ATMs have become very common, while the EFTPOS network has been expanded to a lesser degree. With regard to e-money, there is no scheme currently in operation, although one such scheme has been in its pilot phase for five years without further development.

In addition to offering traditional banking services, credit institutions have been following international trends and introducing services based on technological evolution. Telephone banking has been introduced into the market quite successfully, particularly in urban areas. In the course of 2000, internet banking was introduced almost simultaneously by several banks. Its popularity depends on the internet, the use of which is indeed on the increase, but is not widespread as yet. Since internet banking is a new service in a highly competitive area, its promotion has been intensive. Moreover, mobile telephone banking, based on WAP technology, is currently in the early stages. Mobile telephones, by contrast with the internet, are widely popular, but public acceptance of mobile telephone banking will depend on the cost and the security features of the system.

### 3 Interbank exchange and settlement systems

#### 3.1 General overview

Fund transfers between credit institutions are effected via the payment systems operating in Greece. All credit institutions in Greece hold a current account with the Bank of Greece, which also serves as the settlement account for the purposes of the RTGS system, HERMES.

Until 31 December 2000, that is before the participation of Greece in EMU, two RTGS systems were operating in Greece: HERMES for payments in domestic currency, which became operational in March 2000, and its sub-system, EURO-HERMES, for payments in euro. The latter was connected to TARGET on 4 January 1999, under the restrictions applied to Member States which had not adopted the euro. Since 1 January 2001 the two systems have been integrated into one, HERMES, which is a component of TARGET and processes domestic and cross-border payment orders in euro. Statistical data in Section 3.2.9 refer to both HERMES and EURO-HERMES for 2000, as the “new” HERMES in euro was not yet operational at that time.

With regard to payment clearing systems, there are two systems in operation: DIAS, which handles retail payments (cheques, ATMs, credit transfers and, in the near future, direct debits) and the ACO, through which only cheques are cleared. In both systems, settlement is effected via HERMES on the accounts held by the credit institutions with the Bank of Greece.

The two clearing systems fall under the scope of the oversight exercised by the Bank of Greece.

#### 3.2 The real-time gross settlement system: HERMES

HERMES is the Greek RTGS system, and is owned and managed by the Bank of Greece. HERMES commenced operations in March 2000, and is used for credit transfers among the Bank of Greece and the credit institutions.

The aim of HERMES is to provide the infrastructure to ensure the smooth flow of funds in the domestic market and, through TARGET, to all EU countries, thus facilitating the implementation of monetary policy and minimising the systemic risks related to the settlement of payments.

In 2000 the average monthly turnover of the domestic system was €359 billion (GRD 122.3 trillion), while the monthly transaction volume reached 88,200.

##### 3.2.1 Operating rules

HERMES provides real-time settlement of customer and interbank payment orders, subject to the availability of funds in the settlement account of the sending participant held with the Bank of Greece. The settlement account can be overdrawn only against collateralised assets. The settlement of balances of other payment and securities settlement systems in Greece is also carried out via HERMES.

The operating rules and procedures are described in a document entitled *HERMES System for the Real-time Settlement of Payment Orders in euro: Operating Rules*. This document covers the areas related to the scope of the system, participation (e.g. access criteria, participation procedures, withdrawal of participants, etc.), operational issues (e.g. settlement accounts, types of HERMES orders, settlement procedures, provision of intraday credit), the pricing and reimbursement schemes, as well as legal issues (e.g. responsibilities and obligations of the system manager and participants, violation of rules, dispute resolution). A detailed description of the SWIFT message types accepted by HERMES, an outline of the pricing policy and the related methodology, a list of a certain category of eligible assets for the provision of intraday credit and a glossary of terms are presented in the form of an annex to the Operating Rules.

### 3.2.2 Participation in the system

Any credit institution incorporated or established by means of a local branch in Greece or in another EEA country and duly authorised to operate in Greece may become a participant in the HERMES system, subject to approval by the Bank of Greece. Such approval shall be granted once it has been established that the prospective participant has the required technical and operational infrastructure, is subject to prudential supervision and provides a satisfactory legal opinion.

Membership of the system may also be granted to the treasury departments of central or regional governments of EU Member States, public sector bodies of EU Member States, including the Greek Postal Savings Bank, investment firms, and organisations providing clearing or settlement services which are subject to oversight by a competent authority, subject to the provisions set by the Bank of Greece.

The participation procedure requires that candidates:

- submit an application to the Monetary Policy and Banking Department of the Bank of Greece;
- submit a satisfactory legal opinion referring to “capacity” and “country”, the latter applying only to foreign candidates;
- enter into a membership agreement and accept the system’s operating rules;
- hold or open a settlement account with the Bank of Greece; and
- pay the entry fee.

### 3.2.3 Types of transaction handled

HERMES is available for processing both interbank and customer payments, irrespective of their value. Its primary goal is to attract all

large-value payments in order to reduce systemic risks effectively, but small-value payments represent a significant proportion of HERMES activity.

Certain payments are settled exclusively via HERMES. These are the payments related to:

- single monetary policy operations;
- the settlement of the euro leg of foreign exchange operations involving the Eurosystem; and
- fund transfers in which the Bank of Greece is involved either as a receiving or a sending party.

In addition, the balances of the existing clearing systems operating in Greece settle through HERMES. Large-value netting systems in euro are settled through HERMES.

### 3.2.4 Operation of the transfer system

HERMES accepts payments between 7 a.m. and 6 p.m. (all times quoted are in C.E.T.). No payment orders are accepted for processing after the closing time.

Each participant holds a settlement account in HERMES. The liquidity available to a participant at any time is equal to the current balance of the account plus the funds obtained through intraday credit facilities.

Upon settlement of a payment order, HERMES produces a debit and a credit confirmation for the sender and the receiver respectively, while, in certain cases, a copy of the original message is forwarded to the receiver.

During opening hours, participants may also submit enquiries about the status of payments, cancellation orders for payments which are pending in the queue and balance request messages, as well as general purpose messages requesting any type of information.

The cut-off time for customer payments is 5 p.m. A balance report is sent to all participants immediately after this cut-off time with information about the account balance and the total value of queued payment orders. A balance report is also sent to all participants when HERMES closes at 6 p.m. At the end of the business day, i.e. after the transactions related to standing facilities have been completed, HERMES forwards all participants a detailed statement of all flows to or from their settlement accounts, with the corresponding payment reference numbers, as well as a statement of the total amount to be settled on future value dates and the queued payment orders which were cancelled at the close of the system.

After the system has closed, any debit position on a settlement account is automatically deemed to be a request for recourse to the marginal lending facility. Participants with a credit position may use the standing facility to place deposits at the Bank of Greece. Credit balances at the end of the business day are included in the calculation of the minimum reserve requirement.

In exceptional circumstances, contingency procedures are implemented. These procedures are based on manual processing, where operators simulate the functioning of the payment system application with the help of PC-based tools. With regard to cross-border payments, the arrangements agreed in the context of TARGET are applied.

### 3.2.5 Transaction processing environment

All HERMES-related software components are implemented on a mainframe computer system. The SWIFT FIN network provides the messaging system for HERMES. Participants which do not have the required technical infrastructure may submit paper-based payment orders to the Bank of Greece to be entered manually into the system.

The premises of the Information Systems and Organisation Department, where the mainframe is located, are situated 8 km away from the Bank

of Greece's head office. Communication between the mainframe and the terminal stations at the head office is supported by leased lines.

### 3.2.6 Settlement procedures

For the purpose of settling domestic and cross-border payments, each participant holds a single settlement account with the Bank of Greece.

The system attempts to settle only payment orders with a same-day value. This covers those orders received either on the working day in question or up to two working days prior to that day. Payment orders with a future value are stored by the system to be settled on the specified value date. In the case of payment orders for same-day settlement, participants may specify a settlement time later than the entry of their payment orders into the system. In this case, the payment orders are stored and processed for settlement at the pre-specified time.

The settlement account is debited provided that sufficient funds are available, including funds in the settlement account and funds obtained through the intraday facilities. A payment order which cannot be settled remains in a queue until the closing time of the system, at which time it is automatically cancelled. The partial settlement of a payment order is not permitted.

HERMES provides two levels of priority to distinguish between urgent and regular payment orders. Payment orders are settled on the basis of the level of priority assigned to them by the sending participant. Payment orders with the same level of priority are settled according to the time of arrival (FIFO principle).

Optimisation, a process which performs a multilateral netting of all involved parties, is carried out at the discretion of the Settlement Manager in order to resolve gridlock situations.

Payment orders are irrevocable once the sending participant's settlement account has been debited, and final once settlement has taken place.

The balances of the netting systems (ACO, BOGS and DIAS) are settled through HERMES at a specified time (3.30 p.m., 3.45 p.m. and 4 p.m. respectively), unless otherwise decided by the Settlement Manager.

Each netting system transmits the settlement balances of the participants in HERMES in the form of an electronic file.

During the settlement attempt of each netting system the flow of HERMES payments is suspended. If the settlement attempt is unsuccessful, the relative funds of all banks with short positions are blocked. This feature aims to reduce the risk of there being more banks with insufficient funds in their settlement accounts at the next attempt at settlement.

### 3.2.7 Credit and liquidity risk

A number of risk reduction measures have been incorporated into the design of HERMES. First, the concept of an RTGS system managed by a central bank, featuring real-time settlement in central bank money, eliminates the credit risk from a payment systems perspective. This characteristic is further supported by the fact that the queues for pending incoming payments are not transparent.

The increased demand for liquidity is dealt with through the provision of intraday credit by the Bank of Greece against collateral. There are no limits in respect of the size of collateral.

HERMES also features a queuing mechanism for those payment orders which cannot be settled due to an insufficient amount of liquidity in the sender's account. This queue mechanism facilitates the liquidity management of the credit institutions, since

it allows for the immediate settlement of pending orders as soon as funds become available. Moreover, if a large number of payments accumulate in the queue, a gridlock resolution mechanism is initiated. Future value date queues are also available in HERMES and aim to assist banks in the scheduling of their obligations in a timely manner.

### 3.2.8 Pricing

The pricing of HERMES services is based on the cost recovery principle. The pricing policy foresees the periodic revision of all fees in the event of business conditions changing, e.g. a change in the number of participants, the emergence of alternative payment channels, etc.

Members of HERMES are required to pay an entry fee of €44,020 (GRD 15 million) and an annual fee. A digressive tariff applies for domestic payment orders, which is the same as that applied to TARGET payments. According to this tariff, the transaction fee is €1.75 for the first 100 transactions, €1.00 for the next 900 transactions and €0.80 for each transaction in excess of 1,000 transactions, on a monthly basis. The transaction fee for other transaction types, such as enquiry and cancellation orders, or paper-based payment orders, is currently €1.47 (GRD 500).

### 3.2.9 Statistical data

Statistical data refer to the year 2000 for the systems HERMES (in the national currency, GRD) and EURO-HERMES (in euro), since Greece was not yet participating in the euro area and the "new" HERMES system in euro was not yet operational at that time.

**Table I**

#### The real-time gross settlement system: HERMES

Year 2000	Volume	Value (EUR billions)
HERMES (GRD)	888,456	3,672.5
EURO-HERMES (total)	99,890	538.9
- Domestic	14,500	8.3
- Cross-border	85,390	530.6

### 3.3 Large-value payment systems

Apart from HERMES, there is currently no other system for processing primarily large-value payments.

### 3.4 Retail payment systems

#### 3.4.1 E-money schemes

No e-money scheme is currently operational.

#### 3.4.2 The clearing system: Athens Clearing Office

##### 3.4.2.1 Operating rules

The Athens Clearing Office (ACO) was established in December 1928 and came into operation in January 1929. It is a multilateral net settlement paper-based clearing system which settles in the books of the Bank of Greece.

The ACO operates on the premises of the Bank of Greece and is staffed by Bank of Greece personnel. There are 68 clearing houses throughout the country, each located at either a branch or an agency of the Bank of Greece, operating under the supervision of the main ACO.

The legal basis of the ACO is Article 55 of the Statutes of the Bank of Greece. Its organisation and function are governed by its statutes and it is supervised by its Board of Directors, consisting of one representative of the Bank of Greece, who chairs the Board, three representatives of the state-controlled banks and one representative of the private banks.

The ACO is a designated system under Law 2789/2000, which transposed Directive 98/26/EC on settlement finality into Greek law, on the grounds that the settlement of its balances is effected through HERMES.

##### 3.4.2.2 Participation in the system

The regulations of the ACO do not stipulate any admission criteria. All credit institutions with

head offices or branches in Greece are entitled to become ACO members. The procedure for obtaining membership involves interested parties submitting an application to the ACO and having it approved by four of the five members of the Board of Directors, formally accepting the ACO's statutes and paying an entrance fee. The ACO currently has 54 members.

##### 3.4.2.3 Types of transaction handled

The ACO processes retail and large-value cheques.

The following types of transactions are handled:

- clearing of cheques in Greek drachmae;
- clearing of cheques in euro; and
- clearing of cheques in foreign currency.

##### 3.4.2.4 Operation of the transfer system

The ACO is a paper-based clearing system. Every day, banks sort the cheques presented to them into batches, each containing cheques drawn on the same bank. All cheques, irrespective of where they are paid, are accepted for clearing by any ACO branch, provided that there is a branch of the bank on which the cheque is drawn in the area of that ACO branch.

The batches are sent to the ACO, together with a statement listing each cheque and its value. If there is an error in the batch, it is the bank's responsibility. The overall batch information, including the paying bank, payee bank, number of cheques and total value of the batch, is keyed into a terminal to produce a balance for all the banks and a net position for each bank.

##### 3.4.2.5 Transaction processing environment

Both the head office of the ACO in Athens and its branches use computers that are linked to the mainframe of the Bank of Greece.

The outcome of the cheque clearing operation is transmitted by the ACO to the Bank of Greece via the above electronic links so that the banks' current accounts can be debited or credited with the corresponding amounts. The ACO's automation is therefore limited to its internal transactions and its communication with the Bank of Greece.

#### 3.4.2.6 *Settlement procedures*

At 2.30 p.m. the ACO stops accepting cheques for same-day clearing. (All times quoted are in C.E.T.) Clearing takes place between 2.30 p.m. and 4.45 p.m. At 4.45 p.m. the ACO's clearing balances are transmitted to the Bank of Greece for settlement in HERMES. Upon settlement, all cheques provide same-day value for the paying bank.

Partial settlement of the ACO's balances is not permitted. In the event that one or more banks are unable to cover their net debit positions, the ACO's balances are put in a waiting queue. The relevant banks are then notified to provide the required funds. Attempts to settle the clearing balances are made until 5 p.m., when the ACO's Operator is notified. At 5 p.m. the ACO's unsettled balances are rejected by HERMES and put in a queue to be re-entered in HERMES on the morning of the following business day. The value date is then the date of re-entry.

After settlement, cheques are sent by the ACO to the banks on which they are drawn. A cheque may not be accepted by the bank on which it is drawn for various reasons (e.g. insufficient balance on the customer's account). In this case, the cheque is returned through the ACO to the paying bank. Returned cheques are settled with the value date of the date of return. If the total value of cheques returned by a bank to a specific paying bank on any one day exceeds €30,000, interest is calculated using as a reference rate the Treasury bills interest rate valid as from the first day of that month.

Cheques in foreign currency are cleared through the ACO, but are *not* settled through the Bank of Greece. The settlement of cheques in foreign currency is effected through correspondent banking relationships.

#### 3.4.2.7 *Credit and liquidity risk*

No specific risk management measures are applied. At around 3.30 p.m. the ACO informs all banks of their net positions so that they can provide for their liquidity management. Subsequently, at 3.45 p.m. the ACO transmits the clearing balances to the Bank of Greece for settlement through HERMES. There are no unwinding clauses in the ACO's rules.

#### 3.4.2.8 *Pricing*

The operating expenses of the system are covered by its members and paid on a quarterly basis. The Council of the ACO sets the percentage of the expenses to be charged to each member according to the average number of transactions presented during the previous quarter. The minimum charge is 1% of the total costs.

An entry fee determined by the Board of Directors is also applied to new members.

The Bank of Greece is treated differently with regard to operating expenses; its share is reduced to reflect its costs in providing premises, computer facilities and staff.

#### 3.4.2.9 *Main projects and policies being implemented*

The ACO is considering upgrading its services by introducing computerised procedures and communication channels for its participants.

In addition, measures to improve the management of credit and liquidity risk are under consideration in co-operation with the Bank of Greece in its role as overseer of payment systems.

### 3.4.3 Clearing system: DIAS

#### 3.4.3.1 General overview – sub-systems

DIAS is a clearing system for retail payments. The name DIAS S.A. stands for “Interbanking systems”, and the company was formed in 1989 on the initiative of the HBA. Currently, 36 banks cover the company’s share capital in proportion to their share of the banking market. The largest shareholder is the Bank of Greece. Participation is restricted to DIAS shareholders.

DIAS has developed and operates five sub-systems, each one focusing on a different area, and a sixth is under development, but due to be operational soon. DIAS performs the clearing and then proceeds to consolidate the clearing balances of all the sub-systems.

Each sub-system is described below. (All times quoted are in C.E.T.)

##### 3.4.3.1.1 DIASCHEQUE – Interbanking Cheque Clearing System

This system has been operational since 1993 and is based on the cheque truncation principle, whereby the branch office does not forward the physical cheque to DIAS, but only an electronic message containing the cheque’s information.

##### *Operating rules and operation*

The established operating rules of the system state that each buying bank transmits two files per day. DIAS routes the messages contained in the files to the paying banks, which automatically debit the cheque issuers’ accounts. Files transmitted before the first cut-off of the system, which takes place at 3.15 p.m., are forwarded for cheque settlement through HERMES with same-day value, while files transmitted after the first cut-off but before the second cut-off at 7.30 p.m. are forwarded to HERMES on T+1. The paying bank debits the issuer’s account at the end of day T or T+1.

If a paying bank refuses payment of a cheque for certain pre-specified reasons, the buying bank is authorised to certify non-payment of the cheque. Returned payments transmitted to DIAS are forwarded to the buying bank at 1.30 a.m. on day T+2.

In principle, the bank at which a cheque is presented is responsible for the prompt completion of each transaction, as well as for any loss which may be sustained by a participating bank. In cases of cleared forged cheques, an established Interbanking Committee determines responsibility.

##### *Participation in the system*

30 banks are currently using the system.

##### *Types of transaction handled*

The system currently clears truncated personal cheques as well as bank drafts. The upper limit of the value of an eligible cheque in the context of the system is currently €293,470 (GRD 100 million).

##### *Pricing*

Charging has been set at €0.15 per transaction (cheque cleared) and is paid by the bank at which the cheque was presented.

##### 3.4.3.1.2 DIASPAY – Interbanking Mass Payments (credits)

This system was designed and developed by DIAS in co-operation with the credit institutions.

##### *Operating rules and operation*

The system is based on the electronic crediting of beneficiaries’ accounts in the bank of their choice. The DIASPAY system simplifies and automates operations, eliminating cash transfers and, as a result, the system enjoys both security and lower costs. For their part, the beneficiaries may select the bank of their choice. Their credits



(salaries, pensions, etc.) are automatically credited to an interest-bearing bank account.

#### *Participation in the system*

18 banks are currently participating in the system, and approximately 900,000 beneficiaries receive their salaries and pensions through bank credits.

#### *Types of transaction handled*

Payment of the salaries, pensions and other credits of public and private sector employees.

#### *3.4.3.1.3 DIASTRANSFER – Interbanking Funds Transfer System*

The DIASTRANSFER system was designed by DIAS and the banks and has been operational since 1998.

#### *Operating rules and operation*

The system is based on the electronic handling of credit transfers between DIAS and the banks. The participating sending banks forward their customers' payment orders to DIAS. DIAS then processes these payment orders and forwards them to the receiving banks in favour of their customer beneficiaries. Communication between the banks and DIAS is based on file transfer via messages in a SWIFT-type format.

The system provides for two cut-offs; the first cut-off is at 11 a.m. and the second at 3 p.m. All payment orders received before the second cut-off are forwarded to HERMES for same-day settlement.

#### *Participation in the system*

Eight banks are currently participating in the system.

#### *Types of transaction handled*

The system offers bank customers a fast and reliable service for the transfer of funds between banks, either by account crediting or

cash payment to the final beneficiary.

#### *Pricing*

Charging has been set at €0.15 per order and is paid by the sending bank.

#### *3.4.3.1.4 DIASNET Switching – Interbanking ATM System*

The interoperability of bank ATM terminals offers customers fast and easy service at any bank anywhere in Greece. The system commenced operations in 1996 and currently has 24 banks as users.

#### *Operating rules and operation*

This service was designed to allow the customers of any one bank to use the ATM terminals of other banks.

The network offers the following services:

- cash withdrawal (up to €587, or GRD 200,000, per day); and
- balance enquiries.

DIASNET Switching links the banks' individual computer systems with the DIAS fault-tolerant computer, which operates as a message switch between connected banks.

The acquiring bank levies the following charges on the issuing bank for its services:

- for cash withdrawal, 1% of the withdrawn amount with a minimum of €0.88 (GRD 300) and a maximum of €2.93 (GRD 1,000);
- for a balance enquiry, €0.44 (GRD 150).

#### *Participation in the system*

Almost all banks which have their own ATM network have joined the system, as have a number of smaller banks which do not have the

necessary infrastructure. At the end of 1999, 3,059 ATM terminals throughout Greece were interconnected via DIASNET.

#### 3.4.3.1.5 *DIASEUROCHEQUE – Interbanking Eurocheque Clearing System*

DIAS operates as the national clearing house for eurocheques purchased by Greek banks.

##### *Operating rules and operation*

DIAS collects the eurocheques purchased and then forwards them for settlement to the corresponding national clearing houses of the respective European countries. Most eurocheques are settled by means of the cheque truncation method.

##### *Participation in the system*

14 banks are currently using the system.

#### 3.4.3.2 *DIAS settlement procedures*

DIAS performs the clearing for each separate system and then proceeds with the consolidated clearing. The balances of the consolidated clearing are transmitted to the Bank of Greece via file transfer and entered in HERMES for settlement at 4 p.m.

Partial settlement of the balances is not permitted. In the event that one or more banks

are unable to cover their net debit positions, DIAS' balances are put in a queue. The relevant banks are then notified to provide the required funds. Attempts to settle the clearing balances are made until 5 p.m., when DIAS is notified. At 5 p.m. DIAS' balances are rejected by HERMES and put in a queue to be re-entered into HERMES on the morning of the following business day with the date of re-entry as the value date.

#### 3.4.3.3 *Main projects and policies being implemented*

DIAS has also designed the DIASDEBIT system in order to simplify regular or non-regular payments by means of direct debit.

DIASDEBIT will provide both a standing order and a direct debit option. The system simplifies and automates operations, eliminates cash transfers, ensures timely payments and, as a result, the organisation enjoys security and other significant benefits. For their part, the payers may select the bank of their choice. Their obligations (electricity bills, taxes, mobile telephone bills, rent, etc.) can be automatically debited by standing order or direct debit, while also providing the option of cancellation.

The system is expected to become operational shortly.

## 4 **Securities settlement systems**

### 4.1 **Trading platforms**

#### 4.1.1 **Athens Stock Exchange**

##### 4.1.1.1 *Institutional and legal aspects*

The Athens Stock Exchange (ASE) is a joint stock company. It is owned by a holding company controlled by the Greek state (4.7%), banks (28.9%), listed companies (6.1%), pension funds, institutional investors and insurance companies

(11.8%). The ASE members hold 4.8%, while a mere 0.7% is held by various shareholders.

The Board of Directors is the governing body of the ASE. It is composed of nine members, each appointed for a three-year term, representing the whole financial market (the Ministry of National Economy, the Bank of Greece and the market participants). The Board's responsibilities include administrative, judicial and certain supervisory functions, as well as managing the

authorisation for participation and the imposition of sanctions.

The President of the ASE is appointed by the Minister for Finance. He or she is entitled to impose trading suspensions and to grant permission for block trading in high volumes.

The ASE operates under the supervision of the Capital Market Commission (CMC) and the Government's Supervisor. The CMC, which is an independent public entity operating under the supervision of the Ministry of National Economy, is the body primarily responsible for ensuring the protection of investors and the compliance of market participants with stock exchange legislation. The Government's Supervisor is appointed by the Ministry of National Economy and is also responsible for ensuring the compliance of all trading parties with existing rules and regulations. The Supervisor is present at the trading sessions.

The ASE is governed by Law 2324/95. Furthermore, it operates according to all the relevant EC Directives regarding the capital market, adopted either by Laws or by Presidential Decrees.

The ASE has 90 members. They are all brokerage firms licensed by the CMC. They are entitled to provide all the core and non-core investment services described in EC Directive 93/22 on investment services.

#### *4.1.1.2 Operational aspects*

Trading hours are from 9.30 a.m. to 1.15 p.m., with a 30-minute pre-opening period. Trades are conducted electronically through the automated exchange trading system (SHDO). All orders entered in the system before 9.30 a.m. are part of the formation of the opening prices. A daily price limit of 12% in either direction is imposed on all traded stocks. For all kinds of securities, price limits do not apply in the first three days of a company's listing. Closing prices are formulated by the weighted average of the last ten minutes of

trading. During trading, orders are matched by price. Government bonds, bonds of supranational organisations and corporate bonds are also listed for trading through the SHDO.

The clearing and settlement of all transactions are performed by the Central Securities Depository S.A. (CSD) (described in Section 4.3) on a T+3 settlement cycle.

### **4.1.2 Electronic secondary securities market**

#### *4.1.2.1 Institutional and legal aspects*

HDAT is the electronic trading system of the organised market for Greek government securities. It was established by Law 2515/97, started operations in May 1998 and is operated by the Bank of Greece. The trading platform supports secondary and primary market operations. Moreover, all securities in book-entry form issued by other public entities and deposited in the SSS of the Bank of Greece (BOGS) can also be traded in HDAT.

Law 2733/99 states that supervision and control of HDAT shall be exercised by a seven-member committee appointed by the Bank of Greece Governor's Act for a two-year term, including representatives appointed by the Bank of Greece and HDAT's participants. On issues concerning the conduct of primary auctions, the Ministry of Finance also appoints an additional member. The committee's functions include determining the operational framework of the market (including decisions on business suspension), exercising initiative with regard to investments and the further development of the system, taking decisions on data management and availability (including the policy on data provision to the press) and, finally, playing the role of mediator in disputes arising among participants.

The same legislation states that the Bank of Greece is the manager of the system. In this capacity, the Bank of Greece ensures that:

- the smooth operation of the system is in accordance with the standards and regulations specified by the Committee of HDAT Supervision and Control;
- HDAT's members are supplied with online information on daily transactions;
- the historical database is developed and supported; and
- participants' compliance with their obligations, as stipulated in the Participation Agreement, is supervised and controlled.

There are 34 participants in the system, 11 of which act as primary dealers. These are domestic banks, foreign banks' branches in Greece and foreign institutions (remote access members). The Committee of Primary Dealers' Supervision and Control is responsible for assessing all entry applications as well as the general performance of the participants. The members of the Committee are appointed by the Bank of Greece, the Ministry of National Economy and the Ministry of Finance, the primary and non-primary dealers, and the HBA.

#### 4.1.2.2 Operational aspects

HDAT is a quote-driven market in which all dealers, depending on their rights and obligations, can enter quotes. During trading hours (9.15 a.m. to 4 p.m.) primary dealers are obliged to quote continuously binding bid and offer prices as well as amounts for a specified list of securities through their terminals. The spread between bid and offer prices may not exceed a certain cap (currently 15 price basis points). The minimum quantity of a quote is currently 20 lots (1 lot = €293,470 = GRD 100 million).

Deals are closed through terminals. All quotes and orders are anonymous. HDAT displays the list of quotes and automatically matches the first relevant order with the best available quote displayed. Orders for a quantity of ten or more lots are automatically accepted. Orders for a

quantity of less than ten lots are routed to the dealer with the best quote, who has the option of accepting or rejecting them within an interval of 30 seconds. When a trade is executed, HDAT automatically generates a confirmation of the trade and forwards it to the two contracting parties and to BOGS.

The electronic system guarantees transparency because all the transaction details binding the parties (price, amount and bid/offer prices) are available in real time to all interested parties. HDAT provides online information to the international electronic information providers, Reuters, Bloomberg and Telerate. In October 1999 the electronic trading of repos was introduced in HDAT. The market is based on the "buy/sell-back" type of contract.

The most recent development in HDAT was the introduction, in November 1999, of an electronic credit management system which enables HDAT cash market participants to control their exposure to the settlement risk involved in their government bond transactions.

The system facilitates settlement risk management by:

- defining the maximum settlement exposure ("credit line") of any HDAT member towards its potential counterparties;
- preventing the execution of "sell" contracts with counterparties without credit availability;
- notifying members of the status of all the credit lines they have established;
- allowing members to request credit extensions; and
- allowing dealers to increase, halt and restore credit lines during market hours.

The operating hours of HDAT are determined by a Bank of Greece Governor's Act on the

recommendation of the Committee of HDAT Supervision and Control. The daily operations are divided into three phases: the pre-market, the trading and the market-close phase.

## 4.2 The clearing house

There are no clearing houses operating in the Greek market.

## 4.3 The securities settlement systems

The Greek financial market comprises two SSSs. The Bank of Greece's SSS (BOGS) settles transactions involving all Greek government debt instruments, while the ASE's CSD settles those involving all private equities and bonds.

### 4.3.1 Central Securities Depository S.A.

#### 4.3.1.1 Institutional and legal aspects

The Central Securities Depository S.A. (CSD) was established in 1991 as a joint stock company. Shareholders of the company are the ASE (38.5%), listed banks (19.7%), mutual fund management companies (7.8%), portfolio investment companies (14.8%) and brokerage firms (19.1%). The CSD acts as the exclusive depository and SSS for all transactions in the ASE.

The gradual dematerialisation of all securities since 1999 has constituted a major development for the CSD and the financial market as a whole. Prior to this dematerialisation, all registered and bearer shares delivered to the CSD were immobilised, deposited with the system's custodian and replaced with registered depository certificates. Dematerialisation was carried out in accordance with Law 2396/96 as amended by Laws 2533/97 and 2651/98 and the *Rules Governing the Clearing and Settlement of Stock Exchange Transactions and the Operation of the Dematerialised Securities System* drawn up by the CMC.

The ASE participates actively in the work of the European Central Securities Depositories

Association (ECSDA) as well as that of other related international organisations.

#### 4.3.1.2 Operational aspects

All reports on trading instructions are forwarded to the CSD on T+1. The reports include the transactions of day T, analysed by prices and amounts of securities traded, name and code numbers as well as counterparties included. Following the matching of notifications and the clearing of counterparties' liabilities, settlement is completed on T+3. The dematerialisation of shares made it possible to use DVP and DVD mechanisms. Cash settlement is effected in the cash accounts held by participants at a commercial bank, which acts, through a contract, as a settlement agent.

### 4.3.2 BOGS

#### 4.3.2.1 Institutional and legal aspects

Law 2198/94 (see Section B, Government Gazette 43, 22 March 1994) establishes that the Bank of Greece acts as manager of the system for monitoring transactions in securities in book-entry form. The operational framework is governed by the system's regulations,<sup>1</sup> which can only be amended by a Governor's Act. Operated by the Bank of Greece, the system, called BOGS, started operations in May 1998 and is subject to the control of the Bank of Greece's Internal Audit Department.

The entitlement of securities held within BOGS must be considered at two levels. Participants (intermediaries) hold two separate securities accounts in the system, an *own portfolio* for their own investment purposes and an *investor/customer portfolio* account in which all assets of the participant's customers are pooled. At the level of each participant in the system, separate accounts are kept for the investors by category of securities with the same

<sup>1</sup> "Operating Regulations of the System for Monitoring Transactions in Securities in Book-entry Form", Governor's Act, May 1995.

characteristics. Participants are also under an obligation, pursuant to the applicable supervisory regulations, to keep separate records for each customer. Pursuant to Article 7(2) of Law 2198/94, none of the accounts held with the system are subject to seizure or attachment and are therefore separated from the remaining assets and property of the participants. In addition, Article 11 (2) of Law 2548/97 provides for further protection of BOGS participants – including the Bank of Greece – in the event of bankruptcy of a counterparty. This article ensures that the ownership rights of BOGS participants, either outright or pledged in favour of a participant in the system, are not affected by such bankruptcy.

Participation in the system is subject to the approval of the manager, pursuant to a Bank of Greece Governor's Act. The legal agreement ensures that the participant recognises and accepts the operating rules and conditions, as well as any other binding liability against the operator and the system's participants.

BOGS has been assessed on an annual basis since 1998, with the assessment being based on the standards for the use of EU SSSs in the Eurosystem's credit operations. The system fulfils all the requirements set for January 2002, while the new settlement model accommodates the specific standard for the provision of model I DVP service thereafter.

Finally, the G10/IOSCO disclosure framework has been fulfilled, providing a detailed presentation of the system. It can be accessed online from the BIS' website.

#### 4.3.2.2 Operational aspects

In November 2000 the Bank of Greece introduced a new settlement platform in BOGS. The new operational framework provides for real-time gross settlement through a DVP mechanism (DVP model I according to the BIS definition). Real-time gross settlement is applied for all monetary and intraday liquidity operations of the Eurosystem.

The settlement framework for domestic commercial transactions provides for gross settlement in multiple batches. Within this framework intraday settlement is achieved by periodic settlement cycles executed hourly during the business day. BOGS also provides full matching and clearing services on participants' instructions.

As mentioned above, BOGS acts as the SSS for transactions executed in HDAT. The settlement cycle for these transactions is T+3 (for both the primary and the secondary market). For all other OTC transactions, final settlement is achieved on the value date indicated by the counterparties' notifications.

The cash leg of the settlement cycles is executed exclusively via accounts maintained at the Bank of Greece. Delivery of a security is therefore only finalised upon availability of sufficient funds on the buyer's account at the Bank of Greece. These accounts are automatically connected to BOGS and HERMES, thus providing an online and real-time connection between the delivery and the payment side of the transaction.

In the case of a failed settlement transaction owing to a lack of securities or funds, the instruction is pending and is re-introduced at each subsequent cycle until it can be finalised. This pending queuing system is maintained until the final settlement cycle at the end of the day. This cycle serves as a first risk management mechanism, since all unsettled instructions from the preceding cycles are re-introduced in this final cycle, which operates on a multilateral netting principle in order to minimise participants' liabilities in securities and cash. This netting cycle only serves as a mechanism for minimising liquidity risk and in no way implies any unwinding procedures in the event of any remaining unsettled transactions. These transactions are carried over to the next working day.

An automatic service for securities lending is also provided by the system in order to alleviate

any liquidity constraints which occur on the delivery side of the transaction. Initiation of the service requires that all the relevant documentation has been signed by the counterparties. Lending is based on the total reserve of securities which the participants have declared as available for inclusion in the automatic lending procedure. All kinds of securities deposited in the system are eligible for such inclusion.

The system, situated on the premises of the Bank of Greece, benefits from a highly secured structure. At the same time, its reliance on recently updated technology requires operational continuity in the event of a disaster. This is achieved by the maintenance of a real-time standby function at a second site.

BOGS does not use the services of an external depository for any securities settled in its books. At present there are no direct links with foreign SSSs/CSDs. International CSDs may participate as customers through custodian banks, the latter being direct members of the system.

The system follows the operating regime of TARGET and receives instructions between 9 a.m. and 4 p.m. These operating hours can be extended, when such a need arises, in order to help participants close their positions in TARGET.

#### 4.4 The use of the securities infrastructure by the Bank of Greece

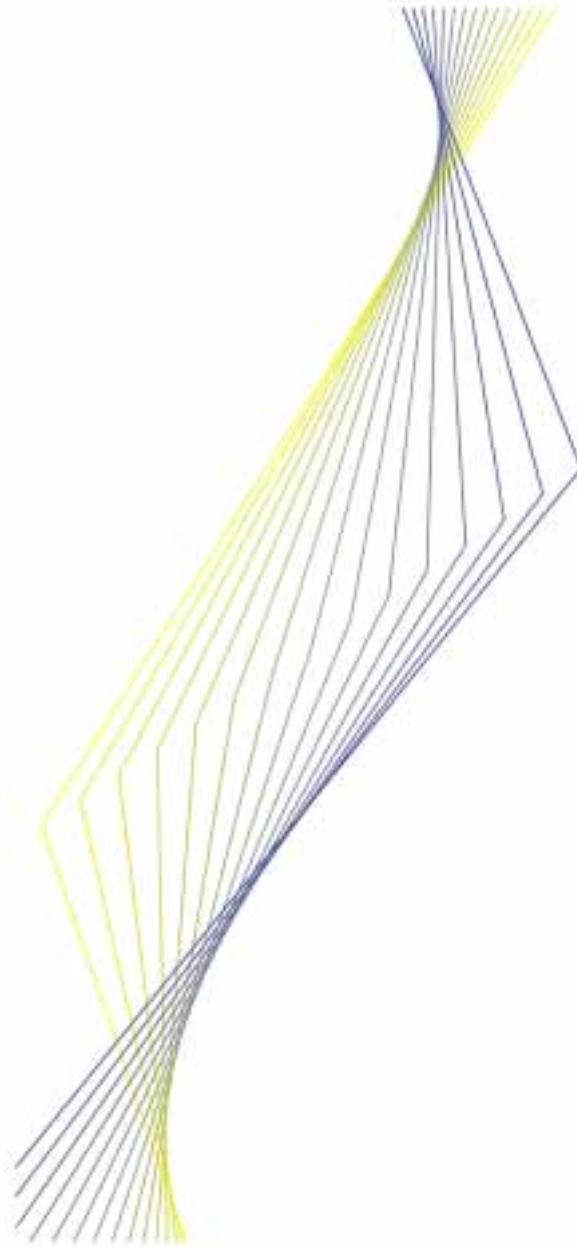
##### 4.4.1 The collateral management system

Depending on the nature of the operation, the Bank of Greece uses one of two different collateral management procedures. When providing liquidity on an intraday basis for the smooth functioning of HERMES, as well as through its marginal lending facility (i.e. Lombard), the Bank of Greece generally uses pledging where collateral is earmarked. Regarding its open market operations, namely main refinancing operations (MROs) and long-term refinancing operations (LTROs), the refinancing takes place through earmarking repos.

With regard to technical infrastructure, the Bank of Greece's collateral management system consists in two components: the software applications *Tier* and *Valuation*. The former is the management tool for the database of eligible assets. The database is updated once a week by means of an input file from BOGS. The *Valuation* software performs the marked-to-market valuation of the collateral pool and of those securities earmarked for repos, while taking account of the margins, haircuts and margin calls in accordance with the Eurosystem's risk control measures. Collateral valuation is updated on a daily basis using data provided by the *Tier* application and the valuation prices from HDAT.



EUROPEAN CENTRAL BANK



**Spain**

**June 2001**



Spain

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## List of abbreviations

<b>AIAF</b>	Association of Securities Dealers – <i>Asociación de Intermediarios de Activos Financieros</i>
<b>BOE</b>	Official Government Bulletin – <i>Boletín Oficial del Estado</i>
<b>CADE</b>	The Spanish Public Debt Book-Entry System – <i>Central de Anotaciones del Mercado de Deuda Pública en Anotaciones</i>
<b>CECA</b>	Spanish Confederation of Savings Banks – <i>Confederación Española de Cajas de Ahorro</i>
<b>CEPS</b>	Common Electronic Purse Specifications – <i>Especificaciones comunes de monedero electrónico</i>
<b>CNMV</b>	National Securities Markets Commission – <i>Comisión Nacional del Mercado de Valores</i>
<b>EMV</b>	Europay-MasterCard International-Visa International (integrated circuit card standards) – <i>Europay-MasterCard Internacional-Visa Internacional (estándares para tarjetas con circuitos integrados)</i>
<b>INFOMEDAS</b>	Network of book-entry public debt inter-dealer brokers – <i>Red de Mediadores entre Negociantes de Deuda Pública Anotada</i>
<b>MEFF RF</b>	Spanish Futures and Options Market (fixed income) – <i>Mercado Español de Futuros Financieros (renta fija)</i>
<b>MEFF RV</b>	Spanish Futures and Options and Market (equities) – <i>Mercado Español de Futuros Financieros (renta variable)</i>
<b>MEFFSA</b>	Spanish Futures and Options Market S.A. – <i>Mercado Español de Futuros Financieros, Sociedad Anónima</i>
<b>SCL Barcelona</b>	Clearing and Settlement Service of the Barcelona Stock Exchange – <i>Servicio de Compensación y Liquidación de la Bolsa de Valores de Barcelona</i>
<b>SCL Bilbao</b>	Clearing and Settlement Service of the Bilbao Stock Exchange – <i>Servicio de Compensación y Liquidación de la Bolsa de Valores de Bilbao</i>
<b>SCL Valencia</b>	Clearing and Settlement Service of the Valencia Stock Exchange – <i>Servicio de Compensación y Liquidación de la Bolsa de Valores de Valencia</i>
<b>SCLV</b>	Securities Clearing and Settlement Service – <i>Servicio de Compensación y Liquidación de Valores</i>
<b>SEMP</b>	Spanish Society of Payment Instruments – <i>Sociedad Española de Medios de Pago</i>
<b>SENAF</b>	Fixed Income Electronic Trading System – <i>Sistema Electrónico de Negociación de Activos Financieros</i>
<b>SIBE</b>	Spanish Stock Market Interlinking System – <i>Sistema de Interconexión Bursátil Español</i>
<b>SLBE</b>	Banco de España Settlement Service – <i>Servicio de Liquidación del Banco de España</i>
<b>SNCE</b>	National Electronic Clearing System – <i>Sistema Nacional de Compensación Electrónica</i>
<b>SNL</b>	National Settlement System – <i>Sistema Nacional de Liquidación</i>
<b>SPI</b>	Spanish Interbank Payment Service – <i>Servicio Español de Pagos Interbancarios</i>

## Introduction

Spanish payment systems have undergone a great transformation during the last four years in order for Spain to be able to join the group of countries participating in the start of Stage Three of EMU.

In this respect, the two large-value payment systems which exist in Spain, namely the Banco de España Settlement Service (*Servicio de Liquidación del Banco de España; SLBE*) and the Spanish Interbank Payment Service (*Servicio Español de Pagos Interbancarios; SPI*), were either newly created in this period or experienced great changes.

The SLBE, created and managed by the Banco de España, started operations in 1996; it is the Spanish RTGS connected to TARGET. Besides settling cross-border transfers, it also settles domestic transfers and payments stemming from market operations and multilateral net systems.

The SPI, created and managed by the participating credit institutions, clears the transactions exchanged by its participants, settling the final positions at the Banco de España. The SPI has carried out the necessary changes to fulfil the Lamfalussy Standards in order to reduce the potential risks in the system.

In 1996, the low-value payment systems completed the task, begun in 1987, of exchanging electronically all the low-value payments in Spain through the National Electronic Clearing System (*Sistema Nacional de Compensación Electrónica; SNCE*), causing the disappearance of all the existing clearing houses. The SNCE, created by the credit institutions and the Banco de España, and managed by the latter, clears all the low-value payment instruments which the participants exchange bilaterally, clearing their final positions on their accounts at the Banco de España. The SNCE also carried out the necessary changes for the introduction of the

single currency, accepting the exchange of payments both in euro and pesetas, and settling the final positions in euro.

With regard to the use of different payment instruments by consumers, credit transfers and cheques are still the most used, followed by direct debits and bills of exchange and, finally, by debit and credit cards and electronic money. This last payment instrument has not developed as expected. Great changes are taking place in the means of communication used by customers, with increasing use of the internet instead of paper or magnetic media to initiate financial transactions. The transposition into Spanish law of the EC Directive on cross-border transfers has been achieved, allowing consumers to take advantage of better prices and execution times.

Payment systems oversight is a task explicitly conferred on the Banco de España under Spanish law.

As regards the securities settlement industry, it has developed significantly during the past five years, bringing the Spanish SSSs into line with new market needs. All of them were assessed as eligible for use in the Eurosystem's credit operations and, at present, they broadly meet the ESCB's standards.

Many changes have been introduced in the settlement procedures by the main Spanish SSSs, the Spanish Public Debt Book-Entry System (*Central de Anotaciones del Mercado de Deuda Pública en Anotaciones; CADE*) and the Securities Clearing and Settlement Service (*Servicio de Compensación y Liquidación de Valores; SCLV*), including the implementation of a gross real-time procedure in CADE for government debt securities, and the introduction of the settlement process cycle on T+3 in the SCLV.

Spanish law also establishes the requirements with which the SSSs must comply in order to be recognised as SSSs. The Spanish SSSs are limited

liability companies (an exception is CADE, which is operated by the Banco de España), the main functions of which are to act as central registers and to manage the clearing and settlement of securities. They are not allowed to assume any risk in performing their functions and operate according to the cost recovery principle. All of them have DVP mechanisms in place. Payments are always made in Banco de España money.

The Spanish SSSs have set up bilateral links to other foreign CSDs for the cross-border transfer of securities on an FOP basis. It is also planned for these connections to provide DVP facilities in the future.

Within the context of the consolidation process which is taking place in Europe, two main events took place in Spain: the merger of the SCLV and Espaclear and the agreement reached between CADE and the SCLV, which aims to create one single CSD for all Spanish securities markets.

The SCLV and CADE, the latter managed by the Banco de España, have agreed to merge under the name IBERCLEAR. A joint-venture company

was established in June 2000, establishing the basis for the future Spanish CSD. The SCLV owns 55% of the capital of this new company and the Banco de España 45%. This project is also open to the regional Spanish depositories (SCL Barcelona, SCL Bilbao and SCL Valencia) and to MEFFSA.

IBERCLEAR is not, for the time being, entrusted with operational activities. Its tasks are mainly to promote and prepare all legal, organisational and technical changes required in order to unify the CSDs and their SSSs. In addition, it is responsible for the international representation of both CADE and the SCLV and for strategic matters. Until the merger project is finalised, both CADE and the SCLV will continue to operate separately.

The finality of the payments and securities transactions channelled through the Spanish payment or securities settlement systems is legally ensured through the specific mention of both systems in the Law on Settlement Finality. This Law incorporates into Spanish legislation the EC Directive which regulates settlement finality in payment and securities settlement systems.

## I Institutional aspects

### I.1 The general institutional framework

The systematic regulation of the most important aspects of the payment and settlement systems was set up with the passing of Law 41/1999 of 12 November on payment and securities settlement systems, also known as the Settlement Finality Law. This important measure implements, inter alia, Directive 98/26/EC of the Council and the European Parliament regarding the finality of transactions in payment and securities settlement systems in Spanish legislation.

Furthermore, Law 41/1999 defines the criteria which the payment and securities settlement systems must meet in order to be legally recognised as such under Spanish law, as well as the complete legal regime with which they must comply.

In accordance with this Law, the overseers of the payment and securities settlement systems are the Banco de España and the National Securities Markets Commission (Comisión Nacional del Mercado de Valores; CNMV).

Law 41/1999 on Settlement Finality specifically mentions the payment and securities settlement systems which, according to this Law, are officially recognised in Spain. Even though other systems could be recognised in the future, those listed in the Law are:

- the SLBE;
- the SPI;
- the securities clearing and settlement systems of the different Spanish stock markets. Since January 2000 SCLV has also been responsible for the safekeeping and for the clearing and settlement system of the fixed-income private securities market of the Association of Securities Dealers (Asociación de Intermediarios de Activos Financieros; AIAF);
- CADE; and

- the clearing and settlement systems of the derivatives markets managed by MEFSA.

#### I.1.1 The regulation of payment settlement systems

The main law governing payment settlement systems is the above-mentioned Law 41/1999 of 12 November on payment and securities settlement systems. In addition, each system has its own internal regulations, which must comply with Law 41/1999.

The Banco de España determines the internal regulations of the SLBE. These rules are published in the form of circulars, orders, technical indications, etc. issued by the Banco de España and addressed to the member credit institutions. The Manual of the SLBE consists of all of these norms taken together. One of the most recent is Circular 3/2000 of 31 May, with the intention being to adapt the functioning of the SLBE to the rules established in Law 41/1999 of 12 November.

The SPI is governed by its own internal regulations, which have been adopted by the managing body of the system. The latest version of these internal rules is dated May 2000.

The SNCE was created by Royal Decree 1369/1987 of 18 September and Ministerial Order of 29 February 1988, which regulated the creation of the system. Its internal operating rules are determined by the Banco de España's Circular 8/1988 of 14 June.

#### I.1.2 The regulation of securities settlement systems

All activities related to the Spanish securities markets are regulated by Law 24/1988 of 28 July on the securities market. This Law establishes the general principles to be observed by the organisation and operation of the primary and secondary securities markets, the basic rules governing the activity of

individuals and institutions participating in those markets and their control and supervision.

This Law has been developed in different types of provisions issued by the central government (Royal Decrees)<sup>1</sup> and the Ministry of Economy (Orders), as well as by other provisions of lower rank issued by the CNMV and the Banco de España (Circulars). Specific operational and organisational rules for each securities market have – subject to the general provisions – been issued by the respective market governing companies or institutions (Rules and Regulations). In addition, some regional governments with powers in this field have the competence to issue provisions (Decrees and Orders) in respect of regional markets authorised by them.

Law 24/1988 of 28 July applies to all SSSs, namely the securities clearing and settlement systems of the stock markets, CADE, the clearing and settlement systems of the derivatives markets managed by MEFFSA and the clearing and settlement system of the AIAF fixed income private securities market (SCLV-AIAF).

Law 24/1988 has been modified by Law 37/1998 of 16 November on the reform of the securities markets, in order to incorporate into Spanish legislation Directive 93/22/EEC of 10 May, as well as Directive 95/26/EC of 29 June regarding investment services in the field of traded securities. It is worth pointing out two aspects of this reform: first, with regard to secondary markets, it establishes the rules of access to membership, regulates the lending facilities and amends the operational regime; second, the new regulation of financial intermediaries reorganises the types of entity participating in the markets and establishes their regime.

Law 37/1998 was the first Law to regulate the IGFs, as required by Directive 97/9/EC on investor compensation schemes, so that no investment firm authorised in any EU Member State may conduct investment business unless it belongs to such a scheme. IGFs ensure that

investors are covered in the event of an insolvency or when ISFs are for any other reason unable to meet their obligations to investors. They are similar to the deposit guarantee funds of credit institutions.

Although Law 24/1988 has a general purpose, there are specific laws which regulate particularly relevant aspects in greater detail, such as Law 2/1981 of 25 March on the mortgage market; Law 19/1992 of 7 July on assets securitisation; Law 46/1984 of 26 December on collective investment undertakings (repeatedly amended); and also the above-mentioned Law 41/1999 of 12 November on payment and securities settlement systems.

Finally, the set of laws, rules and regulations relating to credit institutions must also be taken into account, considering their important role in the field of securities markets (see Section 1.1.3).

Each SSS has specific rules which elaborate the above-mentioned laws. CADE is regulated by Royal Decree 505/1987 of 3 April, and elaborated by Ministerial Order of 19 May 1987.

The SCLV is regulated by Royal Decree 116/1992.

The derivatives markets managed by MEFFSA are governed by Royal Decree 1814/1991 and by the internal MEFFSA rules approved by the CNMV.

The fixed income private securities market of the AIAF is regulated by Ministerial Order of 1 August 1991, later amended by Ministerial Orders of 11 May 1993 and 19 November 1996. These Orders approve the rules governing the market and the regulation of the AIAF, which is in charge of promoting and organising the market.

<sup>1</sup> Royal Decrees, in hierarchical terms, come immediately below Laws. They are central government provisions which set rules detailing and completing those established by Laws.

### 1.1.3 Other legal rules

Law 41/1999 establishes that the disciplinary regime applicable to the members of payment and securities settlement systems supervised by the Banco de España is Law 26/1988 of 28 July on discipline and intervention of credit institutions (*Ley de Disciplina e Intervención de las Entidades de Crédito*). With regard to the SSSs supervised by the CNMV, the disciplinary regime should be the one stated in Law 24/1988 of 28 July on securities markets.

Another, more general, but relevant, legal provision to be mentioned because of its importance in relation to the payment and securities settlement systems is Law 1/1946 on the banking system (*Ley de Ordenación Bancaria*), which establishes the legislation applicable to credit institutions in Spain. This Law has been adapted to EC regulations by means of the Legislative Royal Decree 1298/1986 of 28 June. By contrast, the creation of new banks in Spain and the entry of foreign credit institutions are governed by Law 3/1994 of 14 April and Royal Decree 1245/1995 of 14 July. The latter regulations adapt Spanish legislation on credit institutions to the Second Banking Co-ordination Directive (now modified by Directive 2000/12/EC), allowing the free establishment in Spain of EEA credit institutions.

The Antitrust Law (*Ley de Defensa de la Competencia*, Law 16/1989 of 17 July, broadly amended by Law 52/1999 of 28 December) should also be mentioned. This Law, applicable to payment and settlement systems, prohibits any abuse of a dominant position and any agreements which restrict competition.

The protection of credit institutions' customers, as well as the transparency of the banks' transactions with them are guaranteed by Law 26/1988 of 28 July on discipline and intervention of credit institutions. These provisions, which concern customers' rights, were further detailed in Ministerial Order 31/1989 of 12 December, which elaborated the

above-mentioned Law. This Ministerial Order delegated to the Banco de España the powers to determine and enforce several measures relating to the banks' legal duty of transparency and public disclosure in respect of the conditions which they offer their customers. It also determined the creation of the Complaints Service of the Banco de España (*Servicio de Reclamaciones del Banco de España*), a body which deals with complaints from the customers of credit institutions. The rules of this Banco de España service are detailed in the Circular 8/1990 of the Banco de España of 7 September, later modified by several other Circulars.

Finally, the rules applicable to the transition process to the euro are established in Law 46/1998 of 17 December on the implementation of the euro. This Law establishes the legal measures necessary for a smooth transition to the new currency, as well as measures to ensure the continuity of contracts under the new currency. The law is complemented by Organic Law 10/1998 of 17 December 1998.

## 1.2 The role of the Banco de España

The main tasks of the Banco de España are defined in Law 13/1994 of 1 June, called the Autonomy Law of the Banco de España (*Ley de Autonomía del Banco de España*). The Autonomy Law defines the Banco de España as a government institution subject to public law, which, although reporting to the government in general terms, enjoys full autonomy as far as monetary policy is concerned, with the main objective of such policy being price stability. The Autonomy Law has recently been adapted in view of Spain's participation in Stage Three of EMU by way of a reform of the Autonomy Law (Law 12/1998, of 28 April). The aim of this reform is the full integration of the Banco de España into the ESCB and the recognition of the authority of the ECB in the field of monetary policy given Spain's integration into the euro area.



Other fundamental legislative measures which define the nature, purposes and functions of the Banco de España are the Banking System Law (*Ley de Ordenación Bancaria*) of 31 December 1946, Royal Decree 18/1962 of 7 June on the nationalisation and reorganisation of the Banco de España, and Law 26/1988 of 29 July on discipline and intervention of credit institutions (*Ley de Disciplina e Intervención de Entidades de Crédito*).

With regard to payment and securities settlement systems, the Autonomy Law states that the Banco de España must promote the sound functioning and stability of the financial system as a whole and, in particular, of payment settlement systems. To this end, the Banco de España may regulate interbank and foreign exchange markets. It is also authorised to directly manage payment settlement systems.

Law 41/1999 also establishes the general requirements for membership and operating rules of the different payment and securities settlement systems which the Banco de España (or the CNMV in the case of securities markets) must approve if the systems are to be recognised by law. On the other hand, for a payment or securities settlement system to be legally recognised, a resolution of approval by the government is necessary. This decision is taken on the basis of a report issued by the Banco de España and addressed to the Government.

The Banco de España (or the CNMV in the case of securities markets) is responsible for reporting to the European Commission on the various payment and securities settlement systems which comply with the requirements laid down in Law 41/1999.

The Autonomy Law stipulates that another function assigned to the Banco de España is banking supervision. In addition, the Banco de España is in charge of the oversight of the payment settlement systems, namely the SLBE, the SNCE and the SPI. CADE, the SSS for the government debt book-entry system, is the only SSS managed by the Banco de España, and the

oversight function of the system is thus exercised by the Banco de España in conjunction with the Spanish Treasury.

The SLBE is owned and directly managed by the Banco de España. The central bank acts as the overseer of the system and it is also responsible for the operating rules of the system (see Section 1.1.1).

The Banco de España does not manage the SPI, but it oversees the system via the Monitoring Board of the SPI (*Comisión de Seguimiento*), the Chairman of which must be a staff member of the Banco de España. One of the important functions of this Board is to oversee the drafting of the internal regulations of the system.

### 1.3 The role of other private and public sector bodies

#### 1.3.1 The National Securities Markets Commission

The CNMV is a public law institution created under the Law on securities markets (Law 24/1988 of 28 July). This Commission is in charge of the supervision and oversight of the securities markets and of the individuals and institutions participating in such markets.<sup>2</sup>

All the SSSs are supervised by the CNMV, with the exception of CADE, which is supervised by the Banco de España.<sup>3</sup>

<sup>2</sup> See Section 4.1.1.3

<sup>3</sup> See Section 4.3.1.3

## 2 Payment media used by non-banks

### 2.1 Cash payments

The preference of Spanish customers for cash payments still prevails for several historical reasons, among which tradition seems to be an important reason. Not even plastic cards have affected this trend, since the existence of a widespread ATM network permits fast cash withdrawals. Banknotes and coins are widely used, as shown by the upward trend in the M1 aggregate (approximately 13% on average in recent years).

Spanish banknotes in circulation have different denominations, such as ESP 1,000, 2,000, 5,000 and 10,000 (€6, 12, 30 and 60). Coins of ESP1, 5, 10, 25, 50, 100, 200, 500 and 2000 (€0.006, 0.03, 0.15, 0.30, 0.60, 1.2 and 3) are also in circulation (sometimes commemorative coins with legal tender status are issued).

### 2.2 Non-cash payments

Non-cash payments are based on transferable deposits, which include current accounts and savings accounts. Credit institutions are free to set the interest rates they pay on these accounts provided that they inform the Banco de España as well as their customers in a timely manner. This approach reflects the Banco de España's commitment to consumer protection, covering several issues from the provision of information to the resolution of conflicts through its Complaints Service.

Credit transfers, direct debits and, to a wider extent, debit and credit cards have contributed to a significant decline in both the number and value of cheque transactions. In terms of volume, direct debits take the lead (50.56%), followed by debit and credit cards (24.28%), credit transfers (14.48%) and cheques (10.68%). In terms of value, the most important payment instrument is the credit transfer (47.20%), followed by cheques (38.66%), direct debits (12.92%) and debit and credit cards (1.23%).

#### 2.2.1 Credit transfers

Both the public and private sectors employ this payment instrument for paying labour-related liabilities, i.e. wages, subsidies and pensions. Since 1992 all transfers have been communicated and cleared in a fully automated way through the SNCE (see Section 3).

The increasing importance of information technology (IT) in the banking business, including its economies of scale, have led most credit institutions to provide traditional customers with alternative means for communicating their transactions.

#### 2.2.2 Cheques

Unlike other European countries, cheques are very widespread in Spain and are one of the most important payment instruments in terms of value. However, the flexibility of credit transfers, direct debits and cards (both credit and debit) favours the replacement of the former by the latter.

Cheques are still of great importance (and represented an estimated 38.66% of the total of cashless instruments used in terms of value in 1999) owing to ingrained customer habits and their cost-transfer effect, i.e. the beneficiary bears the corresponding charges when presenting the cheque to his/her credit institution. It should also be noted that cheques as well as bills of exchange imply a very strong legal obligation.

#### 2.2.3 Direct debits

Being the most significant payment instrument in terms of volume, direct debits are steadily being used for all manner of public utility services (telephone, water, electricity, etc.). Given the nature of the related obligations the average amounts are rather small. Indeed, in terms of value, they are the least significant compared with all other cashless payments.

A direct debit order is issued in a standardised way by the creditor, who has been previously authorised by the debtor to charge the account. Sometimes, before the amount is charged to the payer's account, the payer is sent an advance notice, which gives it the opportunity to challenge an incorrect payment.

Direct debit orders are cleared and settled in the SNCE.

#### 2.2.4 Payment cards

Payment card issuing institutions belong to one, or more, of the three different existing network providers<sup>4</sup> in Spain. The Spanish Society of Payment Instruments (Sociedad Española de Medios de Pago; SEMP), Sistema 4B and the Spanish Confederation of Savings Banks (Confederación Española de Cajas de Ahorro; CECA) manage their respective networks and provide their members with their own clearing house services. Settlement is later performed via the SNCE.

Both types of payment card, the credit and the debit card, have gained substantial market shares by comparison with other payment instruments. However, in spite of this increase, card-related payments still constitute only a small proportion of all cashless payments in Spain.

The use of ATMs and EFTPOS terminals is remarkably low given the number installed: approximately four cash withdrawals per year per card at ATMs and eight transactions per year per card at EFTPOS terminals. In 1999 the average value of each transaction was €61.23 (ESP 10,187) via EFTPOS and €72.30 (ESP 12,029) at ATMs.

The use of debit and credit cards is not regulated; thus it is the issuers which impose conditions upon cardholders and retailers when signing membership agreements.

##### Debit cards

These payment cards<sup>5</sup> issued by credit institutions allow their customers to have

transactions directly debited from their current accounts. They can be used at ATMs and for EFTPOS transactions. In the latter case, as with credit cards, retailers receive the proceeds of sales by debit card on their current account on the following day and their bank, in turn, deducts a percentage of the sales turnover paid by cardholders. Though traditionally free of charge, almost all debit cards now bear a relatively low fixed commission on their issuance and renewal.

Debit cards are more common than credit cards. Figures for 1999 show that approximately 1,073 cards existed for every 1,000 persons.

##### Credit cards, travel and entertainment cards

Only credit institutions are legally authorised to issue credit cards. The latter are widely used under various internationally recognised brands such as Visa, Euro/MasterCard, American Express or Diners Club. Visa, the most widely used credit card in Spain, is managed by two companies: Visa España and Visa International. As with debit cards, an annual fee is charged for credit cards and is paid by the holder.

Cardholders often enjoy additional benefits, such as life/travel insurance and travel assistance services.

As with debit cards, almost all transactions (98.33% is the estimate for 1999), whether authorisation or data transmission, are performed electronically.

##### Retailer cards

Retailer cards are typically issued by department stores and can therefore only be used for purchases in the issuer's store or in a chain of stores (or in shops which have bilateral

<sup>4</sup> Currently CECA and Sistema 4B are finalising a merger agreement which will result in a decline in the number of service providers.

<sup>5</sup> Debit cards in Spain are usually ec cards.

arrangements). It is advantageous for issuers that these cards allow cashless payments as it makes them less dependent on high levels of liquid assets in cash form. Usually these cards are free of charge and some of them also include additional advantages such as the ability to pay for goods and services in several instalments at no extra cost, or to accumulate points which are exchangeable for goods or services sold in the issuer's store. Hence these cards are intended as a means of encouraging customer loyalty, increasing the number of customers and consequently boosting sales.

#### *Prepaid cards*

Three different multi-purpose prepaid card schemes are currently in operation in Spain under the aegis of the previously existing payment card network providers: Visa Cash, Monedero 4B and Euro 6000. They offer a reloadable electronic purse product, issued by a credit institution, which is supposed to replace banknotes and coins for low-value payments. These cards are not widely used, as only 2 million operations with a total value of €5.7 million (ESP 949 million) were recorded in 1999, despite the fact that they can be used in more than 130,000 terminals.

The card is charged online by the holder in ATMs which are specifically designed for this purpose, while purchases are made offline, without recourse to a PIN or the issuer's authorisation. Money stored on prepaid cards is subject to compulsory minimum reserve requirements since it is legally defined as repayable funds by Royal Decree 1245/1995 of 14 July. Similarly, the Spanish deposit guarantee scheme is also extended to this type of card, covering up to €20,000.

Single-purpose prepaid card schemes are mainly limited to universities or enterprises, in addition to the telephone cards issued by Spain's leading telecommunication company, which permits national and international calls to be made from public telephone boxes.

#### *ATM and POS networks*

Three networks have been operating in Spain since the 1970s: Servired, Sistema 4B and Red 6000. Almost all credit institutions are linked to one of these networks, be they a savings bank (CECA is the manager of Red 6000) or another type of credit institution.

These networks are fully interoperable and so any card issued by a credit institution linked to one of the schemes can be used at any ATM or POS, regardless of the scheme's provider.

The large number of ATMs and POSs, which is partly due to the extensive network of bank branches, is currently expanding owing to a customer-oriented strategy which explains why Spain still has one of the largest networks in Europe (in 1999, Spain had 1,051 ATMs and 18,695 POSs per million inhabitants, one of the highest proportions in the EU).

Spanish-issued debit and credit cards can also be internationally used as a result of various agreements with other international network providers, particularly in Europe, as is the case with Sistema 4B in Portugal, Andorra, Italy, the United Kingdom and Belgium. Trademarks such as Visa, American Express or Diners Club are internationally recognised and Red 6000 cards<sup>6</sup> are compatible with ATMs belonging to EUFISERV (European Savings Banks Financial Services Company) members.

#### **2.2.5 Postal instruments**

The use of postal instruments in Spain is negligible. Furthermore, the Spanish Post Office, though still a public enterprise, does not have credit institution status. Thus the Post Office cannot directly provide any payment instrument-related services; this can only be done by a credit institution which offers its services through the

<sup>6</sup> Red 6000 is a brand of debit and credit cards, which are issued by some of the Spanish savings banks belonging to CECA.

Post Office. Therefore, clearing and settlement is performed by the credit institution in the same way as explained above.

### 2.3 Recent developments

All card network schemes (namely Servired, Sistema 4B and Red 6000) have agreed on common specifications in order to achieve the full interoperability of prepaid cards within the next few years. By taking part in the Common Electronic Purse Specifications (CEPS) and the Europay-Master Card International-Visa International integrated circuit card standards (EMV) projects, card network schemes are effectively extending their interoperability to an international level.

Software-based e-money developments are still at a very early stage and only a few issuers have thus far carried out pilot schemes within small communities. Nevertheless, e-commerce, mobile banking and home banking are spreading rapidly and aim to provide faster and more efficient services.

Mobile banking (m-banking) is growing, with a whole new range of services to be announced over the short and medium term. M-banking will be implemented through several agreements reached between the country's main credit institutions and telecommunication operators. Although these will initially be for low-value transactions, no limits on the amounts have yet been set.

## 3 Interbank exchange and settlement systems

### 3.1 General overview

A clear difference between high and low-value payment systems still exists in Spain, although all of them have undergone great changes during the last four years. The SLBE has become an RTGS system and the SPI, the other large-value payment system, has developed into a multilateral net system, conforming to the Lamfalussy Standards. Both systems guarantee the finality of payments channelled through them in accordance with the Law on Settlement Finality (Law 41/1999).

With regard to low-value payment systems, the development of the SNCE has been completed, meaning that the netting and clearing of all kinds of instruments are performed electronically by different sub-systems. The SNCE performs nearly all the tasks of the traditional provincial clearing houses, which ceased operating in 1996.

### 3.2 The real-time gross settlement system: Banco de España Settlement Service

The SLBE is the Spanish RTGS system connected to TARGET. It has been operating since 1996.

The system was developed by the Banco de España, which also acts as the operator and overseer of the system. Most of the credit institutions in the Spanish financial system, 230 at present, are direct participants in the SLBE. It settles domestic and cross-border transfers, secondary markets transactions, multilateral net systems and monetary policy operations. Furthermore, it offers additional services such as the matching, registering and procurement of market transactions statistics.

Through the SLBE, the participating institutions can manage the liquidity of all their accounts held at the different branches of the Banco de España. The participants may initiate money transfers between those accounts depending on their liquidity needs, with the purpose of

keeping all the liquidity available in the RTGS account.

### 3.2.1 Operating rules

The system rules are laid down in the Circulars and Technical Applications released by the Banco de España, which are contractually binding on the participants. These contracts and the obligation to open an RTGS account in the SLBE books are the main pre-conditions for participation in the system.

### 3.2.2 Participation

The SLBE is an open system in which credit institutions may participate, provided that they are based in the EEA and are subject to prudential oversight in accordance with Directive 2000/12/EC on banking co-ordination. Furthermore, investment companies subject to the same criteria (Council Directive 93/22/EEC), treasury institutions and their equivalents at the regional level and clearing houses can be participants in the system.

Remote access to the SLBE may also be granted to credit institutions with a permanent base in any EEA country.

In November 2000 there were 230 direct participants in the SLBE, 33 of which were branches (subsidiaries) of foreign credit institutions, of which 22 were from EU countries.

### 3.2.3 Types of transaction handled

The SLBE settles the large-value payments of its participants, both on their own behalf and also on behalf of their customers.

In terms of value, the main financial transactions settled in the SLBE are the cash leg of transactions relating to public debt registered in CADE and the cross-border credit transfers channelled through the national Interlinking component. These are followed by domestic credit transfers and transfers relating to money market operations. Finally, the multilateral net

systems which settle their net balances in the SLBE should be mentioned (stock exchanges, low-value payments, derivatives, the SPI, etc.).

Transactions on behalf of the Banco de España are also processed and settled in the SLBE, provided that the Banco de España is a normal participant in the system.

### 3.2.4 Operation of the transfer system

The insertion of payment orders into the SLBE can be performed through the SWIFT network or by means of a single-purpose terminal workstation with an online connection to the Banco de España computer. In the latter case, the participants may choose between the transmission of files (batches of payments) or the manual entering of payments on a transaction-by-transaction basis. While using the SWIFT network, the necessary security measures (authentication, confidentiality, integrity and non-repudiation) are guaranteed by SWIFT. If the online connection to the Banco de España is used, the necessary security checks (institution codes, operator codes, message encryption, etc.) are performed by the software designed by the Banco de España.

The SLBE participants can choose one of these three types of communication procedure (transaction-by-transaction through terminal, batches of payments through terminal or communication via SWIFT) or a combination of them to enter their payment orders into the system and to receive payments addressed to them. The fact that they can choose the way in which they participate enables credit institutions to take into account their business requirements (number of operations, available resources for internal development, etc.), makes the system flexible and facilitates the participation of both large and small institutions.

The possibility of using an alternative system for access as a backup contributes to the very high availability and reliability of the SLBE.

Sending institutions are the only ones which must communicate their transactions, except

for those transactions which originate from the secondary market (interbank deposits and public debt registered in CADE) which require communication from both participants involved in the operation in order to be matched, registered and settled in the SLBE. For this kind of operation, the SLBE offers online information on transaction discrepancies between the parties in order to resolve incidents swiftly.

The SLBE also settles the balances arising from the clearing of multilateral net systems. The manager of each system reports the final positions to the SLBE by simply using a computer terminal. The SLBE carries out clearing, ensuring that credit positions are not credited before all debit positions have been debited.

The transfers received at the SLBE are processed in real time, debiting the originating institution's account (and crediting the beneficiary account, as the case may be). Where insufficient funds or collateral are available for a possible overdraft, the order will be queued. The position of the order in this queue will depend on the priority assigned to that type of transaction and, if two or more have the same priority, the transactions will appear according to the FIFO principle. The participating institutions can give top priority to one of their transactions. Once funds are received, the first transaction in the queue is settled, unless its value is higher than the new available balance. In this case, the system will continue the search until it finds a transaction which can be settled.

Payments and their final settlements are fully transparent for credit institutions provided that the whole process can be monitored online by the terminals connected to the Banco de España's computer. The same applies to those orders entered through SWIFT. From these terminals, credit institutions can also obtain detailed information on the status of the participants' accounts (balance, settled and queued transactions, payments in its favour retained due to a lack of funds on the originating side, statement of the multilateral net systems settlement, statement of cross-border transactions, etc.). This gives all participants an overview of the settlement process,

facilitating both payment flows and cash management.

### 3.2.5 Settlement procedures

Transactions are settled as and when they are received provided that there are sufficient funds or collateral.

In order to optimise liquidity management, the SLBE has several optimisation mechanisms. If a participant enters a payment order and there are no funds available, the SLBE checks whether the receiving institution also has payments for the first participant which are queued. If this is the case, it will try to match them, and, if possible, to settle them. This process is continuously and automatically performed during the whole session.

In order to resolve gridlock situations, the SLBE operators may start optimisation processes which take into account the queued transactions, the multilateral systems' credit transfers which are pending owing to non-settled debit positions, public debt transactions registered in CADE and available balances. With the aid of this information, a virtual balance is calculated as if all the transactions were going to be settled. (These optimisation processes can be initiated, on a discretionary basis, whenever necessary.) If there are sufficient funds the transactions are settled, and if there are not, the institution faced with a lack of liquidity is required to supply more funds or its transactions will be excluded.

At the end of the day, non-settled transactions are cancelled.

### 3.2.6 Credit and liquidity risk

As the system is an RTGS system, it does not carry any credit risk.

In order to reduce the liquidity risk, the SLBE has specified a settlement timetable for the different multilateral net systems. In this way, institutions can manage their liquidity efficiently and avoid the accumulation of non-settled payments.

Credit institutions can also obtain intraday credit, at no cost, by pledging securities or by means of reverse transactions based on repurchase agreement operations. The greater part of intraday credit in Spain is obtained through these repo operations.

Repo operations are fixed the afternoon before, D-1, and are settled at the start of day D. If a credit institution finds that its liquidity is higher than expected, it can reduce the surplus during the session by cancelling repos in advance; this will be carried out immediately, insofar as CADE settles in DVP. The remaining transactions will be cancelled at the end of the day.

If the intraday credit cannot be returned at the end of the day, credit institutions can use the Eurosystem's standing facilities, turning their intraday credit into overnight credit, provided that the institution has sufficient collateral.

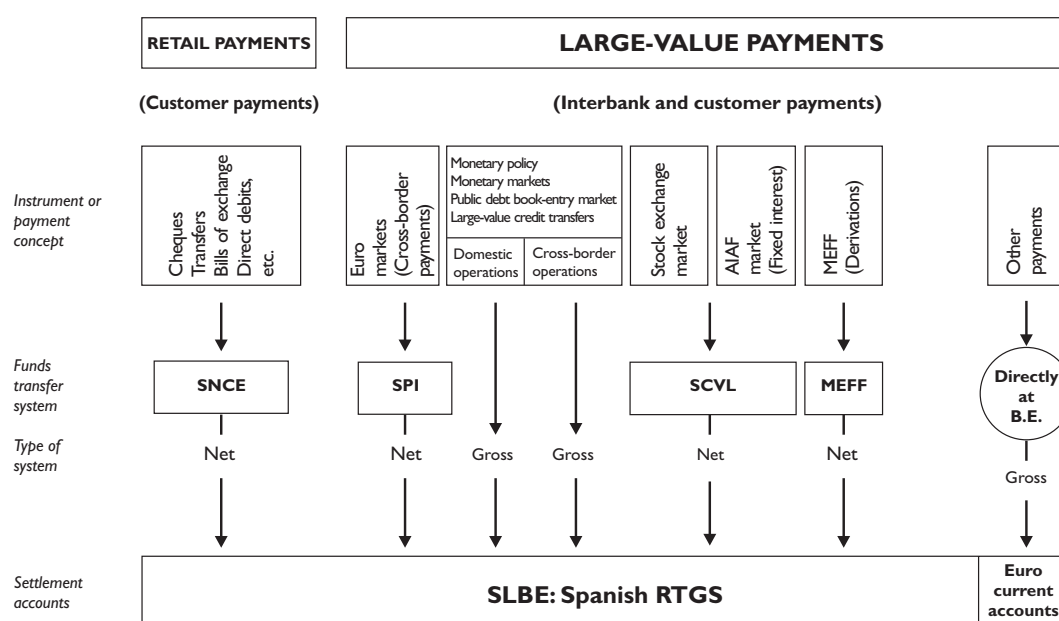
### 3.2.7 Prices

The SLBE has fixed a monthly fee, as well as a price per transaction, which depends on the additional services provided according to the type of transaction (matching, registering, reports, statistics, etc.). Both fees are calculated according to the cost recovery principle.

The connection and communication charges are borne by the participants. Access to the SLBE through a computer requires a PC with specific software, and a flat rate must be paid for the telecommunication. When accessing through SWIFT, the costs are those inherent to the technical requirements of the network and the rates fixed for each transaction.

**Figure 1**

### The organisation of the Spanish interbank payment system





### 3.3 The Spanish Interbank Payment Service

The SPI is a net settlement system which clears and settles large-value payments in euro.

The SPI was set up in 1997 as the result of the upgrade of the former Second Session of the Madrid Clearing House in order to comply with the Lamfalussy Standards. This transformation was performed in order to control the risks inherent in this type of system, and consisted of establishing limits on the participants' exposures and the reinforcement of settlement finality.

Since 1 January 1999 all payment orders processed have been denominated in euro. The SPI has thus become one of the European large-value net settlement systems.

#### 3.3.1 Operating rules

The SPI is owned by its participants. The SPI Monitoring Board manages the Service, and is responsible for issuing, laying down and amending the system's operating rules, which are compiled mainly in the Basic Functioning Regulation and the Operating Instructions. These rules, which must be given final approval by the Banco de España, are compulsory for the participants, as indicated in their partnership agreement.

The Banco de España chairs the SPI Monitoring Board and supervises the activity of the service. The President of the SPI must also be a staff member of the Banco de España.

The finality of payments settled through the SPI is guaranteed as the SPI is recognised as one of the Spanish settlement systems included in Law 41/1999 (Law on settlement finality), which incorporates into Spanish legislation Directive 98/26/EC of the Council and of the European Parliament of 19 May 1998.

#### 3.3.2 Participation in the system

All the credit institutions established in the EEA, as defined in Directive 2000/12/EC on banking

co-ordination, can be SPI members, provided that they are under the prudential supervision of their domestic qualified authority. Participants must also comply with the admission requirements in terms of solvency, technical capacity, SWIFT equipment, and acceptance of the SPI rules.

There are two forms of participation, either as a direct member (associate) or as an indirect one (through an associate). Associate members take part directly in the exchange, clearing and settlement on their own behalf, and some associates also act on behalf of indirect participants. Remote participation is also possible.

With regard to the December 1999 figures, the number of participants is 203, of which 39 are direct members. Six of these are subsidiaries of foreign banks (three of EU banks and three of non-EU banks).

#### 3.3.3 Types of transaction handled

The SPI currently clears large-value payments denominated in euro. The bulk of the operations settled through the SPI can be considered as cross-border (95%) and include payments related to transfers to or from accounts held in Spain by non-residents. The so-called domestic transactions (5%) mainly relate to the settlement of the euro leg of foreign exchange transactions, the exchange of cheques denominated in EMU currencies, and those transfers resulting from trading in the economic rights attached to securities (i.e. coupons).

#### 3.3.4 Operation of the transfer system and transaction processing environment

Payment orders can be exchanged all day via the SWIFT network, while the clearing process takes place between 7.30 a.m. and 4 p.m. (C.E.T.).

Whenever a transaction is entered into the system, the SPI central computer checks, by using the SWIFT FIN copy functionality (Y copy), whether the payment is within the established limits. Provided that this is the case, the SPI

calculates the new net positions of the participants involved and forwards the message to the beneficiary. From this point onwards, the transaction is considered irrevocable. If the payment is not within the established limits it is sent to a waiting queue and the SPI periodically tries to settle it by means of bilateral and multilateral optimisation procedures. The bilateral optimisation procedures are automatically triggered whenever a payment cannot be cleared. The multilateral optimisation procedures can be initiated by the SPI's operators if necessary. This latter mechanism is rarely used.

The participants can determine and change the order of the queued payments by setting and changing the priorities assigned to each payment order.

The application also provides participants with real-time tools for monitoring the status of their limits. In addition, and in compliance with the Lamfalussy Standards, the application has a backup system in the event of technical failure.

### 3.3.5 Settlement procedures

Once the clearing process has finished (4 p.m. C.E.T.), the final position of each member is calculated and communicated to the participants and to the SLBE at the Banco de España, which conducts the settlement by means of the accounts which the participants hold with it. Once all short positions have been debited, the crediting of the long positions takes place immediately. This process is usually carried out between 4.10 p.m. and 4.15 p.m.

### 3.3.6 Credit and liquidity risk

In order to control the systemic credit and liquidity risks, the system was designed with two objectives:

- To limit the exposure of the participants; two different limits are applied.

Each participant establishes a bilateral credit limit for every member. This limit represents the

largest credit position which a participant wishes to maintain with each of the other members. On the basis of the addition of all the bilateral credit limits given to a participant by the others, the SPI calculates the multilateral debit limit, which is a percentage (5%) of this aggregate. This limit represents the maximum overall debit position granted to that participant.

Compliance with these limits is checked whenever a new payment reaches the system. If a payment order does not fulfil both limits it goes to a waiting queue.

- To ensure that settlement is possible even if the participant with the largest debit balance fails to meet its payment obligation. This objective is achieved by means of two measures:

First, the participants establish guarantees in favour of the SPI. Every participant contributes an amount of collateral which is proportional (5%) to the highest bilateral credit limit granted to other participants. In addition, they can afford more guarantees which automatically increase their limits. Guarantees can be constituted on the basis of a pledge of securities, repurchase agreements or a liquid deposit. The securities admitted are Banco de España Certificates and other securities recorded in CADE. These securities are subject to different haircuts, depending on their liquidity.

Second, an agreement has also been reached by the participants in order to cover the shortfall caused by the failure of any participant to meet its payment obligations. The contributions to be made by each participant are proportional to the bilateral credit limit granted to the member causing the failure.

### 3.3.7 Pricing

The SPI's operating costs are shared among its members. All participants must pay an annual fee, which varies according to whether participation is direct or indirect. The participants also have to bear the transmission

fees charged by SWIFT for the messages channelled through its network.

In order to join the system, participants must pay an access fee and the connectivity costs inherent in the technical projects required.

### 3.4 The National Electronic Clearing System

The first ACH system to be operational in Spain was created in 1990. Although initially small (only cheques could be exchanged), the SNCE has grown rapidly and has finally taken over all the duties of traditional clearing houses (all of which disappeared in November 1996), thus clearing electronically all transactions related to retail payment instruments, regardless of their value, such as paper cheques, traveller's cheques, direct debits, credit transfers, bills of exchange and petrol cheques. Petrol cheques are a special kind of payment order on a customer's current account by which the customer can pay at petrol stations.

Most commercial banks, savings banks and credit co-operatives belong to the SNCE since it has turned out to be the fastest and most efficient way of communicating all the data necessary for the rapid clearing of retail payments. This has become possible due to a well-structured legal framework which has brought about various market-efficient solutions, of which truncation (cheques and bills of exchange under €30,050.61 (ESP 5 million) are not physically exchanged) and liabilities agreements appear to be forming the basis. Other solutions, such as arbitration procedures or document standardisation, have also promoted the implementation of the SNCE.

The system takes advantage of the paperless communication networks by providing each associated participant with an infrastructure through which all the relevant payment data are bilaterally exchanged between the interested parties. Later on, once the net amount has been confirmed, the settlement takes place at the Banco de España.

Owing to the variety of payment-related documents, the SNCE's operating scheme relies on several clearing sub-systems, each of which specialises in a single instrument. Currently, according to its governing law, these subdivisions are: cheques, credit transfers, petrol and traveller's cheques, direct debits and bills of exchange.

#### 3.4.1 Participation in the system

The following institutions are entitled to become participants in the SNCE: the Banco de España (as a member of the system, in order to channel the retail payments of the public administration), commercial banks, saving banks and credit co-operatives, provided that they comply with the criteria for becoming a member of the SNCE (such as compliance with the rules and solvency requirements, adequate technical capacity, scale of activity, discipline and financial support for the system).

There are two forms of participation:

- Direct participation, i.e. participating in the exchanging stage of clearing on the institution's own behalf (and also having the possibility of representing one or more indirect participants), and subsequently taking part in the settlement process.
- Indirect participation, i.e. being represented by a direct participant (requirements for indirect participation are less onerous). An indirect participant does not take part in the settlement stage of clearing.

The figures for 1999 showed 28 direct and 226 indirect participants in the cheque clearing sub-system, while the credit transfer sub-system had 27 direct and 226 indirect participants.

#### 3.4.2 Types of transaction handled

Clearing is carried out for cheques, bills of exchange, credit transfers, direct debits and petrol and traveller's cheques. Only for

documents whose amount exceeds a given threshold does a traditional exchange become necessary, provided that their basic data have already been electronically swapped.

At the end of 1999 €502 billion was settled in cheque-related transactions, whereas the figure for credit transfers was €328 billion, for bills of exchange €139 billion, for direct debits €138 billion and for petrol and traveller's cheques €474 million.

### 3.4.3 Operation of the transfer system and transaction processing environment

The SNCE has adopted an intermediate solution which is neither a completely centralised nor a completely decentralised clearing and settlement system. Information is exchanged bilaterally between the parties involved. If no discrepancies are found, the settlement can take place in a centralised way on the RTGS accounts which each credit institution holds with the Banco de España. All communications are carried out on a private virtual network which complies with a set of security standards.

Documents are no longer physically exchanged, but rather their relevant data, i.e. telecommunication lines between the SNCE and member institutions are the main channel for communicating, via common software, the required information which permits rapid clearing. Each document is processed in its respective sub-system, so a net balance for each pair of institutions is obtained in each of the sub-systems. These bilateral balances are reported to the Banco de España.

In order to prevent the system from suffering prolonged downtimes or hardware/software crashes, several recovery procedures have been established. Under exceptional circumstances, the EDItran can be used as well as (to a lesser degree) communication via magnetic tapes.

Each sub-system has its own timetable for communications. The earliest communications can be made at 4.30 p.m. in the direct debit

sub-system, while the bills of exchange sub-system starts at 1 a.m.

### 3.4.4 Settlement procedures

The clearing of instruments which are settled in the SNCE is mainly performed on an electronic basis since the so-called truncation agreements allow for a net settlement without a physical exchange of the documents. The clearing of card transactions follows a two-step approach: first, the card networks determine the net balance of each credit institution, and second, these balances are settled in the SNCE.

Since every pair of institutions report their bilateral net balances to the Banco de España, the latter is entitled to verify their matching and, in the event of discrepancies, to inform the institutions. All discrepancies must be eliminated within a short period of time in accordance with the previously agreed dispute criteria.

Once the bilateral balances have been reported to the Banco de España, the National System for Settlement (SNL) obtains a net net balance (either credit or debit) by consolidating the bilateral balances for each institution in each sub-system. The latter are then settled on the participant's RTGS accounts at the Banco de España by first debiting short participants' accounts before crediting the long ones.

In the event of any incident of a technical nature that prevents communication within a set timetable, the Banco de España is free to extend the timetable, to open a special session or, as a last resort, to permit alternative procedures to solve the problems.

Settlement is considered final at the moment it takes place.

### 3.4.5 Pricing

Participating institutions incur no costs for their adherence to the SNCE. There are, however, connectivity costs arising from communications

and computer equipment as well as from the compulsory rate charged for the software licence.

In addition, each institution must also pay the SLBE's fees for each entry made in its centralised accounts which refers only to the net amount in each sub-system.

### 3.4.6 Main projects and policies being implemented

As there are still residual transactions requiring the physical exchange of documents, several

initiatives have been taken to remove this last obligation. Among other things, several studies are under way with a view to replacing a document which is physically delivered with a scanned image of the document, which is transmissible along with all other information. This procedure may also be extended to truncated documents as a way of increasing the amount of useful data exchanged at very low cost.

## 4 Securities settlement systems

### 4.1 Trading

#### 4.1.1 Institutional aspects

##### 4.1.1.1 Organised securities markets and their specific regulation

Law 24/1988 defines official secondary securities markets as those which operate in complete accordance with the provisions of that Law and its implementing provisions, in particular with regard to the conditions of access, admission to listing, operating rules and information procedures. Other markets regulated under the general principles of Law 24/1988, although not "official", may also be created with the prior approval of the Minister of Economy. All markets must be authorised by the central government, if they are on a national scale, or by the regional governments, if the markets in question are on a local scale.

In 1999 the Spanish Government provided the European Commission with the official list of the regulated secondary securities markets, comprising the public debt book-entry market, the four stock exchanges, the AIAF market<sup>7</sup> and the futures and options markets of MEFFSA.<sup>8</sup>

Settlement systems are established for regulated markets and a ruling body is responsible, among other functions, for the definition and control of market access as well as for the quotation and trading systems.

#### Market ruling bodies

The Banco de España is entrusted with the management and regulation of the public debt book-entry market. In the stock markets, the stock exchange governing companies are special private limited companies which have no financial functions and are non-profit-making. They are legally entrusted with the organisation and operation of the market and their sole shareholders are the members of the relevant stock exchange. The Sociedad de Bolsas is the stock exchange company, a private limited company comprising the stock exchange governing companies. Lastly, the AIAF and MEFFSA act as ruling bodies in their relevant markets.

<sup>7</sup> The market in which mainly corporate fixed-income securities are traded.

<sup>8</sup> There are two different markets, depending on the type of underlying assets: equities and fixed-income instruments.

*Specific aspects of the Spanish secondary securities markets*<sup>9</sup>

- *Public debt book-entry market*

Royal Decree 505/1987 of 3 April 1987<sup>10</sup> created this market and specifically regulates it. It was elaborated by Ministerial Order of 19 May 1987<sup>11</sup>, by a number of Treasury Resolutions and also by Banco de España Circulars.

The Banco de España is entrusted with the management of the book-entry system. CADE, legally regarded as a public service, a division of the bank without legal autonomous status, is in charge, as central depository, of the registration and the organisation of the trading and settlement system of this market, so that there is no managing company legally separate from the bank. Leaving aside the organisational competence of the Banco de España, there is also an Advisory Committee, the members of which are representatives of the bank, the CNMV and the Treasury.

Although this is primarily a decentralised market, where OTC operations prevail, there are also two electronic trading platforms<sup>12</sup> which settle their operations through CADE:

- the network of book-entry public debt inter-dealer brokers (INFOMEDAS)<sup>13</sup> managed by the Fixed Income Electronic Trading System (SENAF), the shareholders of which are brokerage companies and the AIAF. In 1999 four separated trading screens of the “blind-broker” system merged into one single screen to which dealers have access.
- EuroMTS
- Stock exchange

The SIBE is a common trading platform for highly traded securities which interconnects the four local stock exchanges (Madrid, Barcelona, Bilbao and Valencia) operating in Spain. At the

request of the issuer and on the basis of a prior report by the Sociedad de Bolsas, the CNMV determines which of those securities listed on at least two stock exchanges are to be traded on the SIBE. In addition, the CNMV may decide which of those securities can exclusively be traded on the SIBE. The Sociedad de Bolsas is the manager of the SIBE (its only task) and the four stock exchanges’ governing companies own its capital in equal proportions.

Every stock exchange has its own SSS<sup>14</sup> managed by a central depository structured as a private limited company, the shares of which are owned by the market participants. The SCLV, the CSD competent for the SIBE, is also in charge of the settlement of the Madrid Stock Exchange operations.

Among the stock exchange markets, there are two further markets which have recently been created for which the SCLV acts as the SSS and the central depository: the new market (*Nuevo Mercado*) and Latibex.

The new market is intended for securities issued by firms which mainly focus on innovative high-technology industries or sectors offering great growth opportunities. The creation of this new market was authorised by Ministerial Order of 22 December 1999 as a special segment of the Stock Exchange Interlinking System run by the Sociedad de Bolsas. This Order establishes that the CNMV will set the general criteria for determining which firms’ securities are to be

<sup>9</sup> For the types of instrument, see Section 4.1.2.1.

<sup>10</sup> Although the specific regulation came into force prior to Law 24/1988, the general principles already established for the government debt market were incorporated into the Law, and thus were given stronger legal support. However, this Royal Decree was later amended, inter alia, by RD 54/1988 of 29 January and RD 1009/1991 of 21 June.

<sup>11</sup> The drafting of this provision was later amended.

<sup>12</sup> Setting aside the small portion of securities which, although registered in CADE, are traded on the stock exchange.

<sup>13</sup> It is a market to which only leading institutions (dealing entities) have access, and is characterised by the fact that the contracting parties do not know the identity of their counterparties.

<sup>14</sup> For the locally traded (mainly fixed-income) securities.

traded on this market, as well as the listing requirements.<sup>15</sup>

The creation of Latibex, the market in euro for Latin American securities, as an organised system for trading securities and other financial instruments, was authorised by a resolution of the Council of Ministers of 29 October 1999. The CNMV is responsible for the supervision of this market. Equities and debt securities can be traded on Latibex.

- *The AIAF market*

The AIAF market is regulated by Ministerial Order of 1 August 1991, amended by Ministerial Orders of 11 May 1993 and 19 November 1996, which approve the rules governing this market for corporate debt securities. The AIAF is the ruling company in charge of promoting and organising this market. The registration, clearing and settlement functions are carried out by the SCLV (formerly by Espaclear). The CNMV supervises this market.

- *Derivatives markets*

There are derivatives markets in Spain for the trading of financial futures and options contracts. These markets are governed by Royal Decree 1814/1991, amended by Royal Decree 695/1995 in order to include commodities as underlying assets.<sup>16</sup>

There are two markets for futures and options on financial underlying assets: one for equities and another one for fixed income, and they are both run by MEFFSA. This company integrates the trading, clearing and settlement into one single company acting as central counterparty. The rules and regulations of these markets were approved by Ministerial Order of 8 July 1992. The Citrus Fruits Futures Exchange in Valencia was authorised by Ministerial Order of 14 July 1995.

#### 4.1.1.2 *Financial intermediaries operating in the securities markets: types and rules of access to membership*

##### *Investment services and Investment Services Firms*

Law 24/1988 reflects the essence of Directive 93/22/EEC by including a list of investment services and complementary activities. The category ISFs only includes securities dealer companies, securities agencies and portfolio management companies. The creation of ISFs is authorised by the Ministry of Economy on the basis of a prior proposal from the CNMV. In addition, the government may regulate the creation of other entities, and may also allow access to business for other individuals or entities which, not being ISFs, may perform some of the activities included in the investment services list, or which may help to improve developments in the securities markets. Credit institutions are also granted the right to provide these services.<sup>17</sup>

##### *Market members*

In accordance with Law 24/1988, the following institutions have the right of access to membership to official secondary securities markets:

- Spanish securities dealer companies and securities agencies.<sup>18</sup> The securities dealer companies may operate on their own account and on behalf of third parties, whereas the securities agencies can only operate on behalf of third parties;

<sup>15</sup> The CNMV published Circular 1/2000 of 9 February in order to fulfil this mandate. As for the listing requirements, the Circular refers to the general rules. With regard to the specific trading conditions, it refers to the specific regulation to be established by the stock exchange. The Sociedad de Bolsas Circular 1/2000 subsequently set the rules for trading on the new market and Circular 2/2000 the rules for acting as a specialist on it.

<sup>16</sup> It was subsequently amended by Royal Decree 2590/1998.

<sup>17</sup> Credit institutions also have the right of access to membership of organised secondary securities markets, which has been acknowledged as a consequence of the principle of universality of banking business, as foreseen by Community law.

<sup>18</sup> Investment Services Firms, with the exception of portfolio management companies.

- Spanish credit institutions;
- ISFs and credit institutions authorised in other EU Member States, provided that, in addition to fulfilling the requirements laid down in Law 24/1988 to operate in Spain, they are empowered to provide investment services in their home country;
- ISFs and credit institutions authorised in a non-EU state, provided that, in addition to fulfilling the requirements laid down by this Law to operate in Spain, they are empowered to provide investment services in their home country. The Ministry of Economy may refuse access in respect of these entities or impose conditions for prudential and reciprocity reasons; and
- such others as the regional governments with responsibilities in this area may determine.

Access to each market is conditional both on the fulfilment of their specific requirements and on admission by the market-ruling company. Admission is based on the capacity of the applicants and their commitment to respecting the market rules. In the case of stock exchange markets there is an additional membership requirement: participation in the capital of the market-ruling company. The same is applicable to the AIAF market. With regard to the public debt book-entry market, the Banco de España and other entities (as stated in government regulations) may, alongside those entities specified for official secondary markets in general, be entitled to have the status of market members. Access to membership of this market is also granted to entities engaged in securities clearing and settlement activities.

In order to be accepted as a member of a securities market, it is necessary to be recorded in one of the financial institutions' official registers and thus be subject to supervision by the body in charge of the relevant register.<sup>19</sup>

Market members are authorised to introduce orders into the trading systems, either on their own account, on the account of customers only, or on the accounts of both, depending on the type of institution. In addition, any transaction carried out on the markets requires the participation of a market member in order to provide the relevant information on trading between parties. Market membership currently allows access to the respective SSS.

*“Market-makers” and “dealing entities” in the public debt book-entry market*

There are two special categories of member of the public debt book-entry market: market-makers and dealing entities. Their current status is regulated by Ministerial Order of 10 February 1999, and implemented by Resolutions of 11 February and 4 March 1999 of the Treasury (as amended by two Resolutions of 10 April 2000). These provisions detail their rights and obligations as well as access and exit criteria.

The rights of market-makers are, inter alia, access to second rounds in Treasury tenders and to information unavailable to other members, and the exclusive right to strip and reconstitute strippable government debt. As to their obligations, they have to participate in tenders, submitting bids with a minimum value and at a maximum price, and ensure liquidity on the secondary market (quoting some bonds with a minimum value and at a maximum price). As to the dealing entities, they have exclusive access to the INFOMEDAS<sup>20</sup> platform and the possibility of acquiring market-maker status. They are also obliged to participate in quoting on the INFOMEDAS platform with a minimum value.

*4.1.1.3 Supervision of the markets and its members and the role of public institutions*

The Spanish public institutions in charge of supervising the securities markets and their

<sup>19</sup> See Section 4.1.1.3.

<sup>20</sup> See Section 4.1.1.1.



members are the CNMV, the Banco de España and some regional governments where they have competence for a specific regional market.

The Investment Services Directive, introducing the principle of the Community passport or single licence for investment firms, has already been transposed into Spanish Law, as was the case for credit institutions in 1994. According to this principle, the oversight competence in respect of firms established in other EU Member States, but operating on Spanish markets, is shared between the authorities of both countries: their solvency is controlled by the Member State in which the entity is established and their activity on the Spanish markets by the Spanish authorities.

#### *The National Securities Markets Commission*

The CNMV was created under Law 24/1988 as a public law institution with its own legal identity. The entities under its oversight include the market-ruling companies and the specific securities markets intermediaries (i.e. the ISFs). Nevertheless, its competence extends to all other individuals and entities<sup>21</sup> involved in the investment business, as far as their activities on the markets are concerned.

The CNMV exercises its competence, inter alia, through the following functions: registration of entities and qualified shareholders, solvency supervision, inspection, imposition of penalties, regulation (Circulars) and advisory assistance to the Government and the Minister of Economy.

#### *Other authorities*

The Banco de España also has supervisory competence for the securities markets. It is the prudential supervision authority for credit institutions and oversees the participants in CADE, of which the bank is the governing institution.<sup>22</sup> The public debt book-entry market is also controlled by the Ministry of Economy.

#### *Transparency in the operations of regulated securities markets*

The most recent reform of the Securities Market Law amends the transparency regime. It entitles the CNMV, the Banco de España and the market regulatory bodies to determine public information on market operations, disclosure of which is compulsory. Pending the elaboration of this Law through Regulations, CNMV Circular 3/1999 of 22 September 1999 dealt with the transparency of operations on the official securities markets since it was essential to implement the minimum standards laid down in Directive 93/22/EEC.

#### **4.1.2 Operational aspects**

##### *4.1.2.1 Types of instrument*

The three securities markets (book-entry government debt, stock exchange markets and private sector fixed-income<sup>23</sup>) trade securities exclusively by book entry.<sup>24</sup> These markets employ high-tech methods as they use computer networks for the quotation, trading and communication of transactions.

Equities, which can only be traded on the stock exchanges, include ordinary and common shares, preference shares, convertible debt securities and securities bearing acquisition or subscription rights. Those determined by the CNMV (such as debt securities, public and corporate) can also be traded on these markets. All listed securities on the stock exchange markets are dematerialised and kept at the central depository, the SCLV. The majority of the SCLV-eligible shares are, from a legal point of view, bearer shares.<sup>25</sup> Warrants have

<sup>21</sup> Not only the financial companies themselves, such as credit institutions, but also the individuals who, directly or indirectly, control ISFs.

<sup>22</sup> See Section 4.1.1.1.

<sup>23</sup> AIAF market.

<sup>24</sup> However, in the AIAF market, paper securities are deposited and immobilised in the name of SCLV-AIAF, where they are evidenced by computer records to facilitate trading, clearing and settlement.

<sup>25</sup> The regime applicable to "registered securities" (as opposed to "bearer securities") involves particular requirements on the part of the issuer which cannot be considered fulfilled through the simple registration of the securities in book-entry form in the records of an SSS.

medium and long-term maturities and give the right to buy or sell an underlying asset at a set price. Warrants are also listed on the Madrid Stock Exchange.

The public debt securities, which are traded on the public debt book-entry market, can be grouped into the following instruments: i) Treasury bills (*Letras del Tesoro*) issued by the Spanish Treasury, which are discounted instruments with maturities of 3, 6, 12 and 18 months; ii) Government notes (*Bonos del Estado*) issued by the Spanish Treasury are fixed-rate, bearer instruments with maturities of three and five years; iii) Government bonds (*Obligaciones del Estado*) have the same features as notes, and only differ in the term of maturity – 10, 15 or 30 years; iv) public debt securities issued by regional governments, other public entities and corporations and by international bodies to which Spain belongs, as well as securities issued by the ECB and NCBs; and v) strippable bonds with maturities of 3, 5, 10, 15 and 30 years which can be stripped into principal strips and coupon strips; these are traded separately. Issues can be grouped and consecutive tranches of a single issue can be placed, thereby ensuring the volumes of homogeneous securities necessary for liquidity in the secondary markets.

The fixed-income securities traded on the AIAF market are commercial paper (issued by private and public companies), medium and long-term bonds, mortgage bonds, mortgage-backed bonds, matador bonds, securitised bonds and preferred participation units. All these instruments are dematerialised and kept in the central register, the SCLV.

#### 4.1.2.2 Description of the trading systems and operating hours

##### Stock exchange

Equities, corporate bonds and public debt instruments are traded on the stock exchange via two systems: the electronic system known as the Spanish Stock Market Interlinking System (SIBE) and the traditional open outcry.

The SIBE consists of four separate markets: the continuous market for the trading of Spanish shares, the fixed-income electronic market for the trading of debt instruments, the Latibex for the trading of Latin American shares and the new market. The SIBE is in charge of accepting orders, providing trading information and access to the market on a real-time basis.

- Continuous market: this order-driven market provides centralised and automated equity trading for the four stock exchange markets. It has two separate sub-markets, the principal trading market and the special operations market.

The principal market accounts for around 90% of the daily turnover. It is divided into two systems, the open system for most of the liquid shares and the fixing system for the less liquid. Trading hours for open transactions are from 9 a.m. to 5.30 p.m. During the trading session, prices may fluctuate by  $\pm 15\%$  in relation to the previous day's closing price. If the fluctuation exceeds this limit then the CNMV may allow additional margins. If the extra margin is not permitted, trading for this issue is suspended until 12 noon. In the fixing system, orders are grouped together in two sessions, one at 12 noon and the other at 4 p.m., in order to reduce volatility and achieve price efficiency. Limited and market orders with different conditions are accepted. Orders are assigned priority on the basis of price and input time. Trading by blocks takes place outside of normal trading hours and must be communicated to the stock exchange. Either a block trade by size (used for communicating blocks for sizes previously agreed where the minimum amount required is €600,000) or a block trade by price (used for trading and communicating blocks of shares with a 15% variation over the reference price) can be agreed.

The special operations market is open from 5.30 p.m. to 8 p.m. and it trades blocks of equities between agreed counterparties. Depending on the size of the trade, exceptional authorisation may be required (over €250 million).

- Fixed-income electronic market: trading of public and corporate debt takes place between 9 a.m. and 4 p.m. There are two types of trading, multilateral and bilateral. Multilateral trading is anonymous, screen-based and used in two markets: the market of orders (where operations are automatically closed on the basis of the best price and sequence of introduction) and the market of block trades (for blocks of public debt over €300,506.05 (ESP 50 million) in nominal terms and for blocks of corporate bonds over €150,253.03 (ESP 25 million) in nominal terms). Bilateral trading is when the trade is agreed upon between two parties and then entered into the system. The minimal volume is €150,000 for corporate debt and there is no limit for public debt. Prices in this fixed-income electronic market may not fluctuate by more than  $\pm 10\%$  in relation to the previous day's closing price. Should that be the case, the trading for that issue would be suspended.
- Latibex: this market was launched on December 1999 with the listing of Latin American companies. Shares traded here are subject to the same trading and settlement rules as Spanish shares traded on the continuous market.
- The new market: since December 1999, this has been a new segment of the stock exchange market and has different operating rules. For greater information transparency in this segment it is required that the risks associated with the company's activity are described in the listing prospectus, that lock-ups affecting shareholders with significant holdings are disclosed and, at least once a year, the

progress of the business and its future prospects are published. Finally, as regards quotation, the fluctuation limits are more flexible; there are no limits to quotation. Trading is only suspended if the limits exceed 25% (they may be increased during the session), as opposed to a 15% limit on the traditional market.

Securities of small companies (equities and corporate bonds) which do not fulfil the requirements for listing on the continuous market are traded by open outcry. At present, the activity in this market accounts for less than 1% of the combined trading of the four stock exchange markets. Trading takes place from 10 a.m. to 12 noon on the floor of the four exchange markets, in ten-minute rings which are organised by sector. Prices may fluctuate by  $\pm 10\%$ ; variations over this limit cause trading to be suspended for 30 minutes. Special operations may take place outside of normal trading hours and at a price agreed between the counterparties.

#### *Public debt book-entry market*

The design of public debt instruments and the primary market channels aims at developing the secondary market for Spanish public debt. On the one hand, the Spanish Treasury has always tried to issue public debt through open tenders and with a simplified list of instruments. On the other hand, adequate mechanisms have been established to achieve a deep and liquid official secondary market on which government debt securities can be traded.

Trading on the official secondary market for public debt instruments is carried out on different sub-markets. The first-step market is organised by a specialised trading intermediaries network known as SENAF (INFOMEDAS) and the second-step market is an interbank market conducted over the phone or via brokers' screens.

- SENAF-INFOMEDAS is the electronic trading system of financial assets (public and corporate debt securities) created in June 1999 in order to develop and exploit

- the electronic blind-trading system. It acts as a neutral company in the market. Only dealing entities<sup>26</sup> have access to this platform, on which trade is anonymous and at the best price. In order to deal with market risk, this trading platform marks-to-market the daily positions of each participant in such a way that, should an entity run at a loss, it must deposit through the SLBE<sup>27</sup> an equivalent amount which will be credited to the counterparty's account. It is connected to CADE for the purpose of reporting the settlement orders. The minimum amount for government bonds transactions is €1 million. Around 40% of the total trading volume of the secondary market is generated through INFOMEDAS.
- The second-step market is the decentralised segment conducted either over the phone or via brokers. All CADE participants have access to this OTC market on which transactions are carried out on a bilateral basis. Market members must report all their transactions to CADE through the SLBE.
  - Purchases and sales transactions among market members. These entail the dual settlement of cash and securities accounts. In the public debt book-entry market and the AIAF market, outright (spot or forward), sell-by-back transactions and repo operations (in general, two-stage operations) can be carried out. On the stock market, only outright operations are possible and trading is currently concentrated on the spot market.
  - Securities transfers, which are normally the result of a purchase and sale operation between a participant and a third party (customer) who has no own account at the central register. In such a case, it is necessary to transfer securities between the participant's own account and the segregated account in which the participant may act as depository or registrar for the third party.

Another type of transaction is the total or partial immobilisation of the securities balance in order to issue certificates for collateral purposes.

#### *The AIAF market*

The AIAF, the regulated secondary market for the trading of corporate debt securities, is a decentralised market with two segments, one for short-term financial instruments (commercial paper) and the other one for bonds (long-term instruments). Most of the securities are dematerialised, although there is a small percentage of physical securities. Trading is mainly conducted through the OTC market and the information on offers and prices is available on screen. There is an electronic blind broker system, although the turnover in this trading platform is insignificant and no information on this is attached to the statistics tables.

#### *4.1.2.3 Types of transaction handled*

There are two types of transaction commonly used in the Spanish securities markets:

#### *4.1.2.4 Connection to other systems*

Since September 1999 the securities eligible for CADE, traded on the public debt book-entry market, have also been tradable on the EuroMTS platform. Under the agreement signed by EuroMTS Limited and the Banco de España (as manager of CADE), transactions in Spanish public debt securities carried out in the electronic trading EuroMTS system are settled in CADE on T+3.

In this context, it should be mentioned that the cross-border links established by the SCLV and CADE with foreign central depositories allow trade in foreign securities on the Spanish domestic securities markets under the same conditions as domestic securities.

<sup>26</sup> See Section 4.1.1.2.

<sup>27</sup> See Section 3.2.

## 4.2 Clearing

The Spanish SSSs are responsible for clearing and netting cash positions in the markets. However, MEFFSA is the only SSS which can assume settlement risks, since it acts as a central counterparty in the clearing of the transactions carried out on the derivatives market. MEFFSA is the only company which integrates the trading, clearing and settlement of the financial futures and options into one single system. There is no other clearing house in the Spanish markets.

## 4.3 Settlement

### 4.3.1 Institutional and legal aspects

#### *General legal aspects*

Settlement, as an activity relating to the securities markets, is regulated in Spain by Securities Market Law 24/1988 of 28 July, as amended by Law 37/1998 of 16 November. This Act establishes the general principles to be observed by SSSs and it has been elaborated through a number of different provisions.<sup>28</sup>

Law 41/1999 of 12 November, which incorporates the provisions of the SFD, recognises the following SSSs in Spain:

- CADE, which acts as central depository and provides settlement services for the public debt book-entry market. The securities eligible for deposit and settlement in CADE are Treasury bills, bonds issued by the central government and regional governments and other public bodies as well as those securities issued by the Banco de España and the ECB. It is also possible to register public debt securities issued in EU CSDs through the existing links. CADE was created by Royal Decree 505/1987 of 3 April.<sup>29</sup>
- Royal Decree 116/1992 establishes the clearing, settlement and register system

for all securities traded on the stock exchange and in the book-entry record of other dematerialised listed securities through the SCLV. In addition, there are three regional systems in Spain with limited scope: SCL Barcelona, SCL Bilbao and SCL Valencia, the regulatory framework of which is similar to that described for the SCLV. The CNMV and the respective regional governments provide for their regulation. The capital of the SCLV is held by the governing companies of the Spanish stock exchange markets and its participants.

- The clearing, settlement and safekeeping functions for the securities traded on the AIAF market were provided by Espaclear (the securities agency created for that purpose and fully owned by the SCLV) and since October 1997 have also been provided by the SCLV. In March 2000 Espaclear was taken over by the SCLV. Thus, in addition to the securities traded on the stock exchange markets, the SCLV also maintains the accounting register for the securities which are traded on the AIAF market (represented by book-entry form and the physical securities). However, the SCLV maintains two separate settlement systems, the SCLV system mentioned in the paragraph above, and the SCLV-AIAF system for the corporate debt securities listed on the AIAF market. It must be noted that these two systems are managed and operated by the SCLV, which, from a legal point of view, is a single limited company.

Law 41/1999, which implements the SFD, also regulates the consequences of finality with regard to insolvency proceedings which may be brought against a participant. Hence, there is no chance of revoking the sale of securities or the granting of collateral the instructions of which have been delivered and accepted by the

<sup>28</sup> See Section 1.1.2.

<sup>29</sup> See Section 4.1.1.2.

system prior to initiation of the proceedings, or even following initiation, if cleared and settled on the same day. Article 11 of Law 41/1999 modifies the validity and finality of both the funds and securities transfer orders.

#### *Legal basis*

The regulatory framework adopted by the Spanish financial authorities for the Spanish SSSs is as follows:

- CADE: Securities Market Law 24/1988 of 28 July, amended by Law 37/1998 of 16 November; Royal Decree 505/1987; Ministerial Order of 18 March 1999; and Law 41/1999 of 12 November.
- The SCLV and the SCLV-AIAF: Securities Market Law 24/1988 of 28 July, amended by Law 37/1998 of 16 November; Royal Decree 116/1992 amended by Royal Decree 2590/1998; Order of 6 July 1992; Release 4/1992 of 21 October (passed by the CNMV); and Law 41/1999 of 12 November.
- Regional SCLs (Barcelona, Bilbao and Valencia): the legislation of the autonomous governments together with the legal basis applicable to the SCLV.

#### *Regulation and supervision*

In addition to the aforementioned general regulation, there are rules issued by the governing companies of each system with regard to the clearing and settlement procedures. In CADE, these rules are known as Circulars; the technical aspects which are mandatory are made public through Technical Applications. In the SCLV and the SCLV-AIAF, there are Releases and Operational Instructions. These rules are complemented by specific technical rules covering more detailed aspects of their activity. In many cases, the rules require the approval of the corresponding supervisor.

While CADE is supervised by the Banco de España, the CNMV oversees the SCLV, the SCLV-

AIAF, MEFF RF and MEFF RV. As to the regional SSSs, the respective local governments are responsible for their regulation and supervision, together with the CNMV. The systems themselves are also audited externally and internally. In addition, the CNMV, the Banco de España and the aforementioned systems are empowered to carry out on-site examinations which focus on the adequacy of the management skills and the IT equipment as well as of the available human resources.

Although all supervisors and regulators have their own range of competence and carry out their activities on an independent basis, co-ordination takes place at a general level through cross-membership of the Boards of Directors of the different regulatory bodies.

#### *Participation in the systems*

Law 41/1999 sets out that the general requirements for membership in the Spanish settlement systems must be approved by the relevant supervisory authorities and published in the BOE (Official Government Bulletin). In general, the participants are credit institutions and investment services companies.

- There are two main types of membership in CADE: direct account holders which are entities entitled to register their own securities holdings and entities which are allowed to register securities on behalf of customers as well as on their own account. The system clearly separates the participants' own holdings from the customers' holdings as there are two kinds of securities accounts: an account for the participants' holdings and another (omnibus) account for the customers' holdings.

The admission criteria are clearly established in Law 37/1998. In order to be admitted, an institution must belong to one of the categories listed in the aforementioned law (mainly credit institutions, investment firms,

international financial institutions, CSDs and NCBs). Participants must meet solvency as well as technical and management capacity requirements. Remote access is allowed in CADE.

The authorisation and termination of membership is decided by the Ministry of Economy on the basis of a proposal from the Banco de España together with a report from the CNMV. Within each membership category, all members are subject to the same rules and conditions. The conditions under which membership can be revoked are as follows: insufficient trading volume, non-fulfilment of the membership requirements, insolvency procedures, sanctions and a formal request from the participant.

- The SCLV has the following participants: securities dealer companies, securities agencies, brokers, banks, saving banks, official credit institutions, the Banco de España and foreign entities with activities similar to those of the SCLV. Of these entities, those which are market members of a stock exchange must necessarily become participants in the SCLV, while the remainder must apply for authorisation. In order to gain access, the participants are required to have adequate control systems and technical equipment to develop their settlement functions and, where applicable, to participate in the capital structure of the SCLV. For the settlement of the cash leg, it is compulsory to have a cash account at the Banco de España or to designate a settlement bank. It is the CNMV which, on the basis of a report from the SCLV on the fulfilment of the requirements by the candidate, grants authorisation to participate in the system and which also terminates a participant's membership. The circumstances under which membership is rescinded are as follows: a formal request from the participant; non-fulfilment of the requirements; cessation of activities as securities dealer company or securities

broker agency; where an entity goes into debt (as determined by the system); and where the settlement volume is insufficient.

Similar access and exit criteria are defined for the regional SCLs (Barcelona, Bilbao and Valencia).

- In the SCLV-AIAF, it is necessary, in order to become a participant, to be a member of the AIAF market (see Section 4.1.1.3). The scheme for the securities accounts is similar to that of the CADE system. (There is segregation of the securities accounts). With regard to the access criteria, adequate control systems and technical equipment must be in place; all technical and functional requirements must be fulfilled; and a cash account must be held at the Banco de España (or with a designated settlement agent). In addition, the SCLV-AIAF may require the fulfilment of any additional criteria laid down by the SCLV. It is the SCLV-AIAF system which grants authorisation and decides on the termination of the membership status. The three cases in which a participant will cease to be a member are as follows: where the participant makes a formal request, fails to fulfil the access criteria, or enters insolvency proceedings.

#### 4.3.2 Operational aspects

The Spanish SSSs follow three general principles: multilateral netting of the cash leg of the transactions, DVP and neutrality. CADE is the exception and employs a gross real-time settlement procedure. Payments from all the systems are settled on the cash accounts held at the Banco de España (centralised accounts) by the participants.

The central register of each of the securities markets is entrusted to the same institution, which is also in charge of managing the clearing and settlement system. Thus, CADE and the SCLV act as the central register of the securities for which clearing and settlement services are provided. The

Banco de España, as operator of CADE, is the sole holder of government debt securities accounts integrated into a book-entry system. (All securities are dematerialised.) As mentioned in Section 4.3.1.4, there are two types of accounts: an account for recording the securities holdings of the direct account holders and the customers' accounts for the securities held on behalf of customers. CADE makes use of the SLBE<sup>30</sup> as far as the transfer of the orders and the matching and settlement of the securities transactions are concerned. (The SLBE is the settlement system managed by the Banco de España through which the cash leg of the securities transactions is settled). The SCLV manages the central register in accordance with a scheme similar to that of the CADE system whereby participants' accounts may be split into own accounts and customers' accounts.

#### 4.3.2.1 Operational aspects of settlement

##### *Transfer system and transaction processing environment*

In the government debt book-entry market, participants report their transactions via the SLBE on the trade date, regardless of the settlement date. The SLBE matches the communications of each operation and records it as a traded transaction, provided that there are no discrepancies. The securities and the cash accounts (in central bank money) are held on the same IT platform (the Banco de España computing system).

If the trade date is the same as the settlement date, CADE is immediately notified in order to credit and debit the corresponding securities account, provided the seller's balance is sufficient. Transactions with a settlement date different from that of the trade date are reported to the CADE system on the relevant date, as participants may send the communications on a day prior to the settlement date.<sup>31</sup>

In order to update the balance of the customers' accounts, the dealers report the net overall change in the balance on each of their

customers' accounts on a daily basis. Every week, information referring to all the transactions carried out with customers, broken down by purchase and sale, is submitted on magnetic media. CADE checks that these data are consistent with those reported on a daily basis.

In the SLBE, participants are connected to the central computer of the Banco de España through an online computer link. This terminal allows participants to communicate the transaction orders and to obtain online information about the securities transfers instructions as well as balances of the securities accounts. Participants are thus able to monitor the status of their orders (unmatched, matched, provisionally settled, final, etc.) during the entire matching and settlement process.

With regard to the SCLV, since February 1997 the settlement lag has been three days (T+3 on a gross basis) for all securities traded on the stock market. On the trade date, all transactions carried out are reported by the stock exchange members to the SCLV on an aggregated basis (either electronically or via file transfer). Stock exchange members have one day (up to the afternoon of T+1) to break the aggregated trading down into itemised transactions specifying the settling participant. A list of the transactions resulting from the breakdown is reported online by the SCLV to the settling participant. The settlement institutions have an extra day, namely until T+2, to accept or reject any transaction. No rejection implies that the trade is accepted by the settling participant and will therefore be irrevocably settled on T+3. After the net cash positions are settled in the cash account at the Banco de España, the settlement of the trades becomes final (T+3).

Settlement in the SCLV may also occur through the "traspaso", which is a securities transfer

<sup>30</sup> See Section 3.2.

<sup>31</sup> Repo operations are reported on the trade date, thus implying two reverse purchases and sales between the same institutions. The first is normally settled on the same trade date, and the second on the following day or on a later date, as agreed by the trading parties.



between two SCLV participants in which ownership cannot change, either free of payment or against payment, (i.e. when a portfolio is transferred to a different local custodian without change of beneficial ownership).

In the SCLV-AIAF, the settlement cycle is freely negotiable, although the shortest possible lag between trading and settlement is one day (T+1). Transfer instructions are communicated on the day prior to the settlement date. (The cut-off time is 3.30 p.m. on T-1.) Trade details are reported to the SCLV-AIAF which performs a same-day matching of trades and reports any discrepancy. The local custodians pre-match instructions before inputting them into the SCLV-AIAF system on the previous day. Any discrepancy must also be rectified before 3.30 p.m. On the settlement date, the SCLV-AIAF transfers the members' netted securities to members' accounts. It also sends the members' netted cash movements to the Banco de España, which then affects the corresponding cash accounts.

#### *Settlement procedures and DVP arrangements*

Operational since June 1999, CADE is a system in which all securities transactions are settled in central bank money on a real-time basis. There is both an overnight and an end-of-day batch. In the interim period, CADE settles FOP and DVP transactions on a real-time basis. The overnight batch is available for all transaction orders communicated to CADE before 6 p.m. on T-1 and becomes final at 7 a.m. on the settlement day (T), provided that there are sufficient funds and an adequate securities balance in the corresponding accounts. The real-time settlement process runs from 7 a.m. until 4 p.m. during the settlement day. In this real-time process, the application first of all checks whether there is an adequate securities balance. If this is the case but the securities buyer has an inadequate funds balance, the transaction order is rejected and returned to CADE, remaining in a queue. The process is periodically activated until there is sufficient balance on the

corresponding accounts to settle the pending orders with finality. If the balance in the securities account of the seller is insufficient, the operation remains queued. Whenever this securities account is credited, the system checks that the instructions queued can be carried out. At the end of the day, the system attempts for the last time to settle all transactions which were not settled in the first cycle or during the real-time process. The end-of-day settlement batch cycle takes place at 5 p.m. If the securities account of the seller has sufficient balance, it is blocked until the application checks (through the interface with the payment side) that there is also balance in the buyer's cash account. Once the transfers of cash and securities are completed, finality is achieved for each transaction.

The other settlement systems carry out gross settlement of securities and net settlement of cash in a single batch process. In the case of the SCLV and the SCLV-AIAF, the settlement batch procedure takes place at 11 a.m. every day. The settlement of the cash leg also occurs via a multilateral netting procedure on the cash accounts at the Banco de España at 11 a.m. and 10 p.m. respectively in accordance with the netted settlement report submitted by both systems. With regard to the regional systems, the procedures are similar; all have a single batch cycle and use central bank money for the settlement of the cash leg. In SCL Barcelona and SCL Valencia the time-lag between the trading date and the settlement date is T+3 and in SCL Bilbao T+1. In all systems, the participants must have a cash account at the Banco de España or they must designate a settlement bank. In compliance with the DVP principle, co-ordination is required between these systems and the Banco de España managers. Intraday finality is only provided with pre-deposited securities.

#### *Operating hours*

Transfer instructions can be reported to CADE from 7 a.m. to 6 p.m. for their processing by the SLBE. In the SCLV, online communications can be reported between 7 a.m. and 7 p.m., and for

file transfers orders between 5 p.m. and 7 p.m. In the SCLV-AIAF, the time range for the transfer of orders to be settled on T+1 is 8 a.m. to 3.30 p.m. These deadlines can be extended under exceptional circumstances. Similar deadlines to that applied by the SCLV are also applied in the regional SCLs (with the exception of SCL Bilbao, which has an earlier cut-off time owing to its settlement cycle, T+1).

#### *Custody services*

The Spanish systems act as CSDs providing custodial services (depository and register functions) as well as corporate action services. These functions are not outsourced and are directly offered by the systems without the intervention of any third party.

All securities registered and deposited in all Spanish systems are represented in book-entry form (dematerialised), except for the SCLV-AIAF, in which there are also some physical securities. In the latter case, the paper format securities are deposited and immobilised in a depository in the name of the SCLV, which holds the securities on behalf of its participants and customers. They are registered in the SCLV-AIAF by means of computer records. There is a contractual arrangement between the depository and the system.

#### *Credit and liquidity risks and their management*

All Spanish SSSs apply the DVP principle as a basic measure for preventing principal risk, since DVP mechanisms ensure that counterparties are not exposed to principal risk in the course of the settlement process. As regards the settlement risk of the cash leg of the securities transactions, it is overcome, since it takes place through central bank money. Debit balances in securities are not permitted in any system, and neither is the partial execution of the securities transfer orders. The systems are not allowed to take any risk vis-à-vis the participants in the settlement process.

In addition to solvency and other financial and technical capacity requirements established as membership criteria, the following measures are laid down in respect of the Spanish SSSs in order to reduce risk:

- There is an automatic securities lending procedure managed by CADE, whereby any participant which does not have an adequate securities balance at the close of business receives the required securities. In order to become a member of the pool of lenders, the account holders must sign a contract with the Banco de España beforehand (as CADE manager), which specifies the rules governing this securities loan. The loan instrument consists of an overnight repo transaction between the lender and the borrower in accordance with the rules defined in the contract. Use is made of haircuts in order to remove the market risk for the lender, and the interest rate of such instrument is nil (penalty for the borrower). Within this lending facility, the system never acts as counterparty, since CADE cannot assume any risk.
- In order to avoid incidents both in centralised cash accounts and in securities accounts, the Banco de España has established a penalty fee of €1,000 for each securities or cash transfer carried out under the special procedure. The central bank monitors incidents and has established penalties and the possibility of exclusion (temporary or permanent).
- On the stock market, the SCLV has a collateral system to ensure the successful outcome of the trades pending from settlement, which is regulated by Royal Decree 116/92. The collateral may consist of cash deposits, bankers' guarantees or pledged securities. The total amount of the collateral deposited is determined, on a monthly basis, by a combined number of participants in accordance with a criterion based on the actual course of

trading activity over the past month. The quota assigned to each participant is also reviewed every month and is based on the average of pending settlements which the participant has maintained during the past month. This collateral deposited by each participant is used without any limit in order to ensure the settlement of the obligations entered into by the participant. Should this be inadequate, the SCLV proceeds to use the other participants' collateral in proportion to the amount which each has provided. The SCLV may require the participant to deposit additional collateral.

- In the event of a failure to deliver securities, a mechanism called the centralised securities loan is applied by the SCLV. The purpose of this automatic securities lending procedure is to deliver securities to buyers on the settlement date. The non-performing seller obviously does not receive payment from its sale. The SCLV retains these funds, on which a return is obtained to pay interest on the securities borrowed.
- In order to ensure final payment on the settlement date, a guarantee of up to €30 million is provided to the Banco de España by three of the major credit institutions.
- On the AIAF market, the market's governing body obliges those participants trading on the electronic blind broker system to deposit specific collateral to cover the risk run by the system in guaranteeing the successful outcome of these transactions. As to the remaining transaction orders, only entities with a specific capital adequacy level are able to settle the cash leg through the system. On the securities leg, if there is an insufficient balance in the securities account, the SCLV-AIAF does not settle the transaction.

#### *Operational reliability*

All Spanish systems ensure the operational reliability of the technical systems and computers which they use. Analyses have been made of the potential operational risks and threats and adequate measures taken. All of these systems have the necessary processing capacity and the corresponding backup facilities. In the event of a breakdown, the systems can keep the registering and communication functions running. There are also contingency plans for the latter.

The systems carry out regular analyses of the capacity of the equipment and its efficiency and have procedures in place to cope with the development of and modifications to the systems. Any potential modification to the system is adequately tested beforehand.

All the systems have security measures for preventing unauthorised access to the systems as well as unauthorised use of the securities accounts. Access is monitored continuously. In addition, all the systems have strict security measures which safeguard the authenticity, integrity and confidentiality of the information during the whole process, including during the exchange of messages.

#### *Pricing*

The CADE pricing policy is defined, in general terms, within the SLBE in accordance with the operating cost recovery principle. No custody fee is charged to the participants and the transaction fee depends on the transaction type.

The SCLV and the SCLV-AIAF act in accordance with the principle of return on their own resources and their users must cover the cost of the services provided. The SCLV's budget seeks to cover all expenses with its ordinary income. There is an annual membership fee, a settlement fee which is defined by tiers according to the nominal value and a transfer fee. The SCLV-AIAF also has a flat membership fee, an annual

custody fee calculated on the basis of the nominal value and a transaction fee.

#### 4.3.3 Links to other SSSs

Current Spanish legislation entitles Spanish SSSs to open securities accounts in foreign CSDs and likewise to have securities accounts in the name of foreign EU SSSs, which have the same legal status and perform similar activities. Each link is governed by an agreement which requires the approval of the competent economic authority, the Spanish Treasury for the CADE links and the CNMV in the case of the SCLV.

The contracts governing the connections to foreign SSSs have to be defined on the basis of the ECSDA model. All Spanish links which have so far been set up are genuine direct and bilateral links in which no third parties are involved. They have been established exclusively for the transfer of securities on an FOP basis. The links of Spanish SSSs have been assessed and approved as eligible for use in the Eurosystem's credit operations.

The SCLV has made an arrangement with SCL Barcelona, SCL Bilbao and SCL Valencia under which the SCLV has opened an account in these systems with a view to facilitating the transfer of the securities managed by these systems to those foreign depositories to which the SCLV is linked. The scope of this arrangement is limited to allow the SCLV to include in the links to foreign CSDs the securities recorded in the SCL Barcelona, SCL Bilbao and SCL Valencia systems. Thus, the SCLV becomes a member of the different systems and can only hold securities on behalf of the foreign CSDs to which the SCLV is linked, acting as "single entry point" for these securities. Securities cannot be moved from the SCLV to these systems nor can securities issued in the SCLV be transferred between SCL Barcelona, SCL Bilbao and SCL Valencia.

At present, the two main Spanish SSSs, CADE and the SCLV (whose links also cover the securities settled in the SCLV-AIAF), have the following links:

- CADE has set up links to Sicovam, Clearstream Banking A.G., Monte Titoli and Necigef. The securities included in these links are public debt securities.
- The SCLV has links to Monte Titoli, Sicovam and Necigef. The securities included in these links are corporate bonds and equities. In addition, the SCLV has direct links to the register and settlement systems of Brazil and Argentina.

#### 4.3.4 Main projects and future developments

The main project under way in the securities settlement area in Spain is the agreement reached between the SCLV and CADE which aims at merging both systems into a single SSS. This agreement, which has been approved by the Spanish Treasury and the CNMV, aims to establish the basis for the future managing company of the Spanish SSSs, IBERCLEAR S.A.<sup>32</sup>

Until the merger is finalised, both CADE and the SCLV will continue to operate separately. From June 2001 onwards, it is foreseen that the SCLV will be the SSS for equities securities and CADE will be the SSS for all euro-denominated fixed-income securities, both public debt and corporate bonds. Thus, the current three SSSs in place for debt securities (CADE, the SCLV and the SCLV-AIAF) will be merged into the CADE platform and will continue to settle in central bank money. By 2002 IBERCLEAR will become the single CSD for all securities, taking over the settlement procedures run under the CADE and the SCLV systems. Thus, IBERCLEAR will be managing two SSSs: one for equities (T+3 DVP model 2) and another for all debt instruments (T+0/T+n DVP model 1). The reason for the settlement integration of fixed-income instruments in the Banco de España IT environment run by CADE is that this system is already fully compliant with the ESCB standards on securities settlement. In particular, CADE is not only a legally sound and technically

<sup>32</sup> See the introduction to this chapter.

advanced system, but it also provides real-time DVP model 1 facilities in central bank money and settles intraday repos.

#### **4.4 The use of the securities infrastructure by the Banco de España**

The main responsibilities of the Banco de España in the securities settlement field are those derived from the management and operation of the CADE system and those connected with its role as provider of funds settlement facilities to all the Spanish settlement systems. These must, by law, settle the payments derived from the securities transactions through the cash accounts held by the participants with the Banco de España. On the other hand, the Banco de España has a significant relationship with the Spanish systems as user.

The Banco de España uses two main procedures and legal techniques to collateralise the monetary and intraday credit operations: the pool of assets pledged and the repo with transaction margining. In doing so, the Banco de España becomes a significant user of the SSSs and has securities accounts in CADE, the SCLV, the SCLV-AIAF and the regional SCL systems.

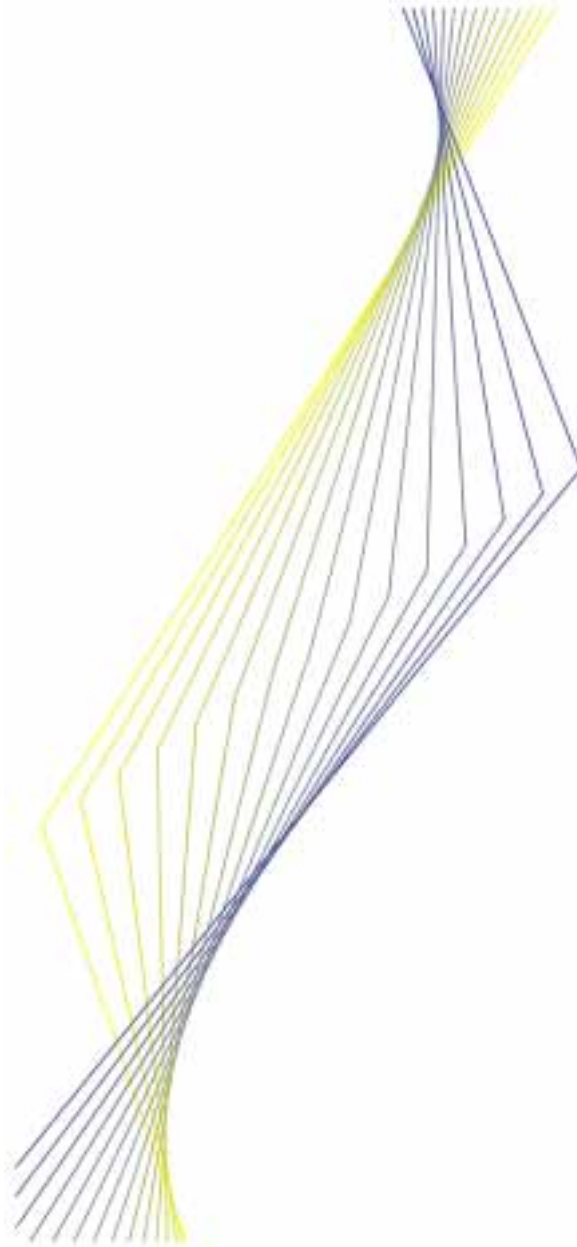
These securities accounts register the securities which are delivered to the Banco de España as collateral in credit operations.

The Banco de España makes use of the securities accounts in accordance with the legal instrument allowed in each system. Hence, the securities accounts in CADE, the SCLV-AIAF and SCL Barcelona can be used for repo transactions and pledging, whereas the securities accounts in the SCLV, SCL Bilbao and SCL Valencia are only used for pledging. In Spain, the formalities required for pledging marketable securities have been simplified. Thus, the securities registered in book-entry form benefit from a more straightforward procedure which does not require a signature in an official deed. In Spain, the pledger of the securities is, from a legal point of view, the owner of the securities and therefore the coupon payments are paid to the latter.

Apart from the aforementioned use, only the securities account in CADE registers securities held by the Banco de España which are a part of the portfolio within the context of the reserve management. However, the balance maintained for this purpose is not significant.



EUROPEAN CENTRAL BANK



**France**

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## List of abbreviations

AFB	French Banking Association – <i>Association Française des Banques</i>
AFEC	French Association of Credit Institutions – <i>Association Française des Établissements de Crédit</i>
AFECEI	French Association of Credit Institutions and Investment Firms – <i>Association Française des Établissements de Crédit et des Entreprises d'Investissement</i>
AFEI	French Investment Firms Association – <i>Association Française des Entreprises d'Investissement</i>
ASF	Finance Companies Association – <i>Association des Sociétés Financières</i>
BCC	Main clearing house known as Clearnet SBF SA – <i>Banque Centrale de Compensation</i>
CB	Banking Commission – <i>Commission Bancaire</i>
CCPs	Postal Cheque Centres – <i>Centres de Chèques Postaux</i>
CECEI	Credit Institutions and Investment Firms Committee – <i>Comité des Établissements de Crédit et des Entreprises d'Investissement</i>
CFONB	French Committee for Banking Organisation and Standardisation – <i>Comité Français d'Organisation et de Normalisation Bancaires</i>
CMF	Financial Markets Council – <i>Conseil des Marchés Financiers</i>
CNCT	National Credit and Securities Council – <i>Conseil National du Crédit et du Titre</i>
COB	French Stock Exchange Commission – <i>Commission des Opérations de Bourse</i>
CRBF	Banking and Financial Regulations Committee – <i>Comité de la Réglementation Bancaire et Financière</i>
CREICs	Regional centres for the exchange of truncated cheques – <i>Centres Régionaux d'Échange d'Images Chèques</i>
CRI	Centre for Interbank Funds Transfers – <i>Centrale des Règlements Interbancaires</i>
FCC	Central Cheque Register – <i>Fichier Central des Chèques</i>
FMC	Financial and Monetary Code – <i>Code Monétaire et Financier</i> , (implemented in December 2000, in which the most important financial acts have been enshrined)
FNCI	National Register of Irregular Cheques – <i>Fichier National des Chèques Irréguliers</i>
GCB	Bank Card Consortium – <i>Groupe Cartes Bancaires</i>
GSIT	Interbank automated clearing group – <i>Groupe pour un système interbancaire de télécompensation</i>
GUF	SWIFT Users Group in France – <i>Groupe des Utilisateurs SWIFT en France</i>
ISB	Interbrokers' sub-system – <i>Sous-système Inter-Sociétés de Bourse</i>
Matif	French financial futures market – <i>Marché à Terme International de France</i>
Monep	Paris traded options market – <i>Marché des Options Négociables de Paris</i>
NSC	New electronic trading system used by the French stock exchange since 1995 – <i>Nouveau Système de Cotation</i>
PLC	Automated intraday repo – <i>Pension Livrée Conservatoire</i>
PLI	Intraday repo – <i>Pension Livrée Intrajournalière</i>
PNS	Paris Net Settlement system
RCB	<i>Réseau Cartes Bancaires</i>
Relit	Securities DVP system – <i>Règlement-livraison de titres</i>
RGV	High-speed Relit system – <i>Relit Grande Vitesse</i>
SATURNE	An SSS operated by the Banque de France until July 1998 – <i>Système Automatisé de Traitement Unifié des Règlements de Créances Négociables</i>
SBI	Brokers'/intermediaries' sub-system – <i>Sous-système Sociétés de Bourse-Intermédiaires</i>
SEME	French banking consortium promoting an e-money product called MONEO – <i>Société Européenne de Monnaie Electronique</i>
SFPMEI	Special-purpose credit institution for issuing e-money – <i>Société Financière du Portemonnaie Electronique Interbancaire</i>
Sicovam SA	A French CSD and clearing authority – <i>Société Interprofessionnelle pour la Compensation des Valeurs Mobilières SA</i>
SIT	French automated clearing house – <i>Système Interbancaire de Télécompensation</i>
SLAB	Delivery by mutual consent sub-system – <i>Sous-système de Livraison par Accord Bilatéral</i>
SNP	Multilateral net settlement system – <i>Système Net Protégé</i> (former name of PNS)
TBF	RTGS system operated by the Banque de France – <i>Transferts Banque de France</i>
TIP	Interbank payment order – <i>Titre Interbancaire de Paiement</i>

## Introduction

A number of important reforms have been implemented in France over the past few years in the field of payment systems and SSSs. The main objectives of these reforms were to minimise the risks arising from interbank settlements, to limit as far as possible collateral requirements and to ensure the openness of the French systems within the context of Stage Three of EMU.

The French infrastructure for wholesale transactions is thus characterised by a common platform for settlement in central bank money, composed of three systems linked by real-time bridges:

- at the heart of this new organisation is the French RTGS system operated by the Banque de France (*Transferts Banque de France*; TBF) which came into operation in October 1997 and is now part of the TARGET system;
- in the field of SSSs, the high-speed Relit system (RGV) started up in February 1998. Thanks to its close link with the RTGS system and a sophisticated mechanism for self-collateralisation, the RGV provides for continuous intraday final DVP in central bank money; and

- launched in February 1997, the multilateral net settlement system (*Système Net Protégé*; SNP) was replaced by the Paris Net Settlement (PNS) system, which can be described as a hybrid settlement system inasmuch as it offers netting mechanisms while settling in real time and in central bank money.

In the field of retail payment media and systems, substantial changes are also under way with the aim of achieving the dematerialisation of interbank exchanges by 2002. There are currently three systems:

- cheque clearing houses, which process cheques in paper form;
- the regional centres for the exchange of truncated cheques (*Centres Régionaux d'Echange d'Images Chèques*; CREICs), which handle dematerialised cheques; and
- the French automated clearing house (*Système Interbancaire de Télécompensation*; SIT), through which all other retail payments are cleared.

The Banque de France has played a major role in these developments, since Article 4 of its new Statute, adopted in 1993, provides for a broad competence to ensure the smooth operation and security of payment systems.

## I Institutional aspects

### I.1 The general institutional framework

#### I.1.1 General legal aspects

##### I.1.1.1 Issuance of payment means

Banking activities and the conditions under which they are carried out in France are governed by Article L311-1 et seq. of the FMC, formerly known as the Banking Act of 24 January 1984. Only credit institutions, the Treasury, the Post Office, the public trustee office (*Caisse des Dépôts et Consignations*) and the Banque de France may conduct banking operations, including the issue and administration of payment means, as a regular part of their business. Without prejudice to the specific provisions applicable to them, the prohibition for any entity other than a credit institution to carry out banking operations on a regular basis does not apply to undertakings governed by the Insurance Code, reinsurance companies, investment service providers, bodies collecting contributions paid by employers to finance construction programmes under the Construction and Housing Code, or securitisation vehicles. This prohibition does not prevent an undertaking from issuing vouchers and cards for the purchase of a particular article or service from it.

The Second Banking Co-ordination Directive, including the principle of mutual recognition of banking licences, was transposed into French law by the Act of 16 July 1992 amending the 1984 Banking Act, while the Investment Services Directive recognising the free provision of investment services through the European passport was implemented by the Act of 2 July 1996.

##### I.1.1.2 Legal basis for payment and securities settlement systems

The Act of 31 December 1993 abolished the “zero hour” rule in payment systems by amending Article L330-1 of the FMC (formerly

Article 93-1 of the French Banking Act). Since the implementation of this provision, netting arrangements for payment systems are legally binding in the event of failure by a bank and the finality of payments in RTGS systems cannot be legally challenged, provided the systems comply with the legal definition of payment systems.<sup>1</sup>

The legal basis for collateral arrangements in payment and securities settlement systems is formed by Article L330-2 of the FMC (formerly Article 93-2 of the Banking Act), amended by the Act of 2 July 1998, which was intended to implement in advance some of the provisions of the Settlement Finality Directive (SFD).

This Article stipulates that regulations, master agreements or standardised agreements governing payment or multilateral settlement systems may provide for collateral arrangements in order to secure settlement within the system. The collateral eligible under the specific regime of Article 93-2 is widely defined (transfers of claims, securities, guarantees, etc.). The transfer of collateral is performed through a transfer of full ownership without any formal requirement to inform third parties and is enforceable despite the provisions of the Business Reorganisation and Bankruptcy Act 85-98.

<sup>1</sup> Article L 330-1-1 of the Monetary and Financial Code (previously Article 93-1 of the Banking Act) states that: “an interbank settlement system or a financial instrument settlement and delivery system shall mean a national or international procedure organising dealings between two or more parties that have the status of credit institutions, or institutions or companies referred to in Article 8 of this Act, of investment firms or clearing house members governed by the Financial Activity Modernisation Act 96-597 of 2 July 1996 or of non-resident institutions with comparable status, for the usual execution, whether or not this involves netting, of payment as well as, where financial instrument settlement and delivery systems are concerned, the delivery of financial instruments between said participants. This procedure must either have been instituted by a public authority or be governed by a master agreement complying with the general principles of a market-wide agreement or a standardised agreement. Where financial instrument settlement and delivery systems are concerned, this procedure must also have been approved by the Conseil des Marchés Financiers”.

The Act of 2 July 1998, now enshrined in Article L330-2 of the FMC, explicitly extended the protection against any “zero hour” provisions to SSSs (see Section 4.3.1).

#### *1.1.1.3 Legal basis for oversight functions*

The legislation adapting the Banque de France’s Statute to the provisions of the Maastricht Treaty states that “the Banque de France shall ensure the smooth operation and the security of payment systems within the framework of the tasks of the European System of Central Banks relating to the promotion of the smooth operation of payment systems” (Article 14-4 of the FMC, formerly Article 4 of Act 93-980 of 4 August 1993, as amended by Act 98-357 of 12 May 1998). This provision establishes payment systems oversight as an integral part of the Banque de France’s statutory tasks within the Eurosystem framework (see Section 1.2 of the euro area chapter).

## **1.2 The role of the Banque de France**

Payment systems oversight forms an integral part of the Banque de France’s statutory tasks. It performs its duty of ensuring “the smooth operation and the security of payment systems within the framework of the tasks of the European System of Central Banks relating to the promotion of the smooth operation of payment systems” through the provision of settlement services, the definition of recommendations and supportive action aimed at facilitating private sector initiatives contributing to a safe and efficient functioning of payment systems (see Section 1.2. of the euro area chapter).

For instance, in the field of interbank settlements, these three tools are used complementarily. Up to the launch of Monetary Union, they were used within the framework of a plan aimed at risk mitigation, especially for large-value transactions. This plan was presented by the Governor of the Banque de France in 1990. It was based on two key principles: intraday irrevocability of large-value payments through the introduction of an RTGS

system and the protection of the clearing systems used for the settlement of large-value transactions against the default of the largest debtor in those systems. As a member of the Eurosystem, the Banque de France now has recourse to these tools within the framework of the common oversight policy for the Eurosystem published by the ECB in June 2000.

Consequently, in 1995, the Banque de France and the French Association of Credit Institutions (AFEC) signed a draft agreement, which led to the creation in October 1997 of the Banque de France’s RTGS system, the TBF. In February 1997, the SNP, the net clearing system for large-value interbank transfers, was launched. Prior to its opening, the Banque de France ensured that the SNP complied with the so-called Lamfalussy standards, the minimum standards of protection defined by central banks for large-value clearing systems (see Section 1.2 of the euro area chapter).

In April 1999, the Banque de France agreed to act as settlement agent for a new net clearing system, the PNS, proposed by the Centre for Interbank Funds Transfers (CRI) which settles payments in central bank money on a continuous basis, ensuring that it complied with the Lamfalussy standards.

In the field of payment instruments, the Banque de France acts as a provider of general interest services to market participants (e.g. the provincial clearing houses) and ensures that payment media security does not become a problem in terms of undermining confidence in the payment systems.

For example, strong competition between banks in the area of electronic purses, where security is an important issue, prompted the Banque de France to encourage market players to formalise minimum functional security requirements (or a “protection profile”) for these products. This exercise involved IT security experts from the banking and smart card industries.

In this process, the policy of the Banque de France was to ensure a level playing-field between the

various projects, to achieve international recognition of the evaluation process and to require that skilled and independent centres conduct the evaluation.

All electronic purse providers in France have commissioned evaluations against the above-mentioned minimum functional security requirements for the trial and potential roll-out phases.

The role of the Banque de France as a service provider in the field of payment instruments relates to its responsibilities regarding two national registers which help to ensure the security of card and cheque payments.

As part of the prevention system established by Act 91-1382 – now enshrined in the FMC – of 30 December 1991 on cheque and payment card security, the Central Cheque Register (*Fichier Central des Chèques*; FCC) stores centralised information on cheque payment incidents and the resulting bank-imposed and court-ordered cheque-writing bans. Pursuant to an agreement, the Register keeps a central record of bank card confiscations by institutions belonging to the Bank Card Consortium (*Groupement Cartes Bancaires*; GCB). Access to this Register is restricted to credit institutions prior to the issuing of a cheque book, though they are also able to consult it before granting a loan.

The above-mentioned Act also states that anyone who receives a cheque in payment is entitled to obtain information from the Banque de France as to whether the cheque is regular. In order to provide this service, the Banque de France keeps a central record in the National Register of Irregular Cheques (*Fichier National des Chèques irréguliers*; FNCI) of all incidents affecting the regularity of cheques drawn on a bank account. These may include cheques stopped on account of loss or theft of cheque books, account closures and details of all accounts held by individuals or firms that have been banned from writing cheques. As authorised by a Decree of the Minister of the

Economy and Finance dated 24 July 1992, the Banque de France has delegated responsibility for implementing the procedures for consultation of the Register, especially by retailers, to a company called Mantis. This company provides a service allowing access to the Register operating under the name RESIST.

Pursuant to the Act of 2 July 1998, the statutory competence of the Banque de France in the field of payment systems oversight also explicitly covers SSSs. Well-designed and efficient SSSs are important for the stability of the financial system. One of the main functions of such systems is to ensure delivery of the collateral used in Eurosystem credit operations and DVP in large-value OTC transactions between intermediaries. The real-time processing of transactions executed via the RGV and final DVP meet the aim of ensuring the security and efficiency of SSSs.

### 1.3 The role of other private and public sector bodies

#### 1.3.1 Financial intermediaries allowed to provide payment services

Following the merger and consolidation process within the financial sector, there were 1,143 credit institutions conducting their business in France at the end of 1999, versus 1,608 in 1994. Of these, 254 were commercial banks licensed as all-purpose institutions to conduct a very wide range of activities; 176 were co-operative banks, savings banks (conventional or national) or municipal banks; 601 were finance companies (*sociétés financières*), which are not allowed to take deposits from the public for less than two years and the activities of which are restricted in accordance with their status; 24 were specialised financial institutions (*Institutions Financières Spécialisées*) entrusted by law with a permanent public interest mission (and unable to engage in banking operations other than those pertaining to that mission). Finally, there were 56 branches of credit institutions incorporated in the EEA and 32 branches of credit institutions incorporated in third countries.

The number of domestic branches of all credit institutions reached 25,501 at the end of 1999.

At the same time, 528 investment firms were conducting their business in France, including ten branches of investment firms incorporated in EEA countries.

The Post Office's financial arm plays a significant role in the French financial system as it holds a large proportion of sight accounts, most of which are held on the books of the Postal Cheque Centres (Centres de Chèques Postaux; CCPs), and of time accounts held with the National Savings Bank.

The Treasury's receiving and paying officers manage bank accounts (around 0.8 million) and carry out a number of banking operations. However, the Treasury has decided to stop this activity as from the end of 2001.

### 1.3.2 Representative bodies

Credit institutions and investment firms are collectively represented in their relations with the public authorities through a two-tier system:

- institutions that are not members of banking networks must belong to a professional association, such as the French Banking Association (Association Française des Banques; AFB) for banks, the Finance Companies Association (Association des Sociétés Financières; ASF) for finance companies and the French Investment Firms Association (Association Française des Entreprises d'Investissement; AFEI) for investment firms; and
- the central bodies of the banking networks and professional associations mentioned above are affiliated to the French Association of Credit Institutions and Investment Firms (Association Française des Etablissements de Crédit et des Entreprises d'Investissement; AFCEI), which represents all credit institutions and investment firms, provides information to its members and to the public,

studies all issues of common interest and prepares relevant recommendations.

### 1.3.3 Regulatory and supervisory authorities

The Banking and Financial Regulations Committee (Comité de la Réglementation Bancaire et Financière; CRBF) issues general rules and regulations applicable to credit institutions and investment service providers (including investment firms).

The Credit Institutions and Investment Firms Committee (Comité des Établissements de Crédit et des Entreprises d'Investissement; CECEI) is in charge of making all individual decisions concerning credit institutions and investment firms, in particular decisions concerning licences.

The Banking Commission (Commission Bancaire; CB), which is chaired by the Governor of the Banque de France, is responsible for supervising credit institutions and investment firms.

Other authorities such as the Financial Markets Council (Conseil des Marchés Financiers; CMF) and the French Stock Exchange Commission (Commission des opérations de Bourse; COB) have responsibilities regarding regulated markets and the establishment and monitoring of compliance with rules related to the provision of investment services and to securities markets (see Section 4.3.).

### 1.3.4 Other entities

The National Credit and Securities Council (Conseil National du Crédit et du Titre; CNCT) conducts studies regarding the conditions under which the banking and financial system operates. The CNCT is also a forum for wide-ranging consultation among the representatives of all parties involved in France's economic and financial sphere.

Several entities have been established to study, discuss and co-ordinate the development of the payment systems infrastructure, both in general

and in banking terms, as well as in terms of technical change and standardisation.

The French Committee for Banking Organisation and Standardisation (Comité Français d'Organisation et de Normalisation Bancaires; CFONB) has set up several working groups to study and promote the simplification of banking operations and the codification of methods and documents used by banks.

A number of economic interest groupings (Groupements d'Intérêts Economiques; GIE) also intervene in the field of payment systems, in particular the SWIFT Users Group in France (Groupement des Utilisateurs SWIFT en France; GUF), the interbank automated clearing group

(Groupement pour un système interbancaire de télécompensation; GSIT) and the GCB (see Section 2).

The Centre for Interbank Funds Transfers (Centrale des Règlements Interbancaires; CRI) is a form of limited company called a Société par actions simplifiée (SAS) under French law, which is currently owned by nine credit institutions and the Banque de France. The CRI plays three different roles: its first purpose is to act as a forum for studying issues in the field of large-value payment systems; it is also the operator of the single platform carrying SWIFT messages for both TBF and PNS (see Section 3); and lastly, it owns and operates the PNS system (see Section 3.3).

## 2 Payment media used by non-banks

### 2.1 Cash payments

Both banknotes and coins are legal tender. At the end of 1999, there were five denominations of banknotes (FRF 20, 50, 100, 200 and 500) and ten denominations of coins (5, 10, 20 and 50 centimes and FRF 1, 2, 5, 10, 20 and 100) in circulation.

Cash in circulation accounted for 12.9% of the monetary aggregate M1 at the end of 1999.

### 2.2 Non-cash payments

#### 2.2.1 Credit transfers

With 1,390 billion operations exchanged in French payment systems in 1999, averaging a value of €55,700, credit transfers rank third behind cheques and card payments in terms of the number of transactions. They account for 15.5% of exchanges of bank and postal transfers.

This instrument is used for payments made by companies, government agencies and local authorities, but seldom by individuals.

The interbank exchange of all credit transfers now takes place in paperless form. Ordinary transfers are settled on the day of presentation, while credit transfers for payment on a due date (which remain rare) are presented two or three days in advance of interbank settlement.

Various types of automated transfers were introduced in 1993 to meet specific needs. Referenced credit transfers (*Virement Référéncé*; VR) are initiated through a home banking service in settlement of an invoice and contain all the references of the creditor. Credit transfers from abroad (*Virement d'Origine Extérieure*; VOE) enable a bank established in France to send a transfer received from abroad via SIT to the payee's bank, along with the information needed by the payee, such as the exchange rate applied and the commission charged. Lastly, credit transfers by electronic data interchange (*Virement Echange de Données Informatisées*; VEDI) contain message references in EDIFACT format.

## 2.2.2 Cheques

The cheque is still the most widely used payment instrument in France. Approximately 3.68 million cheques, with an average value of €529, were exchanged in payment systems in 1999, representing 41% of total exchanges. However, the relative share of cheques in cashless payments has continued to decline steadily since 1993.

Cheques are still popular because customers consider them easy to use, either for remote payments or face-to-face transactions, and they are free of charge for the drawer.

## 2.2.3 Direct debits

Since their introduction in 1967, direct debits have been very successful: over 1.2 billion such transactions were exchanged in French payment systems in 1999, with an average value of €214. They are generally used for recurrent payments such as electricity, gas, telephone and water bill payments, and for monthly income tax payments. Direct debits offer advantages to banks (processing costs are relatively low thanks to automation), as well as to the utility companies (by simplifying their accounting administration) and to individuals (by simplifying the payment).

Initiators of direct debits must be approved by a bank. They must also obtain signed authorisation from the payer, which is then sent to the payer's bank. Before transmitting the direct debit order to its bank for collection, the initiator must notify the payer of the amount and date of the debit (by sending an invoice, for example) to enable the latter to make sure there are sufficient funds on its account or to contest the order if it so wishes.

Use of the interbank payment order (*Titre Interbancaire de Paiement*; TIP) has grown steadily since its introduction in 1988. It now represents more than 130 million operations per year, with an average value of €288. A TIP works in the same way as a direct debit, except the payer is required to assent to each payment

by signing the TIP form which is sent with the corresponding invoice, as with a cheque.

The TIP allows creditors to rationalise and optimise the collection of receivables and banks are able to process them automatically at one of the 13 centres approved by the CFONB before they are exchanged via SIT. The TIP is expected to gradually replace most recurrent remote payments made by cheque.

## 2.2.4 Card payments

### Debit cards

Bank cards are mostly debit cards, which can be used to execute both payments and cash withdrawals through a nationwide network of POS terminals and ATMs.

Debit card payments ranked second behind cheques in terms of the number of transactions in 1999, with 2.4 billion operations being exchanged at an average value of €46.

The cards issued by credit institutions have to meet the technical and security standards set by the GCB. The interoperability of bank cards facilitated by these standards has been the main driving force behind the development of debit cards in France.

There were 37.6 million interbank cards (*cartes bancaires*; CB) in circulation at the end of 1999. Approximately 26 million of these also allow payment to be made abroad (to retailers affiliated to either Visa or Eurocard/MasterCard).

For several years, cards have been systematically equipped with a microprocessor, resulting in an exceptionally low level of card fraud (0.02% of the value of transactions in 1999).

A specific network, the *Réseau Cartes Bancaires* (RCB), is used for the transmission of authorisations for withdrawals and payments. This real-time network enables an ATM or a POS terminal to obtain authorisation from the bank which has issued the card. This authorisation



also means that the payment is guaranteed for the beneficiary.

Card transactions have been processed through SIT (see Section 3.4.1) since the second half of 1995.

#### *Credit cards, travel and entertainment cards*

In previous years, these cards were only issued by bodies which did not, in principle, take deposits, but which were required to have credit institution status in France in accordance with the 1984 Banking Act. Recently, deposit banks have started to issue credit cards, in addition to debit cards.

#### *Retailer cards*

An estimated 20 million cards are issued by retailers or service providers in order to secure customer loyalty and, in some cases, grant credit facilities. The credit is repaid by debiting the customer's bank account. However, once such cards are used to obtain credit, or whenever they can be used at outlets other than the issuer's own, the card must be issued by a credit institution, even though the retailer's name generally features prominently on the card.

#### *ATM and POS networks*

By the end of 1999, 32,500 ATMs had been installed nationwide. In addition to these, there were 718,000 POS terminals in operation. Both ATMs and POS terminals are interoperable.

### **2.2.5 Postal instruments**

Postal instruments are identical to the instruments used by the banks, except for the postal cheque which can also be used as a postal giro.

### **2.2.6 Other payment instruments**

Bills of exchange now play a relatively limited role, with companies preferring credit transfers. Approximately 121 million transactions involving other payment instruments were exchanged in 1999, with an average value of €3,665.

## **2.3 Recent developments**

### *Electronic money*

Three banking consortia were created at the end of the 1990s, each of them promoting competing electronic purses with a specific technology and different market approach:

- Modeus consists of four banking groups, the French national railway company (SNCF) and the Paris transport network (RATP). The product, developed by the RATP, is a multi-application smart card with a ticketing application, along with an electronic purse intended to be universally accepted. The interface with the accepting devices is contactless. The pilot phase was launched in 1999 in the area surrounding a major railway and subway station in Paris.
- Société Européenne de Monnaie Électronique (SEME) comprises seven banks promoting a product called MONEO. The technology used by SEME is based on the German *GeldKarte* scheme, although some specific features have been added, notably an offline loading facility at the point of sale. The MONEO product is a multi-application smart card which incorporates the traditional French debit card application along with an e-purse application. The pilot phase was launched in the city of Tours in 1999.
- Groupe Crédit Mutuel has created a special-purpose company called MONDEX France to buy and operate the licence for the MONDEX International technology for the French territory in euro. The MONDEX system has the following features: a single issuer provides electronic value to members which distribute and acquire it; purse-to-purse transfers are technically feasible between all actors regardless of their status (customers, retailers, banks). The main differences between Crédit Mutuel's project and MONDEX's global principles are that a

fraud detection model based on the activity of individual purses has been added and purse-to-purse transfers have been limited to customers within the same family. The pilot phase was launched in Strasbourg in 1999.

All 11 banks participating in these three consortia are committed to the convergence or the interoperability of the schemes after the trials and have agreed upon a single electronic money issuer, a special-purpose credit institution called the Société Financière du Porte-monnaie Électronique Interbancaire (SFPMEI). The role of

the SFPMEI is to issue electronic money and to collect as well as manage funds received in the course of the issuing process. The SFPMEI also defines the security requirements (technical and organisational) for the schemes and makes sure that they comply with these requirements on an ongoing basis. It guarantees all e-money holders the redemption of their electronic value.

By means of this sole issuance structure, the banks reduce costs and also share the necessary security expertise, while competing on tariff structures and service packages.

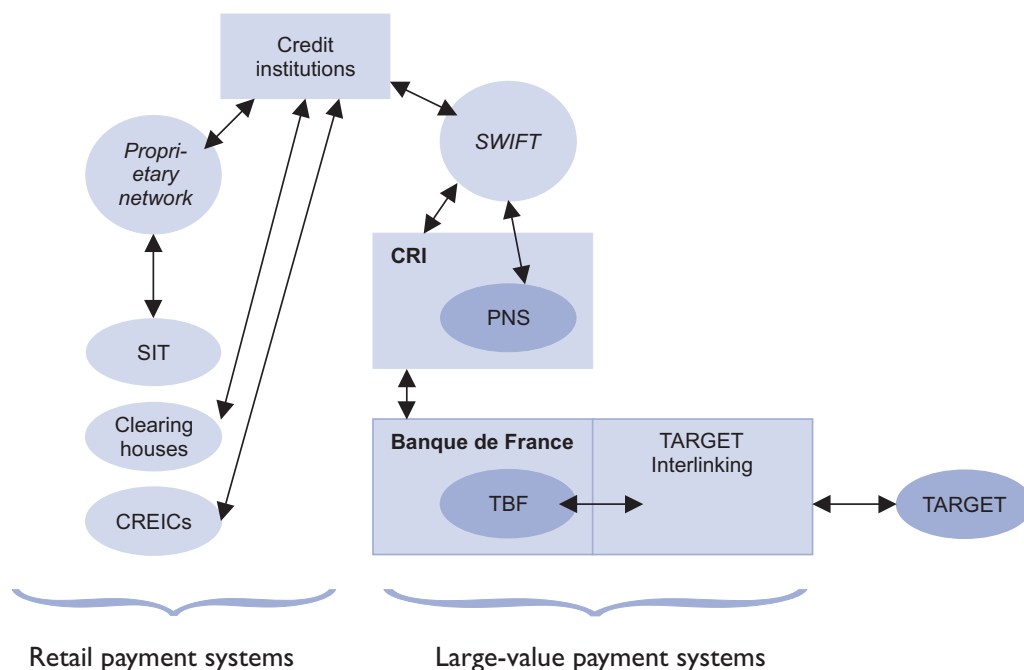
### 3 Interbank exchange and settlement systems

#### 3.1 General overview

The current structure of the French payment systems (excluding SSSs) consists of three retail payment systems and two large-value payment systems:

The retail systems operating in France are:

- the Paris and provincial clearing houses (the *Chambre de compensation des banquiers de Paris* and the *Chambres de compensation de province*) for paper cheques;



- the CREIC regional centres for the exchange of truncated cheques; and
- the French automated clearing house, SIT.

SIT and the Paris clearing house are managed and operated by the GSIT and by a group of banks respectively. The other retail systems are managed and operated by the Banque de France.

Large-value operations are processed in two systems:

- the RTGS system, i.e. the TBF, which is the French component of TARGET, managed and operated by the Banque de France; and
- the hybrid system PNS, managed and operated by the *Centrale des règlements interbancaires* (CRI), an interbank body owned by ten banks.

In the TBF and the PNS, settlement takes place operation by operation, while in the other payment systems, the balances resulting from a business day's operations are settled on a net basis through the accounts held by participants in the TBF.

### 3.2 The French real-time gross settlement system: *Transferts Banque de France*

The French RTGS system, TBF, started operating in French francs on 27 October 1997 and switched to the euro at the launch of TARGET on 4 January 1999. The Banque de France manages the account relationship with TBF participants and the operation of the TBF system, while the CRI ensures the routing and validation of payment and information messages exchanged within the system.

#### 3.2.1 Operating rules

Like the other RTGS systems connected to TARGET, the TBF complies with the minimum common features set forth in the TARGET Guideline (see Section 3.1.1 of the euro area chapter).

Additional rules related to the service level, accounting structure, liquidity provision, pricing policy and the respective liabilities of participants and the Banque de France as system operator are set forth in the agreement signed by each TBF participant (see Section 3.2.2).

#### 3.2.2 Participation in the system

The TBF system is open to:

- credit institutions incorporated or established in France;
- institutions governed by Article L518 of the FMC (formerly Article 8 of the 1984 Banking Act) (public sector financial institutions);
- investment firms incorporated or established in France, provided that they are licensed for activities requiring direct access to an RTGS system and authorised to be a custodian on behalf of customers;
- credit institutions incorporated in an EEA country and benefiting from the European passport;
- investment firms incorporated in an EEA country and benefiting from the European passport, provided that they are licensed for activities requiring direct access to an RTGS system; and
- branches established in an EEA country of credit institutions incorporated in third countries.

By the end of 1999, 270 institutions were participating in the TBF.

Participants are obliged to sign an agreement with the Banque de France. This agreement sets out the rules governing the relationship between the holder of a TBF settlement account and the Banque de France.

Furthermore, each settlement account belongs to a group of accounts, which may consist of a single or several settlement accounts. The balance on a group of accounts must always be positive. Hence, negative balances on a participant's settlement account must be guaranteed by positive balances on other settlement accounts belonging to the same group of accounts. The grouping of settlement accounts is left up to the participants, within the framework of the following rules:

- a participant must hold all its settlement accounts within one single group of accounts; and
- within a group of accounts, all settlement accounts must be held by entities belonging to the same banking group.

The constitution of a group of accounts is subject to a formal agreement between the Banque de France, the holder of the group of accounts and the holders of all settlement accounts within this group of accounts.

Finally, an applicant's technical ability to operate in the system must be positively assessed by the CRI against a set of specific criteria, such as the ability to send correctly formatted payment messages and information requests, the existence of a database recording all operations and the ability to fall back on a remote backup site in the event of an incident on the primary site.

A participant may leave the system the event by giving 40 days' notice. Furthermore, the Banque de France may exclude a participant from the system without giving any notice if it no longer meets the statutory criteria, or if its financial situation or behaviour is deemed to jeopardise the system's security and efficiency.

### 3.2.3 Types of transaction handled

The use of the TBF is mandatory for the settlement of monetary policy transactions and for the settlement of end-of-day balances of

ancillary systems (the RGV and Relit SSSs, the PNS large-value hybrid system, the stock exchange clearing systems and the retail systems). It is also used for domestic and cross-border interbank and customer operations. As the PNS system and the SSS RGV function in real time and in central bank money, TBF also handles real-time liquidity transfers to and from these systems.

Interbank and customer payments can only be originated by the holder of the debited account, with the exception of the Banque de France which can originate operations by debiting other participants. Payments may not be cancelled once transmitted to the system, but the holder of the credited account may transfer them back once settled on the basis of a cancellation request.

TBF participants can issue time-designated payments by specifying the time of day at which they want their payment to be checked for settlement.

### 3.2.4 Operation of the system

The TBF is open every day except Saturday, Sunday and TARGET closing days (see Section 3.1.4 of the euro area chapter). Its operating hours are from 7 a.m. to 6 p.m. C.E.T.

In addition, the TBF provides for an adjustment period between 6 p.m. and 6.45 p.m. C.E.T. First, it closes to new transactions and rejects those still pending in queues. Then, each participant receives a notification of its balance(s) on the account(s) it holds. From the re-opening of the TBF at 6.15 p.m. until the definitive statement of accounts at 6.45 p.m. C.E.T., participants have the opportunity to even out their settlement account balances if necessary. To this end, they may either transfer funds between settlement accounts held within the same group of accounts or exceptionally send payments to other participants which have not totally reimbursed their intraday credit.

### 3.2.5 Transaction processing environment

The TBF uses the SWIFT network and message formats (MT 202 for interbank payments and MT 100 for customer payments). The MT103/MT 103 STP message types were implemented from November 2000 onwards.

SWIFT class 9 message types are also used to convey information and requests concerning account balances, the announcement of central bank operations and settlement of ancillary systems, and system management (e.g. start and end of the day, incident on a TARGET component).

Payment messages are processed using a Y-shaped message flow structure. When a participant issues a TBF payment message, SWIFT forwards an extract of the payment message to the CRI technical platform, which transmits it to the TBF. After checking the extract against settlement criteria, the TBF sends back a notification which bears one of the following status readings: executed, queued or rejected. This notification is forwarded to sending and receiving participants; simultaneously, the original payment message is sent to the receiver, if executed, or returned to the sender, if rejected.

The TBF's processing functions and data are replicated on a remote site for business continuity purposes.

### 3.2.6 Settlement procedures

#### *Standard settlement*

As in other RTGS systems, TBF payments are processed one by one on a continuous basis. Payments are settled with immediate finality in central bank money provided that they meet the following settlement criteria:

- the balance on the group of accounts to which the debited settlement account belongs must exceed the amount of the payment;

- a standard priority payment can settle only if there is no payment in the outgoing high priority queue of the group of accounts; and
- a new standard priority (or high priority) payment can settle immediately only if the standard priority (or high priority) queue of the group of accounts is empty.

Payments that do not meet one of these criteria are queued and subject to further settlement attempts. The TBF manages two queues:

- a high priority queue for monetary policy operations, end-of-day settlement of ancillary systems and cancellation requests; and
- a standard priority queue for other transfers.

When a payment is credited to a participant's account, the system attempts to settle payments queued in its group of accounts, according to its balance and on a FIFO basis within each priority level.

Time-designated payments are processed in the same way as other payments, but they are tested against settlement criteria at the time specified by the sender and not immediately after issuance. Account balances and queues are considered at the level of groups of accounts. A participant's balance is the sum of the balances on all the settlement accounts belonging to the same group of accounts and its queue consists of payments sent by it and other participants belonging to the same group that have not been settled. Participants can transfer funds freely from one settlement account to another within the same group of accounts, regardless of this group of accounts' balance and queues.

#### *TARGET payments*

Outgoing TARGET payments are processed in two stages. They are first processed like standard domestic payments: if the settlement criteria are

met, the TBF debits the sending bank's account and credits a specific settlement account (the Banque de France holds one settlement account per country connected to TARGET). Once this payment is executed, the Banque de France's TARGET platform issues a settlement request to the NCB holding the beneficiary account, using the standard Interlinking procedures (see Section 3.1.6 of the euro area chapter). With regard to incoming cross-border payments, once the Banque de France's TARGET platform receives the settlement request from the sender NCB, the Banque de France's settlement account for this NCB is debited and the beneficiary bank's account is credited.

#### *End-of-day settlement of ancillary systems*

The end-of-day settlement cycle for ancillary systems begins with a confirmation period so that participants have time to check the balances announced by the ancillary system and, if necessary, raise the funds needed to cover their debits. In the event that a participant does not agree with its end-of-day balance, the ancillary system manager must investigate and, should an agreement not be found by the end of the confirmation period, the end-of-day balances arising from the ancillary system must be reissued to the TBF as soon as possible after reconciliation.

Thereafter, settlement occurs either independently for each participant if all balances are held vis-à-vis a central counterparty, or on an "all or nothing" basis if each participant's balance is the sum of its debits and credits vis-à-vis all the other participants in the system. In the latter case, the end-of-day settlement routine checks that all negative balances in the ancillary system can settle simultaneously according to the settlement criteria. If this is not the case, the whole system is queued and is subject to further settlement attempts during its settlement period.

#### *Optimisation mechanisms*

The TBF runs two optimisation mechanisms:

- **Global optimisation:** when a payment is queued, the system computes a virtual balance for each group of accounts, which is the sum of the actual balance and incoming/outgoing queued payments for this group of accounts. If all virtual balances are positive, all queued payments are settled. Otherwise the system makes the same attempt, but considers only "high priority" virtual balances (sum of actual balance and incoming/outgoing high priority queued payments); if these virtual balances are all positive, all high priority payments are settled.
- **Simulation of ancillary systems:** this process is launched every 210 seconds when there are one or several multilateral ancillary systems pending in queues. For each group of accounts, the system computes a virtual amount of liquidity, which is the sum of the actual balance and positive balances in queued ancillary systems. The system then scans through the outgoing queues of each group of accounts and checks which operations could be settled with the virtual liquidity. This process is iterative, because the operations for which the settlement is simulated are credited to other groups of accounts, which in turn allows for the simulated settlement of operations pending in their queues. If there are no other ancillary systems pending in queues at the end of the process, all simulated operations are settled, otherwise balances and queues return to their initial situation.

#### **3.2.7 Credit and liquidity risk**

As in other RTGS systems, the TBF settlement occurs in central bank money and with immediate finality. The debiting of the sending bank's account and crediting of the receiving

bank's account occur simultaneously, so that funds are available to the latter bank in an unconditional and irrevocable manner as soon as the payment is settled. Thus, participants are not exposed to credit and liquidity risks.

The provision of liquidity in the TBF fully complies with the framework defined at the Eurosystem level (see Section 3.1.7 of the euro area chapter), which aims to provide unlimited and free-of-charge collateralised credit to RTGS participants in order to ensure the smooth processing of payments. TBF participants can obtain liquidity either through intraday repos or by using intraday secured loans. This latter mechanism allows banks to obtain intraday credit in exchange for the transfer of good quality private claims to the Banque de France.

### 3.2.8. Pricing

The pricing for the TBF consists of an annual fee and a transaction fee. The transaction fee is the same for all participants, regardless of the volumes they process through the system. The annual fee covers access to both the TBF and the PNS and depends on the number of settlement accounts held within the TBF group of accounts to which the participant belongs. Furthermore, new participants in the system are obliged to pay an entry fee.

### 3.2.9 Statistics

In 1999, a monthly average of 73,000 cross-border transfers and 117,000 domestic payments were issued in the TBF. The daily transaction volumes amounted to 1,200 for the cross-border component and 4,300 for the domestic component, while the daily values were €55 billion and €200 billion respectively. The historical peaks in volume are 7,700 for cross-border payments and 12,400 for domestic payments, and the highest turnovers were €148 billion and €318 billion respectively.

## 3.3 The French large-value payment system: Paris Net Settlement

The Paris Net Settlement (PNS) went live on 19 April 1999 and replaced the SNP, which had been operating since 1997. It is operated and managed by the CRI.

The PNS, which settles in central bank money, can be defined as a hybrid settlement system as it offers netting mechanisms, while transactions are settled in real time.

### 3.3.1 Operating rules

The PNS system is open every day except Saturday, Sunday and TARGET closing days. Its operating hours are from 8 a.m. to 4 p.m. C.E.T.

In order to feed liquidity in central bank money into the system, PNS participants are committed to making a transfer from their TBF settlement account to their position in the PNS at the opening of the system. The minimum amount of this initial transfer is €15 million.

When the system closes at 4 p.m., payments still pending in queues are rejected and the balances of PNS participants are transferred to their TBF settlement accounts. Because PNS payments can only be settled if the debited participant's liquidity is sufficient, balances in the PNS are structurally positive and the end-of-day settlement in the TBF always results in credits to the participants' settlement accounts.

### 3.3.2 Participation in the system

The PNS is open to the same categories of institutions as the TBF (see Section 3.2.2). In 1999, 25 credit institutions were participating in the PNS.

Participants must sign an agreement with the CRI and also with the Banque de France. The latter agreement governs the rules for the settlement account which a participant holds with the Banque de France in order to fund its PNS position with central bank money.

An applicant's technical ability to operate in the system must be positively assessed by the CRI against a set of specific criteria, such as the ability to send correctly formatted payment messages and information requests, the existence of a database recording all operations and the ability to fall back on a remote backup site in the event of an incident on the primary site.

The withdrawal and exclusion of participants follow the same rules and criteria as for the TBF (see Section 3.2.2).

### 3.3.3 Types of transaction handled

The PNS is a credit transfer system, which means that payments can only be issued by the holder of the debited account. It processes customer and interbank payments, as well as liquidity transfers to and from the TBF. The value of payments processed is not subject to upper or lower limits.

### 3.3.4 Transaction processing environment

The PNS operates in an environment similar to that of the TBF (see Section 3.2.5). It uses the SWIFT network and message formats and the Y-shaped message flow structure.

The PNS has a real-time link with the TBF to allow the processing of liquidity transfers between the two systems. A participant wishing to move liquidity from the PNS to the TBF must send a PNS payment to the account that the Banque de France holds in the system; once settled, this payment automatically triggers a TBF transfer from the Banque de France's PNS settlement account to this participant. Conversely, a TBF-to-PNS transfer consists of two steps: a TBF payment from the participant to the Banque de France's PNS settlement account, which, once settled triggers a PNS payment from the Banque de France to the participant.

PNS processing functions and data are replicated on a remote site for business continuity purposes.

### 3.3.5 Settlement procedures

PNS payments are processed one by one on a continuous basis. Each transaction which meets the following settlement criteria is settled immediately:

- the balance on the sender's account must exceed the amount of the payment;
- the balance of exchanges between sender and receiver must stay within the bilateral limit defined by the sender vis-à-vis the receiver; and
- there must be no other payment pending in the participant's queue.

In the event that these criteria are not fulfilled, the transaction is queued. Like the TBF, the PNS permanently scans queues: when a payment is credited to a participant's account, the system attempts to settle payments queued on its account, according to its balance and on a FIFO basis.

The PNS runs two optimisation mechanisms:

- **Bilateral optimisation:** each time a payment from A to B is queued, the system scans queued payments from A to B and from B to A and attempts to settle them simultaneously on a FIFO basis and according to both participants' balances and bilateral limits.
- **Global optimisation:** this process is launched upon a decision by the CRI. First, all payments which would cause bilateral limits to be exceeded are virtually removed from the queues and transitory balances are computed (as the sum of real balances and queued payments which have not been virtually removed). Then, queued payments are virtually removed from the queue of the participant with the transitory balance which is the most negative, until it becomes positive. The same process is applied in an iterative way until all transitory balances are positive. Finally, all



payments which have not been removed from the queue are settled and other payments are queued again in their previous order.

### 3.3.6 Risk management features

PNS's main feature in terms of risk mitigation is its scheme of irrevocable settlement in central bank money.

Furthermore, the PNS offers two types of caps, both of which are fully under the control of the participants and enable them to control their liquidity and credit risks:

- a multilateral cap: by controlling the amount of liquidity fed into the PNS via the real-time link with the TBF, a participant can in practice set a multilateral limit, i.e. define the maximum amount it is ready to pay to its counterparties before receiving payments from them.
- a bilateral cap: participants may set bilateral limits vis-à-vis each other. A bilateral limit set by A vis-à-vis B represents the maximum amount A is ready to pay to B before receiving money from the latter, and thus allows counterparty risk to be controlled. It also acts as a self-regulation mechanism, which encourages participants to bring sufficient liquidity into the system. Indeed, participants which do not provide enough liquidity for the settlement of their operations could be assigned low caps by their counterparties. Such caps would in turn prevent them from receiving payments due to them from the settlement process.

### 3.3.7 Pricing

The pricing principles are the same for the PNS as for the TBF (see Section 3.2.8), although the transaction fee differs between the two systems.

### 3.3.8 Statistics

In 1999, the PNS processed a monthly average of 422,000 payments. The daily turnover was 19,400 payments with a value of €93 billion. The maximum number of payments processed in one day is 33,500 and the highest daily value amounts to more than €152 billion.

## 3.4 Retail payment systems

### 3.4.1 Electronic payment instruments

#### 3.4.1.1 The French automated clearing house:

*Système Interbancaire de Télécompensation*

The *Système Interbancaire de Télécompensation* (SIT) is designed to allow the exchange of all electronic retail payment instruments. The system is a remote transmission network providing direct bilateral links between credit institutions' computing centres under the supervision of joint centres.

The system was implemented by an interbank automated clearing group called the GSIT formed in June 1983. The Banque de France is a member of the GSIT and its decision-making and research bodies.

Almost 6 billion transactions were processed by SIT in 1999, with a value of €2,370 billion.

#### 3.4.1.1.1 Operating rules

The operations of the system are ruled by an interbank agreement governing the exchange conditions (*Charte Interbancaire Régissant les Conditions d'Echange*; CIRCE) which is binding on all the participants.

SIT consists of a network of computers, called stations, located on each participant's premises. Stations must be approved by the GSIT and are dedicated to SIT when connected to the network.

During the working day, all direct participants are committed to receiving the interbank operations addressed to them. Direct participants are financially liable for their own operations and

those of the institutions they represent. They have to comply with minimum volume requirements set by the Board of the GSIT.

The smooth operation of the SIT network and the traffic flow are continuously monitored by a management centre. This centre also monitors security, detecting incidents and automatically re-routing transactions.

An accounting centre keeps transaction records up to date, supplying the requisite data for daily clearing. It transmits the netted multilateral balances to the TBF for settlement.

#### *3.4.1.1.2 Participation*

All banks sending or receiving payments eligible for SIT must participate in the system as either direct or indirect participants:

- direct participants must send and receive, for their own account, a certain percentage of the volume exchanged annually via SIT. The responsibilities of direct participants are both financial and technical and extend to the institutions they represent. There were 19 direct participants at the end of 1999; and
- indirect participants send and receive payments via a direct participant.

#### *3.4.1.1.3 Types of transaction handled*

SIT handles all retail payments between banks excluding cheques (e.g. credit transfers, direct debits and card payments).

Exchanges through SIT continue to be denominated in French francs. Transactions initiated in euro are converted by the sending bank and assigned a special index to inform the receiving parties. SIT will change over to the euro in February 2002.

#### *3.4.1.1.4 Operation of the system*

SIT operates 21 hours a day from Monday to Saturday. SIT working days start at 12 midnight and end at 9 p.m. The cut-off time for same-day settlement is 2.30 p.m. for exchanges up to 1.30 p.m. For payments sent after the cut-off, balances are transferred to the next day.

The acknowledgement of payment transactions between a sending and a receiving credit institution automatically triggers the transmission of an accounting message from the sending party to the SIT accounting centre, which calculates the daily clearing balances to be forwarded to the Banque de France for settlement in the TBF.

#### *3.4.1.1.5 Technical environment*

Each direct participant has one or more processing centres, where a dedicated terminal serves as an access point to SIT. The terminals are connected to all of the joint centres (administration, accounting and backup). Each terminal comprises two kinds of logical units, the SI (Sending Installation) and the RI (Receiving Installation), which communicate with those of SIT and the other participants.

The SIT joint centres, which provide full backup, perform the following specific functions: monitoring the network, controlling the flow of operations, maintaining software consistency and security, accounting and computing balances, and providing the final backup for receiving institutions. The network is designed to support 250 terminals. Data are transferred via the TRANSPAC public packet-switching network.

#### *3.4.1.1.6 Settlement procedures*

SIT balances are calculated after the cut-off (2.30 p.m.) and net balances for debiting and crediting to the accounts of direct participants are then transmitted to the CRI to be settled in the TBF at 3.15 p.m.

#### 3.4.1.1.7 Pricing

The pricing of the system is based on fixed fees according to the type of membership (direct or indirect) and the number of gateways and stations, and variable fees according to the number of operations exchanged (number of operations and groups of operations).

#### 3.4.1.1.8 Credit and liquidity risk management

At present, SIT has an unwinding rule in the event of the failure of a direct participant. A guarantee fund is under consideration.

#### 3.4.1.1.9 Projects under development

Banks have decided that, by 2002, all cheques will be truncated and exchanged through SIT resulting in an increase in the volume of operations.

#### 3.4.1.2 Regional centres for the exchange of truncated cheques

The regional centres for the exchange of truncated cheques (*Centres Régionaux d'Echange d'Image-Chèques*; CREICs) are located in nine major cities (Bordeaux, Lille, Lyons, Marseilles, Metz, Nantes, Rennes, Strasbourg and Toulouse). Managed by the Banque de France, they allow their members to exchange cheque data via magnetic media or electronic file transfer, without the physical exchange of the cheque forms, which are retained by the presenting institution.

Apart from the Banque de France and the Post Office, only institutions with a regional or local structure currently belong to these centres. In 1999, 303 million cheques were exchanged through these centres, representing around 8.2% of the cheques exchanged via interbank channels.

##### 3.4.1.2.1 Operating rules

The rules are agreed upon locally and are described in a pro forma agreement signed by the institutions wishing to take part in the system.

Members are committed to conducting the following operations:

- verifying that the cheque complies with legislation concerning cheques and regulations on banking practice;
- ensuring the accuracy of the information transmitted;
- storing the cheque or an exact copy thereof; and
- providing upon request a copy for ten years following the exchange date.

The current operating rules state that the rejection of a truncated cheque is equivalent in all cases to requiring the physical presentation of the cheque through a clearing house. A decision not to honour a cheque may be taken only after the physical form has been seen. A rejection has to be made within six days. Requests to see a cheque are made via magnetic media and must be answered within five working days by providing a copy of the front and back of the cheque.

##### 3.4.1.2.2 Participation

Members must be authorised drawee institutions agreeing to receive truncated cheques drawn on accounts at any of their branches. In addition to the Banque de France and the Post Office, eight banks were participating in the CREICs at the end of 1999.

##### 3.4.1.2.3 Types of transaction handled

Each participant may deliver magnetic tapes or send files via teletransmission containing the truncated cheque images, rejections and sight requests.

Except where a bilateral agreement provides otherwise, the value of an individual cheque may not exceed FRF 5,000 (€762).

#### 3.4.1.2.4 Operation of the system

When an institution receives a cheque for payment drawn on a CREIC member bank, it makes a record of the cheque, including the magnetic line and its amount, and then stores the physical form. The transactions recorded on magnetic tape or, in some cases, transmitted as electronic files, are presented for clearing. Clearing takes place under the responsibility of the administrator at around midday on each cheque clearing day of the area served by the CREICs.

#### 3.4.1.2.5 Technical environment

The software is provided by the Banque de France, which is the sole owner of the source code. Various local computers are used to process the clearing.

#### 3.4.1.2.6 Settlement procedures

As provided for in the relevant agreements, participants may choose to have transactions settled either on the business day following the session when the instruments were exchanged, or one or two days later, depending on whether or not the cheques are payable locally.

At the end of the clearing process, multilateral net balances are calculated. The settlement of net balances, consolidated with balances from non-automated clearing houses, takes place in the TBF.

#### 3.4.1.2.7 Pricing

The Banque de France, as administrator of the CREICs, passes operating costs on to members in proportion to the number of truncated cheques drawn on them, the number of rejections and the number of sight requests presented by them.

#### 3.4.1.2.8 Projects under development

The CREICs will close down in 2002, as banks will exchange truncated cheques through SIT (see Section 3.4.1.1.8).

### 3.4.2 Paper cheques

#### 3.4.2.1 Provincial clearing houses

There are 103 clearing houses located outside Paris:

- 102 provincial clearing houses are placed under the authority of the Banque de France and operate on its premises; these are located in the capitals of the French administrative departments and in ten other cities; and
- the clearing house of the Principality of Monaco, which operates under the authority of a local private bank.

In 1999, 2,700 million transactions were processed, with a total value of € 1,089 billion.

##### 3.4.2.1.1 Operating rules

Under the terms of various regulations and agreements, cheques must be presented to a specified clearing house, depending on where the paying bank is located. However, a specific procedure called the "outside-area cheque exchange agreement" has been in operation since 1984: the presenting bank may exchange outside-area cheques at the clearing house of its choice, irrespective of the place of payment. This procedure allows cheques to be presented for collection as close as possible to their place of encashment. It leaves the drawee institution free to choose the optimum method for routing cheques to the paying branch, particularly by eliminating the internal circulation of cheque forms.

##### 3.4.2.1.2 Participation

All institutions on which cheques are drawn are bound by regulations to participate in the clearing houses, either directly or indirectly.

##### 3.4.2.1.3 Types of transaction handled

Only cheques and their rejections are now exchanged in paper form through the clearing houses.

#### 3.4.2.1.4 Operation of the system

One clearing house session is held every working day between 11 a.m. and 12 noon. Rejections are settled the same day and cheques are settled after an agreed period of time (D+1 for local cheques and D+3 for cheques presented under the outside-area cheque exchange agreement).

Banks that have signed the outside-area cheque exchange agreement, but which are not represented at all 103 clearing houses, may ask the Banque de France to receive the cheques on their behalf and to forward the cheques to them. This function is performed by the Banque de France's Joint Collection Unit (*Service Commun de Recouvrement*; SCR), which acts simply as an intermediary between the presenting bank and the drawee bank and does not guarantee finality of payment.

The leading credit institutions are party to the outside-area cheque exchange agreement.

#### 3.4.2.1.5 Technical environment

The exchange of payment orders is conducted in paper form. The net balances are calculated on microcomputers, with the data provided by participants being on computer-readable forms.

#### 3.4.2.1.6 Settlement procedures

The net balances, consolidated with the balances of the truncated cheque exchange system, are transmitted to the CRI once a day at 3.15 p.m. to be settled in the TBF, and are posted to the central settlement accounts of the settlement participants designated by the direct participants.

#### 3.4.2.1.7 Pricing

Services in the 102 clearing houses managed by the Banque de France are free of charge, except in the settlement process. With regard to the clearing house of the Principality of Monaco, participants pay a membership fee

corresponding to their share of the clearing house's expenses.

#### 3.4.2.1.8 Projects under development

The provincial clearing houses will close down in 2002, since banks will exchange truncated cheques through SIT (see Section 3.4.1.1.8).

#### 3.4.2.2 The Paris clearing house

##### 3.4.2.2.1 Operating rules

The Paris clearing house is a non-profit-making organisation run by a 15-member management committee. It is the only French cheque clearing house, together with the clearing house of the Principality of Monaco, which is not managed by the Banque de France.

Exchanges are made in three clearing sessions at 10.30 a.m., 12 noon and around 12.30 p.m., depending on the size of the bank and the number of cheques it presents. Settlement takes place at 3.15 p.m.

In 1999, 680 million transactions were processed, with a total value of €830 billion.

##### 3.4.2.2.2 Participation

All institutions on which cheques are drawn are bound by regulations to participate in the clearing house, either directly or indirectly.

##### 3.4.2.2.3 Types of transaction handled

The Paris clearing house, concurrently with the provincial clearing houses, handles the exchange of cheques in paper form.

During the period when the use of euro-denominated cheques started to rise, it was decided to centralise the exchange of such cheques in Paris, except for very large-value cheques (more than €1 million), which would be exchangeable in the centres outside Paris according to the usual procedures.

#### 3.4.2.2.4 Settlement procedures

Balances are settled daily across the participants' accounts in TBF at 3.15 p.m.

#### 3.4.2.2.5 Pricing

Participants pay a membership fee corresponding to their share of the clearing house's expenses.

#### 3.4.2.2.6 Projects under development

The Paris clearing house will close down in 2002, as banks will exchange truncated cheques through SIT (see Section 3.4.1.1.8).

## 4 Securities settlement systems

### 4.1 Trading

#### 4.1.1 Organisation of the French stock exchange

##### *Governance and markets*

The French stock exchange is managed by a business corporation called ParisBourse SA, which has the status of a specialised financial institution under French law. ParisBourse SA has legal, operational and monitoring powers. In the legal field, ParisBourse SA is in charge of submitting market regulations to the regulatory authority, the CMF. It also admits market members and securities to listing. In the technical field, ParisBourse SA operates the computers used for trading and clearing. Lastly, ParisBourse SA monitors all operations and may suspend trading in securities with price fluctuations larger than the authorised daily maximum.

ParisBourse SA manages five regulated markets which, unlike OTC markets, must meet special conditions for listing, pricing and settlement, namely the *Premier Marché*, the *Second Marché*, the *Nouveau Marché*, Matif and Monep. It also operates an unregulated market, called the *Marché Libre*, open to securities not traded on a regulated market because they are either too young or too small to qualify, but which are nevertheless entered into the central order book by the trading members of the Paris Bourse.

The French stock exchange is divided into three areas subject to different rules regarding, in particular, the percentage of the capital listed on the relevant market. The *Premier Marché* includes the largest French and foreign companies, with a market capitalisation of at least €750 million and at least 25% of the capital offered to the public, as well as public and private bond issues. The *Second Marché* includes medium-sized companies, with a market capitalisation of at least €12 million and at least 10% of the capital offered to the public, representing at least €4.5 million. The *Nouveau Marché* is open to high-growth companies, with minimum own funds of €1.5 million and at least €5 million in capital offered to the public, with 50% representing new shares.

##### *Membership rules*

Since the Modernisation of Financial Activities Act of 2 July 1996 (implementing the EC Investment Services Directive), now largely enshrined in the FMC, there have been two categories of intermediaries entitled to offer investment services: credit institutions and investment firms (including Bourse member firms and asset management companies) duly authorised by the French regulatory authorities to provide investment services such as the collection and transmission of third-party orders, trading and third-party asset management.

The CMF checks the business plan sent by the intermediary which includes the planned operations and the arrangements for their execution. Then, the Comité des Etablissements de Crédit et des Entreprises d'Investissement (CECEI) checks that the requisite conditions for offering investment services are fulfilled (e.g. level of the corporate assets, creditworthiness of the shareholders, legal status). With regard to third-party asset management, the necessary conditions for offering investment services are checked by the Commission des Opérations de Bourse (COB).

In order to operate on the regulated markets, these duly authorised credit institutions and investment firms must become members of the relevant market (intermediaries not established in France may join as remote members). Intermediaries which have become market members in order to execute buy and sell orders are considered as trading members. Trading members may also become clearing members (see Section 4.2. on clearing) or subcontract clearing and settlement to a clearing member.

#### 4.1.2 Operating rules of the French stock exchange

Historically, the French stock exchange has been a centralised order-driven market. However, recent reforms such as the introduction of block trading and the opening of the *Nouveau Marché* in 1996 have changed this somewhat.

##### *An electronic central order book*

In 1986, the French stock exchange replaced open outcry trading with a computerised trading system called *Cotation Assistée en Continue* (CAC) based on an order-driven approach in which the price is the result of the confrontation between buy and sell orders. Since 1995, the French stock exchange has been using a new electronic trading system called the *Nouveau Système de Cotation* (NSC). Thanks to this system, trading takes place through member firms acting as brokers and connected via workstations to the

central computers of ParisBourse SA. For each relevant security, the orders entered in the system are ranked first by price limit (for example, a buy order with a higher limit is executed before a similar order with a lower limit) and then in chronological order. The NSC ensures continuous trading of the securities within the following schedule:

- pre-opening from 7.45 a.m. to 9 a.m. when the orders are entered, but without any transactions;
- opening at 9 a.m. when the NSC calculates the opening price in order to match the largest number of bids and asks;
- trading from 9 a.m. to 5.30 p.m. when the orders are executed provided there is a matching order in the central order book. There are different types of order: orders at any price, limit orders, orders at market price, stop limit orders and all or nothing orders;
- pre-closing from 5.30 p.m. to 5.35 p.m. when the orders are entered, but not yet processed; and
- closing at 5.35 p.m. when the closing price is calculated to match the largest number of bids and asks.

When the transaction has been completed, the NSC sends confirmations to the member firms involved and clearing/settlement instructions to Relit (see Section 4.3.3). At the same time, the NSC updates in real time the trading data available on its workstations.

Depending on their liquidity, the securities listed on the Paris Bourse are divided into different trading groups with special trading hours, maximum authorised daily fluctuations and time limits on halts in trading: the most liquid securities belong to the "Continuous A" group (maximum fluctuation of +21.25% and -18.75% and 15 minutes for each halt in

trading), whereas the securities with average liquidity belong to the “Continuous B” group (maximum fluctuation of +10.25% and -9.76% and 30 minutes for each halt in trading). Less liquid securities on the *Premier* and *Second Marchés* are classified in the “Call auction A” group (call auctions at 11.30 a.m. and 4 p.m.), whereas securities on the *Marché Libre* are classified in the “Call auction B” group (call auction at 3 p.m.).

#### *Block trading and market-making*

In order to foster trades by institutional investors involving large amounts of equities, rules for block trading were introduced in 1994 for the largest stocks on the *Premier Marché*. The aim of this mechanism is to increase the liquidity of the market without calling into question the rules of an order-driven market. Before 1994, large orders were executed in stages with no guarantee regarding the average price. Thanks to block trading, large orders are immediately executed at a price derived from the price on the central market. The standard block size is based on the average trade in the relevant stock and should be no less than €75,000. The price is included in the weighted-average spread based on the buy and sell orders on the central market for an equivalent amount. This spread is available throughout the trading day for all eligible stocks.

The *Nouveau Marché* is a price-driven market, with market-makers offering bid/offer spreads at which they are ready to execute trading members’ orders. This price-driven approach is supplemented by an electronic central order book, as in the other French stock market areas. The most active stocks are continuously traded on the central order book (from 9 a.m. to 5.35 p.m.) and the other stocks are traded by call auction at 9.30 a.m. and 5 p.m.

#### *Derivatives markets*

Both Matif and Monep are regulated markets with electronic systems allowing continuous trading from 8 a.m. to 10 p.m., though these hours may vary from contract to contract.

Matif trades futures and options on interest rates. The main interest rate products are the euro Notional bond contract (a long-term product) and the three-month EURIBOR future.

Monep trades futures and options on equities and equity indexes. The main index options are the CAC 40 index option and the option on the European Dow Jones indices (STOXX 50, EURO STOXX 50, STOXX sector indices).

### **4.1.3 Future prospects**

In March 2000, ParisBourse SA issued a joint press release with the Amsterdam and Brussels exchanges disclosing their agreement to merge the three stock exchanges. According to this press release, the project, called Euronext, is aimed at providing a complete range of services from the listing of financial instruments and the trading in instruments and derivatives, to the netting, clearing and settlement of transactions and the custody of purchased securities. The legal merger between the exchanges on 22 September 2000 did not eliminate the domestic markets involved: each issuer will still have the possibility to choose its listing market, but the access rules will be harmonised. This new integrated market, based on the order-driven principle (with continuous or call auction trading) and on a single electronic order book, will be divided into three areas: an area for medium-sized companies, an area for derivatives and an area for blue chips. The systems used will be the NSC for trading, Clearing 21 for clearing and Euroclear for settlement. It is planned to be up and running in the second half of 2001.

## **4.2 Clearing**

### **4.2.1 Institutional aspects**

#### *4.2.1.1 General legal aspects*

The general legal framework applicable to clearing by a central counterparty is mainly provided by the Financial Activity Modernisation Act 96-597 of 2 July 1996, which implemented in France the EC



Investment Services Directive 93/22 (endorsed on 10 May 1993 and in force since 31 December 1995).

In particular, this Act created the CMF, which is a professional authority responsible for establishing and enforcing rules concerning investment service providers, clearing houses and regulated markets. The CMF replaced the previous Conseil des Bourses de Valeurs (CBV), which had been responsible for the stock markets, and the Conseil des Marchés à Terme (CMT), which had been responsible for the regulated futures markets.

This Act, now largely enshrined in the FMC, also replaced or amended previous legal provisions and acts (such as the Futures Markets Act of 28 March 1985) related to the financial futures markets.

Article L442-6 of the FMC (formerly Article 49 of Act 96-597) enforces the full ownership rights of the clearing house over the deposits (including margin deposits) of its members whether in cash or in securities. Article L431-7 (formerly Article 52 of Act 96-597) recognises the validity of multilateral netting performed by the clearing house for operations on financial instruments.

#### 4.2.1.2 *Recent developments in clearing arrangements*

Before May 1999, there were three clearing systems in France:

- the Société des Bourses Françaises (SBF) for equity trades and options (on equities and indices);
- Matif SA for interest rate derivatives, futures and options; and
- the Banque Centrale de Compensation (BCC) for repo and outright trades on government debt securities (the Clearnet OTC service).

Since May 1999, the three clearing systems have merged to create Clearnet SBF SA (the legal name of which is Banque Centrale de Compensation), which is a single clearing house for all products. Accordingly, the capital of the new clearing house was increased to be able to cope with the default of a clearing participant. The capital of Clearnet SBF SA is supplemented by insurance covering potential losses of up to €130 million and by an unconditional guarantee from the whole ParisBourse Group.

Clearnet SBF SA is a full subsidiary of the ParisBourse Group (see Section 4.1). In 1999, Clearnet SBF SA cleared a daily value of €3 billion and managed more than €3.3 billion in deposits and collateral.

#### 4.2.1.3 *Supervision and regulation*

Clearnet SA is a limited-purpose credit institution pursuant to the French Banking Act. Therefore, it is supervised by the CB, which is the French banking supervisor.

The CMF is in charge of establishing (notably through its rules of procedure) the conditions for the approval of the clearing house's rules. This was actually achieved in Chapter II of Title IV of the rules of procedure of the CMF.

#### 4.2.1.4 *Access criteria*

All entities allowed to be a direct participant in a regulated market as defined by Article L421-1 of the FMC, credit institutions and entities with the sole purpose of providing financial instrument clearing services can be admitted as members of the clearing house. Other criteria also need to be fulfilled, such as minimum capital requirements.

The fulfilment of financial and operational access criteria by applicants is checked and is also subject to ongoing monitoring for admitted participants according to a process common to all clearing members irrespective of the market in which they intervene. Currently, 53 institutions are clearing members of Clearnet SA. 15 of them are foreign remote participants.

## 4.2.2 Operational aspects

### 4.2.2.1 Range of instruments cleared

Clearnet SBF SA acts as central counterparty, offering its guarantee against daily initial and variation margin calls for a wide range of financial instruments: stock exchange transactions traded on systems managed by ParisBourse (see Section 4.1), financial and exchange-traded commodities futures and options (Matif), equity and index options (Monep) and OTC securities trades (Clearnet).

The Clearnet system (a specific service of Clearnet SBF SA launched in October 1998) clears and nets all outright and repo transactions in French government securities negotiated through the inter-dealer brokers Prominnofi, MTS France and Brokertek UK. The service was extended to German *Bunds* in April 1999 and is planned to be extended to transactions in Dutch, Italian and Belgian government bonds.

### 4.2.2.2 Guarantee provided and risk management

Clearnet SBF SA acts as central counterparty for instruments admitted to its operations. Once a trade has been transmitted to the clearing house, it is registered and Clearnet SBF SA becomes the counterparty of both the seller and the purchaser.

Since 1998, the guarantee provided by the clearing house only covers its members. The protection of customers is ensured by the participation of clearing members in a guarantee fund. However, individual customers have the possibility to be covered directly by the guarantee of the clearing house, provided that they pay a fee, they post deposits and margin calls on a gross basis and their transactions are booked with the clearing house.

The guarantee provided by Clearnet SBF SA includes the cash value of clearing members' positions and also a procedure for stock exchange transactions to deliver securities to the purchaser on behalf of the defaulting seller.

There are two types of margin requirements:

- initial margin deposits aim to cover the upcoming risk on the open positions registered with the clearing house; and
- the variation margin or margin calls cover the price difference between the original price of the registered position and the marked-to-market price.

Valuation of exposures and margin calls are performed at least daily. Additional deposits are required for positions with risks which appear to be insufficiently covered by the existing deposits. As regards futures and options, intraday price variation limits apply to instruments. If the limit is breached, an intraday margin call is completed.

With regard to financial futures and options, other risk control measures are also implemented such as individual exposure limits and market share limits (in order to avoid market manipulation).

In the event of default by a clearing member, the clearing house may transfer the positions of its customers to another clearing member, or liquidate them to extinguish its obligations or mobilise its deposits and collateral to cover potential losses. The current financial guarantee of Clearnet SBF SA is mainly based on a "defaulter pays" approach. In addition to the amount of deposits and collateral of the defaulter, the soundness of the guarantee given by Clearnet SBF SA relies ultimately on its insurance arrangements and its own capital.

### 4.2.2.3 Clearing platform

Currently, initial margin and margin calls are mainly still calculated separately for each type of instrument cleared by the clearing house. Only some market-makers benefit from the possibility to cross-margin futures and options positions with underlying stocks. This possibility for options and futures has been extended to all clearing members since the launch of the Clearing 21 platform on 8 September 2000. A

further extension will be made when cash products are channelled into Clearing 21.

Since September 2000, Clearnet SBF SA has been implementing a new clearing platform called Clearing 21, which seeks to enable cross-product margining. Clearing 21, which was developed in conjunction with the Chicago Mercantile Exchange and Nymex, is an integrated system for both cash and derivatives products, operating in real time pursuant to the Span margining model. For the time being, Clearing 21 is only used for financial futures, but Clearnet SBF SA plans to extend it progressively to all types of instrument cleared to allow cross-margining and to eventually reduce the need for collateral.

Clearing 21 is a multi-currency platform, which also provides comprehensive real-time information to clearing members on, for example, the type of instrument handled, the position and the type of account.

Clearing 21 provides services for the whole post-trade process including the feeding of the account of the clearing member, the management of positions, the calculation of risk margins, and the generation and sending of delivery/settlement instructions.

#### 4.2.2.4 Settlement procedures

Cash deposits and margins calls of clearing members stemming from their positions on Matif and Monep are settled once a day in the TBF at 10 a.m. OTC positions on outright repo and securities transactions are settled through the RGV (see Section 4.3) and stock exchange transactions are settled through Relit (see Section 4.3).

#### 4.2.2.5 Developments under way

Clearnet SA will be Euronext's single clearing house (see Section 4.1.3) following a merger process with the clearing house of the Dutch market AEX and the Belgian clearing house BXS.

Under the agreement between the ParisBourse Group and Euroclear (see Section 4.3), the Euroclear group confirmed on 21 September 2000 that it had the option of taking an ownership interest of up to 20% in Clearnet SA.

In April 2000, Clearnet SBF SA and the London Clearing House announced plans to collaborate in order to create a consolidated clearing house intended to complement the process of consolidation of stock exchanges and SSSs.

## 4.3 Settlement

### 4.3.1 Institutional aspects

#### 4.3.1.1 General legal aspects

The full dematerialisation of securities was achieved in France with the implementation of Article 94 of the Act of 30 December 1981 (now enshrined in Article L212-3 et seq. of the FMC) and the Decree of 2 May 1983 (not yet enshrined in the FMC). Accordingly, all securities transactions in France are settled through book entries.

The general legal framework applicable to SSSs was substantially modified following the Financial Activity Modernisation Act 96-597 of 2 July 1996 (see Section 4.2.1.1). This Act was amended by the Act of 2 July 1998. In particular, Article 32-16 (now Article L622-7-IV-4 of the FMC) was amended to specify that the General Regulations of the CMF shall determine "the general organisational and operational principles of financial instrument settlement and delivery systems and the conditions under which the CMF approves the operating rules of such systems, without prejudice to the powers granted to the Banque de France by Article L141-4 of the FMC regarding the Statute of the Banque de France and the activities and supervision of credit institutions".

The Act of 2 July 1998 also amended Article 93-1 of the Banking Act (now Article L330-1 of the FMC) in order to clarify that the abrogation of any "zero hour" provision shall apply not only to payment systems, but also to SSSs.

#### 4.3.1.2 *The role of the Banque de France*

The Banque de France played a major role in the re-organisation of the infrastructure for securities settlement in 1995, when it was decided to close down SATURNE, an SSS managed by the Banque de France, and to launch a new system, the RGV, applying RTGS in central bank money (see Section 4.3.2). Since the actual closing down of SATURNE in July 1998, the Banque de France has no longer been involved in operating SSSs.

Pursuant to the Act of 2 July 1998, the statutory competence of the Banque de France in the field of payment systems oversight also explicitly covers SSSs.

#### 4.3.1.3 *The role of other public and private sector bodies*

The task of the COB is to protect investors in securities by supervising the information provided to them and by monitoring the smooth operation of the financial markets.

Sicovam SA, which was created in 1949 and became "Euroclear France" in January 2001, is the French CSD and operates both the SSSs, the RGV and Relit.

In 1999, Sicovam SA had 336 direct participants (including 246 intermediaries, 74 issuers and 16 foreign CSDs) and 273 sub-participants.

Securities with a value of €3,261 billion were deposited on the books of Sicovam SA in 1999.

### 4.3.2 *Overview of recent developments in the organisation of securities settlement systems*

#### 4.3.2.1 *Implementation of Relit Grande Vitesse*

In 1994, when the French financial community decided to switch to a new organisational set-up, the settlement of transactions involving securities was divided between two systems:

- SATURNE, which was created by the Banque de France in 1988 to manage Treasury bills and notes and which was subsequently extended to include all negotiable short-term instruments (e.g. commercial paper, medium-term notes).
- Relit, managed by Sicovam SA, settling since 1990 all transactions in marketable securities, including bonds (public sector as well as corporate) and equities.

In accordance with the definitions usually used by central banks since the BIS report released in 1992, both Relit and SATURNE were "model 2" SSSs, therefore they delivered the securities leg on a gross basis and the cash leg on a net basis. As the organisation of the banks' accounts at the Banque de France prevailing until 1997 did not provide for intraday finality of payment, but only for end-of-day finality, the settlement of the cash leg and consequently the delivery of the securities handled in SATURNE and in the RGV only became final at the close of the Banque de France's business day at 6.30 p.m.

In order to improve this situation, the Banque de France, Sicovam SA and the AFEC reached a partnership agreement in January 1995. According to the terms of this agreement, it was decided:

- to implement a new real-time large-value SSS, called Relit Grande Vitesse, managed by Sicovam SA;
- to shut down the SATURNE system and to integrate its operations into the RGV, which was completed in July 1998; and
- to increase the Banque de France's stake in Sicovam SA to 40%.

This new framework for SSSs is based on the following principles:

- The RGV system, which became operational in February 1998, operates

on a gross basis for both the securities and cash legs (model I), providing irrevocable and final settlement in real time. The system handles transactions continuously within very long operating hours (8 p.m. on T-1 to 5 p.m. on T for market operations).

- The settlement of the cash leg takes place in central bank money.

The RGV system, which was launched in February 1998, allows for final intraday settlement of securities transactions in central bank money. In a set-up similar to that of the PNS (see Section 3.3), RGV participants have central bank money accounts, which can be supplied with liquidity via the links between the TBF and the RGV, and they may transfer central bank money to either of these two systems at any time of the day.

The Relit system continues to be used for categories of securities not eligible for the RGV (mainly equities). However, a new channel called Relit + has been introduced. It operates on the basis of deferred irrevocability until settlement of the cash balances in the TBF and is used for transactions which are also eligible for the RGV, but do not require immediate irrevocability.

#### 4.3.2.2 Merger with Euroclear

On 23 November 1999, Euroclear, Clearnet SBF SA and Sicovam SA announced an agreement to establish an alliance to offer the markets a pan-European solution for clearing, settlement and netting services.

On 24 March 2000, the Euroclear and Sicovam SA boards announced the signing of an agreement in principle to fully merge the two settlement organisations. The final agreement was signed on 21 September 2000 and came into effect on 10 January 2001.

In accordance with the agreement, Euroclear France is now a wholly-owned subsidiary of the

Euroclear bank and will remain incorporated in France. Sicovam shareholders will become shareholders of Euroclear Clearance System plc through one or more newly created Sicovam holding companies. These holding companies will together own 16.67% of Euroclear Clearance System plc, reflecting the valuation of each merging entity. The Euroclear group confirmed on 21 September 2000 its option to take an ownership interest of up to 20% in Clearnet SA.

Existing platforms will be upgraded and interconnected by 2001, thus providing integrated settlement processing in real time for both debt and off/on-exchange equity transactions, in both central bank and commercial bank money, through a single point of entry.

The merger also aims to optimise collateral management and thus facilitate the netting of European stock exchange trades, in particular for Euronext.

### 4.3.3 Relit

Even though there are now two platforms (Relit for all securities which are not eligible for the RGV, especially equities, and Relit + for transactions which are also eligible for the RGV, but do not require immediate irrevocability), the operating functions are the same. Relit +, which uses the same software as the RGV (but without cash positions), will completely replace the Relit software in May 2001.

#### 4.3.3.1 Major regulation

The rules governing both Relit and Relit + were approved by the CMF in January 2000, pursuant to Article 32-16 of the Act of 2 July 1996 (now Article L622-7-IV-4 of the FMC), as amended by the Act of 2 July 1998.

#### 4.3.3.2 Participation in the system

Credit institutions and investment firms licensed in France or established in the EEA and allowed to use the European passport, as well as

CSDs, may be admitted to the system. Other French or foreign institutions can also have access to Relit, provided that the CMF does not veto their participation (for risk prevention reasons).

#### 4.3.3.3 Types of transaction handled

Relit settles transactions traded on the primary, grey and secondary markets, such as outright transfers and securities-lending transactions. It mainly handles retail equity transactions, but also transactions in all securities not eligible for the RGV (warrants, mutual fund shares and some short-term instruments) and transactions in securities eligible for the RGV but not requiring intraday finality.

In 1999, Relit settled transactions with a total value of €5,071 billion.

#### 4.3.3.4 Operation of the system

Relit is based on three matching and pre-settlement sub-systems, plus a settlement sub-system:

- the interbrokers sub-system (*Sous-système Inter-sociétés de bourse*; ISB);
- the brokers-intermediaries sub-system (*Sous-système Sociétés de Bourse-Intermédiaires*; SBI);
- the delivery by mutual consent sub-system (*Sous-système de Livraison par Accord Bilatéral*; SLAB); and
- the settlement sub-system (*Sous-système de Dénouement*).

#### ISB sub-system

The ISB sub-system, which is managed by the clearing house Clearnet SBF SA, is limited to the operations of the stockbrokers. The clearing house ensures the successful completion of settlement by lending securities or cash, if necessary.

#### SBI sub-system

The SBI sub-system, managed by Euroclear France, prepares, in automatic form, the settlement of stock exchange transactions between stockbrokers and other financial intermediaries.

#### SLAB sub-system

The SLAB sub-system, also managed by Sicovam SA, processes OTC transactions entered into by two mutually consenting parties.

#### Settlement sub-system

This sub-system ensures the settlement of transactions channelled by the ISB, the SBI and SLAB sub-systems, as well as FOP transactions entered into directly by Relit participants and corporate actions initiated by Euroclear France.

#### 4.3.3.5 Transaction processing environment

Since 1994, Relit has used a proprietary network called SIGMA.

#### 4.3.3.6 Settlement procedures

There are six chainings during the operating day, which starts at 8 p.m. the previous day. Two night chainings are followed by four day chainings, allowing the Relit participants to adjust their positions. When the settlement is being processed, securities are delivered to the purchaser, provided that they are available on the seller's securities account, on a gross and trade-by-trade basis.

A net cash balance is calculated for each Relit participant. Twice a day, net cash balances are posted to the TBF accounts of the Relit participants or to the accounts of the TBF settlement agents which they have designated to settle their cash positions on their behalf. Once the cash settlement has been completed, the DVP process of the related chainings becomes final. The first settlement stage occurs at 3 p.m. (and is almost complete at 3.45 p.m.)

and the second one at 4.40 p.m. (for final completion before 5.10 p.m.). Pursuant to the TBF rules, if any one participant is not able to fund its negative balance before the end of the settlement period, all balances (including credits) are rejected.

In the latter instance, for stock exchange transactions settled through Relit, both Euroclear France and Clearnet SBF SA take all the necessary measures to ensure completion of the settlement (including the provision of cash from the clearing house). In this respect, the Banque de France opens a new window later in the operating day to make another attempt to settle the Relit system.

Defaulting TBF participants must pay a penalty.

#### 4.3.4 Relit Grande Vitesse

##### 4.3.4.1 Major regulation

The RGV rules were approved by the CMF in January 2000, pursuant to Article 32-16 of the Act of 2 July 1996 (now Article L622-7-IV-4 of the FMC), as amended by the Act of 2 July 1998.

##### 4.3.4.2 Participation in the system

Credit institutions and investment firms licensed in France or established in the EEA and allowed to use the European passport, as well as CSDs, may be admitted to the system. Other French or foreign institutions can also have access to the RGV, provided that the CMF does not veto their participation (for risk prevention reasons).

However, only institutions which fulfil the statutory access criteria for participation in the TBF (see Section 3.3) are allowed to be settlement participants and to open a cash position.

In 1999, 167 institutions were participants in the RGV.

##### 4.3.4.3 Types of transaction handled

The RGV is used to settle all Banque de France credit operations, including monetary policy operations, and intraday credit in the TBF against collateral deposited in Euroclear France (see Section 4.4). The Banque de France uses repos to implement monetary policy and intraday credit operations. Collateral is managed through an earmarking procedure. The whole settlement process is ensured by Euroclear France, which provides all requested services, including the valuation and management of collateral, within operating times fully compliant with TARGET requirements.

The RGV is also used for all large-value transactions between financial intermediaries on fixed income securities, including both outright trades and repurchase agreements.

In 1999, the RGV settled a total value of €33,820 billion; 30% of the transactions, representing 40% of the value, were same-day value trades.

##### 4.3.4.4 Operating principles of the system

The RGV is a model I SSS operating in central bank money, in real time and with immediate finality.

The RGV is based on the following principles:

- it uses purchasing power in central bank money associated with a self-collateralisation mechanism to ensure the intraday final settlement of the transactions handled; and
- a real-time bridge exists between the RGV and the TBF allowing for the smooth and immediate transfer of central bank money in both directions.

### *Purchasing power and self-collateralisation*

In order to enable each RGV participant to settle securities purchases through the DVP system, the RGV monitors purchasing power, which includes two components:

- 1) central bank balances on accounts open on the books of the Banque de France, but operated within the SSS. The use of central bank money directly in the settlement process within the SSS allows for continuous real-time settlement of securities transactions in central bank money. The cash assets are supplied by means of:
  - the sale of securities within the RGV; and
  - transfers from the TBF.
- 2) automated intraday repos (*Pensions Livrées Conservatoires*; PLCs) set up within the settlement process with stocks or flows of securities eligible for use as collateral with the Banque de France. In fact, for participants who do not have the necessary cash to settle securities purchases at the end of the processing procedure, the RGV system automatically transforms the asset component of the purchasing power into actual central bank money through intraday repurchase agreements with the Banque de France using securities in stock (earmarked before the start of each operating day by the RGV participant as potential collateral) or by using securities under processing.

In any event, all intraday repurchase agreements have to be reimbursed before the end of the business day. At the end of the day, the RGV automatically tries to settle the reimbursement of the intraday repos.

If participants have sufficient cash in the RGV to reimburse the repos, their TBF accounts are debited, thereby settling the Euroclear France account in the TBF. If, exceptionally, a

participant does not have the funds to reimburse the repo, Euroclear France settles the whole intraday repo and sets up an overnight repo for the outstanding cash balance with part (or all) of the securities.

#### *The bridge between Transferts Banque de France and Relit Grande Vitesse*

Participants may transfer central bank money between the RGV and the TBF at any time of the day. These transfers are triggered either automatically at certain times of the day or upon the instructions of participants.

A participant can, at will, transfer cash from its TBF account to the RGV by using simple TBF instructions or from its cash position in the RGV to its TBF account.

In addition to these procedures for cash transfers originated by the participants, Euroclear France automatically transfers cash balances from the RGV to the TBF accounts twice in the afternoon.

During the business day, participants may reimburse the intraday repurchase agreements at any time provided that their cash balance is sufficient.

#### *4.3.4.5 RGV operating day*

The RGV operating day starts at 8 p.m. the day before. Night processing permits the settlement of trades agreed the previous day. After night processing, RGV is able to settle same-day value transactions until 5 p.m. These same-day value transactions represent 30% of the volume and 40% of the value handled by the RGV system. Monetary policy operations of the Banque de France can be settled until 6.30 p.m.

#### *4.3.4.6 Risk management*

The assessment of all SSSs which applied to settle ESCB credit operations against the nine standards established by the ESCB was conducted in the course of 1998 and the list of eligible SSSs was



released in September 1999. At this time, the RGV was the only system in the euro area which fully complied with all standards and was therefore able to settle transactions with intraday finality on a DVP basis and in central bank money, within the broad TARGET operating hours and on the basis of a very reliable technical framework.

Thanks to the mechanism for automatically setting up intraday repos, DVP transactions within the RGV always become final during the course of the day and the average percentage of transactions remaining unsettled at the end of the day is remarkably low (less than 0.01%).

#### 4.3.4.7 Transaction processing environment

RGV participants can use, at will, either the RGV workstation or the SIGMA network. Both are proprietary networks. International links with other SSSs use SWIFT securities messages.

#### 4.3.4.8 International links

Securities issued in 11 foreign SSSs may be lodged as collateral at the Banque de France directly through the RGV, using the eligible FOP links established by Euroclear France with the following foreign CSDs: Clearstream Banking Frankfurt in Germany; OeKB in Austria; the National Bank of Belgium's system, Euroclear and CIK in Belgium; CADE and SCLV in Spain; APK in Finland; Monte Titoli in Italy; Necigef in the Netherlands; and Clearstream Banking Luxembourg in Luxembourg.

#### 4.3.4.9 Pricing

RGV participants are charged a custody fee and a transaction fee.

### 4.4 The use of the securities infrastructure by the Banque de France

*The Banque de France as a liquidity provider in the SSS*

The French SSS, RGV, offers intraday finality thanks to cash positions administered within the RGV, which form the cash balance component of the purchasing power and are considered as sub-accounts on the Banque de France's books, and to the use of intraday repos managed by the Banque de France (see Section 4.3.4).

The Banque de France provides a permanent bridge between the RGV and the TBF formed by transfers of liquidity in central bank money (see Section 4.3.4).

The RGV provides an instrument to settle intraday repos in the TBF. This is called the *Pension livrée intrajournalière* (PLI) and it has common features with RGV automatic repos: no interest is paid to the Banque de France, the repo must be redeemed before the end of the day otherwise it is turned into an overnight repo with a high penalty rate and the repo is set up by the SSS. However, there is one major difference: the cash leg is settled in the TBF (and not in the RGV) in order to provide the participant with central bank liquidity.

The PLI is completed in three steps:

- the participant enters an instruction into the TBF specifying the amount of cash needed;
- then, the securities given as collateral are checked by the SSS (if the valuation is not sufficient, the participant's instruction is recycled during the day); and
- the repo is settled: the securities are credited to a Banque de France custody account and the cash is credited to the participant's cash balance and then transferred to the participant's account in the TBF.

#### *Money market operations*

The TBF and the RGV are the systems used by the Banque de France for money market operations. The overnight repos have features

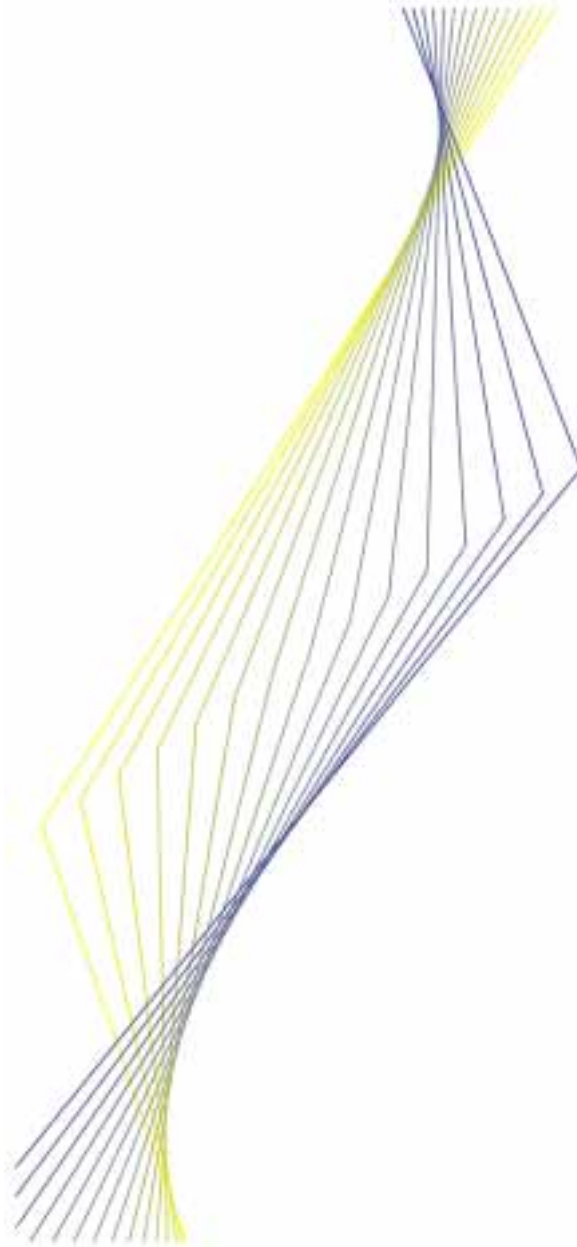
in common with intraday repos since the securities are settled in the RGV and the cash is credited to the TBF accounts. However, the process is different because matching takes place between the participant's and the Banque de France's instructions. Thus, following the allotment results, the Banque de France informs the SSS of the cash amount given to each of its counterparties. Each counterparty enters its instructions specifying the collateral used, after which RGV matches the instructions.

For the redemption of monetary policy operations, the SSS checks the availability of funds in the RGV (and not in the TBF, since it has no direct access to the participants' accounts with the TBF). Therefore, the RGV participants have to monitor their cash balance in the RGV in order to plan the redemption of the repo.

France



EUROPEAN CENTRAL BANK



**Ireland**

**June 2001**

Ireland

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## List of abbreviations

<b>CAS</b>	Central Accounting System
<b>CBISSO</b>	Central Bank of Ireland Securities Settlements Office
<b>CFTC</b>	Commodity Futures Trading Commission
<b>DIS</b>	Daily Interbank Settlement system
<b>HFA</b>	Housing Finance Agency
<b>IBF</b>	Irish Bankers' Federation
<b>IFSC</b>	International Financial Services Centre
<b>IPSO</b>	Irish Payment Services Organisation
<b>IRISCo</b>	Irish Real-time Interbank Settlement Company Limited
<b>ISEQ</b>	Irish Stock Exchange Index
<b>NTMA</b>	National Treasury Management Agency
<b>NYBOT</b>	New York Board of Trade
<b>NYFE</b>	New York Futures Exchange
<b>POSB</b>	Post Office Savings Bank
<b>UCITS</b>	Undertakings for Collective Investment in Transferable Securities

## Introduction

Large-value payments and interbank settlements are effected using a fully automated RTGS system known as IRIS, an acronym derived from the name of the company which owns the system, the Irish Real-time Interbank Settlement Company Limited (IRISCo). The RTGS system, which commenced operations in March 1997, is managed and operated by the Central Bank of Ireland and is interlinked with the TARGET system. Prior to the introduction of RTGS, large-value payments and interbank settlements were carried out via the Daily Interbank Settlement system (DIS), an end-of-day gross settlement system. There is no large-value netting system in Ireland.

In terms of retail payments, both cash and cheques are still widely used in Ireland, while the use of credit and – particularly in recent years – debit cards for making small-value payments has steadily increased in popularity. Credit transfers still play only a relatively limited role in payment systems in Ireland.

Retail payment clearing functions are carried out by three separately incorporated clearing companies: one each for paper debit items (e.g. cheques), paper credit items and bulk electronic payments. Each of the companies has a set of rules which governs the process whereby items are exchanged for value between the financial institutions which participate in the clearing system. The system operates on a multilateral net settlement basis, with the end-of-day settlement payments being effected via the RTGS system. The current clearing structure became operational in 1999, replacing the previous clearing system, which was known as the Dublin Bankers' Clearing.

The Central Bank of Ireland is the body with overall responsibility for the regulation and oversight of payment and securities settlement systems.

There is only one stock exchange – the Irish Stock Exchange – operating in Ireland. The Exchange operates four distinct markets on which securities are traded, covering government bonds and shares in mature companies, exploration company shares and the developing companies market and technology stocks. Irish equity trades are settled in CREST, the system which settles transactions in UK and Irish equities and UK government and corporate debt (see the chapter on the United Kingdom for further details).

In addition to the Stock Exchange, two futures and options exchanges operate in Ireland – FINEX Europe and the New York Futures Exchange (NYFE).

The Central Bank of Ireland continues to operate the register for Irish government bonds and for a small number of bonds issued by the European Investment Bank, the Housing Finance Agency (HFA) and Ulysses Securitisation plc (the latter two bodies are state-sponsored special-purpose financing vehicles). The majority of accounts on the register represent the holdings of private investors, with the holdings of institutional investors largely represented in an omnibus account in the name of Euroclear Nominees.

Transactions in Irish government bonds were settled in the Central Bank of Ireland Securities Settlements Office (CBISSO) until 1 December 2000, when this function was transferred to Euroclear, the settlement system operated by Euroclear Bank.



## I Institutional aspects

### I.1 The general institutional framework

The following is a listing of the principal institutions engaged in the payments and settlements infrastructure in Ireland and an outline of their respective areas of responsibility:

(a) Central Bank of Ireland

- supervision of banks, building societies, stock exchanges, investment intermediaries, futures and options exchanges, money brokers, collective investment schemes and certain other financial institutions;
- regulation and oversight of payment and securities settlement systems;
- provision of settlement account facilities, including management and operation of the RTGS system;
- registrar for Irish government bonds and certain other securities; and
- currency issue.

(b) Irish Stock Exchange

- monitoring compliance by members with the rules of the Exchange;
- stock exchange listing; and
- prevention of insider dealing.

(c) National Treasury Management Agency

- issue and management of Irish government debt.

(d) Irish Payment Services Organisation

- representative body of the Irish payments industry.

(e) Minister for Finance

- control of the Post Office Savings Bank (POSB).

(f) Office of the Director of Consumer Affairs

- retail bank charges.

(g) The Ombudsman for Credit Institutions

- investigation of complaints from individuals and small companies;
- adjudication on disputes arising under the EC Cross-border Credit Transfer Directive.

(h) Investor Compensation Company Limited

- compensation of private clients in the event of an investment firm being unable to meet its financial obligations

The principal legislation relevant to all aspects of payment and securities settlement systems in Ireland, including their regulation and supervision, is listed below:

- Central Bank Acts, 1942-1998;
- Companies Acts, 1963-2000;
- Bills of Exchange Act, 1882;
- Cheques Act, 1959;
- Stock Transfer Act, 1963;
- Building Societies Act, 1989;
- Trustee Savings Banks Act, 1989;
- National Treasury Management Act, 1990;
- ACC Bank Act, 1992;
- ICC Bank Act, 1992;
- Stock Exchange Act, 1995;
- Investment Intermediaries Act, 1995;
- Companies Act, 1990 (Uncertificated Securities) Regulations, 1996;
- Investor Compensation Act, 1998;
- European Communities (Deposit Guarantee Schemes) Regulations, 1995;
- European Communities (Finality of Settlement in Payment and Securities Settlement Systems) Regulations, 1998;
- Finance Act, 2000; and
- relevant case law in general.

## 1.2 The role of the Central Bank of Ireland

### 1.2.1 General responsibilities

The Central Bank of Ireland, which is a member of the ESCB (the primary objective of which is to maintain price stability in the euro area), came into existence in 1943 following the passing of the Central Bank Act, 1942.

While the ECB is responsible for monetary policy decision-making in the euro area, the task of implementing this policy in Ireland lies with the Central Bank of Ireland. In addition, the Central Bank of Ireland supervises most financial institutions in Ireland, together with exchanges and collective investment schemes, as well as being responsible for the regulation of payment and securities settlement systems.

Irish pound banknotes and coins are currently issued by the Central Bank of Ireland, the former under the Central Bank Act, 1989 as amended, and the latter on behalf of the Minister for Finance under the Decimal Currency Acts, 1969 to 1990. Irish pound banknotes are issued in denominations of IEP 5, 10, 20, 50 and 100. Irish coins currently with legal tender status are 1 penny, 2 pence, 5 pence, 20 pence, 50 pence, and IEP 1 (100 pence = IEP 1). Preparations are now well under way for the introduction of the euro banknotes and coins from 1 January 2002. The Central Bank of Ireland's production of the euro coins commenced in September 1999 and the printing of euro banknotes in April 2000.

The fixed conversion rate of the euro to the Irish pound is €1 = IEP 0.787564.

### 1.2.2 Banking supervision

The Central Bank Acts, 1942 to 1998, provide the Central Bank of Ireland with general powers in relation to the granting of banking licences and the supervision of banks. The Central Bank of Ireland also has supervisory powers in relation to building societies (under the Building

Societies Act, 1989), savings banks (under the Trustee Savings Banks Act, 1989) and two state-sponsored credit institutions (ACC Bank under the ACC Bank Act, 1992 and ICC Bank under the ICC Bank Act, 1992).

The Central Bank of Ireland also administers a deposit protection scheme – which covers deposits in licensed banks and building societies – under the European Communities (Deposit Guarantee Schemes) Regulations, 1995, as amended by the Central Bank Act, 1997 and the European Communities (Deposit Guarantee Schemes) Regulations, 1999.

In addition, the Central Bank of Ireland has a supervisory role in relation to certain other financial institutions as follows:

- investment intermediaries;
- stock exchanges and their member firms;
- financial futures and options exchanges and their members;
- money brokers;
- collective investment schemes, including undertakings for collective investment in transferable securities (UCITS);
- certain entities established in the International Financial Services Centre (IFSC) in Dublin; and
- bureaux de change in the context of ensuring the effective implementation of anti-money-laundering provisions.

### 1.2.3 The regulation and oversight of payment and securities settlement systems

The responsibility for the overall regulation and oversight of payment and securities settlement systems lies with the Central Bank of Ireland. The relevant legislation is contained in the Central Bank Act, 1997, which came into force on 9 April 1997.

This Act provides for the Central Bank of Ireland to authorise all payment and securities settlement systems operating in the state and to approve their rules. The Central Bank of Ireland may

impose conditions on approval, revoke approval and issue directions to payment and securities settlement systems or their members. The actions of the Central Bank of Ireland in this regard must be in the interest of the proper and orderly regulation of the systems concerned and of competition between such systems. The general objective of the regulatory regime is therefore to ensure that payment and securities settlement systems in Ireland are effective, efficient and open and that the systems themselves do not cause, or add to, instability in the operation of financial markets. Payment and securities settlement systems are subject to ongoing monitoring by the Central Bank of Ireland, particularly with regard to the acceptability of their rules and of any proposed rule changes. The European Communities (Finality of Settlement in Payment and Securities Settlement Systems) Regulations, 1998, which took effect from 4 January 1999, transposed the SFD into Irish law.

The Central Bank of Ireland also has statutory responsibilities under the Central Bank Act, 1971 for ensuring access to cheque clearing facilities by non-clearing credit institutions and other entities.

#### ***1.2.4 The regulation and oversight of stock exchanges, futures and options exchanges and investment intermediaries***

The Stock Exchange Act, 1995 provides for the approval of stock exchanges and the authorisation of their member firms by the Central Bank of Ireland. These tasks extend to the detailed financial and prudential regulation of stock exchanges and their member firms. This Act also implements the EC Investment Services Directive (ISD) and Capital Adequacy Directive (CAD) for investment firms.

The main provisions of the Stock Exchange Act, 1995 cover the following points:

- approval of stock exchanges, including approval of the rule book which contains, inter alia, the rules of conduct for

stockbrokers;

- authorisation of stock exchange member firms;
- imposition of conditions or requirements on approved stock exchanges and authorised member firms, with particular emphasis on client money and capital adequacy requirements;
- powers of inspection; and
- disciplinary powers.

The supervision by the Central Bank of Ireland of financial futures and options exchanges is governed by the Central Bank Act, 1989. This Act provides that futures and options exchanges may not be established in Ireland unless their rules have been approved by the Central Bank of Ireland. In approving such rules, the Central Bank of Ireland may impose conditions on an exchange and its members. Some aspects of the supervision of members of futures and options exchanges may also fall within the scope of the Investment Intermediaries Act, 1995, which implements those parts of the ISD and CAD not covered by the provisions of the Stock Exchange Act, 1995.

The Investment Intermediaries Act, 1995 provides that all investment firms operating in Ireland are subject to authorisation either by the Central Bank of Ireland or by a competent authority in another EU Member State. Companies established in the IFSC in Dublin to engage in activities on FINEX Europe which do not fall under the supervision of the Investment Intermediaries Act, 1995 are subject to direct regulation by the Central Bank of Ireland under the Central Bank Act, 1989. The nature of the prudential supervision which applies to these companies depends on the type of activity in which they are involved.

The Investor Compensation Act, 1998 transposes the EC Investor Compensation Directive into Irish law and provides a system of compensation in the event of an investment firm (i.e. a stockbroker or investment intermediary, or a bank or building society undertaking investment business) being unable to meet its financial obligations to its

clients. Under this system, payment is available only to private clients, with the maximum level of compensation being limited to 90% of the amount invested (subject to an overall limit of €20,000). In common with most other EU Member States, a specialist company – the Investor Compensation Company Limited – was established under the Act in order to put in place arrangements for the timely compensation of private clients of a failed firm.

Internationally, the Central Bank of Ireland is an active member of both the Forum of European Securities Commissions (FESCO) and the International Organization of Securities Commissions (IOSCO). The former is an EEA committee established in 1997 to improve the framework for supervising securities firms and securities markets, while the latter is the international representative body for securities regulators.

#### **1.2.5 The provision of settlement account facilities**

The Central Bank Acts of 1942 and 1971 provide the Central Bank of Ireland with powers to operate accounts for credit institutions and for the Irish Government. In 1980 the Central Bank of Ireland established the Daily Interbank Settlement system (DIS) and through this medium provided settlement account services to credit institutions. The DIS was replaced by the RTGS system, known as IRIS, which was introduced in March 1997 (see Section 3.2).

#### **1.2.6 The provision of registrar services**

The Central Bank of Ireland operates the register for Irish government bonds and for a small number of bonds issued by the European Investment Bank, the HFA and Ulysses Securitisation plc. The HFA is a company promoted by the Minister for the Environment under the Housing Finance Agency Act, 1981. The Agency has issued bonds on the Irish Stock Exchange and loaned the proceeds to housing authorities. The register of HFA bonds is maintained by the Central Bank of Ireland. Ulysses Securitisation plc was incorporated following the

passing of the Securitisation (Proceeds of Certain Mortgages) Act, 1995. It provides for the securitisation of certain mortgage debts owed to local authorities. The proceeds of securitisation are used by the government to meet extraordinary expenditure items. The register of bonds issued under this programme is also maintained by the Central Bank of Ireland.

Holdings in all of these bonds are recorded in accounts on a stock register system maintained by the Central Bank of Ireland. Following the transfer of the settlement function to Euroclear (see Section 4.3.1), the majority of accounts on the register represent the holdings of private investors, with the holdings of institutional investors largely represented in an omnibus account in the name of Euroclear Nominees. The Central Bank of Ireland carries out all of the standard registrar functions, such as making dividend and redemption payments and updating bondholder records generally.

Dividend and redemption payments are made either by cheque posted to the holder or by electronic funds transfer directly to a specified bank account. Payments to institutional investors who are Euroclear members are paid directly to Euroclear who in turn pay the holders on the due date.

### **1.3 The role of private and other public sector bodies**

#### **1.3.1 Financial intermediaries providing payment services**

Deposit-taking institutions in Ireland, which also provide a variety of payment services, can be classified as follows:

- licensed banks;
- building societies;
- savings banks;
- state-sponsored credit institutions; and
- the POSB.

Apart from the state-owned POSB, all of the other deposit-taking institutions are supervised by the Central Bank of Ireland and are classified

as credit institutions under EC Directives. There are also some credit institutions authorised in other EU Member States operating in Ireland, either on a branch or cross-border basis.

The Central Bank of Ireland is not responsible for the supervision of credit unions or industrial and provident societies (Section 7 of the Central Bank Act, 1971 as amended by Section 30 of the Central Bank Act, 1989).

The wide range of deposit-taking institutions (excluding the POSB) provide a variety of payment services through a network of some 1,000 branches, which equates to approximately one branch per 3,745 of the population. Three of the six banks which are full members of the clearing system (i.e. the clearing banks) are domestically owned and these account for most of the domestic banking business. Some of the clearing banks also have substantial foreign interests, particularly in the United Kingdom and the United States. TSB Bank (a savings bank) and the building societies, which account for a small proportion of both activity and volume in the payment system, are primarily domestically orientated.

Two-thirds of deposit-taking institutions authorised under Irish legislation are wholly-owned subsidiaries or branches of foreign banks. When EU credit institutions operating under EC legislation in the state on a branch basis are taken into account, more than 75% of deposit-taking institutions are wholly-owned subsidiaries or branches of foreign banks. Of the foreign-owned institutions, more than 75% have their parent companies in other EU Member States.

There are currently three building societies operating in Ireland. Under the Building Societies Act, 1989, these were given powers to engage in money transmission business.

The POSB is under the direct control of the Minister for Finance. It is not a credit institution as defined under relevant EC Directives and only provides a limited payments service. It does, however, provide a significant deposit-

taking service and, in addition, sells savings instruments on behalf of the Minister for Finance. Thus the POSB is largely a savings institution, although it does provide a facility for the purchase of payment orders in return for cash through its extensive network of more than 1,900 post offices.

### *1.3.2 National Treasury Management Agency*

The National Treasury Management Agency (NTMA) was established under the National Treasury Management Act, 1990 to manage Ireland's national debt and borrowing programmes. Under this Act, the borrowing and debt management functions of the Minister for Finance and related operational responsibilities were delegated to the Agency, which operates under the general control of the Minister for Finance and is subject to the Minister's directions and guidelines. The NTMA commenced operations on 3 December 1990.

Government bonds are issued by the NTMA as the agent of the Minister for Finance. The bonds are sold by means of auctions conducted through a primary dealer system. The Agency implemented this arrangement in December 1995 with the appointment of six primary dealers (market-makers) and an inter-dealer broker. Primary dealers are obliged to continuously quote two-way prices in certain (benchmark) government bonds. In return, they have exclusive access to tap issues and may be granted switching facilities, at the Agency's discretion, to facilitate the liquidity of the government bond market.

Bond issuance is confined to a limited number of designated fixed-rate benchmark bonds in key maturities (close to 2.5, 10 and 16 years). Amounts in issue in these benchmark bonds currently range from €3 billion to €6.3 billion.

The NTMA also issues Exchequer Notes, once again as agent for the Minister for Finance. These are short-term instruments issued for maturities ranging from one day to one year,

with a minimum investment amount of €100,000.

### **1.3.3 The Irish Stock Exchange**

The Central Bank of Ireland has delegated responsibility to the Irish Stock Exchange for monitoring compliance by members with its own rules, which cover both the conduct of business generally (i.e. relationships between stockbrokers and clients) and overall market regulation (i.e. relationships between stockbrokers). In this respect, the Irish Stock Exchange conducts annual reviews with each of its member firms, and reports on the outcome of these reviews to the Central Bank of Ireland.

Legislation covering insider dealing is contained in the Companies Act, 1990, while various statutory instruments implement EC Directives in relation to listing. The Stock Exchange is the competent body in relation to both insider dealing and stock exchange listing.

The Irish Stock Exchange currently has 23 members. As at 31 December 2000, there were 76 domestic and 20 foreign companies listed on the Exchange. Turnover in equities for the same year was €31.46 billion.

The law relating generally to the issue and trading of securities comprises the Companies Acts, 1963 to 2000, the Stock Transfer Act, 1963 and case law.

### **1.3.4. FINEX Europe and the New York Futures Exchange**

FINEX Europe and the NYFE both operate in Ireland – see Section 4.1 for further details. FINEX Europe is a branch of the Financial Instrument Exchange in New York, and the NYFE is a branch of the New York Futures Exchange. Both are, in turn, divisions of the New York Board of Trade (NYBOT), which was formed in June 1998 as a result of the merger between the New York Cotton Exchange (NYCE) and the Coffee, Sugar and Cocoa Exchange (CSCE).

### **1.3.5 The Irish Payment Services Organisation**

The Irish Payment Services Organisation (IPSO) was set up in 1999 to act as the representative body of the Irish payments industry. There are currently four autonomous companies (IRISCo, DebitCo, CreditCo and EFTCo – see Section 3) operating under the umbrella of this representative body, each responsible for its own operating rules, settlement procedures, standards and access criteria.

IPSO is a limited company with a set of rules which defines its formal relationships with the individual clearing companies. The role of IPSO is mainly consultative and advisory; it is therefore entitled in turn to be advised by the clearing companies in advance of any proposed changes to access criteria, rules and standards. IPSO can also decide to refer any issues or concerns related to the payment industry in Ireland to the Central Bank of Ireland in its role as regulator of payment systems. Each member of a clearing company has the right to membership of IPSO and to representation on the IPSO Board. IPSO also plays a role in facilitating the completion of the daily retail clearings settlement process.

### **1.3.6 The Irish Bankers' Federation**

The Irish Bankers' Federation (IBF) was established in 1973 to represent the general interests of all licensed banks. An extensive network of Working Committees is responsible for proposing policy positions on relevant banking matters, which if adopted by a 12-member Governing Council, become the official industry policy to be pursued by the Secretariat. The current membership of the IBF comprises some 50 financial institutions.

### **1.3.7 The Irish Mortgage and Savings Association**

The Irish Mortgage and Savings Association carries out a similar role in relation to the interests of building societies as the IBF does for those of the licensed banks.

### 1.3.8 *The Ombudsman for Credit Institutions*

An Ombudsman scheme established jointly by licensed banks, building societies, savings banks and the two state-sponsored credit institutions is available to investigate complaints against credit institutions from both individuals and from small companies with an annual turnover of up to IEP 1 million (€ 1, 269,738).

The Central Bank of Ireland has also delegated the role of adjudicating on disputes arising under the EC Cross-border Credit Transfer

Directive to the Ombudsman for Credit Institutions under the Regulations implementing this Directive.

### 1.3.9 *The Investor Compensation Company Limited*

The Investor Compensation Company Limited was established under the Investor Compensation Act, 1998 to oversee arrangements for the compensation of private clients in the event of an investment firm (i.e. a stockbroker or a bank or building society undertaking investment business) being unable to meet its financial obligations.

## 2 **Payment media used by non-banks**

Since the early 1980s, credit cards have grown in importance and continuing technological developments are leading to the more widespread use of, inter alia, ATMs, telephone and internet banking and the transfer of payments data via electronic media. The debit card, which was introduced in Ireland in 1996, has also become a popular payment instrument.

### 2.1 **Cash payments**

A significant percentage of retail payments in Ireland continues to be made in banknotes and coins. Currency in circulation as a percentage of GNP declined from 7% in 1980 to 6% in 1995, but then increased to 6.5% in 1999, reflecting the fact that banknotes and coins continue to play an important role in making payments in Ireland. The amount of coins acceptable as legal tender in any one transaction is limited by the Central Bank Act, 1989 to 20 times the face value of the individual coins presented.

### 2.2 **Non-cash payments**

The use of payment instruments other than banknotes and coins is now widespread in Ireland, reflecting a general expansion in the banking habit among the population. Current

(sight) accounts are the predominant accounts on which non-cash payment instruments used to make domestic small-value payments are drawn. This type of account is usually non-interest bearing. Some banks operate arrangements whereby no charges are made for transactions across current accounts subject to certain terms and conditions. Balances on interest-bearing deposit accounts in the major clearing banks can be transferred to current accounts on demand with little difficulty.

#### 2.2.1 **Cheques**

The issue and acceptance of the cheque as a means of payment is covered by the Bills of Exchange Act, 1882 and the Cheques Act, 1959, as amended, and by case law. The cheque continues to be an important and widely used payment mechanism for many purposes, notwithstanding the introduction of debit cards in 1996. Some 157 million cheques totalling IEP 489.7 billion (€621.8 billion) in value were issued in Ireland in the year ended 31 December 1999.

In Ireland, some 95% of cheques are currently truncated at the paying bank stage. There are no plans at present to introduce truncation at the collecting bank stage.

Although cheque guarantee cards (of which some three-quarters of a million are currently in issue) are not actually payment instruments, they play a role in supporting payments, as their sole purpose is to guarantee the payment of a cheque up to a specified limit (currently IEP 100 or €130). Most banks now issue multi-function cards which may be used as debit cards and to operate ATMs as well as guarantee cheques.

### 2.2.2 Credit transfers

The use of paper credit instruments has increased in recent years, with some 52 million paper credit transfers being processed in the year ended 31 December 1999, these having a total value of IEP 135.9 billion (€ 172.6 billion). The use of electronic credit transfers has also increased, particularly in connection with the payment of salaries by employers directly to their employees' bank accounts. More than 57 million such items, with a total value of IEP 7.1 billion (€ 9 billion), were processed in 1999.

### 2.2.3 Direct debits

Banks continue to promote paperless payment media, such as direct debits and standing payment orders. This is done through the enhancement of these payment services and through the related pricing policy for their use. Some 49 million direct debits, with a total value of IEP 11.1 billion (€14.1 billion), were handled by the banking system in 1999.

Banks also actively encourage large organisations which generate or receive high volumes of recurring payments to use paperless electronic transfers, e.g. by direct debiting of firms' bank accounts and direct crediting of salaries to employees' bank accounts.

### 2.2.4 Debit cards

Following a successful pilot scheme in late 1995, two of the clearing banks introduced a debit card scheme known as LASER in 1996. The scheme has since expanded to include a total of ten credit institutions. There were some

578,000 debit cards in issue as at 31 December 1999 (this figure has since increased to 780,000) and, on average, close to 2 million transactions are handled by the system every month. In 1999 the total value of debit card transactions was some IEP 951.0 million (€1,207.5 million). Retailers who accept LASER payments (some 22,000 throughout the country) simply use a terminal to swipe the magnetic strip on the customer's card, thereby producing a voucher for signature by the customer. The customer's account is then debited, and the retailer's account credited with the amount due within a few days, all by electronic means. Cash may also be provided at retail outlets in addition to making payments for purchases.

### 2.2.5 Credit cards

The generic term "credit card" covers:

- credit cards of the Visa and Access (i.e. MasterCard/Eurocard) type; and
- charge cards (as issued by American Express and Diners Club) which do not generally have an extended credit facility.

Access (MasterCard/Eurocard) and Visa are the main credit cards issued in Ireland. Since first becoming available in Ireland in the late 1970s, the credit card has continued to grow in popularity as a non-cash method of payment for goods and services.

There are currently almost 2 million credit cards in issue in Ireland. In the year ended 31 December 1999, credit cards (of which there were then approximately 1.5 million) were used for some 47 million transactions with a total value of IEP 2.5 billion (€3.2 billion). It is estimated that 25% of the adult population in Ireland now possesses at least one credit card. Outstanding debt on credit cards at the end of December 1999 was €829 million; this figure had increased to €901 million at the end of October 2000, which amounts to approximately 10% of the overall total personal credit (excluding mortgages) provided by deposit-taking institutions.



### 2.2.6 ATM and POS networks

The use of ATMs, especially for cash withdrawal, has grown substantially since their introduction in Ireland during the early 1980s. There are currently around 2.8 million ATM cards in issue and some 1,427 ATMs in service throughout the country, which roughly equates to one ATM per 2,600 of the population. In 1999 ATMs were used to conduct approximately 126 million transactions. The total value of these transactions was in the region of IEP 8.0 billion (€10.2 billion). There is also an extensive network of POS terminals for credit and debit cards in Ireland.

### 2.2.7 Telephone banking

Services such as mortgages and personal loans have been available in Ireland over the telephone for some years. However, customers of the country's main banks can now also conduct everyday banking business over the telephone, 24 hours a day, 365 days a year. The range of services currently on offer (which may vary from bank to bank) is as follows:

- credit card, personal loan and mortgage applications;
- standing order and direct debit instructions;
- account and balance enquiries;
- inter-account transfers;
- bill payments;
- orders for foreign currency;
- cheque book and statement requests;
- cheque stop payment instructions; and
- lost or stolen cheque book or card reports.

A common standard is that all calls to the centres set up specifically to operate the telephone banking service are answered within seconds. Callers must pass a security check before they can conduct their business. Thereafter, the verbal instructions given by the caller over the telephone form the contract between customer and bank in exactly the same way as would a form completed at the counter

in a bank branch. All calls are voice recorded and filed; these recordings then form the audit trail which protects both parties to a telephone banking transaction.

### 2.2.8 Internet banking

The provision of financial services on the internet has tended to take place on a phased basis in Ireland, with institutions at first simply displaying product or rate information only. The next step would typically cover the provision of a limited range of services such as loan calculations and applications. Account enquiry and transfer options might follow before the institution concerned finally proceeds to offer customers access to a full range of internet-based banking facilities.

A number of banks in Ireland are currently progressing steadily through these stages. Further significant developments can be expected to take place in this regard, both in the short term and further into the future.

### 2.2.9 Retailer cards

No information is currently collected for these instruments.

### 2.2.10 Prepaid cards

There are no prepaid card schemes operating in Ireland at present, apart from a number of single-use schemes such as telephone cards. There were two e-money pilot schemes in operation in 1999 and 2000, but both have now finished.

### 2.2.11 Postal instruments

The POSB is operated by An Post, the state company which operates the national postal service. The POSB provides retail money transmission services for government departments, the main national telecommunications company and other public bodies, as well as for the personal sector. The main payment instruments currently provided by the POSB are postal orders and

money orders, which are essentially the same as bank drafts. Other services, less important in terms of activity, include sterling drafts and the services of the Euro-giro system.

Discussions are currently taking place between the POSB and the banks with a view to implementing a number of improvements in the money transmission area. It is expected that developments in this area will focus on coupling the POSB's large network of branches with modern electronic funds transfer technology, thereby possibly leading to greater competition in the provision of domestic payments services. However, at the time of writing, the POSB only operates savings account, and their only formal connection to the payment system is through the issue of postal and money orders. When these are lodged with the banking system, they are settled bilaterally through an account held by the POSB with one of the clearing banks.

### 2.2.12 Other payment instruments

Payable orders, which are a form of debit instrument analogous to cheques, are issued by the Paymaster General for the payment of civil service salaries and for goods and services. These instruments are treated similarly to cheques insofar as they are collected through the banking system and settled bilaterally between the collecting bank and the Paymaster General via settlement accounts at the Central Bank of Ireland.

## 2.3 Recent developments

There is a continuing trend for wages and salaries to be credited directly to employees' bank accounts by electronic funds transfer. There has also been some discussion of the possibility of state welfare and health benefits being paid in a similar manner.

## 3 Interbank exchange and settlement systems

### 3.1 General overview

Large-value payments and interbank settlements are effected using a fully automated RTGS system managed and operated by the Central Bank of Ireland. This system is interlinked with TARGET. Retail payment clearing functions are carried out by clearing companies which have been established specifically for this purpose. Cash and cheques are still widely used to make retail payments, although both are to some extent being replaced by credit and debit cards.

### 3.2 The real-time gross settlement system

#### 3.2.1 General

The Irish RTGS system, known as IRIS, commenced live operation in March 1997. The system is owned by IRISCo, but the interlinking software used to connect the IRIS system to other EU RTGS systems which share the same

hardware platform is owned by the system manager and operator, the Central Bank of Ireland. The latter has a 7% share in IRISCo, whose operating costs are recovered from participants on the basis of their shareholdings in the company.

The RTGS system is fully automated and consists of two major components, the Central Accounting System (or CAS, for which the software is provided by Logica) and the messaging system (SWIFT). All participants hold settlement accounts at the Central Bank of Ireland and must also be members of IRISCo. The RTGS system is essentially the settlement account system of the Central Bank of Ireland.

The IRIS RTGS system is interlinked to the TARGET system.

### 3.2.2 Operating rules

The operating rules of the system are legally binding on all members. A Service Level Agreement is in place between IRISCo and the Central Bank of Ireland, the system manager and operator. The terms and conditions for holding a settlement account at the Central Bank of Ireland are also legally binding and are relevant to participation in the RTGS system.

### 3.2.3 Participation in the system

Access criteria for the IRIS system comply with the TARGET Guideline of the ECB. In addition to credit institutions, the Central Bank of Ireland may also allow the State Treasury access to the system, as well as investment firms established in the EEA and organisations providing clearing and settlement services.

There are currently 23 direct participants in IRIS, namely 21 credit institutions, the NTMA (Ireland's national debt management agency) and the Central Bank of Ireland, which participates both on its own behalf and on behalf of the public sector and international customers. There are no indirect participants in the IRIS system.

### 3.2.4 Transactions handled

The transactions processed by the RTGS system include the following:

Interbank payments:

- interbank money market transactions, e.g. interbank loans;
- commercial interbank payments, e.g. customer payments; and
- settlement of interbank clearings, e.g. retail payment clearings.

Payments between the Central Bank of Ireland, settlement account holders and government accounts held at the Central Bank of Ireland:

- currency issue and withdrawal;
- changes in minimum reserve requirements;

- Central Bank of Ireland and government accounts at the Central Bank of Ireland: clearings (e.g. tax, government expenditure); and
- government bond issues, redemptions and dividends.

Monetary policy operations:

- open market operations;
- marginal lending facility; and
- overnight deposits.

Retail clearings are settled by the net debtors making payments to the Central Bank of Ireland, which in turn then makes payments to the net creditors. No clearings are settled until all of the net debtors have made their payments to the Central Bank of Ireland.

In exceptional circumstances, the Central Bank of Ireland has the ability to apply manual entries (account transfers) to the settlement accounts in the CAS.

In 1999 the system processed some 423,000 transactions with a value in excess of €3,594 million. Of these totals, almost 276,000 transactions were domestic and 147,000 cross-border; in value terms, the respective amounts were €2,525 million for domestic and €1,070 for cross-border payments. For the year 2000, the number of transactions increased to more than 485,000 (295,000 domestic, 190,000 cross-border) and the value to €3,813 million (€2,407 million domestic, €1,406 million cross-border).

### 3.2.5 Operation of the system

All participants in RTGS are members of a SWIFT closed user group. A payment is initiated by the sending member transmitting a SWIFT payment message (MT 100, MT 103 or MT 202) to the destination member. The payment message will be marked as requiring settlement via IRISCo. SWIFT intercepts this message via the FIN Copy (Y-copy) service and holds the message pending receipt of a settlement response from the CAS. The FIN

Copy service transmits a partial copy of the payment message to the CAS containing the following details:

- sending member;
- destination member;
- value date;
- transaction reference; and
- transaction amount.

The CAS then checks the format of the message and that there are sufficient funds on the sender's account to cover payment. If there are sufficient funds on the account, the CAS settles the payment in real time by transferring the funds between the settlement accounts of the sending and destination members, and sends a settlement response to FIN Copy. FIN Copy then forwards the full payment message to the destination member. In the event that there are insufficient funds on the account of the sending member, the payment is queued until sufficient funds are received to permit settlement.

The operating hours of the IRIS system are the same as for TARGET; likewise, operating days are those defined for TARGET in the TARGET Guideline.

### 3.2.6 Queuing

The CAS queues payments which are ready for settlement (i.e. formatting in order) if there are insufficient funds available on the account of the sending member. The CAS also queues payments if the system is busy. All queues are based on the FIFO principle in order of priority by message type. Priorities can be assigned by the sending member; in the absence of any assigned priority, a default value is set by the system. Queued payments may be cancelled or have their priority changed by the sending member.

### 3.2.7 The accounting process

Payment queues contain settlement requests and account transfers. These transactions are single debit and credit accounting transactions.

Both sides of a transaction are posted simultaneously and receive the same time-stamp.

### 3.2.8 Gridlock resolution

Gridlock occurs when two or more payment queues become blocked.

Where there is no shortfall of funds in aggregate throughout the system, the gridlock may be resolved by using the gridlock algorithm in the CAS. This can be initiated manually or can be preset to run at regular intervals. The algorithm examines all queues and chooses a set of payments which can be settled. It may then settle either some or all of the selected payments as one unit of work, and a reference on the payments concerned will indicate that they have been settled as part of a gridlock resolution process.

Gridlock arising from an overall shortfall of funds in the system as a whole may be resolved by an injection of liquidity by the Central Bank of Ireland by means of intraday repos.

### 3.2.9 Enquiries and monitoring

All participants have online access to their account via the participant workstation network. This allows online viewing of their account balance and all settled transactions together with their own outgoing unsettled payments. All RTGS participants may also submit enquiries via SWIFT messages addressed to the CAS, which receive an automatic response.

The Central Bank of Ireland has the facility to monitor all payment queues.

### 3.2.10 Settlement procedures

Each participant has a single settlement account in the CAS, which is used to settle all of its payments.

### 3.2.11 Credit and liquidity risk

Liquidity is provided to participants each morning when the RTGS system opens for

business by means of account transfers by the Central Bank of Ireland. These account transfers are based on the amount of collateral lodged with the Central Bank of Ireland by each participant. Additional liquidity may also be made available if required – there is, in practice, no restriction on the amount of intraday liquidity which may be provided by the Central Bank of Ireland to a participant, subject to the condition that all credit must be fully collateralised. Liquidity is withdrawn from participants at the close of business each day by using the same account transfer mechanism.

Participants' settlement accounts at the Central Bank of Ireland are also their minimum reserve accounts. Only positive balances are permitted on these accounts; participants do, however, have access to minimum reserve balances intraday.

Participants may access the deposit facility on request. Interest on deposits is paid at the rate set by the ECB.

In the event of any participant having insufficient funds to repay their intraday liquidity, the shortfall is treated as a request for access to the marginal lending facility. This lending attracts overnight interest at the rate set by the ECB. Should a participant require additional liquidity during the day, an intraday repo may be requested. Payments can only be made out of available funds; a technical feature prevents participants from maintaining negative balances on the system under any circumstances. The system therefore involves no credit risk for participants.

### 3.3 Retail payment systems

#### 3.3.1 The structure of the clearing system

Three separate clearing companies have been incorporated to take responsibility for the retail payment clearing functions as follows:

- the Irish Paper Debit Clearing Company Limited – DebitCo – (which handles

paper debits, i.e. cheques);

- the Irish Paper Credit Clearing Company Limited – CreditCo – (which handles paper credits, i.e. credit transfers); and
- the Irish Retail Electronic Payments Clearing Company Limited – EFTCo – (which handles bulk electronic payments).

In order to protect the integrity of the clearing systems, the rights, obligations and responsibilities of each member institution are set out in the Articles of Association of each of the individual clearing companies. The procedures to be followed in the event of the insolvency of a participant will be set out in a Payments Obligations Agreement; this is currently being prepared for completion by all members, the clearing companies and the Central Bank of Ireland.

New institutions joining any of the clearing companies are expected to contribute to past non-recurring costs on an objective basis determined by the clearing company concerned in consultation with the Central Bank of Ireland. Such new institutions will also be expected to meet any direct impact costs incurred by each of the existing participants in connection with their entry to the system. Any credit institution authorised to conduct money transmission business may apply for associate membership of a clearing company, using a full member as agent, thereby obtaining indirect access to the clearing system.

#### 3.3.2 The clearing system in operation

Each of the three clearings (debit paper, credit paper and electronic fund transfer) operates in broadly the same manner. The debit paper clearing process is described in detail in this section as an example.

The debit paper exchange is operated by DebitCo. The company's Debit Paper Clearing Rules govern the process whereby cheques and other debit paper items are exchanged for value between financial institutions which participate in the clearing system. These rules also govern

the processes for dealing with unpaid items and for rectifying errors.

The process starts with the collecting bank branch which has accepted debit paper items in a lodgement from a customer. The items will already have been pre-printed with magnetic ink to identify the drawee bank and the account number of the drawee bank customer (the drawer). The collecting bank branch encodes its own identity and the amount of the item in magnetic ink on the bottom of the face of each item, which facilitates mechanical or automated sorting (this process being known by the acronym MICR – magnetic ink character recognition). The items are then sent to the collecting bank's clearing department.

The collecting bank's clearing department gathers each day's debit paper items from all of its branches and sorts them by means of a sorting machine known as an automated reader sorter. This process reads the magnetic ink encoding on all items and groups them according to the drawee bank, thereby ultimately producing a listing of items drawn on each drawee bank.

Generally, most of the collecting banks' clearing departments exchange each day's debit paper items bilaterally with the paying banks' clearing departments. Some participants use IPSO's offices in Dublin as a central exchange, where debit paper items are handed to a representative of the relevant drawee bank's clearing department with related lists. However, this only occurs to a very limited extent.

IPSO's main function in this particular context relates to the calculation of settlement obligations. The total amount of the items being collected by each collecting bank on each respective drawee bank are provided to IPSO in list form. Bilateral and multilateral figures for each participant are then produced and the multilateral settlement figures given to the Central Bank of Ireland, which then debits or credits, as appropriate, the settlement account of each participant. Retail clearings are settled by the net debtors making payments to the

Central Bank of Ireland, which in turn makes payments to the net creditors. No clearings are settled until all of the net debtors have made their payments to the Central Bank of Ireland.

The drawee bank's clearing department then takes the items with which it has been presented and sorts them according to drawee bank branch. This again is done by an automated mechanical process which reads the magnetic ink encoding on the relevant items, which are then presented physically or by means of electronic detail to each of the drawee bank branches.

### 3.3.3 The clearing cycle

The clearing cycle for cheques both drawn on and lodged at the same branch of a particular bank is one business day. Value is given on the same day as the lodgement.

The clearing cycle for all other domestic items – including cheques or credits destined for other branches of the same bank or branches of other banks – is normally three business days. Value may not be given until the next business day following lodgement.

To take an example, on **day 1** a customer lodges a cheque directly to his account at his bank branch. The cheque is recorded as having been lodged on that date. On **day 2**, the cheque is processed in that day's clearing and the customer's bank both receives and gives value for the cheque at close of business on that date. On **day 3**, the cheque is debited to the account of the drawer (i.e. the party who wrote the cheque in the first instance), backdated to **day 2** for value purposes.

For a variety of reasons, not all cheques are paid on first presentation. There may, for example, be insufficient funds on the drawer's account to meet a cheque. Under the clearing rules, a bank has until close of business on **day 4** of the clearing cycle to either pay a cheque or return it unpaid to the bank on which it was drawn. An unpaid cheque should therefore be received by

the bank on which it was drawn on **day 5**. It is, therefore, not certain that funds will be cleared for at least five business days. For this reason, all banks advise customers not to draw against cheques which have not been “cleared for fate” – i.e. honoured and paid by the bank on which they are drawn.

### 3.3.4 The ‘special presentations’ system

There is a payment facility for large-value Irish pound cheques/eurocheques known as the “special presentations” system. Cheques for IEP 500,000 (€634,869.04) or more, provided that they are drawn on nominated bank branches located in central Dublin, may be presented at those branches up to 3 p.m. daily for same-day value in central bank money. The bank on which the cheque is drawn completes the process by making an interbank payment via the RTGS system to the payee bank.

Cheques of a similar magnitude drawn on a branch which is not nominated may be presented to that branch and a bankers’ payment obtained in return, which may in turn be presented at a nominated branch before 3 p.m. This facility is available on a reciprocal basis to all licensed banks on which cheques are drawn. Cheques for which value is given and received in this manner are settled on a gross basis in the settlement system.

Cheques paid via the “special presentations” system cannot be subsequently returned unpaid; in other words, the system provides both finality and value.

## 3.4 Other retail payment systems

### 3.4.1 ATM and POS networks

The clearing banks, together with one state-sponsored credit institution, have a fully interlinked network of 1,136 ATMs. The building societies, together with one other credit institution, have another interlinked network of 93 ATMs. These two networks are interlinked to some degree, but full interoperability does not

yet exist. However, the technical specifications of both are fully compatible, which would facilitate ATM interlinking between most institutions in the future.

The services available on ATMs include cash withdrawal and lodgement; transfer between accounts; account enquiry and statement and cheque book requests. Bill payment facilities are available through part of the ATM network, allowing settlement of electricity, telephone and credit card bills; in addition, Visa and Access credit card holders can use the ATM network for cash withdrawals. A number of ATMs also provide a foreign exchange service in appropriate locations, and customers of some UK banks may also use their cards at ATM networks in Ireland for cash withdrawals.

The major banks have introduced online counter terminals which provide their own customers with access to their accounts held either at that branch or at another branch of the same bank. These terminals may be accessed via the normal ATM card. Cash lodgements and withdrawals using counter terminals have immediate effect on a customer’s balance.

In Ireland there is an extensive network of POS terminals for credit and debit cards. Some of these terminals are linked to a central computer and provide immediate authorisation and give immediate effect to credit card transactions. Others simply collect data for the purposes of subsequently debiting customers’ accounts with the relevant credit card company. The data are sent for processing at the end of each business day via a telecommunications network. While facilities for full EFTPOS are at present in a rapid state of change, such facilities do not yet exist in Ireland. Banks are evaluating the commercial viability of introducing such facilities in the future.

### 3.4.2 Credit card vouchers

Some retailers continue to use paper credit card vouchers for credit card transactions. When accumulated credit card vouchers are

lodged by retailers to their own bank accounts, they are entitled to same-day value. Vouchers pertaining to credit cards which have been supplied by retailers' own banks may be cleared through those banks' normal internal clearing procedures. This simplified process results in credit card holders' accounts with the card issuer being debited within the shortest time possible following the lodgement of the vouchers with the bank.

Where the credit card vouchers are associated with banks other than retailers' own banks (including those located abroad), the information contained on the vouchers is transferred to magnetic tape and dispatched to the respective credit card companies. These companies then prepare further tapes for transmitting the data to the individual banks which issued the credit cards. Such tapes contain information for these banks about their own customers' credit card purchases, which is then transmitted through their internal clearing systems to be debited the next day to the credit card users' accounts. On average this process takes longer than the presentation and debiting of cheques.

### 3.4.3 Bilateral ATM arrangements

Each bank's system automatically produces figures each day for the amounts owed to or due from the other clearing banks as a result of

customers' withdrawals and lodgements via interlinked ATMs. The debit items resulting from the use of ATMs during the day or over a weekend are settled the next working day through the clearing system.

### 3.4.4 Eurocheques

There is a National Eurocheque Clearing Centre in Ireland for processing eurocheques which have been negotiated abroad by Irish residents. The centre is also responsible for processing foreign ATM withdrawals by Irish residents. These transactions are processed on behalf of all banks in Ireland and then transmitted through the banks' clearing departments for next-day debiting to the drawees' accounts. ATM withdrawals and eurocheques negotiated by non-residents in Ireland, up to the equivalent of IEP 800 (€1,015.79), are sent for collection by the bank at which the eurocheque is lodged to the bank on which the eurocheque is drawn.

The National Eurocheque Clearing Centre will, however, cease operations with effect from 31 October 2001. The eurocheque system is no longer widely used, due in no small part to the fact that holders of most credit cards can use them to obtain cash from ATMs when abroad, either on credit or having first transferred sufficient funds to their credit card account to cover their anticipated needs.

## 4 Securities settlement systems

### 4.1 Trading

In Ireland, securities can be divided into the following classes:

- government paper (government bonds, Exchequer Notes and Exchequer Bills);
- CDs issued by deposit-taking institutions; and
- CP. (This category can in turn be divided between equities and non-equity CP.)

Most of these securities are traded on the Irish Stock Exchange.

#### 4.1.1 Institutional aspects

The Irish Stock Exchange monitors compliance by members with its rules, which cover both the conduct of business generally (i.e. relationships between stockbrokers and clients) and overall market regulation (i.e. relationships between



stockbrokers). In this respect, the Irish Stock Exchange conducts annual reviews with each of its member firms, and reports on the outcome of these reviews to the Central Bank of Ireland. The law relating generally to the issue and trading of securities comprises the Companies Acts, 1963 to 2000, the Stock Transfer Act, 1963 and case law.

The Irish Stock Exchange currently has 23 members. As at 31 December 2000, the number of companies listed on the Exchange stood at 76 domestic and 20 foreign. Turnover in equities for the same year was €31.46 billion.

The Irish Stock Exchange operates four distinct markets on which securities are traded. These are as follows:

- the official list, where domestic issues of government bonds and shares in mature companies are traded;
- the exploration securities market, which is the market for the stock of exploration companies;
- the developing companies market (DCM), where the stock of small, new Irish companies is traded; and
- the technology market (ITEQ), the market for growth-oriented companies in dynamic industries.

For equities, the exchange changed to electronic order book trading in June 2000, using the Deutsche Börse XETRA system. The Irish market is supported by a control segment on Deutsche Börse's central platform. The Irish Stock Exchange Index, ISEQ, gives an overview of the market's performance and is published by Reuters continuously throughout the day.

#### **4.1.2 Futures and options exchanges**

There are two futures and options exchanges currently trading in Ireland – FINEX Europe and the NYFE. FINEX Europe is a branch of the Financial Instrument Exchange in New York and was established in 1994. The exchange operates on an open-outcry basis, and trades a variety of

US dollar-based currency and cross-currency futures and options contracts. FINEX Europe's membership is drawn from a wide spectrum of individuals with a financial background and other entrepreneurs. The NYFE is a branch of the New York Futures Exchange in the United States. It also operates on an open-outcry basis, and trades three futures contracts. Both of these exchanges are divisions of the NYBOT.

The NYBOT is responsible for monitoring the compliance of FINEX Europe and the NYFE with the rules relating to matters such as membership, dealing, position and price limits, margining, guarantee fund arrangements and default procedures. NYBOT is regulated in the United States by the Commodity Futures Trading Commission (CFTC). The Central Bank of Ireland has therefore developed a mechanism for the approval of rules and the supervision of the members of FINEX Europe and the NYFE in conjunction with the CFTC.

With regard to rule changes, this mechanism operates on the basis that details of proposed changes are forwarded by the NYBOT to the Central Bank of Ireland for approval. The Central Bank of Ireland reviews such changes and, when these have been agreed, they become effective once accepted by the CFTC. In terms of supervision, the Central Bank of Ireland imposes a requirement on members of the exchanges that they comply with relevant US law, the CFTC regulations and NYBOT rules. A breach of any of these would thereby become a breach of the Central Bank of Ireland's own requirements; the Central Bank of Ireland could then use its powers to take action by, for example, directing a member to suspend trading.

#### **4.1.3 Certificates of deposit**

The purchase and sale of IEP-denominated CDs is managed in the money market. There is a growing market in non-equity CP in Ireland which is carried out mainly in the interbank market.

## 4.2 Clearing

There is no clearing house currently operating in Ireland.

## 4.3 Securities settlement

Transactions in Irish government bonds are settled in Euroclear, while trades in Irish equities are settled in CREST. Transfers of Exchequer Notes are recorded on a register maintained by the issuer, the NTMA.

### 4.3.1 Euroclear settlement

The Central Bank of Ireland Securities Settlements Office (or the CBISSO – formerly called the Gilts Settlement Office, or GSO), in which most trades in Irish government bonds were settled, was established in 1989 and managed by the Central Bank of Ireland. A major review of this settlement system by a committee consisting of representatives of the Central Bank of Ireland, the NTMA and market participants resulted in a decision to transfer the settlement of Irish government bonds to Euroclear (see the chapter entitled “Cross-border payment and securities settlement systems” for details). A description of CBISSO operations can be found in the April 1996 edition of the Blue Book.

The CBISSO closed on 1 December 2000 and settlement by Euroclear members of trades in Irish government bonds and their associated payments through Euroclear commenced on 4 December 2000. Transactions between Euroclear members take place by book entry in Euroclear either on a DVP or an FOP basis. Such transactions are not reflected individually on the stock register maintained by the Central Bank of Ireland, as they do not affect the overall balance on the Euroclear Nominees omnibus account on that register. Cash settlement in respect of transactions involving private individuals or other non-Euroclear participants takes place between the parties outside the Euroclear system.

The settlement of trades in Irish government bonds in Euroclear is governed by a legal agreement between the two parties and an associated service description. These contractual arrangements cover the following areas:

- general principles;
- settlement and custody operations;
- fees; and
- contingency arrangements.

Agreements are also in place to facilitate and record in the Euroclear system changes to the outstanding capital of all bond issues resulting from tranche and cancellation transactions by the issuers.

A daily reconciliation process is carried out between the Central Bank of Ireland, in its role as registrar, and Euroclear. A full reporting system is also in place.

### 4.3.2 CREST settlement

Transactions in Irish equities are settled via the CREST system (see the chapter on the United Kingdom for details), with the cash leg currently being settled in central bank money through the domestic RTGS system by Irish settlement banks. CREST also facilitates the settlement of trades in Irish equities in euro through arrangements with Irish settlement banks. This position with regard to settlement of the cash leg of transactions in Irish equities may change with the move by CREST to real-time DVP in the latter half of 2001.

The legislation covering settlement of Irish equities in CREST is contained in the Companies Act, 1990 (Uncertificated Securities) Regulations, 1996.

### 4.3.3 Settlement of Exchequer Notes

Transfers of Exchequer Notes are recorded on a register maintained by the issuer, the NTMA. The NTMA settles securities and cash individually on a gross basis, with the cash leg being settled in central bank money in the domestic RTGS system.

#### **4.4 The use of the securities infrastructure by the Central Bank of Ireland**

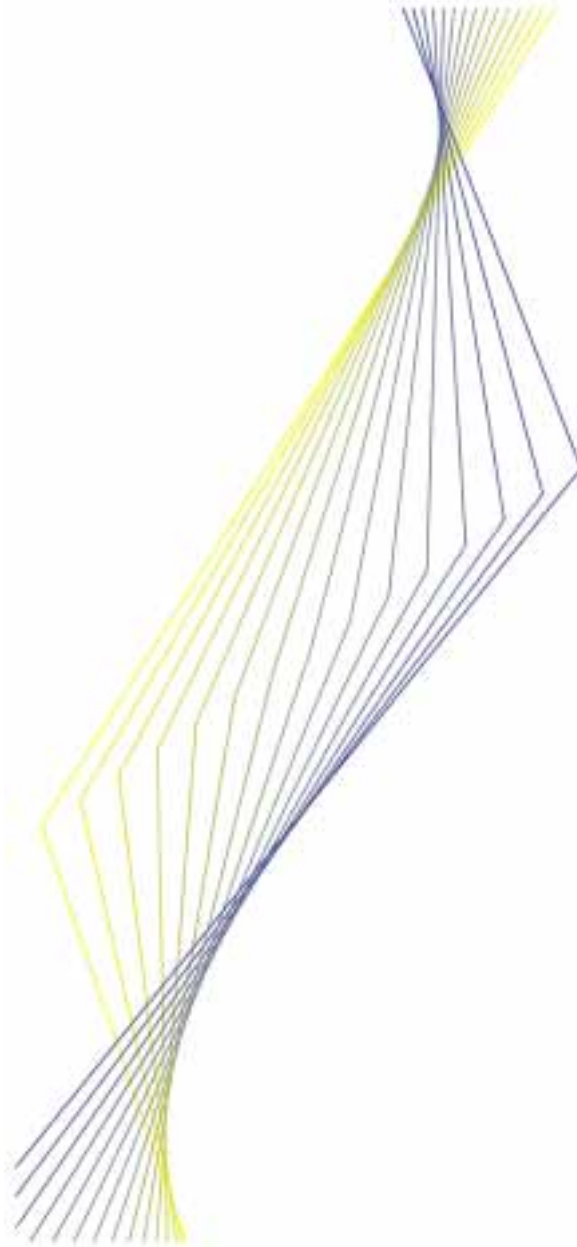
Irish government bonds transferred by counterparties to the Central Bank of Ireland as part of ESCB monetary policy operations or for the purposes of obtaining intraday credit in the RTGS system are recorded in the Central Bank of Ireland's name either on the register of government bonds which the Central Bank of Ireland maintains or within the Euroclear system. Investments in Irish government bonds by the Central Bank of Ireland for reserves management purposes are held in Euroclear.

Similarly, transfers by counterparties of Exchequer Notes to the Central Bank of Ireland, as part of ESCB monetary policy operations or for the purposes of obtaining intraday credit in the RTGS system, are recorded by the issuer, the NT MA.

The Central Bank of Ireland also makes extensive use of the CCBM, acting from time to time as both home central bank and correspondent central bank.



EUROPEAN CENTRAL BANK



**Italy**

**June 2001**

Italy

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## List of abbreviations

<b>ABI</b>	Italian Bankers' Association – <i>Associazione Bancaria Italiana</i>
<b>AIPA</b>	Authority for Information Technology in the Public Administration – <i>Autorità per l'Informatica nella Pubblica Amministrazione</i>
<b>BI-COMP</b>	Banca d'Italia clearing system – <i>Banca d'Italia Compensazione</i>
<b>BI-REL</b>	Banca d'Italia real-time gross settlement system – <i>Banca d'Italia Regolamento Lordo</i>
<b>BIR</b>	Large-value credit transfers – <i>Bonifici di Importo Rilevante</i>
<b>BOE</b>	Cross-border credit transfers – <i>Bonifici Esteri</i>
<b>CAI</b>	Interbank database on cheques and payment cards – <i>Centrale d'Allarme Interbancaria</i>
<b>CCG</b>	Clearing house – <i>Cassa Compensazione e Garanzia</i>
<b>CIPA</b>	Interbank Convention on Automation – <i>Convenzione Interbancaria per i Problemi dell'Automazione</i>
<b>CLFI</b>	Consolidated Law on Financial Intermediation
<b>CO.GE.BAN</b>	Convention for the Management of the Bancomat Trademark – <i>Convenzione per la Gestione del Marchio Bancomat</i>
<b>Consob</b>	Companies and Stock Exchange Commission – <i>Commissione Nazionale per le Società e la Borsa</i>
<b>e-MID</b>	Screen-based interbank deposit market – <i>Mercato Interbancario dei Depositi</i>
<b>EPOP</b>	Electronic payment order procedure – <i>Mandato informatico</i>
<b>EXPRESS</b>	Securities real-time gross settlement procedure – <i>Procedura per il Regolamento Lordo in Tempo Reale dei Titoli</i>
<b>FATF</b>	Financial Action Task Force – <i>GAFI Gruppo di Azione Finanziaria Internazionale</i>
<b>GEC</b>	Direct interbank external lira/euro payments and the lira or euro leg of foreign exchange transactions – <i>Giri in lira/euro di conto estero</i>
<b>IDEM</b>	Market for equity derivatives
<b>LDT</b>	Securities net settlement procedure – <i>Liquidazione dei Titoli</i>
<b>MTA</b>	Stock market – <i>Mercato Telematico Azionario</i>
<b>MIF</b>	Italian futures market – <i>Mercato Italiano dei futures</i>
<b>MOT</b>	Retail government and corporate bonds market – <i>Mercato Obbligazionario Telematico</i>
<b>MTS</b>	Screen-based market for government securities – <i>Mercato Telematico dei Titoli di Stato</i>
<b>PCT</b>	Electronic market for repurchase agreements – <i>Mercato Elettronico dei Pronti Contro Termine</i>
<b>RIBA</b>	Electronic bank receipts – <i>Ricevuta Bancaria</i>
<b>RNI</b>	National interbank network – <i>Rete Nazionale Interbancaria</i>
<b>RRG</b>	Daily matching correction system – <i>Riscontro e Rettifica Giornaliera</i>
<b>SIA</b>	Interbank Company for Automation – <i>Società Interbancaria per l'Automazione</i>
<b>SIM</b>	Securities Investment Firm – <i>Società di Intermediazione Mobiliare</i>

## Introduction

The Italian payment system has changed significantly in recent years in response to European integration, developments in financial markets and on initiatives launched by the authorities.

Substantial changes to the institutional framework have derived from legislative and regulatory measures aimed at: i) strengthening the stability of the Italian payment system; ii) encouraging the use of new payment instruments; and iii) increasing the efficiency of financial markets.

In line with such objectives, the 1993 Banking Law entrusted the Banca d'Italia with explicit responsibilities directed at ensuring the stability of the payment system and fostering its efficiency; the same law envisaged the possibility of the Banca d'Italia issuing specific measures in the field of payment systems. Recent provisions governing the digital signature have laid the foundations for a wider use of open networks in payment activities. As regards securities, the Consolidated Law on Financial Intermediation (CLFI) laid down the principle that the management and organisation of regulated markets are entrepreneurial activities and entrusted the Banca d'Italia with surveillance functions on regulated markets relevant for the conduct of monetary policy. In accordance with the CLFI, the settlement and custody of securities may be carried out by private companies. Against this background, the Banca d'Italia is no longer acting as central depository for government securities.

Within its institutional activities, the Banca d'Italia has devoted special attention to enhancing the reliability and efficiency of payment services. In particular, efforts have been made to increase the use of electronic

procedures for the exchange of accounting information on payment instruments and to streamline the exchange of paper-based instruments. In order to improve the security of cheques, an interbank database – storing data on persons who have drawn bad cheques or written cheques without authorisation – is currently being implemented at the Banca d'Italia. Specific initiatives launched by the Italian Bankers' Association (ABI) directed at promoting the wider use of debit cards have contributed towards increasing the use of the most innovative payment instruments.

As far as the interbank systems are concerned, the reform process implemented in 1998 envisaged the setting-up of a real-time gross settlement system for large-value payments (BI-REL) and a net settlement system for retail payments (BI-COMP). The direct management of the clearing and settlement systems allows the Banca d'Italia to closely monitor risks inherent in their functioning and ensure open and non-discriminatory access to such systems. In recent years, participation of foreign intermediaries in the Italian payment system has been facilitated by implementing remote access. With a view to improving the level of service of the retail payment instruments and reducing the opportunity costs of holding liquidity for the settlement of large-value payments, several initiatives are being implemented relating to both BI-COMP and BI-REL.

Substantial improvements in the efficiency and stability of securities settlement have been achieved with the launch of a new securities gross settlement procedure (EXPRESS), which provides for DVP real-time settlement of both securities and cash legs on a gross-gross basis.



## I Institutional aspects

### I.1 The general institutional framework

The main providers of payment services are the banking system, the Italian Post Office and the Banca d'Italia.

In accordance with the 1993 Banking Law, banking activity consists of collecting deposits on a public basis and granting credit and is restricted to credit institutions. The latter are also authorised to carry out other activities subject to mutual recognition throughout the European Union (under the Second Banking Co-ordination Directive and now under Directive 2000/12/EC of 20 March 2000), notably the issue and management of payment instruments.<sup>1</sup> As a result of merger activities, the number of banks has fallen significantly (from 1,064 in 1990 to 876 in 1999). At the end of 1999, there were 27,134 branches. Foreign banks numbered 57, with 89 branches.

The Post Office plays an important role in the field of retail payments. Over the past few years, postal bank payment services have been growing rapidly so as to compete with the banking system (money orders, credit transfers, giro transfers and, recently, payment cards). In 1999 postal savings amounted to ITL 250 trillion (€133 billion) and post offices numbered almost 14,000.

Law No. 71/1994 has gradually changed the legal status of the Post Office, which, since February 1998, has been a private company owned by the Ministry of Treasury. The main objectives of the privatisation process have been to improve payment services, to achieve a higher degree of automation, to determine a pricing policy aimed at covering production costs and to establish uniform methods for the disclosure of terms and conditions of contract.

As part of the integration of bank and postal circuits, in 1999 the Italian Post Office completed the process of participating in the

interbank procedures for the exchange and settlement of bank and postal cheques. The Banca d'Italia fostered the participation of the Post Office in the low-value credit transfer procedure. This took place in April 2000.

Payment services provided by non-banking intermediaries account for only a small share of the total and are limited to instruments such as payment cards and money transfers.

The regulatory framework of the Italian payment system is based on provisions of the Italian Civil Code, the 1993 Banking Law (see Legislative Decree 385 of 1 September 1993) and other specific laws including the Codified Law concerning note-issuing banks (1910) (see Codified Law No. 204/1910 and the Banca d'Italia's Statutes governing bank transactions negotiated or executed by the Banca d'Italia).

The Banca d'Italia's interest in the proper functioning of the payment system and, in particular, of interbank circuits, also stems from its roles in the implementation of monetary policy and as supervisor of the banking system. The Royal Decree of 6 May 1926 makes the Banca d'Italia exclusively responsible for managing the clearing system for interbank payments, while the Decree of the Minister of the Treasury of 7 May 1991 enables the central bank to regulate the participation of credit institutions in the interbank clearing system on the basis of technical, organisational and capital standards.

The circulation of individual paper-based payment instruments (e.g. cheques) and the discharging of financial obligations (e.g. novation and bilateral netting) are governed by the provisions of the Civil Code and other specific laws (see Royal Decree No. 1345 of 21 September 1933 and Legislative Decree No. 1736 of 21 December 1933).

<sup>1</sup> According to Directive 2000/28/EC of 18 March 2000 electronic money institutions, which issue means of payment in the form of electronic money, are credit institutions.

With regard to cross-border credit transfers, Directive 1997/5/EC was transposed into Italian law by way of Legislative Decree No. 253 of July 2000.

The 1993 Banking Law, which came into force on 1 January 1994, entrusted the Banca d'Italia with explicit responsibilities and powers aimed at ensuring the efficiency and soundness of the payment system (Article 146 on payment systems oversight). This function is performed in accordance with the Guidelines issued by the ECB (see the chapter on the Eurosystem).

With regard to the transparency of banking services, the 1993 Banking Law gave the Banca d'Italia the power to control the way in which commercial banks deliver the information they are required to provide to customers.

Competition is safeguarded by the anti-trust law and the responsibility for avoiding restrictive practices in the banking system is entrusted to the Banca d'Italia (see Law No. 287 of 10 October 1990).

Law No. 197/1991, later transposed into the 1993 Banking Law, enabled the Banca d'Italia to supervise the activities of non-banks which operate in the payment system, including the intermediaries which carry out funds transfers via payment cards in order to counteract money laundering. The same Law limited the use of cash to payments of up to ITL 20 million (around €10,000).

In 1994, following the implementation of the European Investment Services Directive, the Italian Parliament instructed the Government to issue a CLFI. The Government took the opportunity to change the regulation on issuers of securities on regulated markets with a view to better protecting investors and the interests of minority stakeholders.

The CLFI, issued in February 1998, is therefore divided into three main parts: the regulation on issuers of securities traded on regulated markets; the regulation on financial

intermediaries; and the regulation on financial markets and the CSD.

The CLFI confirms the private nature, previously introduced by Legislative Decree No. 415/96, of the management of financial markets, SSSs and the CSD. Privatisation has been achieved by separating the management functions, assigned to private companies, from the supervisory functions, assigned to the public authorities.

In this context, the financial markets have been privatised and financial services, from trading to settlement, are no longer strictly considered as public services. In order to enhance competition among financial services, financial markets are now managed by private companies, while settlement services are in the purpose of being privatised. The privatisation of financial markets and CSDs is specified in the CLFI (see Articles 61, 80 and 204), while the privatisation of settlement systems, particularly SSSs and clearing houses, is the result of the establishment of general regulations pursuant to the CLFI (see Articles 69 and 70).

The legal framework of CSDs has been completed by means of a number of rules on financial instruments' dematerialisation established at the start of Economic and Monetary Union. Dematerialisation is compulsory for all government bonds, for all private listed securities and for financial instruments as set out by the Companies and Stock Exchange Commission (Consob) and the Banca d'Italia according to their degree of circulation.

#### *The legal framework of regulated financial markets*

In Italy the competent authority for regulated markets is Consob, however, the CLFI provides a derogation for those markets that are considered relevant for monetary policy.

In particular, the Ministry of Treasury, having consulted the Banca d'Italia and Consob, shall regulate and authorise wholesale markets for

government securities. Currently, the MTS S.p.A. is the only Italian market management company authorised to manage wholesale markets for government bonds (see paragraph 4.1.1).<sup>2</sup>

#### *The process of privatising the clearing and settlement systems*

The Italian settlement system has long been characterised by fragmentation. In particular, the CSD's activities (notably custodial activities) have always been separated from the management of SSSs. Moreover, the central depository system for government bonds has been managed by the Banca d'Italia and since 1974 the private securities depository system has been operated by Monte Titoli, a private company controlled by the Banca d'Italia. The SSS has always been operated by the Banca d'Italia. The implementation of the CLFI provided an opportunity to reorganise and privatise the clearing and securities settlement systems. The Banca d'Italia's share in Monte Titoli has been sold. The latter is engaged in defining a project for a new netting system to replace the securities net settlement procedure (LDT)(see paragraph 4.2.1).

Three different legislative provisions define the legal principles for the entire settlement system, which consists of an SSS, a CSD and clearing houses for derivative instruments.

SSSs are now governed by a general regulation issued by the Banca d'Italia, in agreement with Consob (see the legal provision of 8 September 2000 on the clearing and settlement of transactions in non-derivative financial instruments under Article 69 of the CLFI). This regulation lays down the general framework and the conditions under which SSS activities can be managed by a private company.

The CSD's activities are governed by a regulation issued by Consob and the Banca d'Italia (see Consob Regulation No. 11768/98) which defines the members, instruments, and the company's instrumental activities.

The activities of derivatives clearing houses are now governed by a general regulation issued by the Banca d'Italia, in agreement with Consob (see the legal provision of 8 September 2000 on the clearing and guarantee of transactions in derivative financial instruments under Article 70 of the CLFI). The new regulation states that the company must have a minimum level of capital and must adopt measures of risk containment such as the collection of margins.

## **1.2 The role of the Banca d'Italia**

### **1.2.1 Payment systems oversight**

The Banca d'Italia has the power to exercise a controlling and guiding influence over financial activities in the field of payment services. The public's interest in the payment system stems from the need to ensure its stability as well as to minimise co-ordination failures which may lead to inefficiencies. Consequently, the role of the Banca d'Italia in the payment system is to ensure the smooth functioning of the system in terms of its efficiency and financial reliability.

As mentioned above, the oversight function is officially assigned to the Banca d'Italia by virtue of Article 146 of the Banking Law (oversight of payment systems) which states that the "Banca d'Italia shall promote the regular operation of payment systems. For this purpose, it may issue regulations to ensure the efficiency and reliability of clearing and payment systems".

The oversight activities apply mainly to private interbank funds transfer systems and to technical and legal features of payment instruments with regard to their circulation and their use, also with a view to protecting payment services customers.

The Banca d'Italia is also concerned with the smooth functioning of the SSS, with regard to both the cash and the securities leg of transactions.

<sup>2</sup> *Italian government bonds are also traded on Euro-MTS – the wholesale market for European benchmark government bonds managed by EuroMTS Ltd.*

According to the institutional arrangements for the Eurosystem oversight function (see the chapter on the Eurosystem), the Banca d'Italia is the principal overseer of domestic payment systems in those areas not specifically covered by the common oversight policy, namely retail payment systems, within the framework of the objectives and core principles defined at the Eurosystem level.

The oversight activities of the Banca d'Italia can be performed autonomously and/or in co-operation with other authorities or private bodies playing an institutional role within the payment system (e.g. at the national level, the Italian Authority for Information Technology in the Public Administration (AIPA)).

The Banca d'Italia divulges its policy stance concerning the oversight function through a full disclosure of its plans and methods of intervention to operators. Accordingly, in November 1999 it published the "White Paper on Payment System Oversight". This document sums up the economic rationale, the scope of application, the main areas of interest and the instruments currently employed by the Banca d'Italia in its capacity as an oversight authority.

A project has been initiated to regulate these functions; this project envisages the establishment of rules by the overseer pursuant to Article 146 of the 1993 Banking Law. In particular this activity should define:

- i) the objectives with regard to the efficiency, reliability and transparency of the technical infrastructures, the circuits and the instruments, all of which must be integrated and interoperable;
- ii) the areas of interest, by specifying the activities and subjective requirements with a view to identifying the operators of the system and the relevant ex ante and ex post information; and
- iii) the rules governing a number of important issues, such as access criteria for the

exchange and settlement systems, e-money schemes and the role of the operators providing technical infrastructures.

The oversight function could also involve undertaking interventions in the field of transparency profiles specific to the payment system with a view to improving the quality of the services provided, the efficiency of instruments, confidence in money and in other means of money transfer.

#### *Oversight function: translation into practice*

In order to enhance security and confidence in the use of cheques, Law No. 507 of 31 December 1999 introduced a new set of sanctions regarding cheques and provided for the establishment of an interbank database on cheques and payment cards (CAI) which is currently under way at the Banca d'Italia. In particular, the database will store data on persons who have drawn bad cheques or written cheques without authorisation; these persons will be prohibited, on a system-wide basis, from issuing new bank or postal cheques for a period of six months.<sup>3</sup> Furthermore, it will contain information on lost and stolen cheques as well as on persons whose authorisation to use payment cards has been revoked.

With a view to ensuring the security of payment instruments, it is also crucial to avoid criminal activities. In this respect, the Banca d'Italia's Oversight Office, in co-operation with the Banca d'Italia's supervision departments and other competent authorities (in particular, the Italian Foreign Exchange Office) took part in both the work of the European Commission on a proposal for amending Directive No. 91/308/EC on the prevention of the use of the financial system for the purpose of money laundering,

<sup>3</sup> In the past, legislation did not provide for system-wide prohibition, but only for the right of the drawer's bank to refuse the drawer its right to issue cheques in the event of a dispute or an equivalent statement for cheques drawn against insufficient funds. This procedure, which is still valid, consists of a legal statement lodged by a notary or other public officer which certifies the non-payment of cheques. It permits the holder of the cheque to take action against the endorsers and their guarantors in order to recover the funds.

and in the activities of the Financial Action Task Force (FATF). At the domestic level, the Oversight Office participated in the publication of a “Decalogue” with instructions for operators to prevent money laundering to be applied also to innovative payment instruments (mainly e-payments).

In accordance with Law No. 287/90, the Banca d'Italia performs the role of an anti-trust authority for the banking sector (see Article 20). In this respect, the overseer analyses the payment systems market available to customers and provides the necessary support for any inquiries concerning anti-trust issues with regard to payment instruments.

In co-operation with the Banca d'Italia's supervision departments, the overseer examines customers' complaints about instruments and payment systems with the aim of assessing whether the complaints in question actually indicate inefficiencies in the payment system (regardless of the outcome of specific disputes).

The 1993 Banking Law restricts the collection of deposits associated with the use of payment instruments to banks. Accordingly, only banks can issue multi-purpose prepaid cards (or electronic money). The current implementation of the legal framework on e-money schemes takes into account the following factors: i) the growing number of software-based e-money schemes for retail payments, promoted by non-financial institutions and carried out via the internet, and the widespread diffusion of technology and standards for smart cards, both for payment and telephone cards, which are raising new concerns over the security, efficiency and transparency of payment instruments in open networks; ii) the ongoing work of the Eurosystem to strengthen the security requirements of each scheme and regulate the interoperability standards in order to improve compliance with the “E-Money Report” (August 1998); iii) the forthcoming transposition of the Directive on the pursuit and the prudential supervision of the business of electronic money

institutions; and iv) the definition of an institutional framework to certify the quality level and to establish minimum common characteristics for digital signature within the Single Market.

Legislative Decree No. 253 of July 2000 – transposing Directive 1997/5/EC on cross-border credit transfers – is a fundamental point of reference with regard to information and customer protection (particularly concerning arrangements for resolving disputes), together with the ECB documents on “*Improving cross-border retail payment services*”. Criteria and principles derived from the above-mentioned documents will be translated into new rules in order to improve the efficiency of the retail payment system.

Italy was the first country in Europe to consider both the digital and hand-written signature as legally binding in 1997 (see Presidential Decree No. 513 of 10 November). In February 1999 the AIPA laid down the technical, financial and capital requirements for those wishing to engage in digital signature certification activities. Banks and financial intermediaries must fulfil these requirements when certifying electronic documents through digital signature, in particular for internet-based e-money schemes. The Banca d'Italia committed itself to fostering the full interoperability of certificates, which is essential to prevent any loss or damage incurred by customers – in terms of costs and services – due to a lack of co-ordination among operators. Such interoperability, which is not automatically guaranteed by law, gives rise to the need for a definition of a technical profile for the banking community.

In the course of 2000 the monitoring of retail payment instruments was launched, with particular attention being paid to cheques and credit transfers with the aim of protecting consumers. In March 2000 a survey (involving commercial banks) was carried out by the overseer on the speeds of execution and conditions regarding charges for cheques (see below). A similar survey was carried out with regard to the speed of execution of domestic

credit transfers of less than ITL 100 million (around €50,000).

Since “quasi-clearing and settlement systems” have recently emerged, the Oversight Office has assessed one of these systems, which manages the retail payments of co-operative banks with regard to: i) conditions for transactions; ii) risk management procedures; iii) the obligations/liabilities of the parties involved; and iv) the means of settling disputes.

### 1.2.2 Market surveillance

The Banca d'Italia has a supervisory role in those markets which are relevant for monetary policy: the wholesale screen-based market for government securities (MTS) and the screen-based interbank deposit market (e-MID).

With regard to the MTS, the objectives of the surveillance carried out by the Banca d'Italia are the overall efficiency of the market and the orderly conditions of trading. Since the market is managed by a market management company (MTS S.p.A.), the Banca d'Italia supervises this company as well. In accordance with the CLFI (see Article No. 66), the market management company is authorised by the Ministry of Treasury in consultation with the Banca d'Italia and Consob. The Ministry of Treasury, in consultation with the Banca d'Italia and Consob, approves the rules of the market. The surveillance of market activity is based on the continuous monitoring of trading and a flow of information (data-feed procedures) stored in a database updated in real time. The Banca d'Italia can request the market management company to provide any kind of data, information and documentation deemed necessary, and may carry out on-site inspections. The Banca d'Italia may also request intermediaries to provide additional information on trading activity.

With regard to e-MID, this surveillance activity is based on the acquisition of trading data stored in a database updated in real time. Trading rules are established by the market management company e-MID S.p.A.; the Banca

d'Italia may request information from the market management company and records of the trading (see Article 79 of the CLFI). Direct access to the data-feed procedures allows the Banca d'Italia to monitor prices, volumes, bid-ask spreads, and dealers' market positions; further information may be obtained upon request. The Banca d'Italia may submit a proposal for the adoption of administrative sanctions against e-MID organisers and participants to the Ministry of Treasury (see Articles 190 and 195 of the CLFI).

As far as securities settlement procedures are concerned, the Banca d'Italia has both regulatory and supervisory responsibilities with regard to the overall infrastructure, i.e. CSDs, SSSs and clearing houses. The Banca d'Italia supervises the settlement management companies as well. The final objective of this framework of tasks, to be exercised in co-operation with Consob, is the containment of the systemic risk inherent in inefficient settlement systems and the prevention of system crises.

### 1.2.3 The operational role of the Banca d'Italia

In Italy the central bank has traditionally played an important role in the direct provision of payment and settlement services with a view to enhancing the efficiency of the payment system and improving its stability.

The operational role of the Banca d'Italia in the payment and securities settlement systems currently entails the issuing of banknotes, the management of both BI-REL and BI-COMP, the management of the securities net settlement procedure (LDT), and the management of government payments as a fiscal agent.

Following market privatisation and the operational framework envisaged by the CLFI, the securities clearing and settlement services and the activities of the securities' centralised custodian have been undergoing profound changes. First, the Banca d'Italia no longer acts as custodian or administrator of government

securities; such activities are now carried out by Monte Titoli (see paragraph 1.3.5). Second, there are plans for the same company to manage clearing and settlement systems for securities transactions.

On completion of such a process the Banca d'Italia will no longer act as manager of the securities clearing and settlement procedure, and its operational role will consequently be limited to the management of BI-REL and BI-COMP. The latter two systems are managed directly by the Banca d'Italia with a view to closely monitoring the risks inherent in their functioning and ensuring open access to them. In this respect, such activity is to be ascribed to the Banca d'Italia's policy, which is aimed at ensuring a level playing-field among intermediaries and at strengthening the reliability of the systems in accordance with the guidelines laid down at the international level.

The introduction of the euro and the resulting boost to the integration of European financial markets led the Banca d'Italia to reassess the range of financial services it had traditionally offered its foreign correspondents, primarily non-euro area financial institutions. Among these services, the Banca d'Italia provides a gateway for correspondents to access TARGET; it is also about to develop a number of services related to cash management, the investment of reserves, securities custody and portfolio management.

### **1.3 The role of other private and public sector bodies**

#### **1.3.1 The Italian Bankers' Association**

The Italian Bankers' Association (ABI) is a representative body for the whole banking system and is responsible for co-ordinating interbank agreements and establishing uniform operational and accounting methods in interbank relations; it promotes, in conjunction with the Banca d'Italia, the widest possible participation in interbank initiatives and the dissemination of information.

#### **1.3.2 The Interbank Convention on Automation**

The Interbank Convention on Automation (CIPA) is an interbank association whose primary concern is to plan initiatives in the field of interbank automation with regard, in particular, to telecommunications systems and interbank applications. It also co-ordinates the implementation of joint projects, particularly with regard to the development of the payment system. CIPA comprises the Banca d'Italia, which acts as chair and provides the secretariat, the ABI, 90 banks and 14 bodies and companies working in the field of interbank automation.

#### **1.3.3 The Authority for Information Technology in the Public Administration**

The Authority for Information Technology in the Public Administration (AIPA) is an independent administrative authority which was established with the aim of increasing, in accordance with efficiency and security standards, the level of information technology within the Public Administration. The Banca d'Italia and the AIPA have worked together with the aim of analysing and solving problems linked both to the use and the broader diffusion of the digital signature among payment systems users, on the one hand, and to the interoperability between banking and financial systems, other economic sectors and the Public Administration, on the other.

#### **1.3.4 The Interbank Company for Automation**

The Interbank Company for Automation (SIA), established in 1977 by the CIPA, has the objective of providing, inter alia, operational support for the automation projects of the banking system. It manages the national interbank network (RNI) and is responsible for the development and operation of an integrated system of services and procedures which constitute the technological platform supporting the payment system and the financial market. Recently, a project for the integration of the RNI with SWIFT has been launched in the light of a

convergence of network systems towards internet protocols. At the beginning of 2000 the Banca d'Italia completed the disposal of its participation in SIA, which in 1999 merged with CED-Borsa (a software company which manages stock exchange trading systems) thereby integrating the management of IT systems in market and settlement systems.

### **1.3.5 Monte Titoli**

Monte Titoli is a company which provides central custody and administration of transferable securities (shares and bonds). After 1986 the CSD's activities in private securities were regulated by a specific Law (see Law No. 289/86) according to which Monte Titoli was the only company authorised to administrate private securities.

In 1998, following the implementation of the CLFI, positive innovations emerged affecting the set of rules governing the CSD; in particular, the CSD is no longer considered to have a monopoly, because the CLFI reinforces the privatisation and liberalisation principle in accordance with which competition is enhanced (see Article No. 80).

As far as government bonds are concerned, in August 2000 Monte Titoli was authorised to manage government bonds, which until then had been managed by the Banca d'Italia; the actual transfer of government securities from the Banca d'Italia to Monte Titoli took place at the end of 2000. Therefore, there is now a single CSD which manages both private and government securities.

Dematerialisation has increased the importance of the CSD because the ownership of securities has to be proven by way of a book entry.

In October 2000 Monte Titoli was authorised to operate the Express RTGS system which, from the outset, has always operated in parallel with the LDT procedure (see paragraph 4.3.1). Moreover, Monte Titoli must, within one year of authorisation, present to the Banca d'Italia and

Consob a project for a new netting system to replace the LDT.

### **1.3.6 The Cassa di Compensazione e Garanzia**

The Cassa di Compensazione e Garanzia (CCG) acts as a clearing house and is responsible for the management of guarantee funds (see paragraphs 4.2.2 and 4.3.2).

### **1.3.7 The Companies and Stock Exchange Commission**

The Companies and Stock Exchange Commission (Consob) plays a regulatory and supervisory role in regulated markets other than wholesale markets for government bonds. The aim of its supervisory responsibilities is the transparency of markets, orderly trading, and the protection of investors.

In accordance with the CLFI, Consob may give authorisation to market management companies, having verified the fulfilment of certain requirements (see Article 63), and it plays a supervisory role in regulated markets and market management companies (see Articles 73 and 74). In the event of serious irregularities in the management of markets or in the administration of management companies, and whenever it is necessary for the protection of investors, Consob adopts extraordinary measures to protect the market and management company from crises (see Article 75).

### **1.3.8 The market management companies**

Market management companies have a number of regulatory and supervisory responsibilities. In accordance with the CLFI (see Article 64), market management companies shall: i) provide the structures and services necessary for the proper functioning of the market; ii) manage the market from an operational point of view; iii) be in charge of admitting, excluding or suspending intermediaries and financial instruments from trading; and iv) ensure compliance with any rules



provided by insider trading laws (registration of operations and distribution of relevant information subject to public disclosure).

## 2 Payment media used by non-banks

### 2.1 Cash payments

The legal tender in circulation consists of banknotes in seven denominations issued by the Banca d'Italia (ITL 1,000, 2,000, 5,000, 10,000, 50,000, 100,000 and 500,000) and coins (around 2% of total legal tender), currently in eight denominations, which are issued by the Ministry of Treasury.

At the end of 1999 the ratio of the stock of currency in circulation to GDP was 6.5% (5.9% in 1994).

Several factors encourage the use of cash in Italy. The "grey economy" is still large and contributes towards increasing the willingness to use cash for payments. Furthermore, certain areas of the country are characterised by a low degree of financial sophistication. On the supply side, the banking sector has built a widespread and cheap ATM network which increases the number of cash withdrawals from current accounts. However, in recent years initiatives such as PagoBancomat (debit cards used at POS terminals) have created a break with past trends. The most important reason for their success has been the low cost for retailers in terms of promoting the product, particularly in department stores and at petrol stations.

#### *Other liabilities issued by the Banca d'Italia*

The Banca d'Italia issues cashier's cheques for amounts of between ITL 50,000 and ITL 500 million (€26 and €258,228) against cash payments for the corresponding amount. In the past, these instruments were used for certain non-recurring payments carried out by the central bank on behalf of public entities (tax refunds and severance pay to central government employees).

Following reforms made in the area of government payments, the use of such liabilities issued by the central bank is declining significantly. In 1999 the Banca d'Italia issued around 1.6 million cashier's cheques (against around 5.8 million in 1994) for a total value of ITL 21,794 billion (€11,255 million).

In 1999 an electronic payment order procedure (EPOP) was launched so as to reduce the use of paper-based documents and to perform government payments via credit transfers.<sup>4</sup> The progressive integration of the Ministry of Treasury's payments into the interbank payment system is being pursued through the widespread use of interbank procedures.

### 2.2 Non-cash payments

In 1999 45 transactions per capita were performed using instruments other than cash (36 in 1994). At the end of the same year, the number of current accounts amounted to 31 million, by comparison with 25 million in 1994 and 22 million in 1990. Moreover, the number of bank branches per 10,000 inhabitants amounted to 4.7 (while postal ones amounted to around 2.4).

According to the most recent survey, approximately 73% of Italian households have a bank current account and 11% a postal current account; the use of accounts differs enormously between northern and southern Italy. In

<sup>4</sup> EPOP is one of the most important innovations in government accounting. It represents the practical implementation of the automation of spending procedures set out in Presidential Decree No. 367 of 20 April 1994. In terms of amount, most of the orders settled in cash are for less than ITL 1 million (€516); on the whole, the large majority of payment orders are for less than ITL 50 million (€25,823).

northern Italy, the ratios are 87% and 8%, respectively, for bank current accounts and postal current accounts; by contrast, in southern Italy they amount to 48% and 15%.<sup>5</sup> Bank instruments account for approximately 85% of the amount and 64% of the volume of non-cash payments. Cheques and banker's drafts are the most commonly used bank instruments in Italy, but their importance is declining while that of direct debits, credit transfers and some kinds of cards for transactional purposes is growing. Payment cards account for only 18.1% of the volume of non-cash payments<sup>6</sup>; however, in recent years the number and use of payment cards have been increasing (see paragraph 2.2.4).

### 2.2.1 Credit transfers

In 1999 bank credit transfers amounted to 293 million, totalling ITL 7,202 trillion (€3,719 billion). These instruments are widely used throughout the economy, even for retail transactions (e.g. direct crediting of wages, salaries and pensions).

The Banca d'Italia has encouraged a thorough overhaul of the circuit which provides for three specialised procedures handling retail, large-value and cross-border credit transfers. All three procedures allow for the settlement of transactions in central bank money and the execution of payments within predefined time limits.

The retail credit transfers procedure, which was launched in November 1994 for transactions of less than ITL 500 million (€258,000), settles transactions through the retail sub-system of BI-COMP (see paragraph 3.3.2). The ABI's regulations provide for maximum payment execution times, ranging from same-day execution for urgent credit transfers initiated before 11 a.m. (quite expensive and representing only a marginal share) to up to four days for ordinary credit transfers.

The large-value credit transfer procedure, handling transactions of over ITL 500 million

(€258,000), is settled through the BI-REL system on the centralised accounts at the Banca d'Italia (see paragraph 3.2).

Since 1999 the cross-border credit transfer procedure, which was designed mainly for large-value payments, has allowed for the transfer of customers' funds through the TARGET system for payments within EU countries. However, a large number of cross-border transactions are still executed and settled through banks' correspondent accounts.

According to a survey carried out by the Banca d'Italia, further improvements to low-value domestic credit transfers could be made in respect of the following critical points:

- the average execution time from originator (debtor) to receiver (creditor) is high (four days);
- there are no specific disclosure rules for customers; by contrast, the Directive on cross-border credit transfers (adopted in Italy in July 2000) requires banks to provide a lot of ex ante and ex post information on speed of execution and charges made both to payer and payee;
- the alternative dispute resolutions (ADR) are not fully compliant with the minimum principles recommended by the European Commission (Recommendation 98/257/EC).

### 2.2.2 Bank cheques and banker's drafts

In 1999 578 million bank cheques (including banker's drafts<sup>7</sup>), totalling ITL 2,084 trillion (€1,076.3 billion), were drawn on bank customers' current accounts.

In recent years, interbank procedures for handling cheques have been revised. At present we have:

<sup>5</sup> The Banca d'Italia, Italian Household Budgets in 1998, Supplement to the Statistical Bulletin, Rome, 18 April 2000.

<sup>6</sup> Payments performed using bank and non-bank cards.

- a procedure for large-value cheques (over ITL 5 million or €2,582) and large-value banker's drafts (over ITL 20 million or €10,329); and
- a procedure for low-value cheques (up to ITL 5 million or €2,582) and banker's drafts (up to ITL 20 million or €10,329).

Low-value cheques and banker's drafts (around 80% of total cheques processed) are handled through a truncation procedure, implemented in 1990, which replaces physical delivery with electronic interbank messages. Data on low-value truncated cheques are conveyed through the RNI at night (day D) and are settled through the clearing system the following day (D+1). Dishonoured cheques must be reported within the following three days (D+4). In July 1999 the Post Office also adopted this procedure for postal cheques.

Despite these improvements, the time it takes for banks to credit funds to their customers remains significantly longer than would be possible following the reform of the interbank payment system carried out over the last decade. The large number of days required for the availability of funds on customers' current accounts remains a major concern with regard to cheque payment services in Italy. Hence, cheques are still perceived as a risky means of payment involving higher levels of administrative costs and more implicit pricing than other non-cash payment instruments.

A survey was conducted in March 2000 on the cost of cheques and the time taken to credit them; the survey covered the entire Italian banking system. The average number of days required for the availability of funds on customers' current accounts was approximately seven working days, or eight days including the finality of the transaction; in both cases peaks of more than ten days were recorded. The charge implicit in the value date averaged four days, with differences between banks ranging from two to six days. This service could be improved upon both by reconsidering

the conditions being applied and by introducing clear charging mechanisms.

### 2.2.3 Collection orders (direct debits and bank receipts)

Italian banks execute collection orders, mainly on behalf of enterprises and public utilities. These orders are originated by creditors and may be executed by debtors through different methods of payment; direct debits are carried out by means of pre-authorised debits of payers' current accounts; collections of bank receipts are executed through other methods of payment (see below).

Direct debits totalled 277 million in 1999 (79 million in 1994) and are mainly used by firms to collect recurrent low-value payments (e.g. utility bills). Bank receipts are used by firms to collect trade and other credits. Bank receipts perform an economic function similar to bills of exchange, but do not have the same legal protection (e.g. they cannot be disputed); nevertheless, owing to a lower stamp duty and the implementation in the 1980s of the electronic bank receipt procedure (RIBA), bank receipts have gradually replaced bills of exchange. In 1999 approximately 241 million commercial bills and paper-based and paperless bank receipts were collected through the banking system; the share of RIBA increased from 38% in 1989 to 70% in 1994 and to 90% in 1999.

Furthermore, over the last four years, a corporate banking procedure has been made available in response to the needs of firms to rationalise and reduce the cost of their banking transactions, a need which has been further increased owing to the fact that firms hold accounts at different banks. This new procedure enables businesses to transmit their payment

<sup>7</sup> The banker's draft is drawn by a bank and is somewhat similar to the traveller's cheque. It is issued solely by specially authorised banks for amounts deposited in cash at the time of issue or debited to the applicant's account. In 1999, banker's drafts represented 19% of the total cheques, totalling ITL 536 trillion (€277 billion), as against 26% and ITL 521 trillion (€269 billion) in 1994.

and collection orders to banks by means of a telematic connection with a single institution which acts as an agent; in March 2000 638 banks were involved, compared with 270 at the end of 1995.

## 2.2.4 Payment cards

### *Debit cards*

At the end of 1999 there were 20.3 million debit cards in circulation which could be used to execute both payments and cash withdrawals through a nationwide network of POS terminals and ATMs.

ATM transactions are processed through the retail sub-system and settled through BI-COMP.

The use of debit cards for withdrawals at ATMs is widespread and growing rapidly. In 1999 499 million withdrawals (24 per card) were executed compared with approximately 100 million in 1990. The share of ATM transactions grew from 50% of total cash withdrawals in the banking system in 1990 to 70% in 1999. In 1999 there was a slight reduction compared with previous years.

The use of debit cards at POS terminals is expanding rapidly. In 1999 over 248 million such transactions were effected compared with 5 million in 1990, thus representing an average annual growth of 47.5% over the 1990-99 period. The number of transactions per card rose from 3.9 in 1990 to 12.4 in 1999. PagoBancomat is the major nationwide debit card network (around 90% of domestic debit cards in circulation). At the end of 1999 the PagoBancomat trademark was shared by some 680 banks which liaise closely; they can compete in offering payment services to their own customers, cardholders and retailers. The main features of this system are as follows: i) the provision of a common infrastructure; and ii) a single trademark and a common set of rules and standards established by the ABI and the Convention for the Management of the Bancomat Trademark (CO.GE.BAN), which are

responsible for organising and operating network facilities.

### *Credit cards*

Credit cards are not widely used in Italy in comparison with other European countries; however, in recent years growing competition among suppliers of payment services and the change in consumers' habits have increased both the number of credit cards and their usage. At the end of 1999, 12.3 million credit cards issued either by banks or non-bank companies (travel and entertainment cards) were in circulation, compared with 4.5 million in 1990. Nevertheless, in 1999 only 55% of credit cards in circulation were used at least once over the year. In the same year, the number of credit card operations totalled 219 million, or 17.8 operations per card in circulation.

A more widespread use of credit cards is still being hampered by ATM cash withdrawals and gaps in services in various parts of Italy. In 1999 the amount of ATM cash withdrawals as a share of GDP per capita represented around 7.5% compared with 1.9% for credit card expenditures. Moreover, the percentage of credit card transactions performed in southern Italy is almost half that of northern Italy; the same discrepancy was noted in 1990.

In the area of credit cards there are two main initiatives. Since 1968, a single bank has been able to issue a card linked to the Visa circuit. Since 1985, it has been possible for cards to be issued on a co-operative basis by *Servizi Interbancari*, a company owned by approximately 140 shareholders, most of which are banks. Around 800 banks are currently taking part in the latter scheme, which represents the major nationwide credit card network (both in the issuer's and the acquirer's market) and is linked both to Visa and MasterCard. In recent years, a number of individual banks have launched proprietary cards directly linked to international circuits. Travel and entertainment cards are issued by American Express and Diners Club.

#### *E-money and card payments over the internet*

Apart from three local e-money schemes of limited importance, a number of new initiatives are currently emerging aimed at developing payment services and instruments for use on open networks. Since June 1999 several schemes sponsored by non-banks have been submitted to the Banca d'Italia for evaluation; these new products call for an overall assessment of the security, transparency and anti-money laundering aspects of electronic money transfers.

With reference to the security of payments via the open network, a survey of the leading issuers of credit cards revealed that in the first two months of 2000, 10% of credit cards in circulation were used at least once for internet, mail or telephone purchases of low-value goods. Moreover, research carried out on the "charge-back<sup>8</sup>" facility revealed that around 60% of total charge-backs are processed for remote credit card transactions (the internet, MO/TO) and 99% of the latter are for "non-authorised" transactions. In the future, the use of the SET-protocol for credit card transactions should reduce this kind of problem.

According to a study carried out by the Banca d'Italia, in February 2000 less than 130 banks were offering their customers payment services through the internet. In relation to the overall supply of banking services via the network, which consisted mainly of securities trading on behalf of customers, payment system operations accounted for around 13% in value and 21% in volume.

#### *ATM and POS networks*

In recent years both the ATM and POS networks have grown rapidly. ATMs numbered 30,203 at the end of 1999; the number of ATMs per branch rose from 0.55 in 1990 to 1.11 in 1999. Currently over 90% of ATMs are interconnected within the nationwide network (*Bancomat*). All banks located in Italy which comply with *Bancomat*'s rules are eligible for membership.

POS terminals totalled 435,000 at end-1999, compared with 22,000 at end-1990. However, their use is still limited (1,074 operations per terminal per year) in comparison with other industrialised countries and domestic ATM cash withdrawals (around 16,500 operations per ATM terminal per year at end-1999). Most POS terminals are linked to the *PagoBancomat* network.

### 2.3 Recent developments

The Banca d'Italia, together with the banking and financial community as a whole is engaged in further initiatives to improve the efficiency of payment instruments and to rationalise the system by correcting distortions. The objective is to facilitate the transition towards the use of the most efficient instruments for each type and size of transaction.

The Italian banking community committed itself to speeding up the process of establishing a definition of the conditions for improving cross-border retail payment services. With regard to cross-border credit transfers, the first initiative to be carried out concerns the standardisation of current accounts in order to promote the distribution of Bank Identifier Codes (BIC) and International Bank Account Number (IBAN) codes by the end of 2000.

With regard to other means of payment, two new projects are under development. Credit card transactions are currently being settled by bank correspondent accounts. However, a new procedure based on the RNI is being developed with the aim of settling through BI-COMP credit card transactions processed by *Servizi Interbancari*. With a view to improving security in credit card transactions, the ABI has established a specific department with the task of creating a microchip card in which the functions of credit and debit cards could be embedded. In the field of central government

<sup>8</sup> The "charge-back" facility is the technical term used by international card schemes to describe the refund process involved in respect of a transaction carried out by a card following the violation of a rule.

payments, the Banca d'Italia, in co-operation with the AIPA and other public bodies, is trying to take advantage of the opportunities offered by the progress being made in online information technology. The integration of the single Public Administration network with the RNI, which is under development, will allow the use of electronic payment orders for all payments made by central departments of the Public Administration and their local units.

As far as the digital signature is concerned, the ABI, in co-operation with the CIPA, launched a

system to enable the banking and financial sector to encourage the use of the digital signature on the internet. The ABI's infrastructure, which will be implemented by the banking system on a contractual basis, relies upon a system composed of various certification authorities. At the highest level, the role of the system certification authority is played by the SIA. Banks, service providers, and technical structures owned by banks may act as certification authorities for end-users.

### 3 Interbank clearing and settlement systems

#### 3.1 General overview

The current structure of the Italian payment system is the outcome of two far-reaching reforms implemented in the 1980s and 1990s.

The first reform, dating back to the end of the 1980s, had two main aims: i) promoting settlement in central bank money by reducing recourse to correspondent accounts; and ii) boosting the efficiency of payment instruments. These goals were achieved by implementing automated interbank procedures – specialised according to the type of transactions (credit transfers, cheque truncation, etc.) – which include common standards and a maximum time for the execution of payments.

The second reform, introduced in the mid-1990s, was aimed, above all, at minimising systemic risks in an environment characterised by a substantial rise in the volume of transactions. Such an objective was pursued through the implementation of two specialised systems: BI-REL for large-value payments and BI-COMP for retail transactions. Both systems are managed directly by the Banca d'Italia. The distinction between retail and large-value payments is not based on the value but on the operating procedures with which the transactions are handled; payments using the same

operating procedure are all settled in the same circuit. Following the start of Monetary Union, BI-REL became the domestic component of TARGET.

In the light of these reforms, interbank payments settled in central bank money increased significantly from six times GDP in 1988 to 40 times GDP in 1998. Following the start of EMU, the reduction in foreign exchange transactions has led to a fall in interbank payments compared with the previous year. In 1999 the interbank payments were 31 times GDP. In the same year, transactions settled on a gross basis accounted for 86% of total payments.

The Italian clearing and settlement system is currently characterised by high levels of reliability and efficiency, ensured by extensive use of automation. A crucial role in payment processing is played by the RNI, which provides the technical infrastructure for the exchange of accounting information relating to payments carried out by banks amongst themselves and between themselves and the Banca d'Italia. Open, flexible and non-discriminatory access to the systems fosters a high-level of competition among intermediaries. Particular attention has been given to promoting the participation of foreign intermediaries in the Italian payment system. To this end, access to BI-REL on a

remote basis through the use of the SWIFT standard was implemented in November 2000.

The Banca d'Italia is currently working on a number of projects directed at enhancing services associated with both large-value and retail payments and offered to intermediaries. As far as the former are concerned, in relation to the harmonisation of RTGS systems in the Eurosystem, the introduction of new advanced functions in BI-REL is currently under way. With a view to meeting users' needs, these projects include the introduction of liquidity-saving mechanisms and the possibility of modifying the order of queued payments. As regards retail payments, planned changes are directed at improving the efficiency of payment instruments in terms of both charges and speed of execution. In this respect, the possibility of settling payments on a same-day basis is under analysis.

### 3.2 The real-time gross settlement system

BI-REL was conceived in close liaison with the banking community and came into full operation in 1998. With the setting-up of BI-REL – which increases the use of central bank money for the settlement of interbank payments – the goal of enhancing the stability of the payment system as a whole has been achieved. Similarly, the possibility of settling payments in real time has contributed to heightening the efficiency of the payment services provided by banks to their customers. The twofold objective of ensuring the orderly and smooth functioning of BI-REL and limiting the liquidity costs for intermediaries has been attained by providing the following facilities: i) intraday liquidity to intermediaries in the form of fully collateralised daylight overdrafts; and ii) a queuing mechanism for temporarily uncovered payments.

#### 3.2.1 Operating rules

In BI-REL, all payments are settled continuously and individually through the centralised accounts held by intermediaries at the Banca d'Italia. The system guarantees the final and irrevocable settlement of payments.

Each centralised account is composed of reserve and overdraft sub-accounts. Since January 1999 the accounts have been denominated in euro; a conversion mechanism has been envisaged allowing intermediaries to settle lira-denominated payments. Payments are settled by making use of the liquidity available in both these accounts and by using an automatic mechanism without any need for intra-account transfers. More specifically, the debiting of payments takes place in the following order: first the reserve account, on the basis of the liquidity available (both voluntary reserves and minimum reserves), then the overdraft account. The crediting of payments is carried out in the reverse order.

According to the harmonisation principles laid down for TARGET, intraday liquidity – which is unlimited but fully collateralised – is provided by the Banca d'Italia free of charge; remote participants are not eligible for intraday liquidity, nor do they have access to the marginal lending facilities. With a view to improving the efficiency of banks through the use of intraday liquidity, banks can transfer securities in real time from their centralised securities accounts to their securities accounts at the central bank.

Another important facility which contributes towards increasing the system's overall efficiency is the queuing mechanism for payments temporarily without cover. It has been designed to enhance the flexibility of the system by preventing banks from having to re-enter payments into the system. Payments entered into the system are channelled according to an order of priority automatically determined by BI-REL: *high priority* is given to clearing balances, transactions with the Banca d'Italia and other NCBs or the ECB, and operations by the Banca d'Italia (such as monetary policy operations, the cash leg of securities transactions and multilateral balances generated by BI-COMP); *medium priority* is given to transactions on e-MID; and *ordinary priority* is given to other interbank payments. Within the order of priorities, payments are executed on a FIFO

basis. At the end of day, the FAFO mechanism is activated automatically a few minutes before the cancellation of queued payments, in order to minimise the number of payments deleted (see Section 3.2.4).

BI-REL allows intermediaries to have information on queued payments. The information given to a participant on its debit positions in the queue is detailed (in chronological order, stating the amount and the counterparty, etc.) in order to allow for the correct scheduling of transfers. With regard to incoming payments, the recipient bank is currently allowed to see only the total amount and the number of payments.

The BI-REL system uses the RNI. As from November 2000 it has also been possible to access BI-REL via SWIFT, which links the system participants directly to the Banca d'Italia. With a view to ensuring the exchange of payments among intermediaries with the use of various different systems (for instance the originator uses SWIFT and the recipient uses the RNI or vice versa), BI-REL provides a SWIFT-RNI protocol conversion service free of charge.

### 3.2.2 Participation in the system

Participation in BI-REL is open to banks, investment firms, organisations providing clearing and settlement services and public sector bodies. In order to be able to participate in the system, the participant must hold a settlement account at the Banca d'Italia and comply with the access criteria set out in the TARGET Guideline. In June 2000 722 intermediaries participated in BI-REL, of which 710 were credit institutions and 12 non-banking institutions. Foreign institutions established in a country belonging to the European Economic Area may have remote access to BI-REL via SWIFT. They are simply required to open a settlement account with the Banca d'Italia and to provide the latter with legal opinions.

Participation in BI-REL is characterised by a high level of flexibility: each participant is able to extend the possibility of using its settlement accounts to other participants through an agency agreement (co-management), but it retains full responsibility in respect of being the owner of the accounts. It is also possible to exchange payments directly through the interbank procedures and confer upon another intermediary the settlement of such payments ("indirect participation").

### 3.2.3 Types of transaction handled

According to the specialisation principle, the following transactions are settled in BI-REL: i) large-value domestic payments; and ii) cross-border payments within TARGET, regardless of their value. In particular, the payments settled include: i) transactions carried out directly by participants through SWIFT or the RNI; ii) the multilateral balances generated by BI-COMP for domestic retail payments; iii) the multilateral balances from the clearing and settlement services of transactions in financial instruments (see paragraph 4.2.1); iv) the cash leg of securities transactions including monetary policy operations settled on a real-time gross basis by using the DVP system (EXPRESS procedure – see paragraph 4.3.1); v) transactions concluded on e-MID (see paragraph 3.2.8); vi) direct interbank external lira/euro payments and the lira or euro leg of foreign exchange transactions (GEC); vii) large-value domestic credit transfers (handled by large-value credit transfers (BIR)); viii) external payment orders for cross-border credit transfers (BOE); and ix) cross-border transactions via TARGET.

### 3.2.4 Operation of the transfer system

The working hours of the BI-REL system are fixed at the European level and are the same as those of TARGET (from 7 a.m. to 6 p.m. C.E.T.). BI-REL's operational day is divided into five cut-off times of which the first two are domestic; the others are laid down in the TARGET Guideline:



- I – Cut-off (12 noon) settlement of the multilateral balances generated by BI-COMP for retail payments.
- II – Cut-off (12.30 p.m.) settlement of the cash leg of securities transactions originated by the LDT procedure.
- III – Cut-off (5 p.m.) time limit for entering payments on behalf of customers (domestic and cross-border). The FAFO mechanism used to optimise the settlement of queued cross-border customer payments starts operating. After this process, uncovered customer cross-border payments are cancelled.
- IV – Cut-off (6 p.m.) time limit for executing interbank transactions (domestic and cross-border) and start of the FAFO mechanism to optimise queued payments (domestic customer payments as well as domestic and cross-border interbank transactions). Payments not covered are cancelled and will not be automatically re-entered the following day.
- V – Cut-off (6.30 p.m.) time limit for recourse to the standing facilities. If intraday liquidity is not paid, it is automatically transformed into marginal lending.

### 3.2.5 Transaction processing environment and settlement procedures

The flow of information in BI-REL follows a “V” pattern; the message linked to each payment is transmitted by the sending bank to the central bank and from the latter to the receiving bank, but only after the cash availability has been verified and the sending bank’s account has been debited. The same procedure automatically provides every operator with information on individual payments settled.

In BI-REL, each debt transaction is posted to the settlement account if funds (including intraday liquidity) are available; temporarily uncovered payments are channelled into the queues.

Queued payments are not revocable except in the event of error; the cancellation of an interbank transaction is carried out by the Banca d’Italia, the system manager, on the basis of requests from both counterparties. Obviously payments are not revocable once the debtor’s account has been debited.

### 3.2.6 Credit and liquidity risks

Given that payments in BI-REL are settled one by one in central bank money and considering the very short settlement time (payments temporarily without cover wait, on average, less than 30 seconds), the credit risk is minimised. With regard to the clearing systems BI-COMP and LDT, given that the securities and cash accounts of the receiving institutions are credited only after checking the availability of funds in the accounts of the institutions to be debited, no fundamental risk occurs.

With a view to discouraging delays in the settlement of the netting systems, banks which are unable to settle their multilateral balances on time are penalised. In particular, banks are charged with: i) penalties of €500 for late settlement of the BI-COMP multilateral balances; and ii) an ad valorem penalty for late settlement of the multilateral balance in the LDT procedure. In this respect, penalties applied may not exceed €25,000. In the event of the insolvency of a participant in BI-COMP, new multilateral balances are determined by excluding the insolvent participant (unwinding). In the event of a participant defaulting in LDT, an unwinding procedure is applied, with the exception of listed equities transactions, the balances of which are covered by the guarantee fund managed by CCG (see paragraph 4.3.2).

### 3.2.7 Pricing

In accordance with the principle established at the Eurosystem level, BI-REL’s pricing policy aims to cover the cost of services offered. The fees charged consist of an annual fee of €1,500 and a transaction fee of €0.50 for electronic domestic payments (€12 for paper instructions). For cross-

border payments, fees are those established at the European level for TARGET. Transaction fees are charged to the sending bank.

### 3.2.8 The screen-based market for interbank deposits

An important role in the distribution of liquidity is played by e-MID, which is the main Italian uncollateralised money market. E-MID is organised and managed by e-MID S.p.A., a private company currently owned by 39 banks and financial institutions. The average daily traded volume was above €14 billion in 1999 and around €15.7 billion in the first eight months of 2000. The market has been continuously growing as an international market and it has now become one of the leading European money markets: non-resident banks currently negotiate around €28 billion each month, amounting to around a 7% share of the entire market.

The market currently has over 200 members, of which there are both Italian and foreign members. Financial intermediaries eligible to participate in e-MID are: Italian banks, foreign branches of Italian banks, EU banks, branches of EU banks established in the European Union, non-EU banks and branches of non-EU banks established in the European Union.

Trades between participants holding an account at the Banca d'Italia are settled automatically via BI-REL; in other cases deals are settled semi-automatically via TARGET. For this reason, in order to be admitted to trading, a financial intermediary must participate in the Italian real-time gross settlement system, or in another RTGS system. When banks – carrying out transactions on e-MID – participate in the BI-REL system, payment orders are automatically sent to such a system; the debiting and crediting of settlement accounts, therefore, takes place in real time (automatic settlement model). When one of the two banks, or both the banks involved, participate in other RTGS systems (cross-border payments), the e-MID system sends payment notices to the bank

which is obliged to pay and the latter has to forward the payment to its RTGS system (semi-automatic settlement model).

Six different types of contracts can currently be traded on e-MID: overnight, tomorrow next, spot next, time deposits, deferred and term contracts. Three-quarters of funds are negotiated overnight and the interest rate on this maturity is strictly correlated to the EONIA. Participants may display bid and offer quotes. When an application is received for a bid quote (request of funds), the contract is automatically executed, while an application for an ask quote may be rejected by the bank offering funds. In addition, e-MID S.p.A. has developed e-MIDER, the electronic market for EONIA swaps, and provides its members access to the MTS repo electronic platform.

The electronic trading platform which supports the market offers important advantages in terms of transparency and efficiency: at any time each participant can view all the current buy and sell proposals. Thanks to its high liquidity, bid-ask spreads are very narrow, especially for the most liquid maturities.

### 3.3 The retail payment system

Following the reform of the Italian payment system implemented in 1998, retail payments are now handled by the BI-COMP system which is composed of two sub-systems: the local clearing sub-system for paper-based transactions and the retail sub-system for paperless transactions. On average, BI-COMP handles around 4 million payments a day (amounting to around €8 billion).

With a view to reducing the settlement risks in BI-COMP, at the end of 1998 all cash balances in the LDT procedure (see Section 4.2.1) were moved from BI-COMP to BI-REL, where they are directly settled in central bank money. As a result of such an intervention, multilateral balances in the BI-COMP system were substantially reduced and no systemic risks currently seem to be emerging in BI-COMP. In the light of the above consideration, no specific risk control measures (like caps, a liquidity pool

etc.) have been implemented.

With regard to participation in the BI-COMP system, access is restricted to banks, the Postal Administration, the Banca d'Italia and the Ministry of Treasury. Participation in BI-COMP may be direct or indirect.

### 3.3.1 The local clearing sub-system

The local clearing sub-system is managed by the Banca d'Italia. It handles paper-based operations requiring the physical exchange of items (i.e. non-truncated bank cheques, bankers' drafts, bills, and postal instruments). The accounting information on paper-based transactions is posted by means of the RNI or a floppy disk, thereby making it possible to automatically determine the multilateral balance of each participant.

With a view to rationalising the exchange procedures and meeting the needs of the banking system, since 1998 the exchange of paper-based transactions has been concentrated within two clearing houses (located in Rome and Milan) instead of being handled at each branch of the central bank as was previously the case.

### 3.3.2 The retail sub-system

The retail sub-system – managed by SIA on behalf of the Banca d'Italia – handles low-value

paperless payments. It includes a set of procedures, specialised according to the type of payment, which operate on the RNI. For such procedures the following operations are channelled: Bancomat operations, truncated cheques, electronic collection orders (RIBAs), direct debits, and retail credit transfers (e.g. of below €258,228). Such procedures are managed by service providers, or *centri applicativi*, which are software companies owned by banks and carry out a number of activities on their behalf concerning the exchange of accounting information on interbank payments. There are four service providers which operate in a competitive environment. Each bank is free to choose the service provider through which payments can be channelled.

The accounting information is exchanged in standardised electronic format without the physical exchange of items. With regard to the settlement of these payments, each service provider calculates the net bilateral balances for each procedure and sends this information to the retail sub-system. The latter, in turn, calculates an aggregated bilateral balance which is posted to BI-COMP. Then, a multilateral balance for each participant is determined in the BI-COM system by summing up the balances of both the retail sub-system and the local clearing sub-system. The multilateral balance is eventually settled in BI-REL.

## 4 Securities settlement systems

### 4.1 Trading

#### 4.1.1 The wholesale screen-based market for government securities

The MTS market is organised and currently managed by MTS S.p.A., a company founded in 1998 when the market was privatised; the company's capital is held by major national and international financial institutions.

Eligible participants in MTS are banks and financial institutions which are committed to providing liquidity to the market on a continuous basis. There are two different types of participants: primary dealers and dealers.

Primary dealers can make proposals and act on other participants' proposals quoted on MTS. They are committed to making two-way quotes on a selected group of government bonds; they

must also meet the minimum capital and trading requirements. Dealers can only act on proposals quoted on MTS. The minimum capital and trading requirements which they are obliged to meet are less stringent.

Proposals are anonymous. Participants become aware of the identity of trade counterparties only after the execution of the trade. For this reason, a dealer willing to buy (or to sell) a bond cannot choose its counterparty, but is forced to trade at the best proposal available; this means that the management of counterparty risk is carried out not on a bilateral basis, but by means of the criteria for membership in the market.

MTS-Italy provides an electronic trading platform which offers great benefits to members and issuers from the Ministry of Treasury in terms of straight-through-processing capabilities, reduced transaction costs, market transparency, efficiency and liquidity.

Four different Italian government bonds are traded on MTS: Cct (floating rate certificates), Btp (fixed rate bonds), Bot and Ctz (zero-coupon securities). In addition some selected eurobonds can be traded. The minimum trade size is currently €2.5 million (€5 million for benchmark bonds).

MTS-Italy also has an electronic market for repurchase agreements (PCT), allowing participants to manage their liquidity positions and their securities portfolios more effectively.

Two types of contracts can be concluded on PCT: i) special repos, where a specific security is named; and ii) general collateral repos, where identification of the security takes place only at the end of the trading day.

There is no distinction of roles among participants and there are no quoting obligations.

The type of repurchase agreements used are buy-sell-back agreements, which signifies the transfer of all the ownership rights to the buyer. All the securities traded on MTS may be the

object of repurchase agreements on PCT. Proposals are not anonymous; trades can be made at any quotation shown on the market, even if it is not the best available proposal.

Finally, MTS-Italy has a grey market where it is possible to trade Italian government bonds for which the Ministry of Treasury has announced the auction, but which have not yet been issued. Securities are negotiable on the MTS grey market until the day on which the auction takes place. The following day the securities begin to be traded on the cash market.

#### 4.1.2 The Italian Stock Exchange

The Italian Stock Exchange is a regulated market for trading investments and has been managed by Borsa Italiana S.p.A. since 2 January 1998. Borsa Italiana S.p.A. is a private company the shareholders of which include banks, investment funds, issuers and other market players. The market company provides for the organisation and smooth functioning of the market; it also ensures that companies and intermediaries comply with entry requirements and that operators comply with market rules. It carries out market surveillance and manages company information.

The Italian Stock Exchange runs various markets: the stock market (MTA); the Mercato Ristretto (restricted market), where ordinary, preference and saving shares, convertible bonds, issue rights, warrants, covered warrants and closed-end funds are traded; the new market for shares in high-growth companies; the market for equity derivatives (IDEM) for futures and options on relevant indices and stocks; the Italian futures market (MIF), for future contracts on government securities, interest rates and options; the retail government and corporate bonds market (MOT); and the market for traditional options on equities (MPR).

Since July 1994 shares, warrants, options and convertible bonds quoted on the Italian Stock Exchange have been traded on an electronic

trading system. This system consists of a computer network which matches up the supply of and demand for financial instruments.

In the course of 2000, the main developments in the Italian Stock Exchange were the introduction of EuroMOT, a new regulated market organised and managed by Borsa Italiana and specifically designed for eurobonds, foreign bonds and asset-backed securities. In May 2000 Borsa Italiana introduced "Trading After Hours", a regulated market aimed at satisfying the demand for trading after the usual closing times of the market. In June 2000 the Italian Stock Exchange launched a new derivatives contract, the mini-Fib, the first IDEM product aimed primarily at private retail investors. It is a derivatives contract on the MIB 30 index (the top 30 blue chip companies) with a size of one-fifth of the existing MIB 30 futures contract (FIB).

#### 4.1.3 Alternative trading systems

The alternative trading system called TLX is an electronic communication network (ECN), organised by a bank, which offers the possibility of trading in equities, bonds, covered warrants and other securities listed on the Stock Exchange after its official closing time, and on unlisted securities throughout the day. Individual investors may only join TLX through an intermediary. The bank managing the network is not formally obliged to ensure that a minimum level of liquidity is provided to the market, nor to guarantee a maximum bid-ask spread.

## 4.2 Clearing

### 4.2.1 Securities net settlement procedure

The technical infrastructure for the securities clearing and settlement is represented by a nationwide net settlement system, the LDT procedure, which is managed and owned by the Banca d'Italia. The main regulations governing the LDT are contained in measures which were adopted in agreement with Consob by the

Governor of the Banca d'Italia in April 1997 and September 2000; operational features are set out in an agreement to which participants must subscribe.

According to the measure adopted by the Governor of the Banca d'Italia in September 2000, access to the LDT procedure is restricted to banks, investment firms authorised to provide investment services in Italy, Italian stockbrokers, CSDs and institutions which operate SSSs or netting and guarantee systems as well as some public entities. Foreign participants may have access to LDT on a remote basis. In particular, a foreign institution which acts as CSD or as operator of either an SSS or a netting and guarantee system may participate in the Italian securities settlement system, on a remote basis, provided it fulfils the following requirements: i) it is subject to supervisory measures equivalent to those in force in Italy; and ii) there is an agreement between the supervisory authorities of Italy and those of the foreign institution's country concerning the exchange of information and the adoption of reciprocal conditions.

Participants may clear and settle securities transactions both for their own account and on behalf of other authorised intermediaries. LDT participants may either settle their cash positions directly on their BI-REL accounts or appoint a bank participating in BI-REL to settle for them.

In June 2000, 280 intermediaries participated in the LDT procedure, including two major banks and five leading investment firms which have access to the procedure on a remote basis.

The LDT procedure and the structure of the accounts of the CSD permit complete segregation between intermediaries' proprietary positions and those of their customers. It also allows settlement banks to manage the securities positions of each of their institutional customers separately, thus avoiding the risk of commingling.

The LDT procedure clears and settles the following types of transactions carried out on the official markets and over the counter:

- outright transactions and repos in Italian government securities carried out on the MTS;
- stock exchange transactions in equities, corporate bonds and Italian government securities; and
- outright and repo transactions in listed and unlisted securities carried out over the counter.

Bilateral net positions, once they are matched and corrected by the daily matching correction system (RRG), are automatically sent to the LDT procedure, which determines for each participant a multilateral balance for all types of securities handled and a single cash balance. At 8 a.m. on the settlement day, the participants are notified of their securities and cash positions. Until 12.30 p.m. the participants can manage uncovered securities balances by means of transfers between accounts at the CSD. Within the same deadline, it is also possible to reduce the multilateral securities balance by concluding assignments. The latter procedure allows intermediaries with a securities shortfall to postpone delivery by virtue of agreements with intermediaries which have creditor balances. Participants with a securities debtor balance which invoke the assignment procedure are required to pay a penalty for each type of security not delivered which consists of: i) €200 to defray expenses; and ii) a surety deposit equal to 20% of the value of the undelivered securities. The surety deposit is fully redeemable upon delivery of the security within three trading days; otherwise a share of the deposit is subtracted.

At 12.30 p.m. securities balances are settled through book entries at Monte Titoli (see paragraph 1.3.5) and cash balances are automatically debited from participants' accounts with the Banca d'Italia. The settlement

mechanism provides a high level of protection against risks by complying with the DVP principle. In fact, the cash and securities credit balances are processed only once all debit balances have been posted.

Transactions concluded on regulated markets are settled on a rolling basis (T+3 for outright transactions and T+2 for repos, while those concluded on the OTC market are settled as agreed between the parties). In 1999 the possibility of settling with the same day value (T+0) was introduced for repo transactions in government securities ("overnight repos"). Such a facility allows those intermediaries which have to deliver a specific government security to cover their position before the LDT procedure begins.

#### 4.2.2 The clearing of derivatives

##### *Institutional aspects*

The general regulation issued by the Banca d'Italia, in agreement with Consob (see the legal provision of 8 September 2000 on the clearing and guarantee of transactions in derivative financial instruments under Article 70 of the CLFI), defines a general framework for clearing in derivatives systems.

The Banca d'Italia and Consob approve the operational rules laid down by the clearing house only after having verified that:

- the clearing house fulfils certain requirements (minimum level of capital, accounting and organisational segregation rules); and
- operational rules laid down by the company comply with the regulations issued by the authorities and are likely to ensure the efficiency, soundness and stability of the system.

There is no specific authorisation for clearing houses and there is no approval of the appointment of clearing house managers. The latter are not requested to fulfil specific requirements.

The general regulation concerning clearing house services determines the categories of participants and establishes the measures of risk containment, such as the collection of initial margins and intraday margins if necessary, and the monitoring of members' daily exposures.

#### *Operational aspects*

The CCG is the clearing house for two exchange markets: the MIF – where trading started in 1992 – and the IDEM, where trading started in 1994. In May 1998 the MIF became a regulated market managed by Borsa Italiana S.p.A.

The risk management procedure of CCG is mainly based on margins. There are also capital adequacy requirements for members. As far as margin requirements are concerned, CCG uses the Theoretical Intermarket Margin System (TIMS) developed by the Options Clearing Corporation (OCC). CCG monitors clearing members' positions on a real-time basis to assess exposure. Intraday margins may be requested. CCG has no power to impose position limits on open positions. However, as part of the constant monitoring of clearing members' positions, additional intraday margins may be requested by CCG where it considers the risk exposure of a clearing member to be too high.

As a result of the Euroglobex alliance with the Spanish Futures and Options Exchange (MEFF) and the *Marché à Terme International de France* (Matif), there is a link between CCG and Matif.

### **4.3 Settlement**

#### **4.3.1 The EXPRESS procedure**

As an alternative to the LDT procedure, transactions concluded on the OTC market may be settled using the EXPRESS procedure managed by Monte Titoli. Moreover, EXPRESS is used for the settlement of monetary policy operations. This procedure provides for real-time settlement on a gross-gross basis (DVP Model I).

The system settles transactions in equities, corporate bonds and government securities.

#### *Institutional aspects*

Securities settlement systems are now governed by a general regulation issued by the Banca d'Italia in agreement with Consob (see the legal provision of 8 September 2000 on the clearing and settlement of transactions in non-derivative instruments under Article 69 of the CLFI).

The new regulation identifies the categories of direct participants and the general management criteria for the settlement of securities. Specific risk management measures must be adopted, such as intraday finality, a queuing mechanism, a reduction in time between the collection of data regarding transactions and settlement, minimum requirements in terms of risk containment and the finality of transactions settled. Moreover, operating hours must be consistent with those of BI-REL.

#### *Operational aspects*

According to the general regulation on securities settlement systems mentioned above, EXPRESS participants are banks, investment firms, the Banca d'Italia, CSDs, SSSs, clearing houses and other minor entities.

As part of the EXPRESS procedure, securities are settled in participants' accounts at Monte Titoli, whereas cash is settled in the participants' accounts in BI-REL. The system benefits from the intraday credit mechanism used by BI-REL. The EXPRESS procedure offers a DVP intraday finality facility and, in order to be able to provide a straight-through-processing service, it is connected to the RRG-REL, a matching system developed by the SIA.

The settlement procedure of the securities leg is carried out in the following steps:

- EXPRESS receives matched transactions from the RRG-REL and gives each a reference number;

- for every transaction, EXPRESS checks the securities account balance of the seller; reserves the securities and sends information to BI-REL for the cash settlement; and
- if the securities are not available on the seller's account, EXPRESS starts the queue management process. Queued transactions are periodically processed in the following order of priority: monetary policy operations; priority input by the intermediary; matching time (FIFO); and stockbuilding on the seller's securities account (FAFO).

The settlement stages of the cash leg are as follows:

- BI-REL checks the cash account balance of the buyer, settles the cash leg and sends information to EXPRESS which settles the securities leg using the reserved securities;
- if funds in the cash account are not available, payments are queued.

As far as indirect cash settlement is concerned, participants in Monte Titoli are allowed to settle their cash positions by means of a settling bank; EXPRESS offers cap management mechanisms to settling banks in order to keep their funds exposure under control.

#### 4.3.2 The guarantee systems

There are currently two guarantee funds aimed at securing, respectively, the performance of securities transactions in listed equities and their settlement (see Articles 68 and 69 of the CLFI). The former, the transactions performance fund, is regulated by the Italian Stock Exchange; the latter, aimed at ensuring timely settlement in listed equities, is regulated by the Banca d'Italia in agreement with Consob.

Both trading and settlement guarantee funds are managed by CCG which, in this case, is not a central counterparty and is not responsible in

respect of its own assets for the default of a clearing member. CCG's assets are segregated from those of the funds.

As far as the settlement guarantee fund is concerned, each member is requested to pay margins to the fund in relation to its activity in terms of the turnover of securities settled during the last two months.

Should a participant in the LDT default, the CCG would replace it in the settlement of listed equities. In doing so, according to the general rules issued by the Banca d'Italia and Consob, the CCG would first use the margins posted by the defaulting participant, and then the survivors' margins, making it possible to close the settlement procedure. The losses arising from the CCG's intervention are shared among participants, in proportion to their turnover.

#### 4.4 The use of the securities infrastructure by the central bank

As regards monetary policy operations, the settlement of open market transactions is completely automated through the new DVP procedure, EXPRESS (see paragraph 4.3.1).

Once the cash and securities positions for each bank are calculated by the Banca d'Italia, the relevant information is transmitted to Monte Titoli. In the event that the settlement day of a refinancing operation coincides with the reimbursement day of previous open market operations, credit and debit positions are netted by the Banca d'Italia so as to calculate each intermediary's netted securities and cash positions.

Where domestic securities are used for such transactions, the automatic entering of the cash and securities positions into the EXPRESS procedure ensures the real-time settlement of both legs. In particular, the cash leg is settled through the accounts held at the central bank (in the BI-REL system); the securities leg is settled by way of book entries on the accounts held by the Banca d'Italia and other



counterparties at Monte Titoli. In the case of foreign securities, the EXPRESS procedure is used if the security concerned is managed by Monte Titoli through cross-border links. Otherwise, the CCBM channel is used.

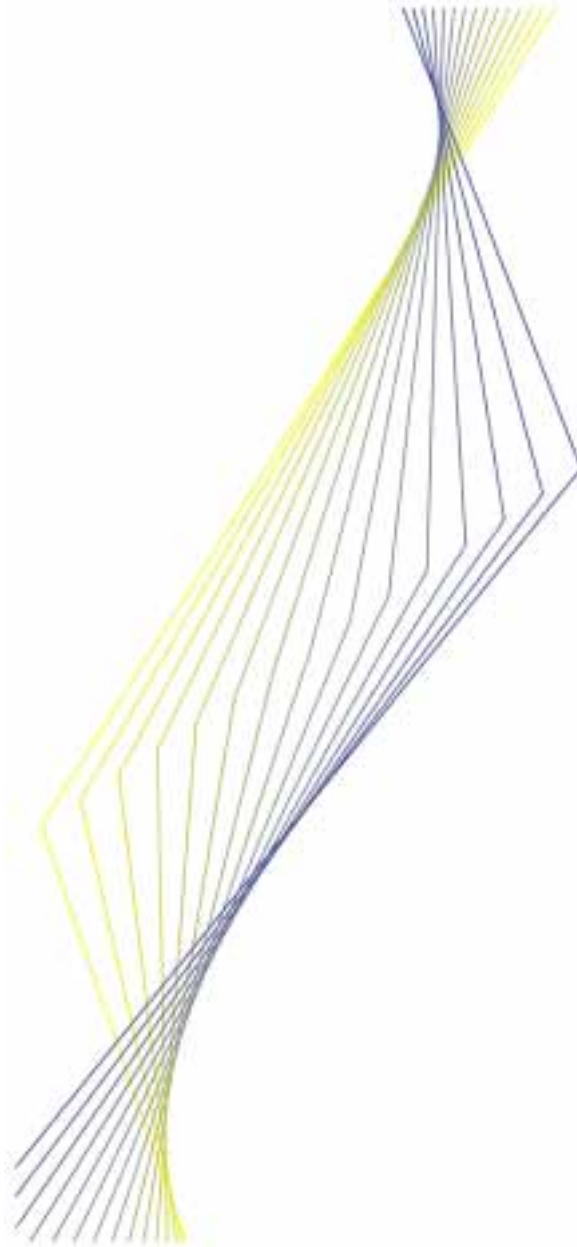
As far as the use of securities as collateral for the intraday liquidity is concerned, an automatic procedure allows intermediaries to transfer securities in real time during the course of the operational day from their accounts to the Banca d'Italia's securities accounts at Monte Titoli. The amount of intraday liquidity available in BI-REL for each intermediary automatically

varies according to the collateral at its disposal. The same procedure is used for the marginal lending facility. Such a procedure allows for a high level of flexibility in the management of collateral, enabling the amount held by intermediaries to be optimised in accordance with the real liquidity needs.

The management of collateral for each intermediary is carried out by the Banca d'Italia and consists of: i) evaluating securities; ii) applying the initial margin; and iii) verifying the collateral adequacy on a daily basis.



EUROPEAN CENTRAL BANK



**Luxembourg**

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Luxembourg

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## List of abbreviations

<b>ABBL</b>	Luxembourg Bankers' Association – <i>Association des Banques et Banquiers Luxembourgeois</i>
<b>Bancomat</b>	The national debit card scheme
<b>BCL</b>	<i>Banque centrale du Luxembourg</i>
<b>CBF</b>	Clearstream Banking Frankfurt AG
<b>CBL</b>	Clearstream Banking Luxembourg SA, the Luxembourg-based ICSD
<b>Cedel</b>	A former Luxembourg-based European clearing house – <i>Centrale de Livraisons de Valeurs Mobilières</i>
<b>CETREL</b>	A company providing services in the field of electronic payment systems – <i>Centre de Transferts Electroniques</i>
<b>CSSF</b>	The Luxembourg financial supervisory authority – <i>Commission de Surveillance du Secteur Financier</i>
<b>LIPS-Gross</b>	Luxembourg Interbank Payment System on a gross basis, the Luxembourg RTGS component of TARGET
<b>LIPS-Net</b>	Luxembourg Interbank Payment System on a net basis, an electronic interbank clearing system
<b>Minicash</b>	The national e-money scheme
<b>UCIs</b>	Undertakings for collective investment

## Introduction

The Luxembourg payment systems have undergone significant change over the past few years both at an institutional and operational level.

At the institutional level, the Institut Monétaire Luxembourgeois (IML), which was responsible, inter alia, for the supervision of financial institutions, was transformed into the Banque centrale du Luxembourg on 1 June 1998.

With the creation of the Banque centrale du Luxembourg, new responsibilities in the area of payment systems have arisen. When the Banque centrale du Luxembourg became a full member of the ESCB, the Luxembourg TARGET component – LIPS-Gross – needed to be set up and went into operation on 4 January 1999.

On the retail payment side, the electronic clearing system, LIPS-Net, which settles its multilateral net position in LIPS-Gross, has completely replaced manual clearing. Its settlement procedure was modified for the launch of the single currency.

Both systems are owned by economic interest groupings, which include the Banque centrale du Luxembourg and the participating banks. The Banque centrale du Luxembourg chairs both these groupings.

Recent years have also been characterised by an increased use of electronic means of payment. This development has probably been furthered by the central organisation of payment services in Luxembourg and by the small size of the country, which enable a high concentration of services. In addition to the traditional use of debit and credit cards, a prepaid card scheme was launched at the beginning of 1999.

On the securities side, the Luxembourg-based ICSD Clearstream Banking Luxembourg SA (CBL), formerly Cedelbank, has been designated by the Banque centrale du Luxembourg to act as the Luxembourg CSD for handling securities used in ESCB credit operations.

## I Institutional aspects

### I.1 The general institutional and legal framework

On the institutional side, considerable changes have occurred over the past couple of years. The Institut Monétaire Luxembourgeois, which was the issuing authority for Luxembourg banknotes and coins during the monetary association between Luxembourg and Belgium was, at the time, in charge of the supervision of credit institutions. It was transformed into the Banque centrale du Luxembourg on 1 June 1998.

Since its inception, the Banque centrale du Luxembourg has been a full member of the ESCB and has hence been contributing to the performance of the System's tasks.

In the meantime, the supervision of financial institutions has been entrusted to a separate body, the *Commission de Surveillance du Secteur Financier* (CSSF), acting under the authority of the Ministry of Finance. The CSSF was created on 1 January 1999.

As regards the legal framework, there is no specific legislation governing all aspects of payment systems. Most aspects are covered by private contracts between financial institutions, customers and retailers.

The *Code Civil*, which contains some very general provisions on payments, lists the various forms of payments, including payment by compensation and payment by novation. Other laws deal with cheques, bills of exchange, collateral, the monetary authority and the supervision of the financial sector.

More recently, the EC Directive on retail cross-border credit transfers, which obliges credit institutions to disclose the terms and conditions of fees on retail cross-border credit transfers, was transposed into national legislation.

The transposition into national legislation of the EC Settlement Finality Directive, which is

intended to reduce the legal risks associated with the participation in designated payment and securities settlement systems, was adopted by Parliament in January 2001.

### I.2 The role of the Banque centrale du Luxembourg

The role of a national central bank with regard to payment systems is generally twofold: it acts both as operator of the payment systems, as well as overseer of the payment and securities systems in general. The first task derives from the need for national central banks to have a secure channel for the execution of their monetary policy and the need for commercial banks to be able to process their interbank payments in a secure environment. The second task stems from the public need for secure and efficient payment channels which safeguard the stability of the financial system as a whole, as well as public confidence in money.

#### I.2.1 Payment systems oversight

The Organic Law on the Banque centrale du Luxembourg refers only in very general terms to its responsibilities in the area of payment systems. In particular, the Banque centrale du Luxembourg is not formally entrusted with oversight in the area of payment and securities settlement systems. However, given the competence assigned to the ESCB with regard to clearing and payment systems by virtue of Article 105 of the Treaty establishing the European Community and Articles 3 and 22 of the Statute of the ESCB, the Banque centrale du Luxembourg acts according to the guidelines and rules elaborated at the ESCB level.

At the domestic level, the issue of payment systems oversight has been discussed within the context of the transposition of the EC Settlement Finality Directive into Luxembourg law. The transposed Settlement Finality Directive clearly entrusts the Banque centrale du Luxembourg with the oversight of

the main payment and securities settlement systems in which it participates. In the near future, the Banque centrale du Luxembourg will communicate its policy lines on this matter to the public by means of a policy statement. At present, the policy lines adopted at the ESCB level are enforced using informal methods such as moral suasion.

This moral suasion is exercised through informal tools (e.g. the monitoring of systems, the maintenance and analysis of statistical data, and the management of settlement accounts), which are used at regular meetings held with the banking community within different groups and committees at the national level.

### **1.2.2 Operational role**

On the operational side, the Banque centrale du Luxembourg holds current accounts for all credit institutions which are subject to the minimum reserve requirements of the ESCB, as well as for other public institutions and selected private institutions from the financial sector.

In order to have an account with the Banque centrale du Luxembourg, counterparties need to comply with the general terms and conditions governing the operations of the Banque centrale du Luxembourg.

In particular, the Banque centrale du Luxembourg does not execute payment orders on an intraday basis for any counterparty with insufficient collateral. In any event, only credit institutions subject to minimum reserve requirements are granted intraday credit against full collateralisation of their overdraft. Debit balances at the end of the business day are transformed into overnight credit facilities (called the marginal lending facility), upon which the marginal lending rate determined by the Governing Council of the ECB is charged.

The most important transactions recorded on the current accounts held with the Banque centrale du Luxembourg relate to the deposit and withdrawal of cash from the national central

bank, monetary policy operations and other payments processed through the RTGS system.

On the cash side, the Banque centrale du Luxembourg is responsible for the circulation of both Luxembourg and Belgian banknotes and coins during the transition period of Stage Three of EMU. From 1 January 2002 onwards, the Banque centrale du Luxembourg will ensure the circulation of euro banknotes and coins, which in the meantime need to be developed and produced under the responsibility of the national central bank and within the framework of the ESCB.

On the non-cash side, the Banque centrale du Luxembourg operates the RTGS system, LIPS-Gross, through which the national central bank offers the Luxembourg banking community a secure and sound way to channel their large-value payments across Europe. LIPS-Gross also offers settlement facilities to the domestic clearing system LIPS-Net.

As regards securities, the Banque centrale du Luxembourg and CBL are in the process of developing a new settlement model similar to the one currently being developed in Germany. This model, called "night-time link", will enable CBL to grant credit to its Luxembourg customers during the night-time processing of CBL on the basis of collateral held at the Banque centrale du Luxembourg. This feature will be available by the end of 2001.

## **1.3 The role of other private and public sector bodies**

Several private sector bodies are involved in the field of payment and securities settlement systems in Luxembourg.

### **1.3.1 Luxembourg Bankers' Association**

The Luxembourg Bankers' Association (ABBL) is the representative body for Luxembourg-based banks. It is responsible for defending the interests of the Luxembourg banking community both domestically and internationally and for enhancing



co-operation within the banking community. With regard to payment systems in particular, it promotes the use of operational and technical standards in conjunction with the Banque centrale du Luxembourg, the CSSF, CETREL (see below) and the banking community.

### 1.3.2 Centre de Transferts Electroniques

The *Centre de Transferts Electroniques* (CETREL) is a company which has been set up by nine banks and the Post Office to provide services in the field of electronic payment systems. It manages the ATMs and POS terminals supporting Bancomat (the national debit card scheme), Minicash (the national e-money scheme) and Visa and Europay products. It also operates the central application of the electronic clearing system and a communication infrastructure used by financial institutions for reporting to the Banque centrale du Luxembourg and the CSSF.

### 1.3.3 Europay Luxembourg/Visa Lux

Both these companies organise the collection, encoding and dispatching of payment instructions from the Europay/MasterCard and the Visa networks. Both companies function with the technical support of CETREL.

### 1.3.4 Clearstream Banking Luxembourg SA

CBL, formerly Cedelbank until the merger with Deutsche Börse Clearing at the end of 1999, is the Luxembourg-based ICSD, as well as the CSD appointed by the Banque centrale du Luxembourg for the handling of securities used within the framework of ESCB credit operations.

## 2 Payment media used by non-banks

The various payment instruments in use in the Luxembourg domestic market are cash, credit transfers, cheques, credit and debit cards and, more recently, electronic money.

### 2.1 Cash payments

Owing to the monetary association between Luxembourg and Belgium, both Luxembourg and Belgian banknotes and coins are legal tender in Luxembourg. With the introduction of the euro and the entry of both countries into EMU, this association and most of the related protocols have become obsolete.

However, according to a bilateral agreement signed by the Luxembourg and Belgian governments on 23 November 1998, both Luxembourg and Belgian coins will continue to have legal tender status in Luxembourg during the transition period until the introduction of euro banknotes and coins. During this transition

period, the Banque centrale du Luxembourg will remain in charge of circulating Belgian banknotes and coins on Luxembourg territory.

The Banque centrale du Luxembourg issues banknotes in denominations of LUF 5,000, 1,000 and 100. Coins of LUF 50, 20, 5, 1 and 0.25 are put into circulation by the Banque centrale du Luxembourg on behalf of the Treasury.

As mentioned above, Belgian banknotes of BEF 10,000, 2,000, 1,000, 500, 200 and 100, as well as coins of BEF 50, 20, 5, 1 and 0.5 are also legal tender in Luxembourg.

The number of Luxembourg banknotes issued has been constantly decreasing over the past few years. From 1996 to 1999, the total value of LUF-denominated banknotes dropped by 19%. Although no precise figures are available, the use of cash in purchase transactions has also

been on the decline in recent years, with the wider acceptance of electronic means of payment by both consumers and retailers. An informal survey found that less than 50% of transactions are made in cash.

## 2.2 Non-cash payments

The money available for cashless payments is deposit money, which makes up around 98% of the monetary stock M1. Around 15% of deposits are kept in Post Office accounts, the remainder in credit institutions. As in other countries, there are various types of deposits and accounts: fixed-term deposits, savings accounts and current accounts. The latter, which allow withdrawals at any time, are normally the only type of account which can be used for cashless payments. As regards interest on accounts, there are several rates. For current accounts, banks usually offer 0.5%. As for fixed-term deposits, there is no common rule for interest rates applied. For savings accounts, banks usually offer a base rate comparable with the marginal deposit facility rate offered by the ESCB, a loyalty premium and an increase premium calculated on the basis of the net increase in the savings. In most cases, no transaction fees are charged, with the exception of special services (cross-border transfers, international cheques, settlement, etc.). In order to enhance automation and promote the use of paperless services, some banks have recently started to charge their customers when credit transfers are presented in paper form.

### 2.2.1 Credit transfers

Credit transfers are the most commonly used cashless payment instrument. Since the launch of the electronic clearing system at the end of 1994, the yearly increase in the volume of credit transfers has averaged 15%.

The total number of credit transfers exchanged in the electronic clearing system in 1999 amounted to 11.05 million, which represented an increase of 12.9% from 1998. The value of these payments came to €32.8 billion, representing a rise of 34.5% from 1998. The

share of credit transfers in the electronic clearing system represented 93.5% of the total volume and 90% of the total value.

All banks offering retail payment services to their customers are either direct or indirect participants in the electronic clearing system. This system offers the facility to clear both standard credit transfers and standing orders, which are used for recurrent payments.

One of the significant developments over the past few years has been the growing use of electronic means of transmission for credit transfers from customers to their banks. Most banks offer their corporate customers the possibility of presenting their payment orders via electronic networks. Private customers also have the possibility of introducing their payment orders electronically, either via home banking and phone banking services or via ATMs equipped with this feature.

### 2.2.2 Cheques

The use of cheques has been declining continuously over the past few years with the growing use of debit and credit cards as payment media.

Debit cards issued in Luxembourg include the cheque guarantee function, which allows customers to issue guaranteed cheques, provided that their cheque card number is written on the back of the cheque and the amount does not exceed LUF 7,000. If these conditions are not met, although the cheque may be valid, it is not guaranteed. The eurocheque system includes an automatic overdraft facility for the customer of LUF 50,000.

The Luxembourg banking sector has decided to abandon the eurocheque function upon the expiry date of the current debit cards at the end of 2001, which will further hasten the decline in the use of cheques.

In addition to the cheques covered by the guarantee function, banks continue to offer

their own cheques to both corporate and retail customers. These cheques are mainly used as a substitute for cash in high-value payments.

Cheques are exchanged in the electronic clearing system either via cheque truncation or, for high-value cheques (i.e. above €12,500), via physical exchange.

In 1999, the share of cheques in the electronic clearing system represented 6.5% in terms of volume and 10% in terms of value, as opposed to 8.5% and 13.5% respectively in 1998. The total number of cleared cheques decreased from 0.88 million in 1998 to 0.76 million in 1999. By contrast, the value of exchanged cheques increased slightly from €3.4 billion in 1998 to €3.6 billion in 1999.

### 2.2.3 Direct debits

In order to simplify the execution of payments, banks promote collected transfer orders such as standing orders and direct debits. In the latter case, the payment is based on a prior written agreement between the debtor and the bank. Before a debit is made from the account, the debtor receives an invoice and thus has the opportunity to challenge the payment. Together with nine banks, CETREL operates a central application system for direct debits. It collects the bank customers' invoices from the payees and generates the transfer orders. This centralised system is called *DOM électronique* and is intended to gradually replace the bilateral systems operated by the banks.

As a result of the growing number of creditors participating in the system, the volume of direct debits has continuously increased over recent years. In 1999, the total number of transactions amounted to 2.1 million, as opposed to 1.6 million in 1998. The value of transactions rose from €168 million in 1998 to €230 million in 1999.

### 2.2.4 Card payments

The total number of payment cards in issue in Luxembourg at the end of 1999 was 533,000.

Broadly, there are two types of payment card: debit cards and credit cards. The domestic debit card system, Bancomat, incorporates both the eurocheque function and, since February 1999, an e-purse function called Minicash.

The most commonly used credit cards are Eurocard and Visa. American Express cards are offered by some domestic banks, but the clearing and settlement of transactions made with these cards does not take place in Luxembourg.

#### 2.2.4.1 Debit cards

##### *Bancomat*

Bancomat is a nationwide debit card scheme, with a total of 280,000 cards in issue at the end of 1999, covering 65% of the domestic population. Of these, 20,000 are Bancomat cards and 260,000 are combined eurocheque-Bancomat cards, including Postomat cards (debit cards issued by the Post Office).

Bancomat cards are standard debit cards which allow customers to withdraw cash at any ATM or to make payments at electronic points of sale in Luxembourg. Insofar as it is a eurocheque card, the holder can also withdraw cash in almost every other European country at ATMs bearing the eurocheque logo.

The currently issued debit cards will expire at the end of 2001. The eurocheque function will then be replaced by the Maestro function, which will allow Luxembourg cardholders to withdraw cash at ATMs and to carry out POS transactions across the world wherever the Maestro functionality is accepted.

Bancomat is run by a group of domestic credit institutions which have adopted common guidelines and standards for their electronic payment system. The technical operation of the system is undertaken by CETREL. In 1999, the Bancomat network consisted of approximately 1,200 EFTPOS terminals based on leased lines and 4,500 automatic online points of sale linked

to the central computer via the public telephone network. Both types of terminal check the following items: validity, expiry date, weekly withdrawal or purchase limit (LUF 25,000 for ATMs and LUF 50,000 for POS terminals).

In 1999, there were 14.7 million transactions (4.7 million at ATMs and 10 million at POS terminals), meaning that each debit card issued was used on average for 17 ATM withdrawals and for 35 POS transactions.

The costs of the system are shared by the banks and retailers and by bank customers through the annual card fee. The banks' costs are shared between the customer's bank, which bears one-third of the cost, and the retailer's bank, which covers two-thirds of the cost. Retailers rent the equipment and pay a fixed amount, plus a percentage fee on each transaction.

#### 2.2.4.2 Credit cards

Visa and Eurocard/MasterCard are the most commonly used credit card brands in Luxembourg. They are offered by all banks involved in the retail banking business, as well as by the Post Office (Visa only). A total of 320,000 credit cards were in issue at the end of 1999.

The clearing and settlement of most credit card transactions (i.e. of Luxembourg cardholders in Luxembourg and abroad, and of foreign cardholders in Luxembourg) is performed by CETREL. For this purpose, two separate entities, Visa Lux and Europay Luxembourg, have been set up to ensure the collection, encoding and dispatching of payment instructions from the Visa and Europay/MasterCard networks respectively.

Only a couple of smaller banks operate their own network.

In December 1999, the Visa and Eurocard network operated by CETREL comprised 310 ATMs and more than 5,000 POS terminals. POS terminals offer two different features: an online procedure and an offline procedure, both

requiring verification for transactions exceeding a certain limit. In the medium term, all offline terminals will be replaced by online terminals accepting all sorts of payment cards (debit, credit and electronic money cards).

The costs of the system are shared by the customers, who pay an annual card fee, and the retailers, who pay a retailer discount fee covering the service of guaranteed payment for all card transactions. Within this system, retailers are paid on a daily basis, whereas cardholders are debited once a month.

#### 2.2.4.3 Electronic money

A multi-purpose prepaid card scheme, called Minicash, was launched in February 1999 by CETREL in co-operation with nine issuing institutions, including the Post Office.

In its first year of operation, there were approximately 250,000 loading transactions with a total value of LUF 100 million. The number of purchase transactions amounted to 57,000 with a total value of LUF 60 million. The total float outstanding at the end of 1999 was approximately LUF 40 million (around € 1 million).

Further details on operational and functional aspects are given in Section 3.

#### 2.2.4.4 ATM and POS networks

CETREL manages most of the ATMs and the POS terminals on behalf of the issuing credit institutions. Both ATMs and POS terminals are accessible via debit and credit cards using PIN codes. International credit cardholders may also access these terminals.

The electronic terminals check the expiry date, validity and maximum limit. Cash withdrawals at ATMs require PIN code verification, whereas credit card payments are signature-based. Both domestic and international card transactions are cleared by CETREL, which operates the licensed company Visa Lux created in 1991. Verification of international cards can be obtained worldwide within 45 seconds.

The basic checks triggered by any transaction at an ATM relate to the PIN code, the card's validity and expiry date, as well as the weekly withdrawal limit.

The basic functionalities offered by ATMs are cash withdrawals and the verification of current account balances.

ATMs are mainly located at bank sites. Some ATMs are integrated in self-service banking terminals, which allow customers to make other types of transaction, such as ordering credit transfer forms or cheques, executing payment orders and making transfers from current to savings accounts.

In 1999, the total number of ATMs managed by CETREL amounted to 310, as opposed to 284

in 1998. In addition to these centrally managed ATMs, a few banks operate their own networks, although these are very small.

### 2.3 Recent developments

Over the past few years, most banks have started to offer online services to both their corporate and retail customers. These mostly include standardised services, such as the monitoring of accounts, the initiation of transfer orders or the communication of financial information. Initiating transfer orders using electronic means allows banks to automatically channel these into the clearing system and hence to reduce their handling costs.

More recently, the online ordering of stock exchange transactions has been added to the range of services offered by most banks.

## 3 Interbank exchange and settlement systems

### 3.1 General overview

The Luxembourg interbank payment systems have undergone significant change over the past few years.

On the one hand, there was the launch on 4 January 1999 of the domestic RTGS system, LIPS-Gross, which is connected to TARGET via the Interlinking component. On the other hand, the electronic clearing system for retail operations, LIPS-Net, which started up at the end of 1994 with only three participants, has, since mid-1998, completely replaced the manual clearing arrangements.

Both systems are owned by economic interest groupings, which are special-purpose companies under Luxembourg law owned by the Banque centrale du Luxembourg and the participating banks.

### 3.2 The real-time gross settlement system: LIPS-Gross

The Luxembourg RTGS system, LIPS-Gross, is owned by an economic interest grouping, RTGS-L Gie, which encompasses all participants in the system including the Banque centrale du Luxembourg.

The Banque centrale du Luxembourg ensures the chairmanship of the Board and all the technical sub-groups. In addition to the Banque centrale du Luxembourg, 11 participants are currently represented on the Board.

#### 3.2.1 Operating rules

The operating rules of the system were adopted by the Board of RTGS-L Gie at the end of 1998 and cover issues such as access criteria, obligations of both the Banque centrale du Luxembourg and the participants, types and formats of messages exchanged, payment finality, crisis management and intraday credit provisions.

### 3.2.2 Participation in the system

Access to the system is granted to credit institutions falling under the scope of the banking supervisory authority. These institutions must be subject to the minimum reserve requirements of the ESCB, have an account with the national central bank and have access to Eurosystem intraday liquidity. Further access criteria relate to the operational and, in the case of foreign participants, legal soundness of the applicants.

Final approval for the access of new participants is given by the Board of RTGS-L Gie, taking into consideration the above-mentioned criteria.

In November 2000, RTGS-L Gie had 32 participants, including the Banque centrale du Luxembourg.

### 3.2.3 Types of transaction handled

The system, which operates via the SWIFT Fin-Copy service, accepts both customer and interbank payment messages (of the types MT 100, MT 103 and MT 202).

There is no obligation for the participants to use LIPS-Gross, except for payments in connection with monetary policy operations, for payments in euro necessary for the settlement of the euro leg of foreign exchange operations involving the ESCB and for the settlement of cross-border large-value netting systems handling euro transfers.

Although the system is intended for high-value payments, there is no lower limit for a payment.

### 3.2.4 Operation of the transfer system

LIPS-Gross is a fully automated system in which payments are exchanged in the form of telecommunications messages. LIPS-Gross uses the SWIFT FIN network, which has meant that there has been limited technical impact on the participants, since most of them were already equipped with SWIFT computer-based terminals.

Participants in LIPS-Gross are equipped with workstations enabling them to monitor in real time their payment flows, the balance of their settlement account and their queued payments. Like the other TARGET components, LIPS-Gross operates between 7 a.m. and 6 p.m.

### 3.2.5 Transaction processing environment

The domestic leg of LIPS-Gross transactions is based on the Y-shaped architecture of the SWIFT network. This means that any payment sent by a participant is intercepted at the level of the technical operator, i.e. SWIFT, which sends a settlement request to the national central bank. Once the settlement procedure has been run through, a settlement response is issued by the national central bank.

All cross-border transactions are forwarded to the central bank of the receiving party via the Interlinking component.

### 3.2.6 Settlement procedures

All payments are settled individually by debiting the account of the sender and crediting the account of the receiver on a real-time basis.

However, before settling a payment, the system checks that the sending bank has enough credit, either in the form of a credit balance on its account or in the form of an overdraft facility backed by eligible collateral. If a payment cannot be settled because of a lack of funds, the payment is automatically stored in a queue and reconsidered for settlement each time a credit is posted to the account. Payments remaining in the queue at the end of the day are rejected.

### 3.2.7 Credit and liquidity risk

Credit and liquidity risk are minimised through binding limits within the system and full collateralisation of intraday credit granted to participants.

### 3.2.8 Pricing

The pricing of LIPS-Gross is based on a full cost recovery principle.

Investment costs are covered by an entrance fee to be paid by every participant in the system.

Operational costs are covered by transaction fees and an annual fee, which has a tiered structure depending on the volume of transactions of individual participants.

The pricing of cross-border transactions complies with the fee structure agreed upon at the Eurosystem level, i.e. €1.75 for each of the first 100 transactions in a month, €1.00 for each of the next 900 transactions and €0.80 for each subsequent transaction.

Domestic payments are charged at €0.80 per transaction regardless of the number of payments sent.

## 3.3 Retail payment systems

### 3.3.1 LIPS-Net

In October 1994, a fully electronic interbank clearing system, LIPS-Net (Luxembourg Interbank Payment System on a net basis) became operational. The network, to which the participating banks, the technical operator CETREL and the Banque centrale du Luxembourg as the settlement agent are connected, is used for the netting and settlement of retail payment transfers between banks.

At the beginning, only three banks were involved in the design and implementation of the system. The number of participating banks has, however, gradually increased over the past few years and reached 13 participants on 1 November 2000. In addition to its function as settlement agent, the Banque centrale du Luxembourg became a direct participant in the system at the beginning of 2001.

Since 1 January 1999, payments exchanged in the electronic clearing system have been denominated

in euro. Payments denominated in any of the sub-units of the euro have also been accepted since the launch of the single currency. For such payments, the amount in the sub-unit is conveyed in parallel with the amount expressed in euro.

### 3.3.1.1 Operating rules

The electronic clearing system is owned by an economic interest grouping, SYPAL Gie, which is a non-profit-making organisation established under Luxembourg law, made up of the participating banks and the Banque centrale du Luxembourg.

The members of SYPAL Gie have entrusted the Banque centrale du Luxembourg with the chairmanship of the Board as well as the management of the grouping.

### 3.3.1.2 Participation in the system

Access to the system is granted to credit institutions falling under the scope of the banking supervisory authority, as well as to the Post Office. All participants must be members of SYPAL Gie and RTGS-L Gie (i.e. they must have an account in the RTGS system), comply with the existing rules and hold an account with the national central bank. The only exception with regard to settlement is the Post Office, the net position of which is cleared through another settlement bank since it is not a member of LIPS-Gross.

The Board of SYPAL Gie is currently made up of five members, although it may have a maximum of seven members. In order to be eligible as a Board member, the participants other than the Banque centrale du Luxembourg need to generate individually at least 15% of the payment flows. Those participants which generate individually less than 15%, but collectively more than 15%, may delegate one common member to the Board. This option is not used for the time being.

### 3.3.1.3 Types of transaction handled

The types of transaction handled in the electronic clearing system involve credit transfers and cheques.

For credit transfers, a distinction is made between standard credit transfers and standing orders. All in all, credit transfers account for more than 90% of the transactions processed.

Although the use of cheques has been steadily declining over the past few years, cheque truncation was introduced in the electronic clearing system in the course of 1998, hence reducing the processing costs for banks. Cheque truncation, however, only applies to cheques with a value lower than LUF 500,000 (or € 12,500). Cheques with a value exceeding this limit are still exchanged physically between participating banks.

Although it is possible to limit the value of payments processed by the system, there are no restrictions imposed on the participants at the moment.

#### *3.3.1.4 Operation of the transfer system*

The payments cleared in the system are grouped into batches at the sending bank and netted following preliminary checks at the level of the technical operator. A batch can include up to 1,000 payments.

The network is star-shaped, which means that each payment batch sent through the system is first received and checked by the technical operator and then netted. After the settlement of the net positions, the payment batches are forwarded to the receiving bank, which can process them without delay.

The settlement process takes place five times a day, i.e. at 7.30 a.m., 10 a.m., 12 noon, 2 p.m. and 4 p.m. The multilateral net positions of the participants in the system are cleared in the LIPS-Gross system. In each clearing cycle, the multilateral net position of each participant is checked against its available credit line in the RTGS system. Provided that there is no breach of any of the participants' credit limits, the multilateral positions of participants are settled in real time. If the limit of one or several participants is breached as a result of the

settlement, an algorithm selects the last payments which caused the limits to be breached and places them in a queue until the next clearing cycle. This procedure ensures that settlement always takes place in due time and that no uncollateralised intraday credit is granted to the banks.

During this netting process, the reserved funds are automatically blocked in the current accounts of the LIPS-Gross participants which have a net debit position in LIPS-Net, to enable, once the netting is complete, the immediate settlement of the net positions.

The settlement of the LIPS-Net positions is a transaction with a higher priority than any "normal" payment initiated by a LIPS-Gross participant.

Shortly after the settlement, the technical operator releases all the payment batches included in the netting process and dispatches them to the receiving banks.

#### *3.3.1.5 Transaction processing environment*

The electronic clearing system uses a private network. It is a file-oriented system which functions on the basis of the "store and forward" principle. The banks operate their access points on UNIX platforms. Backup procedures have been designed in order to enable data exchange via magnetic media in the event of a failure of the telecommunications networks. All banks have high-availability systems to cover the risk of a variety of hardware failures. There is a test environment on a standby platform to test new software releases and to validate the information flows of new participants. A fully-fledged business continuity plan has been worked out to ensure the settlement of at least one netting cycle in the event of a major failure on the part of the technical operator.

#### *3.3.1.6 Credit and liquidity risk*

The electronic clearing system is based on multilateral netting. The limit depends on the amount of intraday credit granted to the



individual participants in the RTGS system. As mentioned previously, since the launch of EMU, credit risk is managed through the intraday credit facilities offered by the Banque centrale du Luxembourg to the credit institutions participating in LIPS-Gross.

#### 3.3.1.7 Pricing

The basic principle as regards pricing is full cost recovery. Pricing comprises a one-off entrance fee, an annual fee and a transaction fee.

#### 3.3.2 Manual clearing

As a result of the increasing number of participants in the electronic clearing system, the manual clearing arrangements were discontinued on 30 June 1998. Manual clearing remains an option within the framework of the business continuity plan.

#### 3.3.3 Card-based schemes

A multi-purpose prepaid card scheme, called Minicash, was launched in February 1999 by CETREL in co-operation with nine issuing institutions, including the Post Office.

Minicash operates through a prepaid rechargeable chip embedded in the existing debit cards. The technology of Minicash is based on the German *Geldkarte* system. Like most prepaid card schemes, it is intended to be a substitute for cash in small-value transactions.

The electronic purse can be loaded up to an amount of €125 (or the LUF equivalent). The loading of the card takes place after the verification of the PIN code at special-purpose loading terminals (operated either by the banks or CETREL) or at ATMs (operated by the banks only). In order to be loaded, a card needs to be recognised by the central security system at CETREL, which also checks the availability of sufficient funds on the card-linked account. In the loading operation, the current account of the cardholder is debited and a dedicated float account held by the issuer is credited via the centralised float account managed by CETREL.

Transactions at the point of sale are offline. Electronic value is simply transferred from the card to the retailer's terminal. Periodically, depending on the number of transactions stored on the retailer's chip card and no later than two weeks after the last download, the retailer sends the information stored in the purchase terminal to the central clearing unit at CETREL via the telecommunications network.

When centrally processing the transactions received, CETREL credits the retailer's account and debits the float account of the cardholder's issuer.

CETREL manages a complete set of mirror accounts, which enables it to trace any transaction carried out in the system.

## 4 Securities settlement systems

### 4.1 Trading

The Luxembourg stock exchange trading hours are from 10 a.m. to 4 p.m.

Since 2 January 1996, all Luxembourg-listed securities have been traded on the multi-fixing segment of the Automated Trading System (SAM), a system in which securities are distributed over a number of fixing groups called in sequence within a fixed time schedule.

On 8 December 1997, the On-Demand Continuous Market (MCD), a quote-driven and market-activated system, was launched.

Trading is fully electronic and decentralised. Market participants trade directly via their local dedicated IT workstations.

In 2000, the total turnover of all listed securities came to €2,819,924,691, of which 35% was accounted for by bonds, 47% by domestic and foreign shares and 18% by units in undertakings for collective investment (UCIs).

#### Bonds

Bonds currently listed on the Luxembourg stock exchange are more or less evenly issued in EU and non-EU currencies. Within these two blocks of currencies, the proportion of issues listed in EMU currencies and USDs is 85% and 78% respectively.

While the bulk of the turnover takes place in EMU currencies (LUF accounting for 87%), the USD is the issuance currency for 57% of the overall amount of bonds listed.

#### Shares

The total number of shares listed on the Luxembourg stock exchange is 297, of which 60 are domestic and 237 foreign. Turnover in these shares is mainly concentrated on domestic shares (99%), whereas foreign shares represent 94% of the overall equity capitalisation.

### Undertakings for collective investment

A total of 4,625 UCIs are listed on the Luxembourg stock exchange, of which 98% are domestic. In 2000, 1,263 new UCIs were listed on the exchange, representing a yearly increase of more than 37%.

### 4.2 Clearing

In the absence of a dedicated central counterparty for securities clearing in Luxembourg, settlement in this context is covered in Section 4.3.

### 4.3 Settlement

#### 4.3.1 Introduction: the corporate structure of Clearstream Banking Luxembourg SA

Cedel was founded on 28 September 1970 to provide for the clearing, settlement, custody and management of securities and precious metals.

On 1 January 1995, with the intention of increasing the company's effectiveness, Cedel became Cedel Bank (and later Cedelbank) in order to take advantage of capital adequacy regulations. At the same time, Cedel International was established as the parent company of the Cedel Group.

In May 1999, Cedel International and the Deutsche Börse Clearing AG decided to merge. Both entities then formed Clearstream International, of which 50% is owned by Cedel International Holding (itself held by international financial institutions), the other 50% being held by the Deutsche Börse AG.

The recently founded Clearstream International is most notably the parent company of Clearstream Banking Luxembourg SA (CBL), Clearstream Banking Frankfurt AG (CBF) and Clearstream Services (located in Luxembourg). Clearstream International officially started operations in January 2000 and is operating under Luxembourg law. CBF has taken over the business of the former Deutsche Börse Clearing and continues to operate under German law as

a bank and as the German CSD, while CBL has taken over from Cedelbank and operates as the Luxembourg CSD.

The Boards of Directors, the management, the corporate functions, IT, and the sales and marketing functions have been integrated since January 2000, whereas the network management is still in the process of being integrated. The two CSDs are currently aiming to migrate all of their operations onto one single IT platform by the end of 2002. The first key step will be completed in February 2001 through the migration of CBF's business in international securities onto this single IT platform.

Clearstream International is represented by offices in London, New York, Tokyo, Hong Kong, Dubai and Mexico City.

#### **4.3.2 The present situation**

CBL is a duly licensed credit institution incorporated under Luxembourg law and is thus authorised to carry out the complete range of banking activities. However, CBL's by-laws stipulate that its core business consists of acting as a depository and providing clearing and settlement services in respect of the securities which have been or are to be deposited with CBL. Consequently, the other banking activities of CBL are limited to facilitating its settlement and clearing services.

Following the transposition of the EC Settlement Finality Directive into Luxembourg law, the European Commission will be notified of the SSS status of CBL, which will thus be covered by the Directive.

#### **4.3.3 Participants in the system**

Membership is open essentially to banks, broker-dealers, investment banks, central banks and CSDs. New members have to meet certain criteria when applying for membership and their credit standings are assessed on an ongoing basis. Criteria against which

membership is assessed include the institution's net worth, its legal structure, its management reputation and the underlying country risk. Today, CBL maintains customer relationships with all major financial institutions from over 70 countries.

#### **4.3.4 Types of transaction handled**

Over 115,000 securities are currently accepted by CBL for clearance and settlement. They include fixed-income bonds such as eurobonds, foreign bonds, domestic bonds and convertibles, money market instruments (including short and medium-term notes, commercial paper and certificates of deposit), as well as equities, depository receipts, units in investment funds, warrants and precious metals. CBL operates a multi-currency system, which currently covers 40 currencies. Customers have discretion over the choice of currency for the settlement of obligations.

#### **4.3.5 Transaction processing environment**

Communication media available to customers to send settlement instructions include the SWIFT network, the CBL communication system, Cedcom, and telex.

Once an instruction is received by CBL, it is checked automatically against validation criteria, such as the International Securities Identification Number (ISIN), to ensure that the instruction was input correctly. Once validated, the instruction has to be matched with the instruction from the counterparty. It is then considered to be a valid settlement order. If the instruction is not validated, the customer is informed immediately so that the instruction can be rectified and a new instruction sent before processing deadlines.

Reports of settled and unsettled trades are available on an hourly basis throughout the day. Full reporting, including information on cash and securities balances and total holdings, is provided to customers after both the overnight processing and the daytime continuous settlement processing.

#### 4.3.6 Settlement procedures

CBL has developed and implemented a book-entry IT system through which cash and securities are exchanged simultaneously. This DVP mechanism is intended to eliminate the principal risk. Where customers cannot deliver securities or cash at the designated time, CBL offers a comprehensive securities lending programme and provides cash lending facilities. These support mechanisms are closely monitored via dedicated cash and collateral management services.

##### *Overnight and daytime processing*

Transactions in CBL are processed during the CBL overnight processing and during the daytime continuous settlement processing. All valid instructions received by 7.45 p.m. (C.E.T.) are settled overnight for value the following day. Continuous settlement occurs on a same-day basis and takes place during the day for all valid instructions received by 4 p.m. (C.E.T.). Transactions failing during the overnight processing can be reconsidered for settlement in the ten subsequent continuous settlement processing cycles.

##### *Bridge settlements*

The original Bridge Agreement between CBL and Euroclear was reached in 1993. Trades with counterparties in Euroclear are settled overnight via the electronic Bridge on a DVP or FOP basis. The Bridge allows transactions to be settled between customers of CBL and Euroclear by means of crediting or debiting the account held by each clearing and settlement system with each other. On 29 November 2000, Clearstream International and Euroclear signed an agreement to supplement the existing overnight Bridge with a new daytime transaction processing feature between both systems. This daytime Bridge for multiple intraday exchanges of securities and cash deliveries is expected to commence in 2001 and will operate manually until an automated solution is available. The main benefits of this additional link will be increased efficiency, greater liquidity of customer transactions and the

possibility of distributing new issues on a same-day basis.

##### *Internal transactions*

Securities held in the CBL system and traded between CBL counterparties are settled in accordance with the counterparties' instructions on a DVP or FOP basis through the simultaneous book-entry transfer of securities and cash between the accounts of the buyer and the seller.

##### *External transactions*

Trades with counterparties on other domestic markets are settled through one of CBL's depositories, either a national CSD or a bank, depending on the market.

##### *The Creation project*

The Creation settlement system is a new central application enabling CBL to offer customers a rapid daytime settlement service. In addition to features such as eligibility checking, settlement and technical netting, provision checking and transaction booking, the new Creation system includes functions such as automatic reimbursement of securities lending, automatic substitution of collateral, automatic collateral top-up and return of specific collateral pledged, and settlement of securities financing.

Based on the principle of continuous intraday DVP settlement, the Creation IT platform is expected to improve liquidity for customers by introducing technical netting facilities.

Migration of all CBL and CBF securities onto the Creation IT platform is expected to be complete by the end of 2002.

#### 4.3.7 Risk management

##### *Default of a counterparty*

From a legal point of view, the default of a participant in CBL does not have an impact on the property rights of its counterparties as

regards securities transactions settled prior to the time of the court order. With regard to securities transferred to a counterparty under a pledge agreement, such collateral may, from the moment the debtor is in default, be used without written notice to meet any of its obligations. In the case of a repo agreement, the default of a participant does not adversely affect the property rights of the owner of the securities. Since settlement of transactions can only occur if the necessary cash and securities provisions are available, customers of CBL are not exposed to the risk of default by another customer.

#### *Securities and cash lending facilities*

CBL manages three different types of securities lending programmes: Automated Securities Lending (ASL), Disclosed Automated Securities Lending, and Strategic Securities Lending (SSL). The mechanisms are optional and are intended to avoid possible settlement failures by customers. In all these programmes, CBL never acts as principal, but merely as an intermediary between the lenders and the borrowers.

In addition, CBL offers three types of credit facilities against collateral: the Unconfirmed Funds Facility (UFF), the Technical Overdraft Facility (TOF) and the Tripartite Financing Agreement (TFA).

Unsecured credit lines are granted to top names in the financial sector only. Prior to opening unsecured credit lines, CBL analyses the customer's creditworthiness, which is reviewed and approved by the CBL Internal Credit Group. The case is then presented to and ratified by the CBL Executive Board. The use of such credit lines is monitored on a daily basis, with particular emphasis on identifying potential large exposures.

#### *Responsibility of CBL*

In the absence of negligence or wilful misconduct on its part, CBL is not liable to customers for any loss, claim, liability, expense or damage arising from any action taken or not taken by CBL. In

addition, CBL has taken out insurance policies covering crime and depository indemnity up to USD 75 million and covering risks of physical loss or damage up to USD 500 million.

#### **4.4 The use of the securities infrastructure by the Banque centrale du Luxembourg**

Following positive assessments of its systems in 1998 and 2000 by the ESCB, CBL was designated by the Banque centrale du Luxembourg to act as the Luxembourg CSD for handling securities used for collateralising ESCB credit operations.

At the domestic level, Luxembourg banks use their accounts in CBL to deliver securities to the account of the Banque centrale du Luxembourg for the purpose of holding adequate collateral for monetary policy and intraday credit operations.

At the cross-border level, the use of the CCBM remains very popular with Luxembourg banks: 64% of all cross-border collateral holdings by Luxembourg banks were via the CCBM as at June 2000. It is interesting to note, nonetheless, that the CCBM is used to a greater extent in all other Eurosystem countries.

However, the use of eligible links established by CBL (i.e. those assessed and accepted by the Eurosystem) accounted for the remaining 36% of collateral held on a cross-border basis in June 2000, meaning that CBL links are the most widely used in the Eurosystem.

The ratio of domestic eligible collateral to cross-border eligible collateral is one to four. This reflects the fact that domestic eligible securities in Luxembourg would be insufficient to meet the banks' collateral requirements for minimum reserves and LIPS-Gross payments.

In addition to its ongoing involvement in the aforementioned ESCB assessment procedure, the Banque centrale du Luxembourg assumes the oversight function for CBL.

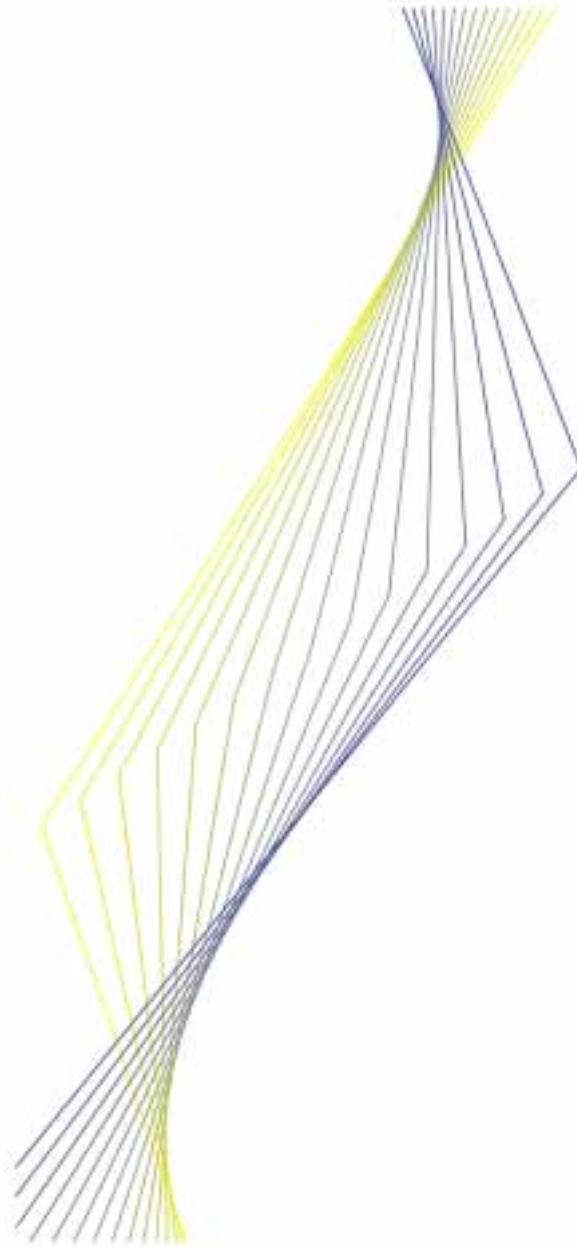
Finally, the Banque centrale du Luxembourg and CBL are in the process of developing a new settlement model similar to the one currently in use in Germany. This model, called "night-time link", will enable CBL to grant credit to its

Luxembourg customers during the night-time processing of CBL on the basis of collateral held at the Banque centrale du Luxembourg. This feature will be available by the end of 2001.

Luxembourg



EUROPEAN CENTRAL BANK



**Netherlands**

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Netherlands

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## List of abbreviations

<b>AEX</b>	Amsterdam Exchanges
<b>BXS</b>	Brussels Exchanges
<b>CSS</b>	Clearing and Settlement System (Interpay)
<b>DNB</b>	<i>De Nederlandsche Bank</i>
<b>DSI</b>	Dutch Securities Institute
<b>Interpay</b>	Net settlement system for low-value payments
<b>MTS</b>	Multatuli Trading System
<b>Necigef</b>	Dutch CSD
<b>NIEC</b>	Dutch Interprofessional Securities Centre – <i>Nederlands Interprofessioneel Effectencentrum</i>
<b>NSC</b>	<i>Nouveau Système de Cotation</i> , a French trading system
<b>NVB</b>	The Netherlands Bankers' Association – <i>De Nederlandse Vereniging van Banken</i>
<b>STE</b>	Securities Board of the Netherlands – <i>Stichting Toezicht Effectenverkeer</i>
<b>Switch</b>	Order routing system on the Euronext Amsterdam Derivative Markets
<b>TES</b>	TOP End Station
<b>TOP</b>	RTGS system operated by the DNB
<b>TSA</b>	Trading System Amsterdam
<b>VEB</b>	Association of Stockholders – <i>Vereniging van Effectenbezitters</i>
<b>Wte</b>	Act on the supervision of securities trade

## Introduction

As with other payment systems around the world, technological innovation and evolving methods of payment have influenced the Dutch payment system. The key characteristics, however, remain largely the same. The Netherlands still relies very heavily on credit transfers or giro payments: less than 2.5% of total volumes of domestic cashless payments are made by cheque and credit card. The majority of Dutch households and businesses hold more than one payment account. In March 2001, 16 million inhabitants held around 21 million accounts.

Retail payment services are provided by most of the commercial banks. All the banks together process around 3 billion cashless retail payments each year. The Dutch payment services market is quite concentrated, as is the banking market as a whole. The bulk of private customer accounts are held with just a few banks. In addition to the deposit-taking institutions offering a wide range of payment services, there are a few international credit card companies and retail chains offering credit card services.

Many of the retail payments are processed centrally at the automated clearing house "Interpay", in which nearly all banks participate. No other low-value payment systems exist.

Large-value payments are processed via TOP, the only RTGS system, which is operated by De Nederlandsche Bank. Although the TOP system is, in principle, intended to handle large-value interbank payments, there are in fact no upper or lower value limits for payments. This also applies to cross-border payments via TARGET to which TOP is linked.

The Dutch SSSs are undergoing a period of transition and will eventually become Europe-based, since the Amsterdam Exchanges (AEX) have merged with Euronext. A single integrated market has been formed together with the other merging companies, the Brussels Exchanges (BXS) and Paris Bourse, comprising a cash market for equities and bonds, a derivatives market and a commodity market. The integration of trading, clearing and settlement will take place in stages and is expected to be complete by the end of 2003.

## I Institutional aspects

### I.1 The general institutional framework

#### I.1.1 The banks as suppliers of payment services

Several large conglomerates, resulting from mergers between banks, insurance companies and investment institutions, dominate the Dutch financial sector. They offer the entire range of financial products. Most institutions offering payment services are banks which form part of these conglomerates. The banking sector consists of commercial banks, banks organised on a co-operative basis, savings banks, mortgage banks and securities credit institutions (i.e. specialised in trading on securities markets). The last two do not offer payment services. They can only access the payment system through an account at one of the other three types of deposit-taking institutions, which basically offer the same range of services, including payment services.

With a view to promoting and maintaining efficient processing and fostering reliable payments, the Dutch banks have set up a central clearing institute called Interpay BV.

#### I.1.2 The legal framework

In the Netherlands, the legal framework underlying payments and securities consists of several general laws as well as private law. An overview of the main provisions governing payments and securities can be found in the sub-sections below.

##### *Legal aspects in respect of payments*

Pursuant to the 1998 Bank Act, banknotes are legal tender up to an unlimited amount, while under the 1987 Coinage Act, coins are legal tender up to a limited amount. The 1992 Dutch Civil Code includes a stipulation to the effect that non-cash payments are legally equivalent to cash payments.

The External Financial Relations Act contains stipulations on external payments, such as the obligation to report certain transactions for the benefit of the compilation of the balance of payments.

The Act on cross-border payment services was designed to implement Directive 97/5/EC of the European Parliament and the EU Council of 27 January 1997 and contains stipulations on the transparency and quality of cross-border payments.

##### *Legal aspects in respect of payments and securities*

With a view to preventing money laundering, the Identification Financial Services Act obliges financial institutions to ascertain the identity of customers wishing to effect certain payments and securities transactions on the basis of an official means of identification. In line with this, the Disclosure of Unusual Transactions (Financial Services) Act provides that staff of, for instance, banks must report unusual transactions to a central Disclosures Office. In addition to these Acts, the Exchange Offices Act requires that exchange offices be registered and that their Directors be trustworthy.

On 1 January 1999 the Finality Act of 17 December 1998 came into force, which seeks to guarantee the final nature of the settlement of transactions in payment and securities settlement systems. To that end, the 1992 Act on the supervision of the credit system and the Bankruptcy Act were amended. This Finality Act is also designed to implement the Directive on settlement finality (Directive 98/26/EC). Under this Act, a court decision involving the invocation of the emergency regulation, an adjudication of bankruptcy or suspension of payment in respect of certain parties does not – by contrast with the zero-hour clause – affect retroactive payments made by these parties in the systems designated. It ensures the secure functioning of the payment and securities settlement systems. On the basis of a recommendation by De Nederlandsche

Bank, the Minister for Finance has meanwhile designated a number of systems.

The 1998 Bank Act, in accordance with the Statute of the ESCB, also contains a provision stating that the national central bank, i.e. De Nederlandsche Bank, shall promote the smooth operation of the domestic payment system. This means that De Nederlandsche Bank is responsible not just at an operational level, but also as an overseer, for ensuring that the payment system functions smoothly. Efforts are being made to draw up an Act on the supervision of settlement systems. This Act would create a supervisory framework on the basis of which standards developed in the G10 context could be imposed on payment and securities settlement systems with a view to fostering and maintaining financial stability.

#### *Legal aspects in respect of securities*

Legislation in the field of securities is aimed at protecting investors and ensuring the adequate operation of the securities market. Within this framework, three Acts are particularly important; apart from this, the securities branch has traditionally been characterised by a high degree of self-regulation.

The Securities Giro Transfer Act of 1977 provides for the establishment of an institute effecting the safekeeping, administration and general control of the book-entry securities transfer system. At this Dutch institute for the book-entry transfer of securities (Necigef), collective deposits are set up in respect of which the owners are entitled to their proportionate share. Necigef determines which securities may enter its book-entry transfer system. Almost all securities listed on the AEX stock market have been declared book-entry securities and are kept in safe custody by Necigef.

The above-mentioned Act will be reviewed in order to accommodate the requirements with regard to securities transactions. Recommendations for changes to the Act suggest, among other things, providing the opportunity to include registered

rights (dematerialised securities) in the book-entry system and also bringing derivatives positions within the protective scope of the Act. The latter suggestion needs to be thoroughly researched.

The Act on the supervision of investment institutions came into effect in 1990. This Act lays down the rules to be observed with regard to the sale of shares in investment institutions. The supervision of these institutions is assigned to De Nederlandsche Bank.

The Act on the supervision of securities trade (Wte) took effect on 15 June 1992. It contains regulations for the supervision of the securities trade both on and off the exchanges, aimed at promoting the proper functioning of the securities markets and protecting the position of the investor. The Act provides regulations on selling securities, acting as an intermediary or portfolio manager and organising a stock exchange. Under the Wte, most of the Minister for Finance's responsibilities and powers were delegated to the Securities Board of the Netherlands (STE). The Wte was an enabling act and contained only framework regulations. Full regulations were laid down in the Decree on the supervision of securities trade (Bte) and in the Further Regulation on the supervision of securities trade, drafted by the STE itself. In 1995, a new version of the Wte came into effect which was designed to bring Dutch legislation into line with the Investment Services Directive (ISD) and Capital Adequacy Directive (CAD) under EU legislation.

From 1 January 1997, a structural change was made to the supervision of institutions admitted to the stock exchange organisation, which at that time was called the Amsterdam Exchanges N.V. (AEX; now called Euronext N.V.), by transferring the responsibility for supervision of these institutions from the AEX to the STE. The Wte 1995 was amended to incorporate this change. At the same time, the Minister for Finance subjected the AEX's clearing and settlement systems to the Supervisory Framework jointly established by the STE and

De Nederlandsche Bank. The Act on the supervision of settlement systems will be a codification of the Supervisory Framework's standards and procedures for SSSs. The scope of the Act is somewhat broader as it also concerns payment systems.

In addition to the supervision exercised as a result of the Wte 1995, the STE is also responsible for the implementation of the Major Holdings in Listed Companies Disclosure Act 1996 (Wmz 1996); the purpose of this Act is to increase the transparency of markets.

## 1.2 The role of De Nederlandsche Bank

De Nederlandsche Bank is a private limited company, the shares of which are held by the Dutch Government. The 1998 Bank Act and the Statute of the ESCB stipulate the tasks of De Nederlandsche Bank in respect of payments. The Bank Act, amended in 1998 to accommodate the Maastricht Treaty, ensures that De Nederlandsche Bank is independent of the Dutch Government.

Pursuant to the 1998 Bank Act and the 1992 Act on the supervision of the credit system, De Nederlandsche Bank is responsible for the supervision of the banking sector. Banks wishing to operate as such and to raise funds which can be withdrawn on demand must obtain authorisation from De Nederlandsche Bank and be entered into its register. This implies that institutions do not necessarily need authorisation in order to be able to offer payment services. Institutions issuing electronic money are, however, required to obtain authorisation.

The 1998 Bank Act distinguishes between tasks performed by De Nederlandsche Bank as part of the ESCB and derived tasks. In both these capacities, De Nederlandsche Bank must ensure the smooth operation of payments. It has a dual role with regard to payment systems: on the one hand, De Nederlandsche Bank provides

payment services to the local stock exchange, for example, and on the other, it is responsible for the oversight of payment and securities settlement systems. In order to be able to perform these tasks adequately, De Nederlandsche Bank holds regular consultations with banks and other parties involved in the functioning of these systems.

### 1.2.1 The operational role

De Nederlandsche Bank's operational contribution towards the smooth and efficient settlement of economic transactions takes the form of services relating to cash payments, non-cash payments and securities transactions.

#### *Services in respect of cash payments*

The 1998 Bank Act states that one of De Nederlandsche Bank's tasks is "to provide for the circulation of money as far as this consists of banknotes". This provision is in line with the Statute of the ESCB, which states that the Governing Council of the ECB may authorise the ECB and the NCBs to issue banknotes within EMU. Within the context of its statutory tasks, De Nederlandsche Bank performs the following tasks in respect of the circulation of money:

- developing and ensuring the production of euro banknotes within the framework of the ESCB;
- distributing banknotes; and
- verifying and inspecting the banknotes in circulation.

Banknotes are distributed through De Nederlandsche Bank's agency network, which was restructured in the run-up to EMU in order to be able to assist the banks more efficiently. Every day, the banks take out large quantities of money to provide their customers with ready cash. They distribute the money further via cash dispensers and their offices (including the post offices). Excess banknotes flow back into the banks, which usually process them in central counting offices, after which they are

returned to De Nederlandsche Bank. The latter then checks the banknotes for counterfeits and for quality, replaces unfit banknotes and puts the fit banknotes back into circulation.

While De Nederlandsche Bank is responsible for banknote issuance, the Ministry of Finance is responsible for minting and issuing coins. The Coinage Act stipulates the manner in which this is to be done. By virtue of a Royal Decree, De Nederlandsche Bank is responsible for the distribution of coins. De Nederlandsche Bank has organised the distribution of coins in line with the distribution of banknotes. It also gives advice on the number of coins to be minted annually.

De Nederlandsche Bank and the Ministry of Finance have made arrangements for the introduction of euro banknotes and coins as from 1 January 2002. In this context, a euro changeover office was established at De Nederlandsche Bank. This office co-operates closely with the banks, the cash-in-transit companies, the retail trade and other market operators.

#### *Services in respect of non-cash payments*

De Nederlandsche Bank performs an operational role in the processing of non-cash interbank payments. Its system is used to settle the payments of institutions which have an account at De Nederlandsche Bank.

All domestic banks are linked to De Nederlandsche Bank's gross settlement system, TOP. In 2000, these banks effected on average 16,000 transactions per working day, with an average daily value of €70 billion. These were large interbank payments arising from domestic money market and securities transactions and cross-border interbank payments carried out via TARGET. In the first quarter of 2000, cross-border payments accounted for 14.7% of the total number of transactions and 53.2% of the total value of transactions processed in TOP.

The banks also settle their retail payments via TOP. These are net amounts arising from the daily clearing carried out by Interpay, the Dutch net settlement system for low-value payments. In 2000, the number of transactions was on average 8 million per working day, with a relatively low daily value of €5 billion. De Nederlandsche Bank itself is not involved in the processing of individual low-value payments, but it does oversee the development of processing systems. Section 3 goes into the operational side of payment systems in greater detail.

#### *Services in respect of securities transactions*

De Nederlandsche Bank plays a major operational role in the settlement of high-value securities transactions. In respect of securities transactions not performed via the stock exchange, it provides DVP services for banks; in the first nine months of 2000, these accounted for around 35% of all transactions in TOP. In addition, De Nederlandsche Bank is the settlement bank for both Euronext Amsterdam Stock Clearing and Euronext Amsterdam Derivatives Clearing. Furthermore, it manages the collateral for the two clearing houses, the advantage of this being a more efficient use of the collateral pool.

### **1.2.2 The role of De Nederlandsche Bank as overseer**

De Nederlandsche Bank performs the task of overseer. Oversight addresses the security, reliability, continuity and efficiency of SSSs, payment systems and payment products. These are, in principle, systems used by a number of institutions. The main objective of oversight is to prevent systemic risk. This applies in particular to the oversight of securities settlement and payment systems. With regard to payment products, the aim is mainly to protect consumers.

Concerning the practical aspects of oversight, a distinction is made between:

- assessing the set-up of the policy frameworks for the management of risks inherent in SSSs, payment systems and payment products; and



- testing the systems' operating procedures.

Oversight of payment systems is the exclusive responsibility of De Nederlandsche Bank. It therefore entails both assessing the set-up of the policy frameworks and testing the method of operation of Interpay's system for low-value payments and of De Nederlandsche Bank's own large-value payment system, TOP. The in-house payment systems of banks are basically subject to the supervision exercised pursuant to the Act on the supervision of the credit system. The internal auditing department plays a major role in the daily assessment of TOP. De Nederlandsche Bank's external auditor also assesses the system in terms of existing standards.

In order to achieve clarity and to make a distinction between oversight and supervision pursuant to the Act on the supervision of the credit system, De Nederlandsche Bank decided to set up a separate unit responsible for oversight. This unit examines and analyses the risks inherent in (new) SSSs, payment systems and payment products and makes recommendations on how they should be managed.

The oversight of SSSs is a shared responsibility. Assessing the method of operation falls within the remit of the Securities Board, while the assessment of the set-up of, and changes in, the policy frameworks for SSSs is the joint responsibility of the STE and De Nederlandsche Bank. To this end, the latter drew up an outline of the policy framework on the basis of the Lamfalussy standards. At the end of 2000, the assessments of the policy frameworks for the existing Dutch SSSs were completed. The merger of the Paris Bourse, the AEX and the BXS may have an impact on the practical aspects of oversight. Consultations are currently being held on this subject with overseers elsewhere.

This sub-section ends with an overview of the systems subject to oversight and the institutions responsible for such oversight.

### Table of payment and securities settlement systems and overseers

	Assessment of set-up	Assessment of operation
<b>Payment systems</b>		
– CSS (Interpay)	DNB	DNB
– TOP/TARGET	DNB	DNB
<b>SSSs</b>		
– Euronext Amsterdam Stock Clearing	STE/DNB	STE
– Euronext Amsterdam Derivatives Clearing	STE/DNB	STE
– NIEC	STE/DNB	STE
– Necigef	STE/DNB	STE
– NLKKAS	STE/DNB	STE

#### 1.2.3 Co-operation with other institutions

For the successful performance of its tasks, it is important that De Nederlandsche Bank receives adequate information from the market sector and that it passes on information obtained from NCBs and other parties involved to the market. All the more so because the start of EMU and the introduction of the euro have added to the importance of international consultations. Through these consultations, De Nederlandsche Bank and the other banks can inform each other about policy objectives formulated elsewhere, as well as their own policy aims. To this end, De Nederlandsche Bank and the other banks have set up a consultative structure.

At the level of the Boards of Management, the Steering Group on the implications of EMU was set up in 1994 to discuss the consequences of the euro for the Dutch banking system. This Steering Group's task was later extended. For instance, it provided guidance on the preparation of the banks' automated systems for the century date change and, in early 2000, it was transformed into a general consultative forum made up of De Nederlandsche Bank and the banking system. De Nederlandsche Bank chairs the forum, while the Netherlands

Bankers' Association (NVB) acts as its secretariat.

Under this Steering Group, there is a Working Group on payments and securities settlement, which serves as a forum for consultations between De Nederlandsche Bank and the Dutch banking and securities sectors. The aim is to achieve a structured exchange of information on major issues relating to payments and securities transactions. De Nederlandsche Bank holds the chair, while the NVB acts as the secretariat. The Working Group reports to the Steering Group. The Working Group is made up of representatives of De Nederlandsche Bank and the commercial banks, as well as of the stock exchange (ad hoc) and Interpay.

Outside the EU, NCBs are holding consultations on developments relating to payments and securities transactions. In this context, the main forum is the G10 CPSS, for which the BIS serves as the secretariat. De Nederlandsche Bank's Executive Director, who is responsible for payments, sits on this Committee. The Committee was established in the early 1980s and examines how systems and financial markets function; it may also make recommendations. With regard to securities transactions, the Committee often works in conjunction with the International Organisation of Securities Commissions (IOSCO). Within the forum of the CPSS, numerous issues have been examined, such as the settlement of cross-border securities transactions, the settlement of forex transactions, electronic money, RTGS systems, as well as settlement mechanisms for stock exchange-traded and OTC derivatives.

### **1.3 The role of other private and public sector bodies**

An overview of the other important private and public players in the payments and securities sectors can be found in the sub-sections below.

#### **1.3.1 Bodies in the payment sector**

##### *The Netherlands Bankers' Association*

The Netherlands Bankers' Association (NVB) is the most important interbank consultative body in the banking sector. Its objective is to serve the interests of banks in a general sense. Nearly all banks registered in the Netherlands are members of this Association. The interbank consultative body has a relatively simple structure, with policy committees, committees and working groups to advise the Association's Executive Committee.

The Association's Policy Committee on payments is the main consultative body in respect of payment systems. It is made up of those members of the Boards of Management of the various banks who are in charge of payment systems. This Committee is concerned with general policy frameworks and joint infrastructures, as well as retail and wholesale products. An Advisory Committee on payments consisting of the banks' senior payments managers supports the Policy Committee. This Committee heads a number of working groups covering a variety of aspects relating to payment systems.

##### *Interpay Nederland BV*

Interpay Nederland BV is the central clearing institute set up by the banks with a view to promoting and maintaining efficient payment processing and reliable payment systems. The banks are both its shareholders and customers. The organisation is made up of six business units, each responsible for a specific product/market combination. Interpay is the clearing institute for retail payments. It runs the network of POS terminals and the interbank authorisation network for cash dispenser transactions and issues credit cards and provides image-processing services to individual banks.

Consultations are held within the Advisory Board, made up of the members of the Advisory Committee on payments of the NVB.

#### *Working Group on the Efficiency of Payments*

The Working Group on the Efficiency of Payments is made up of representatives of the representative organisations of suppliers (banks) and users (consumers and businesses) of payment systems, as well as of governing and public bodies. The aim is to contribute to an efficient set-up of Dutch payment systems by exchanging information on practical bottlenecks and policy issues, and by striving for joint agreements on efficiency measures. The Working Group does not have regulatory competences. Its secretarial tasks are performed by De Nederlandsche Bank.

#### **1.3.2 Bodies in the securities sector**

##### *Euronext N.V.*

On 22 September 2000, the AEX, the Bourse de Paris and the BXS officially merged to form Euronext, establishing the first fully integrated cross-border single currency stock, derivatives and commodities market. Euronext is a holding company with the three stock exchanges working as operating companies with their registered offices in Amsterdam. Being a Dutch company, Euronext has a two-tier board structure, as required under Dutch company law.

Euronext Amsterdam N.V. has replaced the AEX, is a wholly-owned subsidiary of Euronext N.V., and is responsible for the organisation of the Stock Exchange, the Derivative Markets and the Commodity Markets.

##### *Securities Board of the Netherlands*

The Securities Board of the Netherlands (STE) was established in 1988, following a decision to entrust the supervision of the securities trade, both on and off the stock exchange, to an independent organisation, removed from both government and the securities sector itself. The STE's mandate is to ensure the proper functioning of the securities markets, to protect the position of investors and to increase the transparency of the securities markets. Since

1 February 1989, the STE has been entrusted by the Minister for Finance with the supervision of the Dutch stock exchanges. The STE reports on the supervision it exercises to the Minister for Finance. At the national level, the STE works together with two other supervisors from the financial sector. These are De Nederlandsche Bank and the Insurance Industry Supervisory Board (*Verzekeringskamer*). At the international level, the STE is the Dutch representative at the International Organization of Securities Commissions (IOSCO) and the Forum of European Securities Commissions (FESCO).

##### *Dutch Securities Institute*

The Dutch Securities Institute (DSI) was established to foster the confidence of investors in the securities sector by promoting the quality and integrity of the people employed, in particular traders, investment consultants, portfolio managers and investment analysts. To this end, it keeps four public registers, maintains a Code of Conduct and has set up a Complaints Committee.

##### *Necigef*

Pursuant to the Securities Transfer Act, Necigef is responsible for book-entry transactions, as well as the custody, management and administration of securities on behalf of the participants. Necigef is a wholly-owned subsidiary of Euronext Amsterdam N.V.

The management of securities which do not fall within the scope of the securities Giro Transfer Act, such as dematerialised bonds, may be carried out by the Dutch Interprofessional Securities Centre (NIEC).

##### *Association of Stockholders*

The Association of Stockholders (VEB), founded in 1924, aims to promote the interests of stockholders and stockholding in general.

## 2 Payment media used by non-banks

### 2.1 Cash payments

Banknotes and coins are the media used for cash payments. Both are legal tender, although the acceptance of coins by the public is compulsory only up to certain maximum amounts. Under the terms of the Coinage Act 1948, the Royal Mint, an institution supervised by the Ministry of Finance, produces coins. In accordance with Article 105a of the Treaty establishing the European Community (Treaty) "The ECB has the exclusive right to authorise the issue of banknotes. The ECB and the national central banks may issue such notes". With reference to the Treaty, the Bank Act 1998 stipulates that De Nederlandsche Bank has the sole right to issue banknotes in the Netherlands.

At the end of 1999, the currency in circulation consisted of six denominations of banknotes (NLG 1,000, 250, 100, 50, 25, 10) and eight denominations of coins (NLG 50, 10, 5, 2.50, 1, 0.25, 0.10 and 0.05). The currency in circulation at the end of 1999 amounted to NLG 38.2 billion (€17.3 billion), of which NLG 35.4 billion (€16 billion) was accounted for by banknotes. Banknotes constitute 13% of the narrow money supply M1 and 5% of the broader money supply M3.

No exact figures are available for the number of cash payments. As a rough estimate, around 70% of the total volume of commercial transactions are effected in cash. Apart from everyday expenses, cash is also used in specific markets such as the used-car market, as well as when tax evasion plays a role. The total volume of cash payments in 1999 was estimated at 6.5 billion, while the value of cash payments was estimated to be €60 billion (NLG 130 billion). However, the larger the value of the payment, the greater the tendency to pay by cashless means and to use money on deposit.

### 2.2 Non-cash payments

Non-cash payments are made by transferring money deposited on a sight account, to which the account holder has direct access, by ordering the bank to withdraw or transfer the amount desired. Most households and businesses hold one or more accounts. At the end of 1999, they held 21 million accounts, of which around 1.5 million were corporate accounts. Nearly all transactions in trade and industry are settled by cashless payments.

At the end of 1999, 87% of the narrow money supply M1 was held in the form of sight deposits with banks. Over 3 billion cashless payments were made that year for a total value of around €2,723 billion (NLG 6,000 billion). In order to transfer deposits Dutch banks offer similar payment instruments, such as credit transfers, direct debits, payment cards and cheques. Banks also offer payment services which are not related to sight accounts, such as travellers' cheques and money orders. The value and volume of these services is relatively limited.

#### 2.2.1 Credit transfers

Practically all non-recurrent payments in trade and industry, as well as some household payments, are effected by means of ordinary credit transfers. This payment instrument, which has been standardised between banks, is also used by the central government and local authorities. When used by households, most of the original ordinary credit transfer instructions are still sent in paper form. However, a growing number of account holders use data communication lines to deliver payment orders to their bank, either by using a computer (electronic banking) or a telephone (telephone banking). Corporate customers and government institutions mostly use non-paper-based, electronically readable methods of payment. Bulk payment orders are usually delivered on physical data carriers, such as diskettes and magnetic tapes. A rapidly rising number of corporate orders are being delivered via direct data communication lines.

In order to make processing more efficient, Dutch banks offer two types of pre-prepared credit transfers: the standing order and the “in payment transfer” or “accept giro”. In order to pay recurrent bills, an account holder may choose to set up a standing order with the bank, on fixed dates, for fixed amounts and for a named account. This non-paper-based method of payment is frequently used for rent, subscriptions, insurance premiums, etc. On the fixed date, the bank effects the transfer and no further action on the part of either the account holder or the payee is required.

When using an accept giro, the payee takes the initiative by sending a fully prepared transfer form together with the bill. In most cases the payer’s account number, name and address are already stated, as they are already known from previous payments. All the payer has to do is sign the form and send it to their bank. This payment instrument is used for both regular and non-recurrent payments of either fixed or varying amounts, e.g. insurance premiums, subscriptions or bills for deliveries to regular customers.

This pre-prepared transfer is a paper-based instrument which is mainly processed by means of image-processing technology to convert the relevant payment data into digital information. However, a growing amount of accept giro information is reaching banks in digital form, as account holders use electronic banking software packages to deliver their payment orders. In this case, account holders take care of the conversion of the relevant data. Banks are looking into a digital version of this pre-prepared transfer by using internet sites to send bills and accept giros (electronic billing).

Giro payments are prominent in the Netherlands, as 41% of the total volume and over 90% of the total value of retail payments are made by credit transfer. Credit transfers are often used for business-to-business payments. The average amount of a payment by credit transfer is over NLG 5,000.

### 2.2.2 Direct debits

Direct debits constitute a separate category of instruments for collecting payments. In the past, the payer signed a mandate authorising the payee to charge the former’s account for goods delivered or services rendered. The transfer is initiated by the payee, who sends the payment order in electronic form (on magnetic tape or via data communication links) to the banks with instructions to collect the money due by debiting the debtor’s account in favour of its own account. The payers, however, remain in charge of their accounts, maintaining the opportunity to make use of a payback guarantee at their banks at a certain point in time.

Direct debits are frequently used for collecting recurrent payments, such as payments to public utilities and telephone companies. The electronic form and the short processing route make the direct debit a very efficient means of collecting payments. Dutch banks offer several types of direct debits in order to meet the specific needs relating to certain types of payment, such as paying for lottery tickets (without a payback guarantee) and mail-order services.

Direct debits represent by far the most popular instrument for transferring money deposits. In 1999, 29% of all retail payments were made by means of direct debits. The average amount paid using direct debits is around €135 (NLG 297).

### 2.2.3 Payment cards

Payment cards are plastic cards with several functions used to initiate payments at the point of sale or to make withdrawals from an account. For the issuer, the most important function is the authentication of the account holder by checking a signature or a PIN.

Since around 1995 the use of payment cards, especially debit cards, for daily retail payments has grown enormously, partly replacing cash and almost completely replacing the use of guaranteed cheques.

At the end of 1999, the total number of payment cards in issue was 24.2 million, consisting of 4.1 million credit cards and 20.1 million debit cards. Most debit cards are equipped with an electronic purse function.

The following types of payment cards are in circulation: debit cards, credit cards, retailer cards and prepaid cards (single purpose and multi-purpose).

#### *Debit cards*

Debit cards are cards with direct electronic access to a bank account with the use of a PIN. Almost all debit cards are equipped with a magnetic strip as well as a microchip. Three types of debit functions can be distinguished: withdrawals, payment and mere identification in the context of payments.

Debit cards are used to make withdrawals, either in cash at an ATM or in electronic money by loading an electronic purse. In 1999 over 80% of all cash withdrawals were made at ATMs, accounting for 530 million transactions. The average amount withdrawn increased to €73.5 (NLG 162) per transaction. All 6,700 ATMs in the Netherlands are interoperable and are connected to the international ATM network. For security purposes, use of another bank's ATM is limited daily in terms of both the number of withdrawals and the amount withdrawn.

Debit cards are used mostly at EFTPOS terminals in shops, restaurants and hotels, etc. In the mid-1990s, the number of POSs grew enormously, as did the volume and value of the transactions. In 1999, the total volume of EFTPOS transactions exceeded 700 million, accounting for a total value of €32 billion (NLG 71 billion), which amounts to 26.5% of the total volume and only 1.4% of the total value of cashless payments. At the end of 1999, 145,575 terminals were in operation. The availability and reliability of the network exceeded the minimum standard of 99.98%.

Debit cards are also used for mere identification in the context of payments. Traditionally, the signature on the card has been used for identification in conjunction with the use of guaranteed cheques. Cards are increasingly being used as an electronic identification device to authorise credit transfers (remote payments) made by telephone or to authorise payments over the internet.

#### *Credit cards*

The volume of credit cards in circulation increased considerably from 420,000 in 1988 to over 4.1 million in 1999. The number of credit card transactions at the point of sale is still modest: just over 1.5% of non-cash payments are made by credit card. Since most Dutch banks issue Eurocard/MasterCard, this brand is most often used. Despite the fact that most banks do not issue Visa, the number of Visa cards issued is high owing to a co-branding strategy with non-financial institutions (insurers, automobile associations, etc.). Some retail chains actively promote their own retailer cards (private label cards), but from a payments point of view, their role is insignificant compared with the use of payment cards and cash.

#### *Prepaid cards*

A prepaid card is a payment card which contains purchasing power that is paid for in advance. The most widespread prepaid card is the single purpose telephone card, which enables national and international telephone calls to be made from pay phones. The use of these cards is declining owing to the spectacular growth in the use of mobile phones and the use of multi-purpose electronic purses.

Two major multi-purpose prepaid card schemes have been developed in the Netherlands: "Chipper", a joint venture between the Postbank and KPN Telecom, issued by the Postbank and ING Bank; and "Chipknip", issued by the other banks. Both Chipper and Chipknip banks have decided to add the purse-containing chip to the existing debit cards, making most

Dutch payment cards hybrid, incorporating two payment functions: “pay now” (debit) and “pay before” (purse). Agreements have been made amongst the issuers of Chipper and Chipknip to ensure that any retailer’s terminal is capable of processing both types of card transaction. In March 2001 Dutch banks announced an agreement on a common technical infrastructure. At the beginning of 2002 all cards using Chipper technology will be replaced by cards using Chipknip technology.

At the beginning of 2001, around 21 million cards were equipped with an electronic purse (14 million Chipknips and 7 million Chippers). These purses can be loaded at over 27,000 loading devices (including public phones) and can be used for payments at over 160,000 EFTPOS terminals and in over 20,000 KPN telephone cabins, making single purpose telephone cards less necessary. Though the infrastructure is ready for mass use, the Chipper and Chipknip are not popular. Given that the added value likely to be generated by replacing small-value cash payments and the use of coins with electronic purses is high, major efforts are being made to promote the use of electronic purses for the payment of parking and library fees, and for purchases from vending machines and the use of public transport.

Moreover, banks are investing in applications to use the chip-card technology for identification purposes in telephone banking and internet banking.

#### 2.2.4 Cheques

Given that a satisfactory giro transfer system has been available to the public from a very early stage, non-guaranteed cheques have never played a major role as a general payment instrument in the Netherlands. In the second half of the 1960s, however, following the large-scale introduction of sight accounts for the public, the guaranteed cheque was introduced together with a cheque guarantee card showing the cardholder’s account number and signature. It served as one of the main non-cash

instruments for payments at the point of sale in the period between 1970 and 1990. In the 1990s, the number of cheque payments declined tremendously, reflecting their replacement by EFTPOS payments. Given the decline in the use of cheques, as well as the high processing costs, Dutch banks have decided to stop issuing cheques by July 2001 and to terminate processing by the end of the year.

### 2.3 Recent developments

#### *New distribution channels for payment services*

Many corporate and private bank customers use electronic banking systems to send credit transfers and to receive account information. The next step in the evolution of electronic banking involves further adaptation for its use via the internet. Internet banking enables account holders to access their accounts from any location in the world connected to the internet. Security is guaranteed, using hard tokens (calculators or the already widespread chip cards).

In a similar way to the situation in electronic banking, banks provide automated banking services via telephone, particularly for their private customers. With such services, most banks provide information on customers’ accounts and the possibility of transferring money to and from their own savings and investment accounts. Large retail banks also allow customers to send credit transfers to third party accounts. Some banks use smart telephones and chip cards to ensure the security of these transfers.

The second step in the development of telephone banking involves the use of mobile phones for banking and internet services. If a mobile phone is equipped with a secure chip card, it becomes a small terminal with many possible applications, such as making financial transactions. The new generation of mobile telephones will give rise to the development of a wide range of new services, including WAP-based secure payment services.

### *Retail payments via the internet*

Dutch banks offer I-Pay with SET as an electronic payment system to enable secure payments to be made with credit cards and debit cards via the internet. I-Pay has been adapted to allow secure transactions. A digital signature is sent with each payment and data are sent in coded form. The reliability of the payment system is guaranteed by the unique combination of a payment password, keys, security diskettes and a PC. If any one of these components is missing, payments cannot be effected by I-Pay.

In addition to I-Pay, individual banks are developing other means of internet payment, such as credit cards combined with transaction

codes, electronic credit transfers combined with calculated authentication codes and even e-mail-based credit transfers.

Since internet retailers are faced with many different means of payment, companies have been established which specialise in back-office payment processing. These new "payment intermediaries" take care of the administration and settlement of all incoming internet payments, no matter what kind of payment instrument or method is used. Some banks offer the same kind of services, increasing the competition between banks and non-banks, such as consulting agencies and telephone companies.

## **3 Interbank exchange and settlement systems**

### **3.1 General overview**

Cashless payments are processed in two interconnected payment systems:

- the system of De Nederlandsche Bank; and
- the system in which the other banks participate (Interpay).

The formal connection between the systems exists in the form of accounts held on the books of De Nederlandsche Bank.

### **3.2 The real-time gross settlement system: TOP**

TOP is the name of the real-time gross settlement system of De Nederlandsche Bank. TOP has been designed for processing and settling large-value payments in euro. TOP is not an acronym. Rather, the system is named after the market sector in which it operates: the "top", i.e. the sector handling the largest-value payments in the Netherlands.

The total transaction volume in TOP in 1999 was 3.4 million, with a total value of €15,600

billion. The average value per transaction was €4.6 million.

#### **3.2.1 General overview**

The purpose of De Nederlandsche Bank's current account system is to offer current account facilities to banks and to the government, thus permitting the settlement of payment transactions. Although TOP is, in principle, intended to handle large-value interbank payments, there are in fact no upper or lower value limits for payments. This also applies to cross-border payments through TARGET.

The TOP system only handles credit transfers on a gross basis, which means that in the event of inadequate cover for a debit transaction on a participant's current account, either a credit balance or an unused collateralised overdraft are used; a payment order cannot be processed. For this purpose, a queuing mechanism has been developed.

TOP processes a number of different types of transactions. First, there are the purely domestic



transactions, such as the normal interbank transfers, securities transactions, net settlement transactions and cash cover transactions. In 1999, the share of these domestic transactions was 40.6% of the total volume and 42.2% of the total value.

The second category relates to “8007” transactions, which are domestic interbank transactions where at least one non-resident account holder is involved and where balance of payments reporting obligations must be fulfilled. These transactions constituted 46.3% of the total volume processed in 1999 and 7.6% of 1999’s total value.

Third, there are the pure cross-border payments through TARGET, with a 13.1% share in total volume and a 50.2% share in total value in 1999.

TOP makes it possible to assign up to three different priorities to a payment order: priority 2 for urgent payments, priority 3 for normal payments and priority 9 for non-urgent payments. The latter are not processed immediately, but are dealt with during another part of the process, such as daily settlement, or at closing time. High priority payment orders must be processed as quickly as possible. To this end, part of the balance may be reserved for such orders. Participants cannot assign payments priority 1, which is the highest priority determined by De Nederlandsche Bank and is reserved for, amongst other things, net settlement transactions.

### 3.2.2 Participants in the system

The access criteria for participants in TOP are set by the ESCB in respect of the participation of credit institutions in the TARGET system. Within this framework, De Nederlandsche Bank set the following access criteria for participation in TOP:

- financial departments of central or regional governments of EU Member States which are active in the money market;

- institutions forming part of the government sector, as referred to in Article 3 of Council Regulation (EC) 3603/93, which have been authorised to hold accounts for customers;
- supervised credit institutions as referred to in Article 1, first indent, of Directive 77/780/EEC which are established in the EEA; and
- supervised investment firms as referred to in Article 1.2 of Directive 93/22/EEC which are established in the EEA; and
- supervised providers of clearing and settlement services.

In addition to domestic central governmental institutions, all authorised credit institutions are eligible to participate, including Dutch-based subsidiaries of foreign banks and branches of foreign banks to which the Second Banking Co-ordination Directive of the European Community is applicable. Other international account holders include NCBs and some international institutions.

Some accounts are held by non-bank financial intermediaries such as payments and securities clearing institutions, but they have limited use of the system and do not have access to the credit facilities. The rules are identical for all participants. Each participant subject to reserve requirements normally holds one reserve account, which may also be used to make payments. A TOP participant that is not subject to minimum reserve requirements will use one or more current accounts for making payments.

### 3.2.3 Types of transaction handled

As mentioned above, TOP processes both domestic and cross-border transactions. The most commonly used types of transactions are briefly discussed below. In TOP, each transaction type is designated by a letter code.

#### *FA transaction*

An FA transaction is a standard transaction for domestic interbank payments, e.g. call loans.

FA transactions can be entered by each participant in respect of accounts for which it is entitled to authorise debit transactions. When entering the payment order, the account holder indicates the desired priority. In the case of a standard FA transaction, the priority will usually be 2 or 3. Within TOP, FA transactions may be scheduled. Scheduling means that the payer assigns a future value date to the payment order. TOP records the transaction and queues it for processing on that future date. Scheduled transactions may be withdrawn; for this reason, until the value date, the payee cannot obtain information on scheduled credit transactions to its account.

#### *Cash cover transaction*

A cash cover transaction (CH) is used when banknotes and coins are transported by cash-in-transit companies from the offices of De Nederlandsche Bank to participants. Participants authorised to make such withdrawals enter a cash cover transaction debiting their own account and crediting the DNB office concerned, before the withdrawal takes place.

A cash cover transaction is an irrevocable payment order which reserves account cover for a future value date. It can be assigned priority 2 or 3. The transaction is settled on the value date. If account cover is insufficient, the order is queued. If, on the date a cash cover transaction is entered, no account cover has been reserved at the closing time for such transactions, the transaction is cancelled.

#### *Trade-for-Trade transactions*

Trade-for-Trade (TfT) transactions concern the gross settlement of OTC securities transactions in the wholesale sector of the EA Stock Exchange. During the day, the Dutch securities settlement institute, Necigef, sends payments instructions arising from securities transactions to TOP containing payment orders from a single participant. The payment orders are settled individually in real time. The batch is sent through SWIFT.

#### *Net settlement transactions for domestic clearing systems*

The TOP system is used for the net settlement of retail payments. Payment instructions arising from netting processes are forwarded at certain times during the day, after which the payers' and payees' accounts are debited and credited in TOP for the resulting net amounts. TOP is used to settle four types of payments: the bulk retail payments (BV) by Interpay, the bulk retail securities payments by the Euronext Amsterdam Stock Clearing (CV), the bulk payments by the Euronext Derivatives Clearing (OV) and the urgent payments by Interpay's special Telegiro circuit (TV, see Section 3.3.).

Net settlement transactions are handled in TOP as a "unit of work". Settlement is effected as soon as the appropriate proportion of account cover has been reserved for all accounts to be debited. Net settlements are automatically assigned priority 1 and cannot be scheduled.

#### *8007 transactions*

An 8007 transaction (DP) is a payment order involving a cross-border payment where at least one non-resident account holder is involved. "8007" refers to the code under which these transactions must be reported to De Nederlandsche Bank for the compilation of the balance of payments. These transactions do not in themselves affect the balance of payments, because they imply the use of interbank payments to settle a payment in favour of or to the account of a customer of the other bank. This explains why it is called a domestic transaction.

#### *Cross-border transactions*

In TOP, there are two types of cross-border transactions conducted through TARGET: Interlinking customer payments (IC) and Interlinking interbank payments (IB).

Cross-border payments to countries which are not operating on the day in question are

rejected by TOP. Cross-border payments to countries which have not yet opened for operations but will be operating on the day in question are absorbed by TOP.

In the Netherlands, cross-border payment orders for TARGET can be sent to TOP through the TOP End Station (TES) or through the SWIFT network. Provided that the payer's account cover is sufficient, TOP converts the cross-border payment order into an interlinking message and reserves the required proportion of the payer's account cover. The interlinking message is sent to the NCB of the country where the payee holds an account. This NCB credits the payee's account and notifies De Nederlandsche Bank. TOP then lifts the cover reservation and debits the payer's account, sending the payer a debit note. The debit note is sent either via TES or via SWIFT, in line with the medium used for entering the order. A participant may choose the medium through which it wishes to receive debit notes.

### 3.2.4 Operation of the transfer system

The TOP system is in operation from 7 a.m. to 6 p.m. for the receipt of payment orders requiring same-day settlement. The closing time for customer payments, however, is 5 p.m. Within these operating hours, allowance must be made for interbank deadlines for certain types of transaction and certain TARGET deadlines for customer payments. TOP's opening hours have been brought into line with TARGET's opening times and calendar of operating days.

When TOP closes, the Payments Supervisor starts the end-of-day process which is meant, among other things, to reveal whether all queues are empty. If they are not, the Payments Supervisor will, in consultation with the parties involved, take appropriate action (ranging from a request to replenish an account balance to the cancellation of transactions). If all queues are empty, the value date is closed by preparing and transmitting the "statement of account", the

"end-of-value date survey" and the "daily 8007 external payments report".

### 3.2.5 Transaction processing environment

Participants communicate with the TOP system either through TES or through the SWIFT network. These dummy workstations are linked to TOP's mainframe through dedicated, encrypted lines. Because the SWIFT network allows for straight-through processing (STP) and is already used for cross-border transactions through TARGET, this network is increasingly used to deliver domestic payment orders in TOP.

Since the latest TOP release in November 2000, participants have been able to use the SWIFT network to deliver all types of domestic and cross-border transactions. This release is dominated by the introduction of the MT 103 message. This new message type for customer payments contains extra validated fields, which can be used for information on interest rates, charges, etc. and thus enhances the possibilities for STP. A special message type (MT 103+) will be introduced to achieve a higher STP standard. Moreover, the MT 103 can be used for all domestic and cross-border transactions.

### 3.2.6 Settlement procedures

During opening hours, TOP settles payments irrevocably and with immediate finality upon receipt. As soon as the account cover is sufficient, TOP ascertains whether one or more items from the queue can be processed. In addition, batch items (8007) which have the same priority are sorted in ascending order of value. This enables all items to be processed as soon as possible. Following settlement, debit and credit notifications are sent to the account holders concerned.

If account cover is not sufficient, payments are queued. The order of payments within the queue depends on two factors: priority and time of receipt. Orders are arranged within the queue on the basis of their priority and, within

each priority class, on the basis of the time of receipt. The order of transactions within the queue also governs the order of processing: transactions in the same priority class are handled on a FIFO basis. As soon as a credit transaction is effected, TOP once again checks whether transactions from the queue can be processed.

The order of queued items can be influenced by means of "pointing". A payment order may be pointed forward, that is, towards the head of the queue, immediately before orders with priority 2. Orders with priority 1 always remain at the head of the queue. An order may also be pointed backwards, that is, towards the rear of the queue, immediately after orders with priority 3.

A queued transaction cannot be revoked. Queued transactions can only be cancelled by the Payments Supervisor of De Nederlandsche Bank in consultation with all parties involved. Participants are allowed to change the order of the queued transactions within the same priority class.

### **3.2.7 Credit and liquidity risks and their management**

As TOP only settles transactions subject to sufficient cover, there are no liquidity or credit risks.

### **3.2.8 Pricing policies**

De Nederlandsche Bank recovers its costs. It charges each account holder an annual fee of €725. In addition, transaction fees are charged which differ according to the medium used and the monthly number of transactions. Cross-border transactions through TARGET are subject to the price structure of the ESCB.

### **3.2.9 Main projects and policies being implemented**

In the near future, SWIFT will become the primary channel for payment-related communications. To

this end, the current workstation, TES, which is still often used to communicate with the TOP system, will be run down.

TOP will expand its capacity to send and receive messages via SWIFT and will form a "Closed User Group" in order to serve all participants. TOP has been recognised as a "Market Infrastructure" within SWIFT, meaning a higher service level is provided by SWIFT. Consequently, in the event of problems, TOP will be given high priority during recovery.

In order to improve the exchange of payment information, TOP will be provided with a web server, so that customers in a Windows environment can be connected to a virtual private network (a secured network over the internet). Authentication will be effected by means of a digital certificate on a chip card. This communication channel will not be used for credit advices or transfer orders.

It is planned that in time TOP will use SWIFTNet, a new service, to exchange information and to send transfer orders based on internet protocols.

At the banks' request, De Nederlandsche Bank is working on the introduction of a facility which will allow the daily stream of transfers processed by Interpay to be split into "lots". Instead of settling once a day, net settlement will take place around every 30 minutes. Multiple net settlement will reduce systemic risk, improve the service to banks by providing irrevocable output after settlement of each lot, and speed up the overall processing time of transfer orders.

## **3.3 The retail payment system: Interpay**

In order to facilitate the collection and processing of retail transfers between their customers, the banks formed a common clearing house in 1967, which is now called Interpay. This circuit currently consists of around 70 banks, where altogether around 12.5 million accounts are held.

It should be noted that, apart from the clearing, which takes place through the facilities provided by Interpay, a considerable amount of retail transactions are processed at the large banks themselves, using in-house processing facilities. Since the banking sector is highly concentrated, a large number of payments are for transfers between customers of the same bank. Consequently, some of these in-house payments do not reach the clearing house, but are transmitted to the individual banks' processing centres.

Interpay not only acts as the automated clearing house for interbank payments, but also as the central routing switch for all EFTPOS transactions and some ATM transactions, and as a sub-contractor for parts of the Eurocard issuing and transaction authorisation process. Additionally, Interpay performs image-processing services for some banks.

The Interpay clearing house system is fully automated. The number of transactions processed in 1999 was 2,152.5 million, with a total turnover of NLG 2,962.9 billion (€ 1,344.5 billion).

### **3.3.1 General overview**

Banks participating in the Interpay system have a common account numbering system, which allows for an automated number check. Account numbers, as well as names and addresses of account holders of the participating banks, are administered centrally by Interpay.

Interpay is merely an intermediary between the participating banks. It receives transfer orders and converts them into debit and credit items for individual banks and individual account numbers, by means of an automated system. The transfer orders can be sent in by individual banks or by large companies. Interpay collects the entry data for all financial transactions and transfers these to the bank. In some cases, Interpay passes the payment details straight on to the customer of the bank.

The purely technical operations by Interpay are followed by financial settlement. The participating banks have authorised Interpay to manage the daily settlement process at De Nederlandsche Bank on their behalf; the account of each bank is debited or credited by the difference between the total debit and credit items.

Interpay has no financial relationship with bank customers. It does not know the account balances, makes no entries in accounts and, consequently, does not produce statements of account. It is the individual bank itself which, using automated processes, makes the actual debit and credit entries in the accounts and produces and sends the statements of account.

### **3.3.2 Participation in the system**

Almost all deposit-taking banks participate in the system. De Nederlandsche Bank is not a participant, although it uses some of the Interpay services.

### **3.3.3 Types of transaction handled**

Interpay handles all types of retail transaction: mass regular disbursements by firms such as the payment of salaries, express payments, mass regular payments by consumers such as the payment of utility bills by means of accept giro and direct debits, and all kinds of retail transactions using debit and credit cards as well as cheques and electronic purses.

### **3.3.4 Operation of the system**

The system is a net settlement system. In fact, it comprises two systems: the Clearing and Settlement System (CSS) for bulk payments and the Telegiro circuit for urgent payments.

The Telegiro circuit was created for urgent payments between banks and between their customers. This service includes very fast (i.e. within a few minutes) and guaranteed settlement and notification to the beneficiary of the irrevocable settlement. It is often used for paying relatively large amounts, for example in real estate transactions.

The guarantee does not involve any risk, because the system is based on a collateralised credit facility, which is separated on a daily basis from the facility that participating banks have at De Nederlandsche Bank. The formal settlement of these covered interbank payments takes place once a day at De Nederlandsche Bank on a net basis.

### 3.3.5 *Transaction processing environment*

Although processing takes place in two operating centres, the clearing house system, CSS, operates in an integrated manner. Transfer orders may be submitted in different ways, by both banks and corporates. The latter deliver their mass payment orders and direct debits directly to the clearing house on magnetic tapes or via data communication lines. Banks use the same kind of data carriers, but may also present bulk payment orders on paper, in which case Interpay takes care of their conversion into digital form. Interpay processes paper-based standard payment orders, as well as cheques and “accept giros”, using image-processing technology. Consequently, Dutch banks do not need to exchange any paper-based payment information.

The clearing process is organised on the basis of two daily runs, one in the evening and one in the morning. Settlement takes place once a day: the outcome of the evening run is settled the next working day together with that day’s morning run. Routing for the debit and credit banks involved takes place on the basis of a central file, containing all the account numbers and customers’ names and addresses.

Payment orders delivered before 8 a.m. on magnetic tape or before 9.30 a.m. through data communication lines can be processed in the morning run and settled the same day.

The banks have a common account numbering system, which allows for automated error controls. All numbers contain nine digits and are centrally distributed by Interpay. Although it is not a formal participant in the clearing house, De Nederlandsche Bank also makes use of the Interpay account numbering system.

### 3.3.6 *Settlement procedures*

Interpay is authorised by the participating banks to effect the daily settlement payments at De Nederlandsche Bank on their behalf. Settlement takes place at around 1.30 p.m.; settlement of the Telegiro sub-system takes place at around 2 p.m. As is the case for the current account system of De Nederlandsche Bank, settlement is subject to sufficient cover for debit positions. During the course of the morning, banks are informed by Interpay of the net results to be expected so that they can raise additional liquidity in the money market before settlement time, if need be.

Part of the clearing and settlement procedures will change as multi-settlement is introduced (see Section 3.4.9).

### 3.3.7 *Credit and liquidity risks and their management*

Credit and liquidity risks are not managed within the clearing house system, but rather in De Nederlandsche Bank’s system via its relationship with the money market. As mentioned earlier, Interpay informs the participating banks of the net retail clearing results to be expected, this information then being used by the liquidity managers of the banks. As mentioned above, credit and liquidity risks do not in principle exist in the Telegiro sub-system owing to the fact that it is fully collateralised.

### 3.3.8 *Pricing policies*

The basic pricing policy of Interpay is that the system should be self-financing. For this reason, prices are based on full cost recovery (which covers cost and a surplus percentage). In practice, a certain amount is paid per transaction and per batch, by both sender and receiver.

### 3.3.9 Main projects and policies being implemented

Interpay is working on improving the CSS system to achieve continuous processing, which will provide real-time information on the payments being processed. The system basically remains a net system, but in the near future it will settle more than once a day (multiple net settlement). Therefore, the clearing of retail payments will close every 30 minutes for settlement at De Nederlandsche Bank and then reopen for the next clearing round. Daily multiple net settlements will satisfy banks' and corporates' growing need to speed up the overall processing time.

Another improvement concerning the speed and reliability of payment processing is the possibility of making a direct connection from customers' administrative systems to Interpay's technical infrastructure: I-connect offers banks and firms several ways of connecting their administrative

systems directly to the processing system. When open standards are used, it becomes easy to deliver transfer orders via data communication lines. Using an internet browser in a Windows setting facilitates the dial-up process either by way of a local service provider or a direct line to Interpay. Mass transfer orders (over 50,000) are transported by ISDN lines using the File Transfer Protocol. As most of the bulk payment orders are delivered by means of physical data carriers, progress can be made in this area.

Furthermore, Interpay is working on a new way of electronically processing accept giros without using paper forms, which can be described as electronic billing. Instead of sending a paper invoice together with an accept giro form by post, suppliers would send it electronically to Interpay, which would forward it to the website of a debtor's bank. Debtors would receive a message saying where to find it and would electronically make out and deliver their order to transfer the amount due.

## 4 Securities settlement systems

In September 2000 the AEX, the BXS and the Paris Bourse officially merged to form Euronext. A single integrated market was formed, comprising a cash market for equities and bonds, a derivatives market and a commodity market. Trade will be conducted on one technical platform, with unified listing and trading rules, with the former national exchanges becoming local entry points. Clearing of securities and options will be centralised in Paris (Clearnet). A unified settlement and custody platform will be provided by Euroclear, the cash settlements will continue to take place in the systems of the NCBs and securities settlement will continue to be executed across the books of the national depositories.

The trading, clearing and settlement integration will take place in stages, with completion being

expected by the end of 2003. Consequently, this section mainly describes the transition period. Apart from Euronext, there are no other securities exchanges.

### 4.1 Trading

#### 4.1.1 Euronext

The three domestic financial centres continue to use their local primary markets for listed companies. The listing requirements will, however, be harmonised to such an extent that Euronext will operate as a single integrated market for all listed securities. There will, therefore, be just one group of listed securities, although these securities will have entered the market via a specific listing centre (Amsterdam, Brussels or Paris). Each listed security will be accessible to all members of Euronext,

regardless of the nationality of the issuer or the member.

Over 1,300 companies will have shares listed on the Euronext primary market, which will be segmented as follows. A segment for the 100 largest companies will be created, as selected on the basis of market capitalisation and certain minimum liquidity criteria. Based on figures from May 2000, these companies represented a market capitalisation of €2,000 billion, composed of 61 French companies (64.6%), 30 Dutch companies (31.1%) and 9 Belgian companies (4.3%).

There will also be a Euronext segment for the next 150 largest companies. In addition to these "Top Stocks" segments, Euronext will operate a segment specially designed for companies operating in the New Economy and a special segment for small and mid-cap companies. Euronext will also have a bond segment for listing both government and corporate bonds.

With regard to the secondary market, the Euronext rule book will provide for four main trading mechanisms for all products listed: continuous trading with or without specialists and auction trading with or without specialists. It has been agreed with the regulators in the three member countries that a market participant licensed in one particular market will automatically receive a passport enabling it to operate in another Euronext country as well.

Euronext will offer fully integrated trading, clearing and settlement. With regard to cash securities, Euronext will provide a unified order-driven trading platform based on the French system NSC (*Nouveau Système de Cotation*). The NSC trading system is expected to be implemented in the first half of 2001 and full clearing by the end of 2001 (Clearing 21).

In order to operate a single options market accessible from each of the three Euronext entry points, migration from floor trading to an electronic trading system will be necessary. A quote-driven market will guarantee that in the

single electronic order book pre-trade prices are continuously available during trading hours for as many option series as possible. Contract specifications for equity options will be harmonised in terms of size, expiration cycle, last day of trading, and style. The futures market, however, will be an order-driven market.

#### 4.1.2 *Securities trading during the transition period*

During the transition period, institutions currently admitted to Euronext Amsterdam are allowed to trade Dutch listed companies' stock only.

##### *Securities markets*

Until the technical migration is complete, Euronext Amsterdam will continue to operate the official Dutch share and bond market. The EA Stock Exchange is an order-driven market; prices are set on the basis of orders placed by trading parties. The market is divided into a retail segment and a wholesale segment. For each stock listed, limits exist to determine the segment in which a transaction will be traded.

Transactions in listed securities on the retail market must be settled through Euronext Amsterdam. With regard to the wholesale market, prices may be determined outside the Euronext Amsterdam Stock Exchange. The Exchange, however, must be notified of the transaction and the price at which it was concluded. Euronext discloses the direct deal turnovers to the market to promote fair pricing in the retail segment.

The Euronext Amsterdam Stock Exchange opens at 9 a.m. and closes at 5 p.m.

##### *Financial intermediaries*

The trading of securities is conducted through Admitted Institutions, intermediaries authorised by Euronext Amsterdam to perform certain functions. Two main categories of intermediaries can be distinguished: brokers and specialists.



Brokers can be subdivided into securities credit institutions and non-securities credit institutions, the difference being the registration at De Nederlandsche Bank. As the latter are not under De Nederlandsche Bank's supervision, they need the co-operation of a bank for the settlement of both its money and its securities positions. Specialists (*hoeklieden*) take positions against buyers or sellers, where necessary by entering buy and sell prices in the electronic order book for a range of securities assigned to them by Euronext Amsterdam.

#### *Trading systems*

For listed shares, i.e. non-government bonds and shares in investment funds, Euronext Amsterdam operates an electronic trading system called the TSA (Trading System Amsterdam). Private and institutional investors' supply and demand orders come together in this trading system. All of the securities included in the AEX's indices and a small number of other securities are traded in the limit order book, where orders are electronically listed. This system automatically executes orders where the price and order size permit. Prices are always publicly quoted for these securities to facilitate trade.

The large number of securities not traded in the limit order book use the trading system for the national market and are traded on a public order book. Liquidity in these securities is usually low.

The wholesale trade in government bonds takes place within the Multatuli Trading System (MTS). This trading system is accessed by traders known as inter-dealer brokers. Inter-dealer brokers have no positions of their own; their function is to bring together buyers and sellers. Wholesale bond trading is often done within professional circles.

### **4.1.3 Derivatives trading during the transition period**

#### *Markets*

Euronext Amsterdam Derivative Markets N.V. are responsible for organising trade in derivatives, a category which includes options on shares, bonds, precious metals and currencies, as well as financial and agricultural futures. Options and futures are also traded on a number of indices, such as the AEX index, which measures the performance of 25 leading Dutch companies.

#### *Financial intermediaries*

Three main categories of intermediaries can be distinguished: public order members, floor brokers and market-makers. A public order member is a bank or a broker that brings orders from institutional and private investors to the market. This type of member does not have direct access to the exchange floor and requires the assistance of a floor broker to execute an order. Market-makers quote the buy and sell prices of the options classes assigned to them.

#### *Trading systems*

Contrary to the Euronext Amsterdam Stock Exchange, Euronext Amsterdam Derivative Markets are not screen-based. Trading is conducted centrally on the exchange floor on an open-outcry basis, with a high level of computerisation in the area of order routing. Options are mainly traded through the market-maker system. Market-makers quote a fixed price for an option series at the request of a floor broker. In order to ensure that investors are always able to trade, the derivative markets require that market-makers provide continuous bid and offer prices, or quotes. The trading system is therefore quote-driven. The buy and sell prices are quoted by market-makers in competition with other market-makers. Market-makers call out their prices and floor brokers choose the best prices for the execution of their orders. The order routing

system on Euronext Amsterdam Derivative Markets, Switch, is a system with a fully computerised order book. Orders are submitted electronically and completed transactions are confirmed in the same way. Limit orders which cannot be executed immediately can be placed in the electronic order book.

Trade in financial futures takes place between floor brokers and futures traders. Brokers and traders call out their prices and conclude transactions. Traders and brokers also specify the number of contracts covered by the prices they quote. Prices are quoted in competition with other traders.

Trading on the agricultural futures market is based on the open-outcry system and takes place on the floor of Euronext Amsterdam Derivative Markets. Investors can buy and sell futures on potatoes, pigs and piglets, or trade options having potato futures as their underlying instrument. In terms of volume, the Amsterdam agricultural futures market was Europe's second largest exchange for agricultural products in 2000.

Euronext Amsterdam Derivative Markets also allow professional parties to conclude options contracts outside the central market and still present them for settlement at the Exchange. These are referred to as OTC transactions. In the Euronext Amsterdam Derivative Markets these OTC transactions are referred to as professional (or "Prof") transactions. These contracts must fully comply with the Exchange's standard specifications with regard to maturity, underlying instrument and exercise price. In the "Prof" system, transactions are settled in the same way as Exchange transactions. Contracts on the OTC market are negotiated by the market participants in bilateral consultations. On the OTC market, there is more choice and flexibility.

## 4.2 Clearing

### 4.2.1 Euronext

From 1 February 2001, the clearing functions of the three Exchanges will be centralised at Clearnet SA, the clearing house of Euronext Paris, with branches in Brussels and Amsterdam (Clearnet Amsterdam Branch).

Assets and liabilities of the national clearing systems will be transferred to Clearnet SA, which will then become the CCP for all transactions on all Euronext exchange floors. The software envisaged combines clearing functions for equities and bonds with clearing functions for derivatives (integrating positions and risks on different markets).

The clearing systems themselves have not as yet been integrated, because the software will not be implemented for all clearing members before autumn 2001. Therefore, during the transition period, national clearing systems will still be used.

### 4.2.2 Securities clearing during the transition period

In Amsterdam, there are separate clearing institutes for clearing securities and derivatives. These have been subsumed as operating companies into Euronext Amsterdam Clearing & Depository and are called Euronext Amsterdam Stock Clearing and Euronext Amsterdam Derivatives Clearing (since 1 February 2001 this has been called Clearnet Amsterdam Branch). In both cases, the clearing institute acts as the CCP and guarantees the settlement of transactions. Settlement takes place on a net basis at Necigef, which has also been subsumed by Euronext Amsterdam Clearing & Depository. OTC transactions are immediately settled on a gross basis, either through the clearing institute or on a Tft basis.

Euronext Amsterdam Stock Clearing organises the clearing and settlement of all retail transactions and part of the wholesale transactions on the

Stock Exchange. The securities clearing process is described below.

At the end of the trading day, trades are automatically entered into the securities clearing systems. Euronext Amsterdam Stock Clearing becomes the counterparty to both parties to a transaction as soon as the trade has been processed and transaction confirmation reports have been sent to the clearing members. By placing itself between the two parties, Euronext Amsterdam Stock Clearing guarantees the completion of every transaction.

#### *Clearing member structure*

Clearing is based on a clearing member structure. The Euronext Amsterdam Clearing has a layered clearing member structure: the clearing organisation forms the top layer, the clearing members are in the layer below, the Admitted Institutions in the next layer, and the customers of Admitted Institutions in the bottom layer. In principle, the clearing organisation deals with the clearing member only and the clearing member in turn deals with the Admitted Institution, and the Institution with its customers, etc. This is also referred to as the principal-to-principal relationship.

Participating clearing members may become a general clearing member or a direct clearing member. Direct clearing members are only permitted to clear transactions for their own customers or for themselves. General clearing members can also settle transactions on behalf of other Exchange seaholders, which in turn have their own customers.

#### **4.2.3 Options clearing during the transition period**

Euronext Amsterdam Derivatives Clearing organises the clearing and settlement of all derivatives transactions. The derivatives clearing process is described below.

At the end of the trading day, trades are transmitted via an automatic link from the

options market systems to the derivatives clearing system. As soon as options clearing has processed the trades and sent transaction confirmation reports to clearing members, it automatically becomes the clearing member's counterparty. The clearing member's position with Euronext Amsterdam Derivatives Clearing is held by an affiliated bank or stockbroker. Clearing members acting for market-makers hold a position on behalf of their affiliated market-makers.

#### *Clearing members*

Similarly to securities clearing, options clearing is based on a system of clearing members. Clearing members are Exchange seaholders and must meet special requirements in the areas of expertise, risk management and capitalisation. Their responsibility is to settle transactions for their own account and for third parties. Seaholders which are not clearing members have to make arrangements with a clearing member for the settlement of their transactions.

Euronext Amsterdam Derivatives Clearing guarantees that every transaction it accepts will be completed (by virtue of its principal-to-principal relationship with clearing members). It acts as the counterparty to every buyer and seller. Clearing members give their customers the same guarantee. Euronext Amsterdam Derivatives Clearing requires collateral for positions in options and futures, as stipulated in a set of risk management rules. Margin requirements are a vital aspect of this system, providing a buffer against the risks involved in the trade in options and futures.

Professional parties qualify for special arrangements which are geared to the specific needs of the OTC market in options. Under the terms of the "Prof" regulation, for example, contracts with the same specifications as exchange-traded contracts can be traded OTC and still be presented to the Exchange for clearing.

Clearing and settlement of commodities market transactions takes place through the EA Commodity Clearing, formerly known as NLKKAS, which combines a clearing house function with a clearing member function.

### 4.3 Settlement

Settlement involves instructions to transfer the ownership of securities. For the time being, Euronext will settle securities at the local CSDs. Furthermore, cash settlement will take place in the country where the clearing member involved is headquartered and will continue to be effected in central bank money.

In order to create a single platform for both clearing and settlement, a joint venture is planned between Euronext and Euroclear aimed at centralising all settlement and depository functions for cash, equities, bonds and derivatives, in a single system within the Euroclear corporate structure. Euroclear is an ICSD, which settles transactions involving international and domestic securities and uses a network of local correspondents for both money and securities settlement. Euroclear does not act as a CCP.

The French CSD, Sicovam, has already announced its intention to merge with Euroclear by the beginning of 2001; the Belgian and Dutch CSDs are expected to have merged fully by 2003.

#### 4.3.1 Securities settlement

Transactions in securities can be settled in two different ways: via the netting system or via the Tft facility.

##### *Exchange settlement*

The vast majority of all settlements at Euronext Amsterdam Stock Clearing are processed using the netting system. Settlement consists of the delivery of the relevant securities to Stock Clearing, which delivers the securities to the designated recipient. Stock Clearing determines the amount of the different securities which each clearing member should deliver or receive and determines the

countervalue in euro of every delivery or receipt. At the end of the day, all positions held at Stock Clearing are netted. Transactions are settled on a net basis at T+3, i.e. on the third trading day after the transaction. Stock Clearing also initiates cash settlement between the deliverer and recipient, on a DVP basis. Money transactions in euro are handled by De Nederlandsche Bank. The exchange transactions can be conducted from 9 a.m. until 5 p.m. In 1999, the volume of these settlement transactions was 1,375,000.

##### *Off-exchange settlement*

In addition to book-entry transfers not related to payments, Necigef offers facilities for Tft settlement in co-operation with De Nederlandsche Bank. This is a settlement facility which allows off-exchange transactions to be settled on the basis of DVP. Each transaction is settled individually. Securities are transferred between accounts kept at Necigef, while funds transfers are made in real time via the accounts held by the relevant Necigef participants at De Nederlandsche Bank. As transfers made in Necigef and De Nederlandsche Bank system are final and irrevocable, there is no counterparty risk in this settlement system. In 1999, De Nederlandsche Bank settled 982,000 Tft transactions with a total value of €619 billion. DVP transactions can be made from 9 a.m. until 3 p.m.

#### 4.3.2 Central securities depository – Necigef

The Dutch CSD, Necigef, is a part of Euronext Amsterdam's operations. The depository is responsible for book-entry transactions and the custody, management and administration of all kinds of securities on behalf of Necigef participants. When banks deposit securities held by their customers with the depository, book-entry positions appear which make it possible to settle securities transactions by book-entry transfer. When the depository declares that securities have been admitted to the book-entry transfer system, these securities are governed by the Dutch Securities Giro Act. This means that

the investors in those securities are joint owners of the securities in the system and their ownership rights will not be affected if their bank or the depository goes into receivership. Consequently, there is no counterparty risk in this settlement system.

The vast majority of all Dutch securities are registered at Necigef. In December 1999, the total number of issuers registered was 2,266, accounting for nearly 5 million securities in custody with a nominal value of €270 billion (NLG 594 billion). The sharp fall in physical securities movements and the need to improve efficiency have led many issuers to eliminate physical certificates (dematerialisation). This is often done by replacing the original certificates with a single global note. The adaptation of the Securities Transfer Giro Act in November 2000 made full dematerialisation possible for the first time. The shift from bearer securities to book entry-type securities now has a legal basis.

Necigef is linked to CSDs in Belgium, France, Germany, England, Finland, Austria and Switzerland.

#### 4.3.3 Credit and liquidity risk management

Credit and liquidity risks are mainly controlled by margin requirements applicable to the participants and by the involvement of De Nederlandsche Bank as collateral manager, liquidity provider and settlement bank.

##### *Collateral requirements*

In order to secure the settlement of transactions, both EA Securities and Derivatives Clearings require clearing members to provide collateral by the fulfilment of margin obligations and by a contribution to the clearing fund.

The clearing organisation acts as the CCP in transactions. Consequently, it is responsible for the fulfilment of the obligations arising from clearing. In the event of default on the part of one of the parties, it may itself have to purchase the securities to be delivered by the defaulting party

or, in the case of an obligation to purchase, to sell the purchased securities. Consequently, it is also exposed to market risk arising from unexpected price movements. To that end, it requires clearing members to provide collateral to equalise the margins required to fulfil the financial obligations. These margins are calculated on the basis of the obligations ensuing from positions taken (initial margin) and from the non-realised profits and losses (variation margin). The collateral may consist of underlying instruments (cover on Euronext Amsterdam), domestic or foreign securities, or debt instruments.

The clearing fund serves as a supplementary form of guarantee. It provides a joint guarantee to the clearing members in return for which they are required to pledge securities as collateral (tier 1 and tier 2 assets). The clearing fund's size is computed on the basis of contributed risk.

The total clearing fund of the Stock Clearing should at least cover the price risk which arises for the clearing member with the largest position. This fund amounts to a minimum of €70 million. The total clearing fund of the Derivatives Clearing is calculated on the basis of clearing members' average number of open options in a certain option fund or option series multiplied by a fixed amount per contract. The clearing fund of the Options Clearing has no minimum level and currently stands at €200 million.

##### *De Nederlandsche Bank's involvement*

- *Management of collateral*

The management of collateral for both Euronext Amsterdam Stocks Clearing's and Derivatives Clearing's margin obligations as well as for both clearing funds is performed at De Nederlandsche Bank. Clearing members meet their margin requirements by means of a guarantee based on the collateral deposited by them in the form of book-entry securities. Banks already have a collateral account with De Nederlandsche Bank for posting assets to be

used as collateral in Eurosystem monetary policy operations and TARGET intraday credit operations. In addition to the management of collateral, De Nederlandsche Bank also provides additional intraday liquidity to the Euronext Amsterdam Stock Clearing in the event of settlement problems.

- *Liquidity arrangement*

In the event that a clearing member can no longer meet its settlement obligations, a liquidity problem arises at Euronext Amsterdam Stock Clearing which has to be resolved as though it were a potential systemic risk. Although Euronext Amsterdam Clearing & Depository has sufficient collateral – under the margin and clearing fund structure – to bear the financial consequences, Stock Clearing would need a large amount of cash at short notice in order to complete the settlement of funds transfers with clearing members before the

Exchange opens. To that end, De Nederlandsche Bank provides intraday liquidity, one of the fundamental requirements set by the overseer in the context of risk management. The arrangement for liquidity provision up to a maximum value of €68 million requires full collateralisation. In the event that overnight liquidity were required, this would be provided by a number of commercial banks.

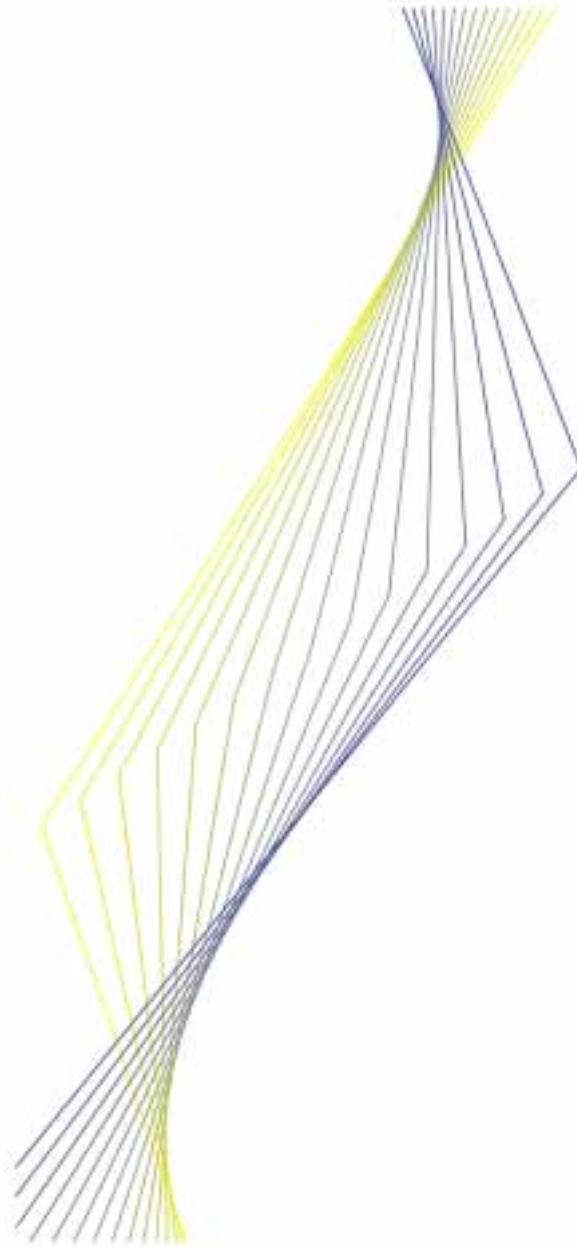
- *Settlement bank*

De Nederlandsche Bank acts as a money settlement bank for Euronext Amsterdam Stock Clearing, as well as for its Derivatives Clearing. Every working day, early in the morning, De Nederlandsche Bank settles the outcome of both clearing processes in TOP. As mentioned above, off-exchange transactions are settled on a gross basis at De Nederlandsche Bank as well.

Netherlands



EUROPEAN CENTRAL BANK



**Austria**

**June 2001**



Austria

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## Abbreviations

AEM	Austrian equity market
AGB	General terms and conditions of business – <i>Allgemeine Geschäftsbedingungen</i>
AGM	Austrian growth market
ARTIS	Austrian Real-time Interbank Settlement System
APSS	Austrian Payment Systems Services Ges.m.b.H.
A-SIT	Secure information technology centre – Austria <i>Zentrum für sichere Informationstechnologie – Austria</i>
ATX	Austrian traded index
BSI	German Federal Office for Security in Information Technology – <i>Bundesamt für Sicherheit in der Informationstechnik</i>
BWG	Banking Act – <i>Bankwesengesetz</i>
DAIC	Direct Austrian Interbank Communication
DevG	Foreign Exchange Act – <i>Devisengesetz</i>
DCM	Direct Clearing Member
DG	Direct transaction – <i>Direktgeschäft</i>
DS	Direct Settlement System
EBK	Electronic banking communication – <i>Elektronische Bankenkommunikation</i>
EBK-IS	EBK Interface System
EBK-ISS	EBK Integrated Security Subsystem
EQOS	Electronic Quote and Order Driven System
FinalitätsG	Settlement Finality Act – <i>Finalitätsgesetz</i>
GABE	Financial services organisation which has specialised in, inter alia, ATM services – <i>Geldausgabeautomaten-Service Gesellschaft m.b.H.</i>
GCM	General Clearing Member
KSchG	Consumer Protection Act – <i>Konsumentenschutzgesetz</i>
LEOs	Long-term Equity Options
LZ	Delivery versus payment transaction – <i>Lieferung gegen Zahlung</i>
NBG	Federal Act on the Oesterreichische Nationalbank
NCM	Non-Clearing Member
NEWEX	New Europe Exchange
OeBS	The banknote and security printing works which is a subsidiary of the Oesterreichische Nationalbank (OeNB) – <i>Oesterreichische Banknoten und Sicherheitsdruck Ges.m.b.H.</i>
OeKB	Austria's main financial and information service provider for the export industry and the capital market – <i>Oesterreichische Kontrollbank AG</i>
OeNB	The Austrian national central bank – <i>Oesterreichische Nationalbank</i>
ÖTOB	Austrian Futures and Options Exchange – <i>Österreichische Termin- und Optionsbörse AG</i>
PATS	Partly Assisted Trading System
PICS	Price Information, Clearing and Settlement System
PostSpkG	Postal Savings Bank Act – <i>Postsparkassengesetz</i>
QUICK	Austrian electronic purse scheme
RIVA	Risk Valuation System
ScheckG	Cheques Act 1955 – <i>Scheckgesetz 1955</i>
SICS	Securities Information Clearing and Settlement System
SigG	Electronic Signatures Act – <i>Signaturgesetz</i>
STUZZA	Research Association for Payment Co-operation – <i>Studiengesellschaft für Zusammenarbeit im Zahlungsverkehr</i>
ÜberweisungsG	Cross-Border Credit Transfers Act – <i>Überweisungsgesetz</i>
WechselG	Bill of Exchange Act 1955 – <i>Wechselgesetz 1955</i>
WU	Securities transfer – <i>Wertpapierübertrag</i>
Xetra	Exchange electronic trading

## Introduction

Austria's payment system is characterised by a dense network of bank outlets and post offices and a large number of payment products. It is governed by Austrian law, which has fully implemented the relevant European Directives.

The infrastructure available comprises uniform systems for the processing of payment transactions with traditional instruments such as credit transfers, debits or cheques, and for the rapidly growing number of electronic payment media, which in Austria focus primarily on cash dispensers (ATMs), points of sale (POS) and increasingly also electronic purses.

The Austrian system is marked by a high degree of co-operation in the banking sector and essentially functions on the basis of contractual agreements. The common platform for this co-operation is the Research Association for Payment Co-operation, referred to by its acronym,

STUZZA (*Studiengesellschaft für Zusammenarbeit im Zahlungsverkehr*). This association was founded in 1991 and is owned by Austria's large commercial banks and the Oesterreichische Nationalbank (OeNB).

The OeNB's operational role in the payments sector is limited to the settlement of interbank transfers. For this purpose the OeNB operates the Austrian Real-Time Interbank Settlement System (ARTIS), which is the Austrian component of TARGET.

The OeNB has a voice in all payment developments of relevance for the economy, with a particular focus on security issues in the field of electronic money. Payment systems oversight activities will be carried out on the basis of the respective policy stance of the Eurosystem.

## I Institutional aspects

### I.1 The general institutional framework

#### I.1.1 General legal issues

Since Austria does not have a specific law which comprehensively regulates payment transactions, a variety of laws contain numerous provisions (see the list below; the names are self-explanatory and all the laws are executed by the relevant federal minister). The relationship between the transacting parties is largely governed by civil law, including, but not limited to, the Consumer Protection Act (*Konsumentenschutzgesetz*; KSchG) and is subject to the general terms and conditions of business (AGB), which have to be officially approved by the regulator, i.e. the Federal Minister of Finance.

Article 1 of the Banking Act (*Bankwesengesetz*; BWG) stipulates that the carrying-out of non-cash payment transactions and the clearing of checking accounts for others, if conducted on a commercial basis, are banking activities which can only be conducted by properly licensed credit institutions. The supervisor of credit institutions is the Federal Minister of Finance. In 1999, a draft amendment of the BWG, empowering the OeNB to oversee payment systems, was discussed, but it has not as yet materialised.

Foreign payment transactions are governed by the Foreign Exchange Act (*Devisengesetz*; DevG) and the announcements made by the OeNB pursuant to this Act (i.e. the regulations of the OeNB). Since 1991, foreign payment transactions have been fully liberalised.

The Cheques Act (*Scheckgesetz* 1955; ScheckG) and the Bill of Exchange Act (*Wechselgesetz* 1955; WechselG) are the transformation into Austrian law of the respective Geneva Conventions of 1925. (Note: 1955 in the official name of both laws indicates the year of re-announcement of pre-war legislation.)

The Cross-Border Credit Transfers Act (*Überweisungsgesetz*; ÜberweisungsG), the

Settlement Finality Act (*Finalitätsgesetz*; FinalitätsG) and the Electronic Signatures Act (*Signaturgesetz*; SigG) are the transformation into Austrian law of Directives 1997/5/EC, 1998/26/EC and 1999/93/EC respectively.

### I.2 The role of the central bank

The Federal Act on the Oesterreichische Nationalbank (NBG) confers a variety of rights and duties on the OeNB. The most important provisions are as follows:

The OeNB:

- may provide facilities to ensure efficient and sound clearing and payment systems within the EU and with other countries (Article 50);
- may, in line with its duties as a member of the ESCB, collect, process and submit data (Article 44); and
- has, notwithstanding the powers of the ECB, the exclusive right to produce and issue banknotes which are legal tender in Austria (Articles 4 and 61).

#### I.2.1 Oversight and regulatory competence

In Austria, payment systems oversight is regarded as a macro-prudential oversight feature and has already been conducted for some years in the area of e-money. In line with the decisions taken at the ESCB level ("The framework for the oversight of payment systems in Stage Three of EMU" and the respective follow-up decisions), the OeNB is entrusted with the conduct of payment systems oversight. While the establishment of a legal foundation for payment systems oversight in Austrian law is envisaged, at present the policy stance is enforced through moral suasion. Up to now system operators have followed the OeNB's recommendations to a sufficient degree.

Since May 1999 the assessment of technical system security issues (especially those relating to the Austrian electronic purse scheme, QUICK) has been entrusted to the secure information technology centre (A-SIT), a joint effort of the Ministry of Finance representing the Republic of Austria, the OeNB and Graz University of Technology. Its prime function is to serve as an independent technology assessment and evaluation management centre in the field of IT security. A-SIT's mission is to fulfil tasks comparable to those of the BSI in Germany in the field of electronic signature, cryptography and electronic commerce and to support the OeNB in technical payment systems oversight issues.

### **1.2.2 Provision of banknotes and coins**

Banknotes and coins are provided to the Austrian business community and consumers through the OeNB's Vienna headquarters and its eight branches located in the capitals of Austria's *Länder*. Banknotes are produced by the OeNB's printing works, Oesterreichische Banknoten und Sicherheitsdruck Ges.m.b.H. (OeBS), a 100% subsidiary, and coins are struck by the Austrian Mint (Münze Österreich AG), which is also 100% owned by the OeNB.

### **1.2.3 Operational role of the OeNB**

As stated above, the OeNB's operational role in the payments sector is limited to the settlement of interbank payments (ARTIS, see Section 3.2 below). The accounts which the OeNB holds for Austrian banks are used for money market transactions, the fulfilment of minimum reserve requirements and the provision of cash; moreover, they are used especially for the settlement of bilateral clearing positions between banks. The OeNB has no operational role in non-cash retail payments.

### **1.2.4 Co-operation with other institutions**

The OeBS and three other subsidiaries of the OeNB, Austria Card (plastic cards and identity cards, system solutions), Card Solutions (design

and development of chip card solutions) and the Austrian Mint (coin and medal minting), have combined their knowledge, experience and innovative power to form a working group called the Money and Cards Group. This group is the partner for integrated solutions in methods of payment and related security systems. The business extends beyond the minting of coins, printing of forgery-proof banknotes and production of innovative chip cards. The strengths of its experts include comprehensive expertise in the planning and project management of production facilities. The resulting quality, together with security, are the cornerstones of the group's activities, which uses its links to create a platform to offer knowledge and technology worldwide.

## **1.3 The role of other private and public sector bodies**

### **1.3.1 The Austrian postal savings bank**

The Postal Savings Bank Act (*Postsparkassengesetz; PostSpkG*) determines the role of the postal savings bank in payment transactions. The Austrian postal savings bank's business policy is geared to profitability considerations.

The distribution network of the Austrian postal savings bank comprises 2,300 post offices. Handling some several hundred million paper-based payments annually, the postal savings bank is one of the leading banks in domestic retail payment transactions.

The Austrian postal savings bank performs the function of "principal banker" of the Federal Republic of Austria, i.e. the majority of the latter's payment transactions are effected through its account system.

### **1.3.2 The Research Association for Payment Co-operation**

The Research Association for Payment Co-operation, known by its German acronym STUZZA (a private limited company), was established in 1991 as a common forum to

improve the Austrian payment system's efficiency. STUZZA is owned by the OeNB and large commercial banks and thus brings together the major players in the payment industry and also, indirectly, all sectors of the Austrian banking system.

The major task of STUZZA is to work out efficient – and thus cost-effective – operational sequences in the organisation of payment transactions, and to reach agreement on common standards. However, it is neither authorised to define binding rules – as the implementation of proposed new measures requires the consent of all sectors – nor does it have an executing function, as it does not provide any payment services.

Major projects have so far been the logistics of cash, electronic signatures, mobile banking, large-value payment systems (includes the standardisation of the national RTGS systems) and the implementation of a multibank standard for electronic banking.

### ***1.3.3 Europay Austria/Austrian Payment Systems Services GmbH***

In 1993, Austrian credit institutions – in their capacity as shareholders – decided to merge the Eurocard/MasterCard, debit card POS and ATM activities of Eurocard Austria and of GABE (Geldausgabeautomaten-Service Gesellschaft m.b.H.) into Europay Austria Zahlungssysteme Ges.m.b.H.

While Europay Austria deals with all strategic and marketing issues relating to Eurocard/MasterCard, EFTPOS plus ATM (Maestro) and QUICK, its subsidiary, Austrian Payment Systems Services Ges.m.b.H. (APSS), which was also established at the time of the merger and in which the OeNB has a 10% share, carries out all EDP-based technical service functions of Europay Austria for all POS, ATM and QUICK transactions in Austria and abroad.

### ***1.3.4 The Austrian Federal Economic Chamber and pressure groups***

The representation of banks' economic interests is organised along lines similar to those of the banking industry. The following bodies exist: the Austrian Federal Economic Chamber (Wirtschaftskammer Österreich), the Austrian Bankers' Association (Verband der österreichischen Banken und Bankiers), the Association of Raiffeisen Credit Co-operatives (Fachverband der Kreditgenossenschaften nach dem System Raiffeisen), the Federal Association of Austrian Savings Banks (Hauptverband der österreichischen Sparkassen), the Federation of Austrian Co-operatives (Österreichischer Genossenschaftsverband) and the Federation of Austrian State Mortgage Banks (Verband der österreichischen Landes-Hypothekenbanken). Consumers' interests are expressed primarily through the Austrian Federal Chamber of Labour (Bundeskammer für Arbeiter und Angestellte) and the Association for Consumer Information (Verein für Konsumenteninformation).

## 2 Payment media used by non-banks

### 2.1 Cash payments

Cash payments still play a very dominant role in day-to-day transactions. Although the market share of electronic payment systems such as debit cards and electronic purses is rapidly increasing, the total amount of cash in the market is also increasing. The value of cash in circulation outside credit institutions expanded from ATS 170.2 billion (€12.37 billion) in 1995 to ATS 182.8 billion (€13.29 billion) in 1999.

Banknotes are supplied mainly through ATMs (called *Bankomat* terminals) based on the Maestro system run by APSS.

### 2.2 Non-cash payments

Between 1995 and 1999 the overall volume of transactions increased from around 700 million to 806 million. During this period the value of transactions increased from ATS 6,676 billion (€485 billion) to ATS 16,692 billion (€1,213 billion).

#### 2.2.1 Credit transfers

Classic credit transfers from one account to another have become increasingly paperless. Bank-to-bank routing has already been completely electronic for several years. While the total volume of credit transfers increased from 432 million in 1995 to 466 million in 1999, paper-based credit transfers decreased from 282 million in 1995 to 238 million in 1999. Looking at the value of credit transfers, the share of paper-based credit transfers in overall credit transfers in fact declined even further: the total value of credit transfers grew from ATS 5,173 billion (€376 billion) in 1995 to ATS 14,883 billion (€1,082 billion) in 1999, while that of paper-based credit transfers only rose from ATS 3,169 billion (€230 billion) in 1995 to ATS 4,570 billion (€332 billion) in 1999.

#### 2.2.2 Direct debits

While the number of direct debit transactions only increased from 210 million in 1995 to 237 million in 1999, their value surged from ATS 457 billion (€33 billion) to ATS 1,346 billion (€98 billion).

#### 2.2.3 Internet/mobile phone banking

Customer orders are shifting more and more from paper-based orders to internet-based or mobile phone-based transactions. However, reliable data on this development have not as yet become available.

#### 2.2.4 Cheques

Since the guarantee function of the banks for cheques ends in 2001, the number of cheque transactions has already declined to a very low level and is likely to disappear almost completely. The total value of cheque transactions decreased from ATS 1,014 billion (€74 billion) in 1995 to ATS 379 billion (€27.5 billion) in 1999, and the volume of cheques processed fell from 32.5 million in 1995 to 15.9 million in 1999.

#### 2.2.5 Payment cards

##### *Debit cards*

Debit cards are widely used and are being accepted in an increasing number of shops. The degree of market penetration of Maestro, the leading system in Austria, is quite high (3,382 terminals in 1995; 28,763 in 1999) and the speed of development is average within the European context.

##### *Credit cards*

In the field of credit cards, all major international players have established systems in Austria. The total number of cards issued in the market (1.19 million in 1995; 1.67 million in 1999) and the number of transactions (14.6 million in 1995; 26.7



million in 1999) is rather small, while, as is the case in all countries with highly developed giro systems, the average amount paid is high. The value of transactions was ATS 25.3 billion (€1.8 billion) in 1995 and ATS 40.6 billion (€2.9 billion) in 1999. This indicates that credit cards still do not play a dominant role in everyday life, but rather are used for special purposes.

#### *Prepaid cards*

QUICK, the Austrian e-purse system, has posted large increases in the total number of transactions (from 87,000 in 1996 to 2.2 million in 1999) and in the volumes transferred

(from ATS 18 million (€1.27 million) in 1996 to ATS 161 million (€11.69 million) in 1999).

### **2.3 Recent developments**

The preparations for QUICK transactions via the internet and the shift to the common electronic purse specifications (CEPS) standard are both at an advanced stage.

The first electronic bill presentment and payment product was launched at the end of 2000, and internet-based payments are facilitated by new prepaid card schemes.

## **3 Interbank exchange and settlement systems**

### **3.1 The Austrian Real-time Interbank Settlement System**

The Austrian Real-time Interbank Settlement System (ARTIS) was launched in July 1997. It was adapted to meet the requirements of TARGET, successfully starting as the Austrian component of TARGET on 1 January 1999.

Originally, communication within ARTIS was based on the existing electronic banking communication (EBK) system, which had been in use since 1989. When ARTIS began operation in 1999, SWIFT and direct access (ARTIS Online PC) were added as options to access ARTIS.

#### **3.1.1 Operating rules**

ARTIS is governed by the published set of terms and conditions applicable to it.

#### **3.1.2 Participation in ARTIS**

Participation in ARTIS is permitted under the conditions stipulated in the TARGET Guideline and the domestic general terms and conditions of business of ARTIS.

In principle, banks licensed in Austria and banks based in the European Economic Area (EEA) (as remote access participants) are qualified to participate provided that they meet the access criteria.

Banks may also take part in ARTIS as indirect participants, i.e. they may assign the authority to operate their account to another bank. Throughout the entire communication process, the network access point of the authorised institution is used.

#### **3.1.3 Operation of the electronic banking communication transfer system**

The electronic banking communication (EBK) transfer system offers electronic communication between participants, with APSS serving as the centre. The system manages and controls electronic payment transactions between Austrian banks, the OeNB and commercial customers. It allows the paperless handling and transmission of data between the participating banks.

EBK is conceived as a star network with its central node in APSS, which monitors the exchange of data between the individual EBK

participants as well as the network control of the overall system. The system is a store-and-forward system and does not allow internal processing of the individual messages by the banks.

EBK accepts incoming messages (from a sender) and forwards these messages instantaneously to the recipient. If the addressee is not ready to receive the message, EBK will store it until the addressee logs in. The sender of a message may request end-to-end confirmation from the addressee to ensure that the message has indeed been received. If an addressee fails to send such confirmation within ten minutes (e.g. because the addressee is not ready to receive), EBK will send an overdue warning informing the sender of the message of the delay in transmission.

To ensure maximum security and data integrity, each message is authenticated and encoded. The authentication and encoding of the message is end-to-end, i.e. only the sender or the addressee can process, change or decode messages within the EBK. Within the framework of EBK, payment orders, account information of the OeNB and private authenticator key exchange information can be handled.

### 3.1.3.1 EBK transaction processing environment

With a view to rationalising and simplifying user access points, software for IBM hosts (Direct Austrian Interbank Communication (DAIC)) and for DEC computers (EBK Interface System (EBK-IS)) has been developed in co-ordination with the development of the central computer in the APSS and is made available by the manufacturers against payment of licence fees.

The security requirement is fulfilled by a special program (OS/2) running on a personal computer called the EBK Integrated Security Subsystem (EBK-ISS). EBK-ISS executes the automated encoding, decoding and authorisation of EBK messages.

For the wide utilisation of PCs or networks, PC software is available through APSS and the

Austrian banks under the label of EBK-PC. When using DAIC or DEC, this function is supported by PCs with EBK-ISS software. This allows uniform and easy-to-handle automatic end-to-end encryption. The entire EBK system uses general standard data formats via the LOGICA protocol and a pre-defined selection of basic network protocols (SNA LU2, SNA LU6.2, X.25).

### 3.1.3.2 Pricing of EBK

The APSS offers two cost scale options for EBK.

Option 1: prorated software development costs, a one-off payment of ATS 50,000 (€3,633.64) and transaction costs.

Option 2: ATS 30 (€2.18) per transaction for the first 40,000 transactions; for transactions beyond this level, a sliding price-scale is applicable as follows:

1-5,000	ATS 9.00 (€0.65) per transaction
5,001-12,000	ATS 8.40 (€0.61) per transaction
12,001-21,000	ATS 7.80 (€0.57) per transaction
21,001-35,000	ATS 6.30 (€0.46) per transaction
35,001-60,000	ATS 5.40 (€0.39) per transaction
60,001-100,000	ATS 3.30 (€0.24) per transaction
100,001-150,000	ATS 2.20 (€0.16) per transaction
over 150,000	ATS 1.20 (€0.09) per transaction

The scale applies to one calendar year.

### 3.1.4 Types of transaction handled via ARTIS

The following types of payment should be carried out via ARTIS:

- OeNB payments (money market operations, cash transactions, etc.);
- payments to other large-value systems;
- interbank payments arising from money market and foreign exchange transactions;
- interbank payments for customers (if they are to be credited on the same day); and

- payments of very large value.

### 3.1.5 Operation of the transfer system in ARTIS

ARTIS provides for the same time-schedule as TARGET.

The RTGS system provides for the following procedures and time-schedules, fixed in accordance with TARGET requirements:

- Acceptance of (national) payment orders from 6.30 a.m.

From this time on, the RTGS participant may transmit orders to ARTIS. However, orders are not processed until settlement starts.

- Start of settlement (7 a.m.)

When settlement starts, the payment orders are processed. Moreover, all information functions (enquiries) are available to the participants.

- Cut-off 1 (5 p.m.)

This marks the deadline for participants to close their accounts for cross-border customer orders. From this time on, only national and interbank payment orders are admitted.

- Cut-off 2 (6 p.m.)

From this time on, RTGS participants can no longer initiate transactions on their accounts.

- Cut-off 3 (at 6.30/7 p.m.)

Between cut-off 2 and cut-off 3, payment orders may still be transferred from the OeNB's internal systems to ARTIS. A negative account balance at cut-off 3 starts the overnight overdraft procedure (pledge of securities to the OeNB to cover the account).

- End of settlement

At cut-off 3, all unsettled payment orders in the waiting queue are returned to the participants. There is no more account activity.

- End of operation

Marks the closure of RTGS. The OeNB sends account statements to the participants.

ARTIS consists of two components: communication (transmission of messages) and payment order management/account management.

In the "payment order management/account management" component, the orders are processed (queue management, posting and relevant information functions, management of intraday credits) and posted into the participants' giro accounts at the OeNB.

### 3.1.6 Transaction processing environment in ARTIS

ARTIS is a system of highest integrity with various means of safeguarding the availability of the system and the correct execution of payment orders. ARTIS is designed to make system failure highly improbable.

All connections in the network are doubled, so there is a backup for every single line within the system. Moreover, contingency measures are implemented as demanded by the ECB.

If there is a break in the connection between the participant and ARTIS (problems on the part of the participant, line problems, network problems), it is possible for participants to place their payment orders conventionally, i.e. by telex, telephone or fax.

The RTGS application is implemented and operated on the system platform of the OeNB. Operation at the OeNB provides an optimum solution for two essential elements of the system, the connection with OeNB account management and the OeNB securities system, and the connection with the Interlinking system (i.e. TARGET).

Both the originating and the receiving institution must hold an account with the OeNB. Orders are accepted for same-day processing or future value. Using ARTIS, the participant is offered several service functions. Participants are able to order credit transfers, make direct debits, assign priorities to their orders, cancel payment orders not yet executed and apply for intraday credit in

the ARTIS system. Moreover, participants may check their own account with regard to balances, account entries, the intraday credit line and recourse to it, and queued orders.

Payment orders are only executed on a covered basis, and posted immediately and irrevocably into OeNB accounts. The system is characterised by the highest security standards and maximum transparency.

In order to automatically process payments via SWIFT, the payment order or request message must follow certain field specifications, which are somewhat more restricted than under the usual SWIFT rules.

The OeNB also offers direct access to ARTIS, via either a dedicated line or the ARTIS Online PC. Payment orders can also be placed by telephone or fax. These procedures are compliant with the four-eyes principle using an individual test key for each transaction. Thus, no subsequent paper-based document is required.

### 3.1.7 Settlement procedures in ARTIS

All incoming payment orders are put in the queue of the account to be debited and are processed according to the FIFO principle. If there is no other payment in the queue and the account has sufficient cover at the moment at which a payment order comes in, the payment order is settled and posted immediately.

The originator has the possibility of assigning up to three priorities to each payment order. All other orders can be classified as “urgent”, “standard” or “low” priority. All orders entered by the OeNB will have higher priority. Payment orders in the queue are processed in order of priority and in accordance with the FIFO principle. Payment orders in the queue may be cancelled or changed by the originator.

Only formally correct messages are accepted. A message will be considered formally correct if the account numbers of the originator/recipient

are valid, if the originator is authorised to carry out the transaction on the account to be debited and if the field specifications are met. If a message is formally defective, it is rejected by the system and an error message is issued.

Payments which have not been executed by the end of the day will be cancelled. The originator of the payment order is notified, and there is no automatic execution of such cancelled payments on the following day.

### 3.1.8 Credit and liquidity risk in ARTIS

The OeNB does not take any risk on failing payments, since payments are only executed if the current account has sufficient cover or if the participant is within its overdraft limit.

If a participant suffers a liquidity shortage, intraday credit up to the required amount is granted to the participant on request, provided eligible collateral is provided on the security deposit account. Participants do not have individual overdraft limits; rather, there is one line for the accumulated intraday credits granted. To protect against exchange losses, a haircut (i.e. taking into account the difference between the market value of a security and its collateral value) will be applied to the collateral securities.

The participant is notified of whether an overdraft has been granted or refused by electronic means, with a positive response immediately initiating the processing of payments in the queue of the account concerned. The intraday credit granted is valid until the end of the day.

### 3.1.9 Pricing in ARTIS

Generally, the ARTIS fee consists of a handling and a booking fee. The handling fee applies to payments transmitted in non-electronic form.

With regard to the booking fee, the participant can choose between two options. Option 1 is to pay €0.5 per transaction, while option 2 provides for the payment of a fixed amount of €100 per month plus a transaction fee of €0.25.

Of course, the TARGET fee structure applies to Interlinking payments.

The provision of intraday credit is free of charge. However, interest is charged in the event that the provision of overnight credit is necessary on account of the need to liquefy collateral. The interest rate is geared to the applicable market rate (plus penalty).

### 3.1.10 Statistical data of ARTIS

In 1999, the average daily volume of ARTIS transactions was 2,853, with an average daily value of ATS 180.8 billion (€13.1 billion).

### 3.2 The large-value payment system

There is no large-value payment system besides ARTIS operating in Austria.

### 3.3 The retail payment system

The bulk of retail payments in Austria are processed on a bilateral basis between credit

institutions. SWIFT, EBK or dedicated lines may be used as the infrastructure.

In line with the structure of the Austrian banking sector, payment transactions are effected through the OeNB, the Austrian postal savings bank, major Austrian banks or banks organised in multi-tier sectors with central institutions (savings banks, rural credit co-operatives (*Raiffeisen*) and industrial credit co-operatives (*Volksbanken*)).

Inter-sectoral payments are carried out through bilateral accounts or holdings with third-party banks. In the multi-tier sectors, the central institutions are in charge of intra-sectoral and inter-sectoral liquidity equalisation. Banks not belonging to a multi-tier sector maintain bilateral settlement accounts. Usually, the larger institution acts as the account keeper, while the smaller institution keeps verification records. The accounts are conducted as creditor accounts, i.e. they carry interbank deposits for payments and liquidity management.

## 4 Securities settlement systems

### 4.1 Trading

In Austria organised trading for the cash and the derivatives market takes place at the Vienna Stock Exchange (Wiener Börse).

#### 4.1.1 Vienna Stock Exchange –cash trading

##### 4.1.1.1 Recent developments and ownership structure

The Vienna Stock Exchange was founded in 1771, making it one of the oldest in the world. In December 1997 the former Vienna Stock Exchange and ÖTOB AG (the Austrian Futures and Options Exchange) were merged to form Wiener Börse AG. Since the amendment of the Stock Exchange Act (*Börsegesetz*) in 1998,

Wiener Börse AG has been an exchange-operating company organised under private law. It was granted a licence to operate and manage the Vienna exchange by way of an official notice of 3 April 1998.

In June 1999 the Republic of Austria sold its 50% stake in Wiener Börse AG to 30 listed companies. The new ownership structure now includes major Austrian banks and listed companies. The Vienna Stock Exchange is Austria's only stock exchange.

The creation of the new Vienna Stock Exchange was a major step forward in establishing Vienna as an independent market for Austrian, central and eastern European securities and their corresponding derivative instruments.

Compared with other international stock exchanges, the Vienna Stock Exchange is relatively small. However, the introduction of international capital market standards, a wide range of listed companies and a link-up with the German Xetra (exchange electronic trading) system have made Vienna more attractive to potential international investors.

As a stock, futures and options exchange, the Vienna Stock Exchange intends to function as a centre of expertise for Austria and central and eastern Europe. Following the trend of growing co-operation between exchanges, Wiener Börse AG established a strategic partnership with Deutsche Börse AG, which led to the introduction of the Xetra system.

#### 4.1.1.2 The general legal framework

The federal government is in charge of the legislation governing stock exchange regulation and its implementation. Exchanges are regulated by the Stock Exchange Act of 1989, as amended (most recently in 1999). All relevant EC Directives have been incorporated into the Stock Exchange Act. Furthermore, the special terms and conditions of business of the Vienna Stock Exchange govern its function as a securities exchange.

The Stock Exchange Act passed in 1989 fundamentally reformed the organisation of the stock market and stock exchange supervision. It also introduced new standards for the admission of securities and more detailed and precise duties of disclosure (listing particulars and reports) and, moreover, tightened regulations to protect investors, bringing them into line with the contents of EC Directives (requirements for the admission of securities to listing on the stock exchange, trading rules, supervision, regulatory standards applying to issuers and dealers, insider dealing provisions). The 1993 amendment to the Stock Exchange Act made the misuse of insider information a criminal offence and required participants in the market to take effective steps to prevent insider trading.

Further relevant legislation includes the 1991 Capital Markets Act (*Kapitalmarktgesetz*), which abolished the formal approval procedures for new issues by the Federal Ministry of Finance and introduced comprehensive disclosure standards for publicly offered issues to protect investors. In January 1999 the Takeover Act (*Übernahmegesetz*) entered into force and an independent Takeover Commission was established.

#### 4.1.1.3 Supervision

The Federal Minister of Finance is responsible for the legal supervision of exchanges. At the beginning of 1998, an independent Austrian Securities Authority (*Bundeswertpapieraufsicht*) was established to exercise market supervision. The main tasks of this institution are the supervision of securities transactions and of disclosure requirements for issuers with regard to price-related matters, the monitoring of compliance codes and insider rules as well as co-operation with international bodies.

#### 4.1.1.4 Membership

In order to trade on the cash and derivatives markets of the Vienna Stock Exchange, an institution must become a member of the Vienna Stock Exchange and must have the required technical and human resources. The August 1999 amendment of the Stock Exchange Act opened membership to credit institutions, investment firms and local firms domiciled in EEA Member States or third countries.

A membership application can be submitted for participation in:

- trading in securities (specifically for trading in shares and bonds and/or in warrants);
- trading in options and financial futures contracts;

- the settlement system for securities transactions concluded through the exchange; and
- the settlement system for trades in options and financial futures contracts concluded through the exchange.

The settlement system for the cash market is operated by Oesterreichische Kontrollbank AG (OeKB), the clearing system for the derivatives market by Wiener Börse AG itself. The types of member on the cash and derivatives markets are classified as follows:

- General Clearing Members (GCMs) are authorised to settle transactions for their own account and for customers as well as for other members (NCMs) on the condition that a clearing agreement with such members has been concluded.
- Direct Clearing Members (DCMs) are authorised to settle transactions for their own account and for customers.
- Non-Clearing Members (NCMs) have access to the trading system, but are not admitted as clearing members.
- Clearing agents are obliged to settle trades of Indirect Clearing Members only to the

extent that they have been authorised by the Indirect Clearing Member.

- Indirect Clearing Members are customers of the clearing agent.

4.1.1.5 Market segmentation of the Vienna Stock Exchange

The Stock Exchange Act of 1989, as amended, empowers the Vienna Stock Exchange to grant or to deny the admission of securities to listing. For all securities traded on the Vienna Stock Exchange, an application must be made for admission to one of the market segments stipulated by law.

In 1999 the Wiener Börse AG introduced a specialist system as part of the new segmentation of the Vienna Stock Exchange. The specialist system was designed to supplement the existing market-maker system by introducing an additional brokerage function with the aim of increasing liquidity in the market. The specialist must place firm, competitive buy and sell quotes and fulfil certain obligations (minimum size, maximum spread) for a given period of one year. Furthermore, the specialist can also assume the role of a product provider in certain market segments.

The market segmentation of the Vienna Stock Exchange subdivides the markets according to liquidity and the type of market-making. The following trading segments can be distinguished:

Austrian equity market (AEM)			Austrian growth market (AGM)	ÖTOB market (ÖTOB)		Other securities market (OSM)	Unregulated securities market (USM)	
ATX market (Xetra)	Specialist market (Xetra)	Auction market (Xetra)	Shares (Xetra)	Austrian derivatives market (OM)	CECE derivatives market (OM)	Bonds and other securities (OM*/Xetra)	Warrants market (OM)	Unregulated securities market (Xetra)
Shares			Futures and options		Bonds, warrants and other securities			

\* currently three warrants via the OM System.  
Source: Wiener Börse AG.

A) The Austrian stock market is broken down into the Austrian equity market (AEM) and the Austrian growth market (AGM):

Only Austrian traded index (ATX) blue chip shares (currently 22) are listed on the Austrian equity ATX market. Companies listed in this segment are obliged to prepare their annual accounts according to International Accounting Standards Committee (IASC) standards, the US Generally Accepted Accounting Principles (GAAP), or to adapt the Austrian standards to one of these standards. In addition, they are obliged to set up a link to an electronic medium (ad hoc disclosure) and to produce quarterly reports and a corporate calendar. At least one specialist and two market-makers must be committed to placing buy and sell quotes on a permanent basis.

The requirements for the Austrian specialist equity market are less stringent. Companies are obliged to set up a link to an electronic medium (ad hoc disclosure) and to produce a corporate calendar. Furthermore, one specialist is required; additional market-makers are possible, but not obligatory.

The Austrian equity auction market contains all the remaining shares and participation certificates; this segment does not have any further requirements.

The AGM is a special market segment for small and medium-sized growth companies. It is modelled largely on Deutsche Börse AG's *Neuer Markt*. This segment lists companies with a market capitalisation of at least ATS 500 million (reference value) and realistic growth prospects. In addition, they must issue a minimum volume of €5 million, have at least €1.5 million in stockholders' equity and a free float of 25% or more. One specialist is required; additional market-makers are possible, but not obligatory.

All equities on the AEM and AGM are traded via Xetra.

B) Bonds, warrants and other securities:

Most trading in bonds takes place in the interbank market or involves institutional investors. Government bonds are usually traded over the counter, with only a small proportion traded on the Vienna Stock Exchange. Measures recently taken to increase government bond market liquidity (e.g. an increase in volume) have helped total market turnover to rise significantly. Owing to the increase in volume, the most liquid government bonds are also eligible for trading on EuroMTS, an electronic bond trading platform for European benchmark bonds.

The other securities market (OSM) contains securities which belong to neither of the market segments mentioned above, such as all bonds admitted to the official market, and warrants, dividend right certificates and investment certificates. All these securities are traded via Xetra.

The unregulated securities market (USM) contains all securities admitted to the unregulated market. Shares that do not fulfil the listing requirements for admission to official listing may be traded on the unregulated market of the Vienna Stock Exchange. There are no formal listing procedures. Warrants are traded via the fully electronic trading system by OM systems. All other securities are traded via Xetra.

C) Futures and options (ÖTOB market):

All derivatives of the ÖTOB market are traded via the fully electronic trading system by OM systems. (For further information see Section 4.1.2 below.)

#### 4.1.1.6 Trading system

On 5 October 1999, in co-operation with Deutsche Börse AG, the Xetra system was introduced on the Vienna Stock Exchange's cash and bond markets, replacing the OeKB's EQOS system. Xetra is a screen-based trading system for shares and other securities; this system enables cross-border securities trading.



The following types of securities are traded via Xetra: Austrian shares, Austrian participation certificates, Austrian investment certificates, international shares, international investment fund certificates, profit-sharing certificates and profit-sharing rights, subscription rights and debt securities.

The Xetra system is a platform which provides all market participants with equal access to the market regardless of their location. In Vienna, services such as market control, trading surveillance, fee schedules and rules and regulations are provided by Wiener Börse AG.

Additional benefits offered by the central, open order book include the concentration of liquidity and improved market transparency. Furthermore, additional liquidity is provided by special intermediaries (market-makers and specialists). Low transaction costs are guaranteed by the electronic matching of orders. A more customer-oriented set of order placement rules allows individualised

order specifications in terms of validity and type of execution. The new trading system is linked to an integrated clearing and settlement system.

When Xetra was introduced, the trading hours on the Vienna Stock Exchange were extended from 8.30 a.m. to 5.30 p.m.

In general, orders of any size may be traded through Xetra, as the minimum trading lot is one unit. All orders are anonymous, meaning that trading participants cannot see who places an order or a quote in the order book. Xetra offers a wide range of options for individualised order specification.

#### 4.1.1.7 Trading procedure and types of trading

The Xetra market model for the Vienna Stock Exchange supports continuous trading with several auctions as well as trading with only one auction per trading session.

<p><b>AUSTRIAN EQUITY MARKET</b></p> <p><b>ATX market</b></p> <ul style="list-style-type: none"> <li>• Opening auction</li> <li>• Continuous trading</li> <li>• Intraday auction</li> <li>• Continuous trading</li> <li>• Closing auction</li> </ul> <p><b>Specialist market</b></p> <ul style="list-style-type: none"> <li>• Opening auction</li> <li>• Continuous trading</li> <li>• Closing auction</li> </ul> <p><b>Auction market</b></p> <ul style="list-style-type: none"> <li>• One auction per trading session</li> </ul>	<p><b>AUSTRIAN GROWTH MARKET (AGM)</b></p> <ul style="list-style-type: none"> <li>• Opening auction</li> <li>• Continuous trading</li> <li>• Closing auction</li> </ul> <hr/> <p><b>OTHER SECURITIES MARKET (OSM)</b></p> <ul style="list-style-type: none"> <li>• One auction per trading day</li> </ul> <hr/> <p><b>UNREGULATED SECURITIES MARKET (USM)</b></p> <ul style="list-style-type: none"> <li>• One auction per trading day or</li> <li>• Opening auction</li> <li>• Continuous trading</li> <li>• Closing auction</li> </ul>
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Source: Wiener Börse AG.

#### Auction:

With auctions, the liquidity available in a security is concentrated at a specific point in time. An auction consists of the call phase, the price determination phase and the order book

balancing phase. Prices are determined according to the principle of executing as many orders as possible. The auction price is the price at which the largest volume of orders can be executed and the fewest are left unfilled. The order book is open

during the call phase. An indicative price or the best buy/sell limit is quoted in order to inform market participants of the market situation. An auction schedule is published to announce the times at which specific securities are to be called.

Continuous trading:

Continuous trading starts after the end of the opening auction. In Xetra, each order is first entered into an electronic order book in which buy and sell orders are displayed opposite each other. In continuous trading, the order book is open, showing aggregate order volumes along with applicable limits. As soon as buy and sell orders are matched, they are executed automatically by the system. The advantage of continuous trading is that trades can be concluded at any time without the need to wait for an auction. The market-makers and specialists at the Vienna Stock Exchange guarantee that firm buy and sell quotes are entered into the system continuously, thus increasing the liquidity of the market.

Routing orders via Xetra:

Xetra trading at the Vienna Stock Exchange is open only to institutions admitted to trading on the exchange, such as banks and their representatives (dealers). The dealer responsible enters all investors' orders in the electronic order book. The system automatically checks whether a matching order is available on the opposite side of the order book and whether the order can be executed. If none match, the order remains in the order book.

Exchange data provided by Wiener Börse AG: Wiener Börse AG supplies real-time and historic data on prices, trading volumes and indices generated on the Vienna Stock Exchange in the Xetra and OM trading systems. All data include all indications and estimated prices on the official and semi-official markets, the unregulated market and the ÖTOB market of the Vienna Stock Exchange.

Furthermore, the installation of the "profit line" online database system enables the provision of information on bonds, investment funds and equities to facilitate access to yield curves, price and performance indices, company profiles, stock

exchange indices, stock exchange performance and turnover.

#### 4.1.1.8 Risk management

Specific risk management procedures, e.g. admission requirements, the daily marking-to-market evaluation of positions, collateral requirements, are in place.

Every member of the Vienna Stock Exchange must provide collateral calculated on the basis of all pending stock exchange transactions, taking into account the developments in prices and the volatility of the respective securities. (This collateral is referred to as an *Arrangementkaution*.) The collateral is used to cover any shortfalls on the part of a defaulting member. Collateral requirements for stock exchange trades are calculated by the Vienna Stock Exchange on a daily basis and reflect the total financial risk to which each participant is exposed by its open trades (see also Section 4.3.1.8).

### 4.1.2 Vienna Stock Exchange – derivatives trading

#### 4.1.2.1 Legal basis and ownership structure

In December 1997 the former Austrian Futures and Options Exchange (ÖTOB AG) was merged with the cash market of the Vienna Stock Exchange to form Wiener Börse AG. This part of the Vienna Stock Exchange is responsible for the trading and settlement of standardised derivatives business in Austria.

Generally, the Rules of the Stock Exchange as well as the BWG are applicable. Other relevant rules and regulations (specified by Wiener Börse AG) include the rules for trading and clearing, contract specifications, position limits, margin calculation, market-making, general clearing, fee structure and other agreements.

#### 4.1.2.2 Membership

The Vienna Stock Exchange's ÖTOB market is open exclusively to carefully chosen clearing

members. It is the counterparty to all transactions, as buyer to the seller and vice versa, and therefore guarantees all transactions. Trades from an exchange member who might not be a clearing member, i.e. an NCM, must be cleared through a general clearing member. There are two different types of member of the clearing house:

- **General Clearing Members:** GCMs may clear for own transactions, customer transactions and in general for any other exchange member transactions and/or those of NCMs. The financial requirements for a GCM are significantly higher than for a normal DCM.
- **Direct Clearing Members:** DCMs of the clearing house may clear for own transactions and for customer transactions. They are not allowed to clear for NCMs.

#### 4.1.2.3 Products traded

The Vienna Stock Exchange's ÖTOB market provides clearing for all standardised derivative products in the three market segments, i.e. the stock market, the index market and the bond market. All contracts are cleared according to the different product specifications. These specifications naturally require different systems, settlement procedures and handling. This allows for a flexible treatment of the different trading periods in these market segments.

The product range traded on the Vienna Stock Exchange's ÖTOB market includes:

- a) Austrian derivatives: futures and options on the ATX, ATX stock options.
- b) CECE derivatives (CECE index family): futures and options traded on the CTX, HTX, PTX, STX, RTX and RDX. The CECE index family comprises traded indices of the major blue chips in the Czech Republic (Czech Traded Index, CTX), Hungary (Hungarian Traded Index, HTX), Poland (Polish Traded Index, PTX), Slovakia (Slovak Traded Index, STX), Russia (Russian

Traded Index, RTX, and the Russian Depository Receipts Index, RDX) and a benchmark index for the whole region (CECE Index).

The indices have served as the basis for futures and options trading on the Vienna Stock Exchange since spring 1997. They have been published since July 1996. One of the main targets for the establishment of the CECE indices is the opportunity to trade different markets on a single trading platform in a single currency. All indices are calculated in US dollars, which is the predominant currency for the valuation of international portfolios. The HTX, CTX, PTX and STX are also available on a local currency basis.

#### 4.1.2.4 Trading system

**Types of order:** Orders for futures and options can be specified according to position (long, short), option series (underlying), exercise price, option type (call or put), expiry date, price limits and number of contracts.

The various types of order can be differentiated on the basis of their composition (and size), the prices quoted and their treatment in the order book. On the basis of the price quoted, a distinction is made between limit orders and market orders. Market orders must be specified on the basis of their execution type (fill or kill, immediate or cancel). Limit orders can also be specified on the basis of the time of validity (rest of day, good till expiration, good till date).

Trading in futures and options on the Vienna Stock Exchange is conducted via a fully electronic trading system developed by OM which permits the immediate and swift execution of transactions. For each listed derivative instrument, at least three market participants have committed themselves to acting as market-makers and to quoting binding bid and offer prices. Permanent quotes are entered for all major futures maturities and options series; bid and offer quotes are entered for the remainder upon a quote request. The orders entered into the trading system are

ranked according to time and price and are executed if matched.

### 4.1.3 NEWEX

New Europe Exchange (NEWEX), a jointly owned subsidiary of Deutsche Börse AG and Wiener Börse AG, was opened in Vienna in November 2000. It is an exchange dealing exclusively with central and eastern European securities and offers international investors easy access to the highly dynamic economic region of central and eastern Europe. As a regulated, high-quality market for securities from the entire region, NEWEX bundles liquidity, making it the central trading and financing platform for international market participants and issuers.

NEWEX operates on the tried and tested Xetra platform. Clearing and settlement is performed by Clearstream. To ensure transparency, high corporate reporting standards are a key mark of quality, as NEWEX requires stringent admission criteria on the basis of private law contracts with listed companies, as well as regular disclosure of corporate information. NEWEX is also open to further co-operation projects and partnerships with the exchanges of central and eastern Europe, with the aim of fully exploiting the available synergy potential.

## 4.2 Clearing

Austria has no independent clearing house. Post-trade and pre-settlement clearing services which are performed in connection with the settlement procedures (and not in a separate clearing entity) are described in the following section.

## 4.3 Settlement

The OeKB runs the CSD (referred to in German as *Wertpapiersammelbank* (or WSB)), i.e. an automated settlement system for over-the-counter (OTC) transactions known as the Direct Settlement System (DS) and for stock exchange transactions (a clearing system referred to in German as an *Arrangement*); this system is described in Section 4.3.1.

The clearing and settlement of transactions in futures and options on the Vienna Stock Exchange is an integral part of the latter's fully electronic market system (see Section 4.3.2).

### 4.3.1 Settlement and clearing of OTC and stock exchange transactions

#### 4.3.1.1 The OeKB as a central securities depository

In 1872 the Wiener Giro- und Cassenverein was founded as the first institution in the world to offer CSD services. It was followed in 1965 by today's CSD operated by the OeKB.

The OeKB is a specialised bank and acts as a financial and information service provider for the export industry and the capital market. It is a joint stock company (*Aktiengesellschaft*) under Austrian law; its shareholders are mainly domestic commercial banks. The OeKB is a private-sector entity and is organised on a for-profit basis.

By way of a decree dated 9 April 1965, the Federal Ministry of Finance, together with the Federal Ministry of Justice, granted the OeKB the function of Austrian CSD. The basis for the securities deposit business is the Securities Deposits Act (*Depotgesetz*).

According to the Securities Deposits Act of 1969, as amended, all securities are held in collective safe custody, which enables the depository to hold the securities of different owners in collective safe custody without the need to segregate the securities and put them into separate safe custody for each owner. All holders of a certain category of securities are co-owners in relation to their holdings. The CSD provides a broad range of custody and settlement services. Deposit information includes regular credit and debit notes and quarterly statements. These agreements provide for reconciliation every time a transaction is performed and for monthly statements of account.

The rights and obligations pertaining to the CSD are regulated by the Securities Deposits

Act and the CSD's general terms and conditions of business.

#### 4.3.1.2 Relevant regulations

Austria does not have a specific law which regulates securities transactions in a comprehensive way. Instead, various laws provide the legal basis. The following legal texts contain provisions on securities trading and settlement:

- BWG 1993: obligation to obtain a licence for securities trading; securities and custody business is entrusted to banks exclusively.
- Securities Deposit Act: provisions regarding the custody of securities and the safeguarding of the owner's rights.
- Regulation issued by the Federal Minister for Justice: designation of the OeKB as the CSD.
- General Terms and Conditions of Business.

Following an amendment of Austrian insolvency laws in August 1997, the "zero hour" rule was repealed and the settlement of securities transfers is now final. The Directive on settlement finality was implemented in Austrian Law in July 1999.

The OeKB developed the DS for off-floor transactions and securities transfers; it went into operation in March 1991. It consists of an automatic accounting and settlement system for securities transactions which are not channelled through the stock exchange settlement system and a securities transfer system which can be accessed by users via an electronic network. The use and the operation of the DS is governed by the stipulations of the business terms of the CSD.

Clearing and settlement of all transactions concluded at the Vienna Stock Exchange is conducted by the OeKB as the clearing agent authorised by Wiener Börse AG. The OeKB's

clearing desk (*Arrangementbüro*) was set up in 1949 by virtue of a decree of the Vienna Stock Exchange Council. All securities admitted to official trading or to the semi-official market on the Vienna Stock Exchange participate in this clearing system; thus, all transactions executed are usually settled in accordance with the Rules for the Clearing of Trades on the Vienna Stock Exchange. The clearing rules and the business terms of the Austrian CSD are relevant to the clearing procedure.

#### 4.3.1.3 Supervision

The CSD is part of the OeKB, a bank which is subject to Austrian banking regulations. Its banking licence was granted by the Federal Ministry of Finance. The OeKB is supervised by the Federal Ministry of Finance, which is the regulatory authority for credit institutions in Austria and responsible for their supervision.

The Federal Ministry of Finance, as the competent banking supervisory authority, acts in close co-operation with the OeNB. The Ministry of Finance exchanges information with the OeNB on a regular basis in what is known as the Expert Commission. Under the NBG, the OeNB may request information from the OeKB, but does not undertake regular oversight. With a view to sustained financial market stability, however, the OeNB has a vital interest in the smooth settlement of transactions.

The newly created Austrian Securities Authority is in charge of market supervision and monitors the proper conduct of trading on the Vienna Stock Exchange.

#### 4.3.1.4 Participation in the system

Every CSD deposit holder with the necessary electronic facilities is entitled to use the DS. Credit and other financial institutions as defined by the EC Directive on investment services, brokers at the Vienna Stock Exchange, foreign CSDs and clearing institutions may become participants in the Austrian CSD. Applicants must provide a written application stating their business intentions and

expected volumes, and a copy of their latest annual report. They are also required to be subject to financial supervision within their home country.

The CSD currently maintains links with the following CSDs for all types of securities: Clearstream (Frankfurt, Luxembourg), Necigef (Amsterdam), SIS (Zurich), Euroclear (Brussels), Sicovam SA (Paris), Keler (Budapest) and Monte Titoli (Milan). The CSD plans to establish further links with other EU SSSs. Securities transactions via links are based on similar rules to domestic procedures.

Furthermore, the CSD maintains links with foreign depositories for its foreign holdings. The Austrian CSD acts as depository for Euroclear in respect of all Austrian bonds. All securities admitted by the Euroclear system are transferable to the CSD.

Participation in stock exchange clearing is limited to, and mandatory for, all stock exchange members (banks and non-official brokers) and the official brokers. Every participant must maintain a cash account with the OeKB to settle all financial transactions occurring in the course of settlement.

#### 4.3.1.5 Types of transaction

DS supports settlement of the following types of transaction:

- DVP (*Lieferung gegen Zahlung*; LZ): A DVP transaction is a securities transaction concluded between two DS users against payment of an agreed and fixed sum.
- Direct transaction (*Direktgeschäft*; DG): A DG is a securities transaction concluded between two DS users at a given price. (This procedure is similar to the DVP transaction, but includes accrued interest.)
- Securities transfer (*Wertpapierübertrag*; WU): A WU is a transfer without payment of the counter-value.

To provide collateral for monetary policy operations, the Austrian CSD system is used for the transfer of securities from the securities accounts of counterparties to the OeNB's security account with the OeKB. The main task of the CSD is to ensure that the securities are pre-deposited in the OeNB's securities accounts with finality. All these transactions are FOP deliveries effected through book entries.

#### 4.3.1.6 Cash settlement

The cash settlements required in the course of securities administration are effected via the current accounts which each Austrian CSD participant must hold with the OeKB. Furthermore, CSD participants may hold cash accounts with the OeNB. The participants can decide whether the transaction is to be settled in commercial bank or central bank money. The OeKB has established a fully automated interface with the OeNB's Austrian TARGET component system, ARTIS. The direct link between the OeKB's DS and the Austrian RTGS system, ARTIS, has been operational since January 1999. The OeKB is able to provide intraday settlement of the cash leg in central bank money. Intraday DVP operations in central bank money are also possible with this link.

#### 4.3.1.7 Settlement procedures

In January 1999 the OeKB increased the number of settlement cycles for FOP instructions to five, and same-day settlement is now possible until 5 p.m. Settlement is effected in batches at 7 a.m., 11 a.m., 1.30 p.m., 3.30 p.m. and 5 p.m. There are three settlement cycles for DVP instructions. After conclusion of the settlement cycle for securities and funds transfers, both become final simultaneously. The timing of finality is the same for all types of securities and currencies settled.

This provides a facility for settling operations with intraday finality based on the basis of multi-batch processes. Settlement occurs daily for all types of securities. In exceptional circumstances it would be possible to extend the cut-off time.

Furthermore, the OeKB plans to upgrade its system with a new settlement system based on RTGS procedures by 2001, thus allowing real-time DVP.

In the case of direct transactions and DVP transactions, both parties must enter the details of the transaction using an input device approved by the CSD. (In the case of securities transfers, the assigning party enters the data.) Direct and DVP transaction data which have been entered but not yet matched will remain directly accessible to the DS user who enters them by the value date. This means that they can still be unilaterally corrected or cancelled.

Direct and DVP transactions with matching trade details input by the buyer and seller will be released for further settlement. The parties can only cancel matched transactions by mutual agreement.

On the value date, the CSD debits the ordering party's deposit and credits the beneficiary's deposit. The CSD will carry out orders only if the ordering party's deposit has a sufficient credit balance.

The CSD's operating hours are from 8 a.m. to 6 p.m. from Monday to Friday. The CSD has fully harmonised its operating hours with TARGET opening hours (and with the OeNB's requirements for the Austrian RTGS system, ARTIS). In the event of an emergency, the CSD may extend its operating hours to meet market requirements.

The Securities Information Clearing and Settlement System (SICS) is used to clear and settle transactions on the Vienna Stock Exchange within the clearing and settlement system (*Arrangement*). SICS uses the transaction data delivered by the Xetra system for fully electronic settlement. In this manner, SICS supports the clearing procedure within the clearing and settlement system.

Data on transactions are collected directly when deals are closed and are automatically fed

from the Xetra system into the settlement system, with a further interface with the CSD system where most securities transfers are administered. With the integration of the trading systems and the settlement system with the CSD, full data integrity from the moment of the order entry procedure at the bank to the moment of book entry in the CSD system is achieved. Therefore, SICS makes it possible to minimise settlement risk.

Real-time electronic trading information can be made available to and processed by bank IT systems. The operating hours of SICS are between 8 a.m. and 8.30 p.m. on stock exchange business days. The transfer is compatible with the most modern data transmission techniques. Conventional sources of error can now be eliminated since data are transferred directly from the OeKB's central settlement system to a bank's in-house system without any additional processing.

The clearing and settlement system is based on a rolling settlement procedure with daily settlements on a T+3 basis.

The settlement procedure offers both full collateralisation of exposures and settlement security, while optimising capital employment by means of "netting positions". The members of the Vienna Stock Exchange can net all buy and sell transactions for settlement purposes. Prompt and detailed information guarantees cover ideally matched to exposure. As information is prompt and comprehensive, 99.7% of transactions are settled on time, the international benchmark being 96%.

Owing to the netting effect that goes along with the pooling character of the clearing and settlement system, DVP arrangements apply to the net balances per category and the net balance of the cash sides of all trades in all categories. It is guaranteed that participants will only be paid if they are able to deliver the required balances of the individual securities and vice versa. Netting arrangements are based on Austrian civil law. There is an explicit

recognition of the enforceability of netting agreements in the Austrian insolvency laws.

The CSD's terms of business do not allow pre-deliveries or pre-funding. Generally, settlement will be performed only if securities and cash are available on the accounts of the respective parties to a transaction (bilateral settlement). In the case of the settlement of trades on the Vienna Stock Exchange, all transactions contracted for a given value day will be settled in one batch and netting in respect of securities and cash will take place on a multilateral basis.

A further service is Custody Clearing Link Deutschland (CCLD), with the OeKB offering the clearing and settlement of trades executed in Xetra Frankfurt on cash and safekeeping accounts with the OeKB.

#### 4.3.1.8 Risk management

The DS is a mere execution system, i.e. it simply executes the orders, without any possibility of interference on the part of the system.

The CSD's terms of business do not allow pre-deliveries or pre-funding. Generally settlement will only be performed if securities and cash are available in the accounts of the respective parties to a transaction (bilateral settlement). If a participant does not provide the required amount of cash or securities for whatever reason, the relevant transaction will be separated and postponed for settlement in the next batch. This postponement may be repeated for three days. On the fourth day the transaction will automatically be eliminated from the DS.

To avoid unwinding as a result of securities shortage, the Austrian CSD – acting as an agent – offers a securities lending and borrowing programme. After admittance to this programme, which is conducted by the Austrian CSD, the participant declares itself willing to join the securities lending and borrowing programme as an occasional or automatic lender or as an occasional borrower. The borrower must provide full collateralisation

amounting to 120% of the borrowed bonds and 150% of the borrowed shares. The amount of collateral will be reviewed and is enforceable. Collateral can be supplied either in cash or in securities.

In the case of stock exchange trades, every member of the Vienna Stock Exchange must provide collateral, which is calculated on the basis of all pending stock exchange transactions, taking into account the developments in prices and the volatility of the respective securities (clearing collateral known as an *Arrangementkaution*). This collateral is used to cover any shortfalls on the part of a defaulting member. Collateral requirements for stock exchange trades are calculated daily by the Vienna Stock Exchange and reflect the total financial risk to which a participant is exposed by its open trades. Collateral can be supplied either in cash or in securities. The CSD must check that the required amount is deposited in the relevant collateral accounts.

Should one of the participants fail to provide the necessary securities or cash, the shortfall will be supplied by using the collateral of the respective participant pursuant to the Vienna Stock Exchange's terms of business for clearing and settling its trades (*Arrangementordnung*).

#### 4.3.1.9 Operational reliability

The Austrian CSD operates with systems support, auditing and backup systems. The OeKB has implemented a set of contingency handling procedures and a disaster recovery plan. Two EDP centres are available at different sites, equipped to allow resumption of full operations within approximately three hours, even in the event of a severe breakdown. The procedures developed by the OeKB/the CSD are audited and approved by the OeKB's internal audit unit. Furthermore, external audits are performed.

The SWIFT network is used for the message-based exchange of settlement information.



### 4.3.2 Settlement and clearing of standardised derivative products

#### 4.3.2.1 Relevant regulations

The clearing of future and options contracts concluded on the Vienna Stock Exchange is an integral part of the fully electronic market-place system (see Section 4.1.2). The Vienna Stock Exchange's derivatives exchange is responsible for the trading and settlement of standardised derivatives business in Austria.

As a neutral clearing house, the Vienna Stock Exchange guarantees the fulfilment of transactions in derivatives and also requires clearing members to deposit margins for all binding positions (futures and short positions in options). The Vienna Stock Exchange maintains principal, agent and market-maker accounts. The OeKB runs margin and clearing accounts for euro-denominated instruments, and Euroclear runs accounts for US dollar-denominated instruments.

Generally, the Rules of the Stock Exchange as well as the Austrian Banking Act are applicable. The rules and regulations of the derivatives exchange consists of extracts from the Stock Exchange Act and the Rules of the Stock Exchange, rules for trading, rules for clearing, contract specifications, position limits, margin calculation, effects of capital measures, market-making, general clearing, fee structure and other agreements.

#### 4.3.2.2 Participation

The Vienna Stock Exchange clears exclusively for carefully chosen clearing members. The clearing house is the counterparty to all transactions and therefore guarantees the fulfilment of transactions in derivatives.

Trades from an exchange member who might not be a clearing member, i.e. an NCM, have to be cleared through a GCM. (For types of membership, see Section 4.1.2.2.)

#### 4.3.2.3 Types of transaction

The Vienna Stock Exchange provides clearing for all standardised derivative products in the three market segments, i.e. the stock market, the index market and the bond market. All contracts are cleared according to the particular product specifications. These specifications naturally require different systems, settlement procedures and handling. This allows for a flexible treatment of the different trading periods in these market segments. For the current range of products, see Section 4.1.2.3.

#### 4.3.2.4 Clearing procedures

The OM in operation at the Vienna Stock Exchange is a real-time clearing system which is fully integrated with the exchange system. The transaction transport mechanism enabling the integration is the OMnet network. OMnet is also the external network used for members to access the exchange and clearing house via the respective user devices. Information on accepted and matched trades is received over OMnet in real time on a transaction basis from the market-place system.

The clearing system consists of several sub-systems, e.g. the SE system, which is the bookkeeping system of the derivatives market. All payment transactions within a market are booked on a daily basis in the SE sub-system. On the settlement day a file with all relevant booking instructions is sent to the custodian bank electronically, which subsequently processes the booking instruction automatically.

The clearing procedures reflect the market structure of the clearing system, i.e. procedures for every market segment. The main operational phases at the Vienna Stock Exchange are those of reconciliation (8 a.m. to 8.30 a.m.), trading (9 a.m. to 5.30 p.m., CECE markets 9 a.m. to 5 p.m.), exercises (5.45 p.m. to 6 p.m.; from 5.45 p.m. to 6.30 p.m. on the expiration day) and after-business functions.

The first operation on an exchange day is the reconciliation of settlements and margins to

make sure that the clearing results are consistent. As the instructions are sent automatically to the bookkeeping system too, the completeness and consistency of all settlement transactions can be continuously monitored.

The after-business functions include batch procedures, and all relevant clearing information is generated, margin requirements are calculated and the settlement function is performed. After all functions have been processed, the payment data are moved automatically to the SE, where payments and accounting are handled.

The members must pay the amounts outstanding by 8 a.m. at the latest on the next banking day. If a member defaults, the Vienna Stock Exchange will start a specific default procedure, i.e. it will close out positions and call in margins. Thanks to the strict membership selection criteria, this has never happened.

#### 4.3.2.5 Risk management

The heart of the risk management system of the Vienna Stock Exchange is the Risk Valuation System (RIVA), which actually calculates the margin requirements of the clearing members. RIVA analyses the derivatives portfolios of the members and computes the appropriate margin to cover the risk of the clearing house and its members. The system regularly informs clearing members of the actual value of their total position and calculates the collateral requirements. Writers of options and buyers

and sellers of futures must provide collateral. The collateral requirement is updated at least once a day.

#### 4.4 The use of the securities infrastructure by the OeNB

The role of the OeNB in the context of the settlement of securities transactions is restricted to being a market participant and a user of the OeKB systems. With respect to monetary policy instruments, the OeNB uses a pooling system for collateralisation. The eligible counterparties deliver securities into a pool of assets (pre-depositing). In the case of a monetary policy transaction, a global blocking of collateral takes place (without earmarking for individual transactions or collateral). The pool is evaluated daily using marking-to-market procedures. Counterparties may substitute underlying assets on a daily basis.

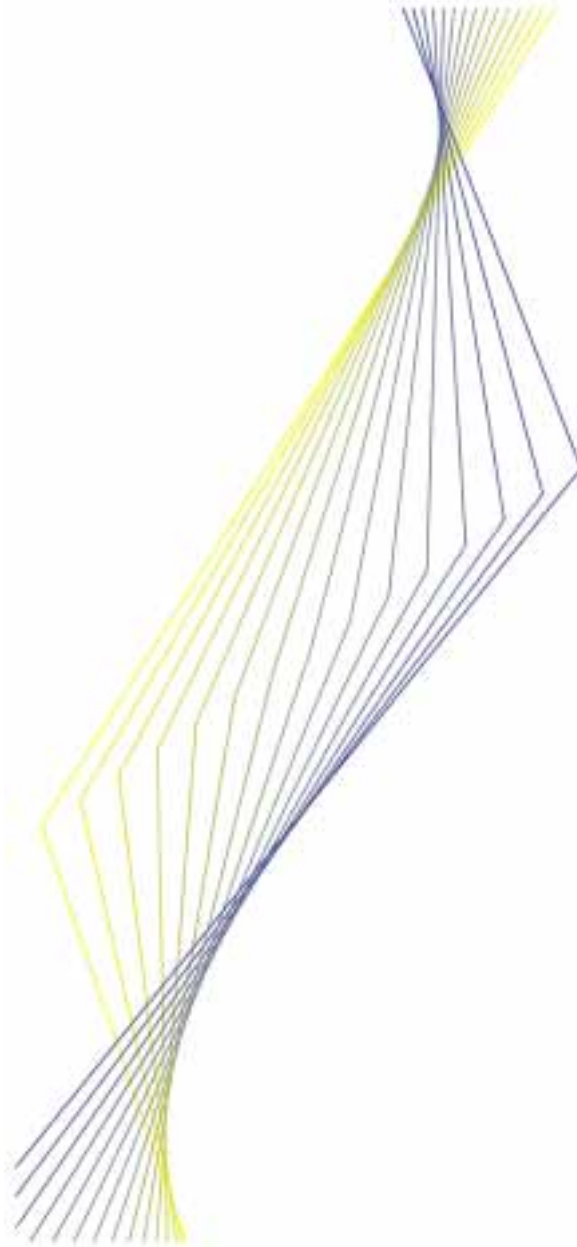
Domestic securities are held in custody with the national CSD at the OeKB. Delivery of collateral can be performed via:

- the OeKB's DS, which is directly linked to the OeNB's in-house system;
- the assessed direct links between the OeKB and Euroclear, Monte Titoli, Necigef, Clearstream and Sicovam SA; or
- the correspondent central banking model (CCBM).

Austria



EUROPEAN CENTRAL BANK



**Portugal**

**June 2001**

Portugal

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## List of abbreviations

<b>ABDP</b>	Oporto Derivatives Exchange Association
<b>ABVL</b>	Lisbon Stock Exchange Association
<b>APB</b>	Portuguese Banking Association – <i>Associação Portuguesa de Bancos</i>
<b>BVLP</b>	Lisbon and Oporto Stock Exchange – <i>Bolsa de Valores de Lisboa e Porto</i>
<b>CCCAM</b>	Central Mutual Agricultural Credit Bank – <i>Caixa Central de Crédito Agrícola Mútuo</i>
<b>CISP</b>	Interbank Co-ordinating Commission for Payment Systems
<b>CMVM</b>	Securities Market Commission – <i>Comissão do Mercado de Valores Mobiliários</i>
<b>IGCP</b>	Public Debt Management Office – <i>Instituto de Gestão do Crédito Público</i>
<b>Interbolsa</b>	Transferable securities centre and nationwide securities settlement and clearing system
<b>LIST</b>	Lisbon Trading System
<b>MEDIP</b>	Special Government Debt Securities Market – <i>Mercado Especial de Dívida Pública</i>
<b>MEOG</b>	Special market for block trading in bonds – <i>Mercado Especial de Operações por Grosso</i>
<b>MOI</b>	Intervention operations market – <i>Mercado de Operações de Intervenção</i>
<b>MMI</b>	Interbank money market – <i>Mercado Monetário Interbancário</i>
<b>MTS Portugal</b>	The company managing the MEDIP trading system
<b>Multibanco</b>	Nationwide ATM and POS network
<b>OEVTs</b>	Primary dealers in Portuguese government securities
<b>PMB</b>	Multi-purpose prepaid card – <i>Porta-moedas Multibanco</i>
<b>PSI-20</b>	Portuguese Stock Index
<b>SDD</b>	Direct debit system – <i>Sistema de Débitos Directos</i>
<b>SEND</b>	Futures and options trading system
<b>SFAC</b>	Credit-purchase financing company – <i>Sociedade Financeiras para de Aquisições a Crédito</i>
<b>SIBS</b>	Interbank Services Company – <i>Sociedade Interbancária de Serviços, SA</i>
<b>SICOI</b>	Interbank clearing system – <i>Sistema de Compensação Interbancária</i>
<b>SICAM</b>	Integrated mutual agricultural credit scheme – <i>Sistema Integrado de Crédito Agrícola Mútuo</i>
<b>SITEME (ex-SISTEM)</b>	Market electronic transfer system – <i>Sistema de Transferências Electrónicas de Mercado</i>
<b>SLOD</b>	Settlement system for other depositors – <i>Sistema de Liquidação de Outros Depositantes</i>
<b>SPGT</b>	Large-value real-time gross settlement system – <i>Sistema de Pagamentos de Grandes Transacções</i>
<b>TEI</b>	Electronic funds transfer system – <i>Transferências Electrónicas Interbancárias</i>
<b>UNICRE</b>	Portuguese interbank credit card organisation

## Introduction

Payment systems in Portugal have undergone considerable change in recent years. Extensive interbank co-operation has facilitated the swift development of modern systems based on the automated processing of payment instructions. In addition to systems that have been operating for a number of years, such as automated clearing systems for cheques and bills of exchange, an electronic funds transfer system (TEI) and a multi-purpose prepaid card scheme (PMB), a new direct debit system (SDD) was finally implemented in October 2000 (see Section 3.3.4.3).

The Banco de Portugal, a public law entity which is legally responsible for the regulation and oversight of payment systems, has lent its full support to the modernisation of the Portuguese payment industry. The large-value RTGS payment system (*Sistema de Pagamentos de Grandes Transacções*; SPGT) became fully operational on 30 September 1996. In view of Stage Three of EMU, the Banco de Portugal then worked on connecting the SPGT to the TARGET system.

In the 1990s, the securities markets and settlement systems underwent significant change. Since January 1999, the new integrated market electronic transfer system of the Banco de Portugal, SITEME (see Section 4.3.1), has been processing money market operations. There were also extensive developments regarding trading. In 1996, the derivatives market started operating and, in 1999, the options market was launched with a new trading system for futures and options (see Section 4.1.1.6). In 1999, the Lisbon and Oporto stock exchanges merged to form a single stock exchange, the Lisbon and Oporto Stock Exchange (*Bolsa de Valores de Lisboa e Porto*; BVLP – see Section 4.1.1), using the new Lisbon Trading System, LIST (see Section 4.1.1.4). Most recently, in 2000, a new company, MTS Portugal, began managing the electronic trading system for the Special Government Debt Securities Market (*Mercado Especial de Dívida Pública*; MEDIP) (see Section 4.1.2).

In 1997, the Banco de Portugal set up an Interbank Co-ordinating Commission for Payment Systems (CISP) for the purpose of promoting the development, standardisation and use of interbank payment instruments and payment systems (see Section 1.2.1).



## I Institutional aspects

### I.1 The general institutional framework

The opening-up of the banking sector to private investors in 1983 and the partial privatisation of state-owned banks initiated in 1989 provided strong impetus towards diversification, modernisation and competition in the financial system. The prospect of the Single Market and the establishment of an increasing number of foreign banks in Portugal led to the growth of new market sectors.

Since 1986, legislation has been passed aimed at harmonising Portuguese national law with that in force in the EU. It has focused, inter alia, on the following aspects: the definition of credit institutions; rules for granting and revoking licences to establish credit institutions; rules for the operation and supervision of credit institutions; solvency and liquidity ratios; and the promotion of competition.

The creation of the Single Market led to further changes induced by the need for legal harmonisation. These changes included the regulation of the types of credit institution and financial company and their activities (Decree-Law No. 298/92) and the liberalisation of capital flows (Decree-Law No. 170/93).

The Stock Exchange Market Code of 10 April 1991 provided for the liberalisation and privatisation of stock exchange operations, while the Banco de Portugal continued to be the settlement agent for clearing and settlement through a single national system.

The main objectives of the new Code, published on 13 November 1999, included simplifying and modernising the original Code, incorporating several European Community Directives and responding to the need for stock market integration and internationalisation.

Owing to the nature of their activity, credit institutions and financial companies are the main

providers of payment services. This activity is explicitly recognised in regulations established by the Government and by the central bank in its role as the monetary authority.

Decree-Law No. 298/92, which regulates credit institutions and financial companies, stipulates that credit institutions are institutions, the activity of which consists in, inter alia, taking deposits or other repayable funds from the public and granting credit on their own account.

On 30 December 1994, a deposit guarantee fund was created, in which all deposit-taking institutions participate (except for the mutual agricultural credit institutions belonging to the integrated mutual agricultural credit scheme (SICAM), which have their own guarantee fund), with a view to ensuring the protection of smaller deposit holders and, ultimately, the stability of the financial system.

#### *Financial intermediaries providing payment services*

#### *Credit institutions*

At the end of 1999, the Portuguese banking system comprised 64 banks, six savings institutions and 154 mutual agricultural credit institutions (one of which, the Central Mutual Agricultural Credit Bank (CCCAM), is the coordinating body).

Increased competition has led to the gradual repeal of the previous restrictive regulations governing the activity of commercial and investment banks.

At 31 December 1999, the five largest Portuguese banking groups held approximately 80% of total deposits and Caixa Geral de Depósitos, the largest Portuguese bank, which is wholly owned by the state, held 20%. At the end of 1999, there were 20 branches of foreign credit institutions operating in Portugal, 17 of which were from the EU.

The savings institutions form the financial arm of the mutual associations, and the focus of their activity is on collecting small savings.

At present, CCCAM and all but three of the mutual agricultural credit institutions form SICAM, within which there is a shared responsibility system. CCCAM has the authority to monitor compliance with the applicable prudential ratios and limits.

Moreover, the agricultural guarantee fund, the aim of which is to guarantee the reimbursement of deposits and the financial stability of the mutual agricultural credit institutions, is financed by these institutions, CCCAM and the Banco de Portugal.

#### *The postal system*

The Portuguese postal system comprises 1,070 offices throughout the country and participates in the payment system in two ways: first, as an agent of Caixa Económica Postal, which is a department of Caixa Geral de Depósitos, it offers accounts and payment services; and second, it also provides a specific system, distinct from the banking system, for making domestic and cross-border payments with postal money orders.

#### *Credit card companies*

Credit cards are regulated by Decree-Law No. 166/95 and Notice No. 4/95, which stipulate that only credit institutions or credit card companies are authorised to issue credit cards and to determine the related contractual clauses.

In 1974, UNICRE was set up as a corporation owned by 18 banks to centralise the issue of credit cards. This interbank organisation had the sole right to represent all foreign credit cards in Portugal and was the only organisation authorised to issue domestic credit cards until 1988, when other banking entities were also allowed to do so, albeit through the centralised acquiring network of UNICRE. UNICRE is also the issuer of the Unibanco card, which is linked with Visa at the global level. In May 1991, the Secretary of State to the Treasury announced in a resolution the total liberalisation of the issue and management of credit cards. The number of cards issued independently by credit

institutions currently exceeds the number issued by UNICRE.

## **1.2 The role of the central bank**

### **1.2.1 General responsibilities**

#### *Statutory responsibility*

The Banco de Portugal is part of the ESCB, which was officially established on 1 June 1998 and comprises the ECB and the NCBs of the 15 EU Member States.

Pursuant to the Organic Law of the Banco de Portugal, endorsed by Decree-Law No. 5/98 of 31 January 1998, the Banco de Portugal shall provide for the stability of the domestic financial system by performing the function of lender of last resort and shall be responsible for the supervision of credit institutions, financial companies and other bodies, such as credit card issuing and acquiring companies, regional development companies and foreign exchange offices.

With respect to payment systems, Article 14 of the above-mentioned Organic Law states that it shall be incumbent on the Banco de Portugal to regulate, oversee and promote the smooth operation of payment systems within the scope of its participation in the ESCB.

#### *Establishment of common rules*

The Banco de Portugal prepares regulations and issues instructions regarding the operation of interbank clearing and settlement systems and interbank markets. The existing rules relating to payment systems cover interbank transfers resulting from the automated clearing of cheques and other payment instruments, as well as large-value payments executed through the SPGT.

In 1997, the CISP was set up. This Commission's objectives are to co-ordinate the activities of the interbank working groups, to define the strategies for the development of retail payment systems, to promote interbank co-operation on new products and to regulate and standardise

payment systems. The Commission is composed of representatives from the Banco de Portugal, which chairs it, several commercial banks, the Interbank Services Company (*Sociedade Interbancária de Serviços*; SIBS) and the Portuguese Banking Association (*Associação Portuguesa de Bancos*; APB).

#### *Supervision and audit*

According to its Organic Law, the Banco de Portugal is responsible for monitoring money and foreign exchange markets within the scope of its participation in the Eurosystem. As supervisor, the central bank has the power to establish the rules of conduct to be followed by the entities under its supervision. In performing this function, the Banco de Portugal may take any measures deemed necessary to prevent or halt actions that contravene existing regulations, including those related to payment systems.

### **1.2.2 The provision of processing and settlement facilities**

#### *The provision of settlement accounts*

All participants in the interbank clearing system (*Sistema de Compensação Interbancária*; SICOI), the interbank money market (*Mercado Monetário Interbancário*; MMI) and the large-value RTGS system (*Sistema de Pagamentos de Grandes Transacções*; SPGT) – i.e. the Treasury, credit institutions and financial companies – must hold a single non-interest-bearing current account with the central bank for settlement purposes. The Banco de Portugal is also the settlement agent for stock exchange transactions. Since 1 January 1999, settlement accounts at the Banco de Portugal have been denominated in euro.

The Banco de Portugal is not involved in retail activities, except for certain relatively small-sized transfers from abroad to beneficiaries resident in Portugal (mainly embassies). Therefore, it does not hold accounts for non-financial institutions.

Credit transfers between institutions not participating in the SPGT (see Section 3.2) are carried out using SWIFT, telex or secure fax through SLOD, the settlement system for other depositors (see Section 3.2.2).

Transactions in the MMI and in the Intervention Operations Market (*Mercado de Operações de Intervenção*; MOI) are transmitted via SITEME, which connects the Banco de Portugal with each interbank market participant.

#### *The provision of credit facilities*

Participants in the SPGT have access to intraday collateralised credit between 6 a.m. and 5 p.m. (local time), which has to be reimbursed by the cut-off time for the interbank period (see Section 3.2.7). Other institutions participating in SLOD, though also holding deposit accounts with the Banco de Portugal, cannot be granted intraday credit.

#### *Pricing policies*

The Banco de Portugal's pricing policy is based on the principle of recovering the cost of the banking services it provides.

### **1.2.3 Co-operation with other institutions**

The central bank is involved in co-operation at both a general and an interbank level.

Co-operation with the Securities Market Commission (*Comissão do Mercado de Valores Mobiliários*; CMVM) and the Insurance Supervisory Authority (*Instituto de Seguros de Portugal*) is carried out within the National Council of Financial Supervisors (*Conselho Nacional de Supervisores Financeiros*), established by Decree-Law No. 228/2000 of 23 September 2000 and chaired by the Banco de Portugal. In addition, the deposit guarantee fund, the agricultural guarantee fund, the investors' compensation fund and other entities may be invited to participate in the meetings. The Council's objectives are to co-ordinate the financial system's supervisory activity and to facilitate the exchange of information.

On interbank matters, the central bank co-operates with the APB on the CISP (see Section 1.2.1).

#### 1.2.4 Main projects and policies

As a result of the changeover to the single currency, the Banco de Portugal is involved in co-ordinating interbank co-operation with regard to the introduction of the euro.

#### 1.3 The role of other private and public sector bodies

The main banking institutions are members of the APB, the goal of which is to promote and implement all necessary measures to contribute to the technical, economic and social development of its members' business. The APB is represented on the CISP (see Section 1.2.1).

The Treasury, which plays an important role in the government payment sector as a result of the process of modernisation of the Government's traditional payment system, has adopted the Treasury cheque for making payments because it is an instrument which is fully compatible with the automated interbank data processing systems.

SIBS, which was founded by 26 banks in 1983 (then representing 98% of the retail banking market), is the central operational body of the automated interbank payment system. SIBS has played a central role in all projects related to payment systems, e.g. the common ATM and EFTPOS network, the automated clearing systems, multi-purpose prepaid cards and the SPGT. SIBS is also represented on the CISP.

## 2 Payment media used by non-banks

### 2.1 Cash payments

The legal tender in circulation consists of five denominations of banknotes (PTE 500, 1,000, 2,000, 5,000 and 10,000) issued by the Banco de Portugal, and seven denominations of coins issued by the Treasury (PTE 1, 5, 10, 20, 50, 100 and 200).

At the end of 1999, banknotes accounted for 95% of the stock of currency in circulation, which amounted to PTE 1,458.2 billion (€7.3 billion). The large denominations (PTE 5,000 and 10,000) represented 86% of the total value of banknotes in circulation.

The share of cash in M1 has fallen progressively over the past ten years, from 21.1% in 1992 to 12.5% in 1999, as a result of the increasing use of cashless payment media. The development of ATM facilities for direct payments (i.e. public utility bills, taxes, etc.) and the spread of EFTPOS terminals and multi-purpose prepaid cards suggest that the downward trend in the use of cash is likely to continue.

### 2.2 Non-cash payments

Non-cash payments mainly originate from sight accounts. The number of sight accounts at 31 December 1999 was estimated at 20.6 million, which represented an average of two accounts per inhabitant.

There are no limits regarding the payment of interest on sight accounts. Direct debits are normally free of charge, provided they are effected through an automated system. The issuing of new cheque books is subject to charges. Some banks collect an annual fee for cheque guarantee cards and debit cards. Dormant sight accounts are usually penalised with a maintenance fee. Banks are free to set charges for the services they provide and interest rates paid on sight and time deposits are agreed between banks and individual customers.

The practice as regards value dates is as follows:

- the same working day value date when an account is debited;

- the following working day value date when an account is credited.

The legal framework for non-cash payments is provided in part by the Portuguese Commercial Code, supplemented by the uniform laws on bills, certificates of indebtedness and cheques. By law, the payer's bank cannot invoke the reason "lack of or insufficient funds" for not honouring cheques under PTE 12,500 (€62.3).

Payment cards and cheques are the main payment instruments in terms of volume, accounting for 47% and 34% respectively. However, in value terms, credit transfers are the main instrument (91%), followed by cheques (8%). Direct debits represent 12% of non-cash payments in volume and 1% in value.

### **2.2.1 Credit transfers**

The two main forms of credit transfers – conventional standing orders and variable standing orders – are the most common means of payment used by corporate customers to pay their suppliers and employees. In 1999, 84% of the volume of credit transfers was paperless.

### **2.2.2 Cheques**

Cheques are the second most used payment instrument after payment cards and their usage continues to grow. In 1999, 283.5 million cheques totalling PTE 60,280.8 billion (€300.7 billion) were issued. Cheques represent 34% of non-cash payments in volume terms and around 84% of all issued cheques (cleared and uncleared) are truncated.

### **2.2.3 Direct debits**

Direct debits are also a commonly used instrument, mainly in the larger urban centres, simplifying payment for public utility services (water, electricity, telephone, insurance, etc.). In 1999, the number of direct debits reached 98.6 million with a total value of PTE 5,149.1 billion (€25.7 billion).

## **2.2.4 Payment cards**

### *Debit cards*

The significant increase in the use of debit cards in Portugal over the last decade is linked to the creation of SIBS, in which 34 credit institutions participate (as at the end of 1999), which are nearly all retail banks. SIBS specialises in payment system automation services. At the end of 1999, the number of cards in issue was 10.8 million, compared with 2.4 million in 1990.

Most banks issue edc/Maestro, ec/Cirrus and Visa Electron cards.

Banks began to issue cheque guarantee cards in the mid-1980s. An estimated 0.3 million cards were in issue at the end of 1999. The issuing of these cards is subject to a fee, which varies from bank to bank.

Approximately 0.1 million eurocheque cards were in circulation at the end of 1999. These cards are only issued by some Portuguese banks, which must deal directly with the Eurocheque organisation.

### *Credit cards and travel and entertainment cards*

Credit cards may be issued by banks or by UNICRE (see Section 1.1). In addition to Unibanco, UNICRE represents Visa and MasterCard for a large number of banks under the labels Premier, Classic, Gold and Prestige. The issuer of Amex cards in Portugal is a bank. Some of the cards issued have both credit and debit functions and offer a wide range of additional services, such as travel and personal accident insurance, car rental and discounts with various hotel chains.

At the end of 1999, there were more than 2.5 million credit cards in issue. The total volume of credit card business was estimated to be approximately PTE 1,000 billion (€5 billion), compared with PTE 139 billion in 1990.

Many retailers have their own credit cards, but they delegate the issuance of cards, the

management of credit lines and the assumption of credit risk to credit-purchase financing companies (*Sociedades Financeiras para de Aquisições a Crédito*; SFACs). At the end of 1999, the 207,000 cards issued by these companies had been used for 211,000 transactions amounting to PTE 6.3 billion (€31.4 million).

#### *Retailer cards*

Large retail outlets, car rental companies and petrol companies issue their own in-house cards. At the end of 1999, petrol companies had issued 364,000 cards with an annual volume of 14.6 million transactions for a total value of PTE 88.6 billion (€341.7 million).

#### *Prepaid cards*

The number of prepaid cards issued by Portugal Telecom (the main telecommunications company) and used in payphones reached a total of 6.7 million in 1999.

The Portuguese multi-purpose prepaid card (*Porta-moedas Multibanco*; PMB) came into operation in March 1995.

At the end of 1999, the 228,000 PMB cards in circulation had been loaded 472,000 times with a total of PTE 1.2 billion (€6.1 million) and an average loading value of PTE 2,630 (€13.2), and had been used for five million transactions with an average transaction value of PTE 244 (€1.2).

#### *ATM and POS networks*

In Portugal, there is only one nationwide ATM and POS network called Multibanco, which is operated by SIBS. It is a real-time online system. The national ATM network was implemented in 1985 and this network was subsequently extended to include the EFTPOS terminals. All open-access ATMs operated by any bank can be used by all the customers of other banks. In addition to these shared ATMs, special terminals have been installed inside bank premises. These limited-access machines provide special services to the bank's own customers. Access to

the system is safeguarded by means of magnetic stripe cards and PINs.

At the end of 1999, the number of ATMs installed throughout Portugal (including the limited-access ATMs not operated by SIBS) was 8,850, compared with 821 in 1990. The machines of the six banks which operate their own ATM networks for the exclusive use of their customers totalled 2,019. Withdrawals represented 60.2% of total transactions carried out through SIBS machines, followed by account balance enquiries (32.5%) and other payment services (7.3%). In 1999, in both open and limited-access ATMs, 289 million transactions (cash withdrawals and debit payments) were carried out, compared with 39.2 million in 1990, amounting to around PTE 4,065.6 billion (€20.3 billion). The daily usage rate is 90 operations per machine, including account balance notifications and statements. The SIBS Multibanco network also caters for cash withdrawals made using cards of non-residents through mutual agreements with other international networks (MasterCard/Europay, Visa, Bancontact in Belgium, 4B in Spain, SSB in Italy, CLAU in Andorra and LINK in the United Kingdom). Thus, the holder of a Multibanco card has access to ATMs in other European countries. In 1999, foreigners made 4.9 million withdrawals in Portugal, valued at PTE 108.3 billion (€540.2 million) and Portuguese nationals made 1.7 million withdrawals abroad, totalling PTE 20.2 billion (€137.6 million).

Electronic funds transfers at the point of sale (EFTPOS) are expanding rapidly. At the end of 1999, there were 60,054 points of sale and 81,017 machines, compared with 2,672 in 1990. These registered an annual turnover of PTE 1,757.1 billion (€8.8 billion), as against PTE 45.5 billion in 1990. These turnover figures correspond to 342.5 million operations in 1999, compared with 7.8 million in 1990. New EFTPOS terminals are mainly being installed in retail outlets – especially smaller ones – and at filling stations.

### 2.2.5 Postal instruments

Situated outside the banking system, the postal transfer system (*Serviços Financeiros Postais*) offers an important means of payment, used mainly by the social security authorities to make low-value pension payments, and, on a smaller scale, by companies and individuals. Recently, following a campaign by the social security authorities for the payment of pensions via bank transfer, the issuing of national postal transfers has shown a downward trend. This system benefits from a larger and denser network of branches than the banking network. In 1999, the issuing of national and international postal transfers reached 20.6 million in volume and PTE 727.5 billion (€3.6 million) in value, which represented an average of PTE 35,400 (€176.6) per transfer.

### 2.3 Recent developments

In the mid-1980s, Portugal witnessed rapid developments in the telecommunications field, making it possible to implement teleprocessing networks, both within the larger banks and through interbank links. Interbank co-operation, promoted by the APB together with the central bank, resulted in the creation of the two above-mentioned interbank companies, SIBS (for

automated payment networks) and UNICRE (for credit cards).

Banks have made considerable efforts to modernise customer access to payment services. Online connections with corporate customers, home banking, e-banking and mobile-phone banking are now available in Portugal.

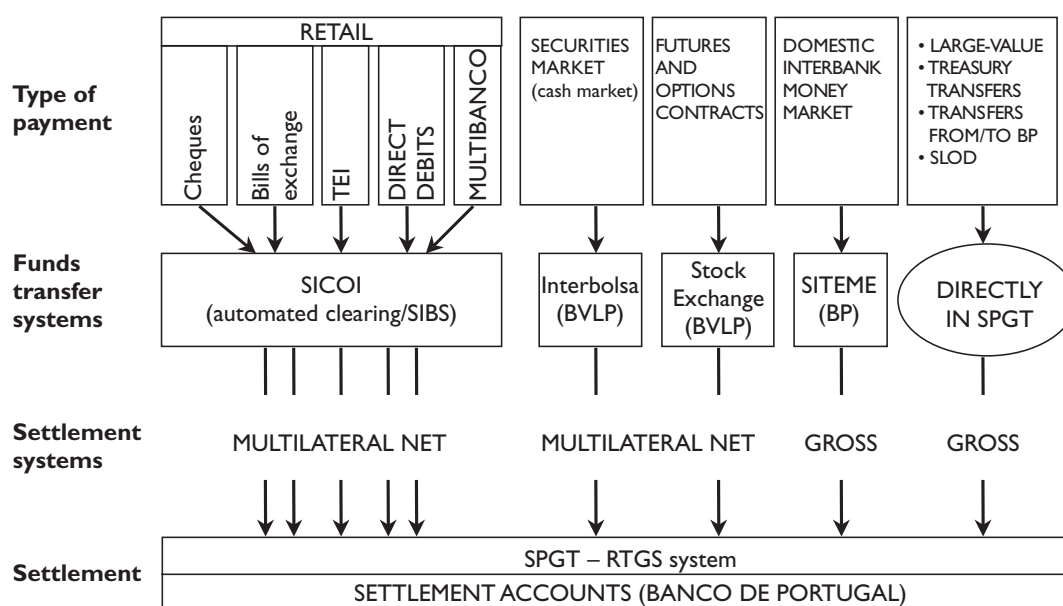
SIBS has been involved in operating the Multibanco network, the PMB scheme (see Section 2.2.4), automated cheque clearing (see Section 3.3.4.1), the TEI (see Section 3.3.4.2), automated bill of exchange clearing (see Section 3.3.4.4) and the new direct debit system SDD (see Section 3.3.4.3).

As regards Multibanco, further developments are envisaged, aimed at providing a wider choice of services through this network. It is already possible to pay for a wide range of services (e.g. train and theatre tickets, taxis, utility bills) and for road tolls using either a debit card or a Via Verde (a magnetic tag placed on a car windscreen identifying the driver's bank account, from which the road toll is debited, thus enabling the driver to pass through toll stations without stopping).

### 3 Interbank exchange and settlement systems

#### 3.1 General overview

**Figure 1**  
Interbank payment systems and securities systems in Portugal



The Banco de Portugal is both the manager and settlement agent for the interbank clearing system and the SPGT.

All banks possess electronic processing (*teleprocessamento*) networks for their inter-branch transactions, enabling the immediate transmission of data between branches and thus making it possible for a customer to access its bank account at any branch of the bank's network.

Payment flows between banks are made by means of settlement accounts held with the central bank or, to a lesser extent, *nostro/loro* accounts. For the exchange of information on interbank payments, banks use either the TEI or traditional means (telex, secure fax, SWIFT network). Debits/credits between institutions are cleared mainly through SICOI systems. The final settlement takes place on the accounts held with the central bank.

SICOI is an automated interbank exchange and settlement system, allowing the indirect channelling of information between banks through a central interface (SIBS), which selects and directs the processed information to the various entities: recipients, drawees and the central bank. This system is based on an online electronic processing system, operational 24 hours a day.

Transactions between institutions on the domestic markets (the MMI and MOI), which are registered on and conducted through SITEME, are settled on a gross basis by the Banco de Portugal, which debits and credits the participants' settlement accounts (see Section 1.2.2).

In mid-1993, the Banco de Portugal, as agreed at the European level, started to implement the SPGT with the direct participation of SIBS and resident credit institutions. In full operation since



30 September 1996, this large-value RTGS system, which was the first to be implemented in Portugal, channels all payments above a predefined amount that were previously processed through the interbank netting systems (see Section 3.3).

On 4 January 1999, the SPGT became part of the TARGET system.

### 3.2 The real-time gross settlement system: SPGT

The SPGT, which became fully operational in 1996, is a system operated and managed by the Banco de Portugal. System communications between participants and the Banco de Portugal are based on the SIBS network with other alternative means (SWIFT and fax/telex) as an emergency backup. The main objectives of this RTGS system are:

- to minimise credit, liquidity and systemic risks; and
- to provide participants with information in the course of the day on the balance of their accounts with the Banco de Portugal and on queuing and other operations that have been carried out.

As such, it constitutes an essential instrument to help participants manage their funds.

#### 3.2.1 Operating rules

The operating rules of the SPGT are laid down in the relevant regulation approved by the Board of Directors of the Banco de Portugal and contractually accepted by the system participants. The SPGT Regulation stipulates the broad outline of the system and the relations and responsibilities of the parties.

The Procedures Manual is also a main reference document for the SPGT and provides the participants with the detailed and practical procedures to be followed in order to ensure that the system functions smoothly.

The System Manual (a non-binding document) aims to provide an overview of the main operational features of the SPGT and a complete description of its components: the message processor, the settlement processor, the SPGT control system and the interfaces with the participants and the Banco de Portugal.

#### 3.2.2 Participation in the system

The following entities may apply for SPGT membership: i) credit institutions authorised to operate in Portugal, according to the law of Portugal and the European Community; ii) public sector bodies accepting deposits or other repayable funds authorised to participate on a case-by-case basis, which frequently initiate or receive large-value transfers involving other participants; and iii) the Treasury. Access is granted provided that the applicants possess the minimum technical facilities required by the system, have signed the SPGT membership contract and have paid the membership fee.

At the end of 1999, the SPGT had 45 participants.

The other 160 financial institutions, which hold deposit accounts with the Banco de Portugal for the main purpose of settling operations in SITEME, which is operated by the Banco de Portugal, are not eligible to participate in the SPGT (namely the mutual agricultural credit banks, which are represented by the CCCAM, and investment, leasing and factoring companies). These financial institutions are integrated into a specific gross settlement system called SLOD, which is a less sophisticated system governed by more restrictive rules (e.g. participants have no access to the SIBS transfer channel and therefore use fax, telex, etc., and cannot be granted intraday credit), although settlement does occur within the SPGT.

#### 3.2.3 Types of transaction handled

The operations described below must be processed via the SPGT, irrespective of their unit value:

- i) settlement of the interbank clearing system balances (cheques, Multibanco, TEI, direct debits, bills of exchange), stock exchange clearing balances and certain other operations;
- ii) money market operations contracted and processed via SITEME; contracting and repayment of operations; and
- iii) operations carried out with the Banco de Portugal (excluding SITEME operations).

The following operations must be processed via the SPGT, provided that their unit value is equal to or more than €500,000:

- i) interbank transfers between participants (including transfers on behalf of customers) with a value date that falls within the two subsequent working days; and
- ii) settlement of large-value cheques (equal to or more than the above-mentioned limit).

Alternatively, other operations between participants with the same value date and a unit value of below €500,000 may be processed via the SPGT before the TEI's second cut-off (see Section 3.3.4.2). However, this will be subject to a penalty rate if the value is less than €100,000.

Credit transfers ordered by participants in the SPGT in favour of non-participants (but which are SLOD participants) must be channelled via the SPGT irrespective of their unit value.

Operations are also processed via the SPGT, regardless of their unit value, when related to the following:

- i) TARGET cross-border transfers;
- ii) transfers ordered in favour of other Banco de Portugal depositors not participating in the SPGT (SLOD participants); and
- iii) credit entries resulting from transfers ordered by other Banco de Portugal depositors in favour of SPGT participants.

### 3.2.4 Operation of the transfer system

The strategy behind implementing the SPGT was to open a communications highway between the Banco de Portugal and the system participants for the purpose of transmitting payment orders and settlement confirmations, while keeping the processing of the central bank's operating systems largely as it was at that time. Special interfaces were set up between the operating system of the Banco de Portugal and the SPGT.

The information system of the SPGT was based on the following principles:

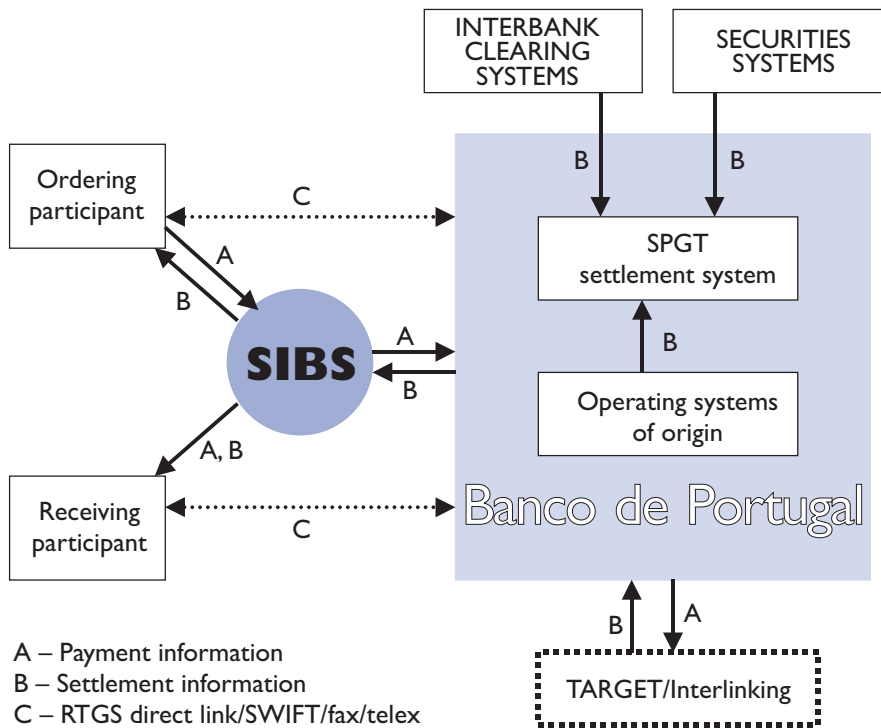
- The creation of a new internal system at the Banco de Portugal for the continuous management of depositors' positions, which featured specific facilities enabling the operational departments of the Banco de Portugal to enter operations directly, if necessary. This settlement system constitutes the heart of the SPGT.
- The development of a new system based essentially on the infrastructure of the SIBS (as a communications network). This system is intended to channel details of large-value payments made by SPGT participants to the Banco de Portugal and to send back the relevant confirmations or rejections, i.e. confirmation of settlement in each participant's account.
- Non-interference with the interbank and stock exchange clearing systems in operation, performing the simple reception and handling of the respective clearing balances.
- The maintenance of the other peripheral systems operating within the Banco de Portugal – SITEME, the foreign exchange system, etc. – together with the implementation of automated interfaces between these systems and the SPGT.
- The creation of an interactive enquiry facility that would allow SPGT participants

to consult their positions online, using a direct link to the Banco de Portugal (not compulsory).

The SPGT (see Figure 2) mainly comprises the following components: the SPGT communications system (between the Banco de Portugal, SIBS and the participants) and the SPGT settlement processing system. The latter is not only made up of the continuous position accounting system, but also of the sub-system which incorporates the

processing of payment orders channelled via the SIBS, the settlement of orders received from the Banco de Portugal operating systems, the queuing of operations and the SPGT control system. The set of interfaces used to link the internal operating systems, the securities settlement systems (SSSs) and the interbank clearing systems to the SPGT settlement processing system, as well as the cross-border Interlinking component, complete the SPGT.

**Figure 2**



The Banco de Portugal built a direct online link, which is independent from the SIBS communications structure, between the central bank settlement system and the participants in the SPGT. This alternative information channel provides participants with full details of the settled operations, the queuing operations, the operations with a subsequent value date, the balance on the settlement account and the amount of intraday credit granted.

As far as SPGT participants are concerned, the SIBS developed a standard front-end Treasury Management Application to act as an interface between the SPGT participants, SIBS and the Banco de Portugal. It also provides facilities to enable participants to channel their transactions to the SPGT beforehand, to monitor money flows to and from other participants and to control minimum reserves held at the central bank.

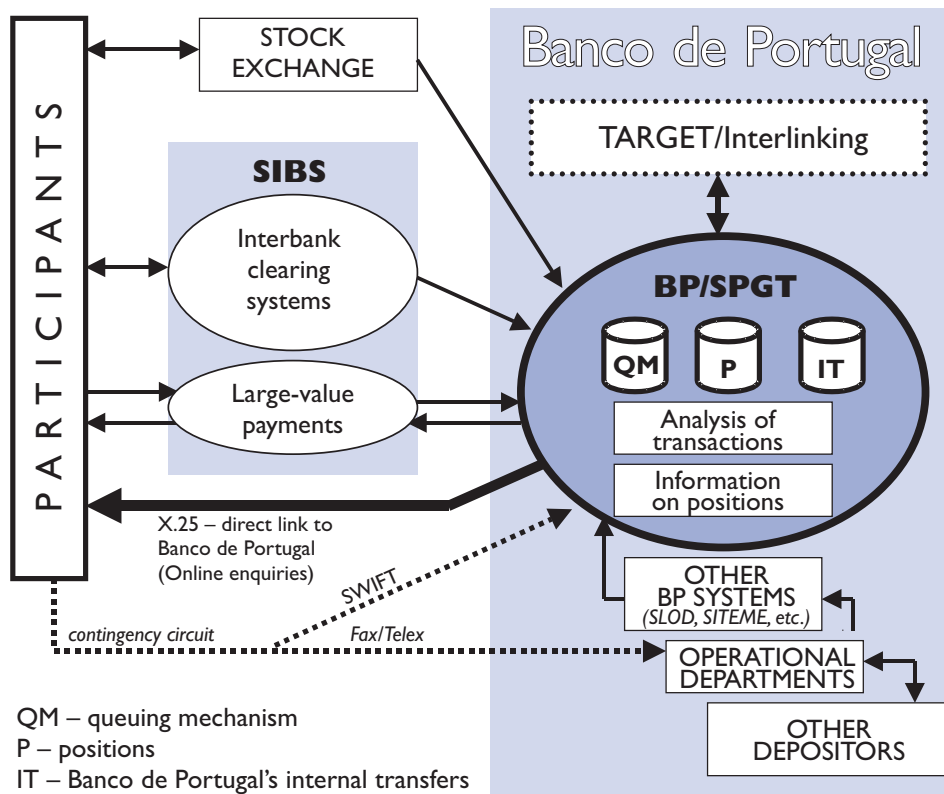
**3.2.5 Transaction processing environment**

In the context of the message routing configuration, the SPGT is a classic Y-shaped settlement system.

As a message-based system, the SPGT was structured with a view to facilitating a fast, confidential and secure exchange of information among the users of the system.

Figure 3 illustrates the major links between the parties/systems in the SPGT. The links represented are those with the clearing systems (interbank and stock exchange clearing systems), with the operational systems of the Banco de Portugal and with the direct online link between participants and the Banco de Portugal for information on settlement accounts only.

**Figure 3**



Also relevant is the contingency circuit, which may be implemented in two ways: i) the automatic processing of operations via SWIFT; and ii) the manual entering of SPGT operations by Banco de Portugal staff on behalf of participants who are temporarily unable to use the mechanisms normally provided for this purpose. As a general rule, all the means of communication used must have authentication and confidentiality mechanisms similar to the normal mechanisms. In addition to SWIFT, the

following alternative communication devices may be used: encrypted fax, encrypted telex and courier services (only in the event of all previous solutions failing to work).

In order to meet the computer security objectives established for the SPGT, all system users are obliged to use cryptographic security modules known as SSMs (the SPGT security modules to be connected to each participant’s application gateway).

The equipment is protected against misuse by physical and computerised devices, which would cause all the information contained (program and data) to be destroyed.

The confidentiality of SPGT messages is guaranteed at two levels: i) at the message cipher level, messages exchanged within the SPGT can circulate from sender to receiver in coded form; and ii) at the message structure level, SPGT messages are structured on the basis of the concept of data blocks. Since the SPGT is a Y-shaped system, the latter concept enables details of domestic payment orders to be held at SIBS, which delivers the data only when the central bank's SPGT settlement system confirms settlement.

### 3.2.6 Settlement procedures

The core segment of the SPGT is the current account settlement application for use by SPGT participants.

Every institution participating into the SPGT holds a single settlement account with the Banco de Portugal, the debit balance of which cannot exceed the standby collateralised credit ceiling previously agreed with the central bank.

The operations entered in the system are processed/settled in accordance with a schedule beginning at 6 a.m. and ending at 5 p.m. local time. The cut-off for credit transfers channelled via the SPGT highway is 5 p.m. local time.

Orders that exceed the predefined credit ceiling are held in a queue. Queued operations are placed in one of three levels of priority: A, B or C. For example, operations related to the settlement of SICOI net balances have the highest priority, A. The remaining pending operations are stored in chronological order (FIFO) within each block of priorities and in order to resolve gridlock situations and, if necessary, accelerate the settlement of queuing operations, there are specific operational and technical procedures, such as:

- permanent virtual system-wide gridlock resolution. Whenever an operation is settled, placed in the queue or cancelled, and the collateralised current account credit facility is increased for a participant, the system estimates the system-wide netting of all operations, although the settlement always takes place on a gross basis.
- periodic simulations;
- ordering within the same priority category in accordance with increasing value; and
- changing the predefined priorities B and C to priority A; this can only be done while the settlement of the balances of interbank clearing systems is pending.

Any operation entering the queue must be covered by sufficient funds and/or collateral within 90 minutes (a system parameter) and always before the time at which the queuing mechanism normally closes (5 p.m. local time), otherwise it is cancelled.

The ordering participant may ask the system to cancel a queuing operation. If it is a domestic payment, confirmation by the beneficiary of the transaction is required.

The operations and transfers are considered final from the moment they are entered into the receiving settlement account.

The settlement account of the participant sending a cross-border payment via TARGET/ Interlinking is debited, provided that there are sufficient funds (a sufficient account balance or collateralised intraday credit), and the account with the receiving central bank is credited simultaneously. As with domestic payments, if funds are insufficient, the cross-border payment is held in a queue and must be covered within 90 minutes.

A cross-border transfer is final only after the receiving central bank has confirmed the payment.

### 3.2.7 Credit and liquidity risk

SPGT participants may use their required reserves as intraday liquidity to make payments. If necessary, they may also use the following instruments: a standby collateralised current account credit facility and a special credit facility known as a supplementary intraday liquidity facility.

The standby collateralised current account credit facility allows the participants to have a debit position on the settlement account up to a predefined amount set in the collateralised intraday credit agreement, which is calculated on the basis of certain indicators, e.g. debt balances in the clearing systems.

Participants may reimburse intraday standby collateralised credit by 5 p.m. local time by means of market operations among themselves and/or with the Banco de Portugal via SITEME. If by the SPGT closing time credit institutions have not reimbursed any outstanding intraday collateralised credit, they may make use of the marginal lending facility, which is one of the two standing facilities available to the Eurosystem's counterparties. The maturity of credit extended under this facility is overnight and the interest charged is the marginal lending facility rate, as announced by the Governing Council of the ECB.

The supplementary intraday credit facility is a form of repo of eligible securities. This intraday credit instrument has been created with a view to providing participants with a means of satisfying intraday liquidity requirements arising from the need to cover queuing operations within 90 minutes.

### 3.2.8 Pricing

The main purpose of the SPGT price list is to promote the correct and efficient use of the system with a view to:

- stimulating the gross settlement of large-value payments;

- ensuring the smooth operation of the system and avoiding gridlock situations, especially at SPGT closing time; and
- covering the operating costs of the system.

The price structure of the SPGT is based on parameters such as the amount, entry time, queuing time and settlement time (normal and late) of the payment.

This price structure includes three price categories: a membership fee, a monthly user charge and a variable charge for each type of operation.

The pricing of SPGT operations aims to accelerate the transmission of payment orders and avoid gridlock situations at normal closing time (5 p.m. local time) and, for this reason, there are lower prices for transfers channelled to the SPGT earlier in the day. A penalty charge is applied to the cancellation of queued payments after the time-limit for their settlement has expired (90 minutes). At the same time, the pricing is intended to discourage the processing of low-value payments through the SPGT. For cross-border TARGET payments, a common EU-wide price is in force, based on a degressive fee system according to the individual average daily number of transactions carried out in a month.

### 3.2.9 Statistical data

In 1999, the volume of payment orders and settlement confirmations processed by the SPGT settlement system was 2,556 operations per day, with an overall value of PTE 2,462 billion (€12.3 billion).

## 3.3 The retail payment system: SICOI

### 3.3.1 Operating rules

The operating rules of the SICOI automated interbank clearing system are based on its Regulation, issued by the Banco de Portugal,

and on the Technical Specifications Manuals agreed between the commercial banks, SIBS (as the network provider) and the Banco de Portugal, and distributed by the central bank to the participants.

The SICOI Regulation lays down the system guidelines and the responsibilities of and relationships between participants.

The Technical Specifications Manuals are also important documents with regard to the smooth operation of the system because they define detailed procedures which participants must follow in the field of data transmission. Currently, there are five such manuals, one for each of the present sub-systems (see Section 3.3.4).

### 3.3.2 Participation in the system

The participation of banks and other similar entities is subject to an application for membership, which must be approved by the Banco de Portugal. This application must be accompanied by the opinion of the service provider (the SIBS), verifying that the applicant institution meets the necessary technical and operating conditions. Participation in a sub-system is subject to the successful completion of a set of tests defined by the service provider.

In order to directly participate in SICOI, applicants must participate in the SPGT. Participation in one or more SICOI sub-systems does not necessarily imply participation in the other sub-systems.

Participants may be involved either directly or indirectly. The entities not participating directly in any of the sub-systems may be represented through a direct participant who will assume, vis-à-vis the other participants, the rights and obligations of the parties represented.

The Banco de Portugal may, for technical reasons, cancel authorisations already granted (e.g. if a participant's communications systems frequently break down). A lack of liquidity and non-

compliance with rules laid down in the SICOI Regulation may also lead to the withdrawal of previously granted authorisations.

### 3.3.3 Types of transaction handled

SICOI covers the automated clearing of the following types of transaction: cheques, credit transfers, direct debits, commercial bills and transactions carried out through the Multibanco network.

### 3.3.4 Operation of the transfer system

The system operates on every banking working day. It is open 24 hours a day and it encompasses the five sub-systems mentioned below, each with different processing procedures and data formats, which are defined in the respective Technical Specification Manuals.

#### 3.3.4.1 Cheque sub-system

Almost all cheques processed in this sub-system are truncated, which means that the documents are kept at the first collection bank. However, there is a limit above which original cheques must be exchanged among participants (approximately 3% of the cleared cheques). There are four business centres, located in Lisbon, Funchal (Madeira Island), Ponta Delgada (the Azores Islands) and Angra do Heroísmo (the Azores Islands), where sessions for the physical exchange of non-truncated cheques and similar documents subject to automated clearing are held each working day, although only one settlement takes place for the consolidated amount of the debits and credits of the four centres. At the end of 1999, the sub-system had 42 direct participants and 18 indirect participants.

All cheques must comply with a common standard, which includes an OCR-B optical line in order to allow automated processing and data transmission among participants.

Large-value cheques are processed through automated clearing, but they are settled on a

gross basis in the settlement accounts with the Banco de Portugal (see Section 3.2.3).

#### 3.3.4.2 *Electronic funds transfer sub-system*

This sub-system (TEI) covers both domestic and cross-border credit transfers of up to €500,000. In excess of this amount, they must be channelled through the SPGT. All transactions are paperless. Data transmission and clearing take place twice a day at the cut-off times indicated in the table in Section 3.3.4.6: the first cut-off is for domestic and cross-border credit transfers ordered by private and commercial customers, while the second is mainly for domestic and cross-border interbank transfers. At the end of 1999, there were 47 direct participants and six indirect participants in this sub-system.

#### 3.3.4.3 *Direct debit sub-system*

This sub-system began operating in the last quarter of 2000 and covers pre-authorized debits on the payer's bank account initiated by the payee. The payer has to issue a mandate according to the standards defined by specific regulations of the Banco de Portugal in order to pay utility bills, insurance, school fees, etc. These regulations also establish the rights and obligations of creditors, debtors and participant credit institutions.

The debit authorisation is granted electronically by the debtor, mainly through the Multibanco network. To protect the consumers, the debtor has five working days to revoke debits after the debit is made.

This newer sub-system was created to gradually replace the older direct debit system, in existence since 1983, which is based on bilateral arrangements between the creditor businesses and each of the debtor's banks. The two systems are likely to continue to co-exist for the foreseeable future.

This sub-system started with 30 participants.

#### 3.3.4.4 *Bill of exchange sub-system*

This sub-system is based on the total truncation of commercial bills at the drawer's bank. The information collected is transmitted electronically by the latter to the drawee's bank seven days before maturity. The data are stored for seven days in a centralised electronic portfolio at the SIBS. There are two types of bill, classified according to the manner in which they can be paid: domiciliary bills are paid by debiting the customer's bank account; while non-domiciliary bills are paid at any bank branch or through a Multibanco terminal. Settlement is by netting for bills with a value below €500,000, and by gross settlement in the SPGT for higher values. In addition, this sub-system also accepts commercial bills denominated in foreign currencies, which are settled in the respective currency through the correspondent bank accounts via SWIFT.

At the end of 1999, there were 30 direct and five indirect participants.

#### 3.3.4.5 *The Multibanco sub-system*

This sub-system covers transactions made with debit cards and credit cards at ATM and EFTPOS terminals (see Section 2.2.4) and operates in real time seven days a week. A wide range of transactions can be carried out at ATM terminals, including cash withdrawals, deposits, transfers (both within the same bank and interbank), payment of public utility bills, mobile phone card loading, payment of commercial bills, payment of monthly school fees, booking of and payment for theatre and train tickets, loading of multi-purpose prepaid cards, account balance enquiries and statements, placing of orders for cheques and alteration of PIN codes. Originally, the location of ATMs was restricted to bank branches, but in recent years it has been extended to supermarkets, large companies and public services.

The electronic authorisations required by the direct debit sub-system and by Via Verde (see Section 2.3) are received through ATM terminals. Via Verde toll payments are also cleared using this sub-system.



The Multibanco sub-system also processes PMB transactions.

The PMB scheme was developed by SIBS. The Banco de Portugal, although not directly involved in the development of this electronic purse system, is kept regularly updated. It was set up in order to offer a more convenient means of payment than banknotes and coins for small transactions averaging around PTE 400 (€2). Only deposit-taking credit institutions may issue PMB cards and clearing and settlement of transactions are performed through SIBS and the Banco de Portugal, respectively. The maximum value per card transaction is PTE 63,000 (€314), which is the maximum amount that can be stored on the card. Any ATM or PMB terminal can provide cardholders with information on the stored value and also produce a record of the last 30 transactions made with a card. At present, no fee is charged to users of the card. Redemption is possible, although this is not free of charge in most cases, and holders of PMB cards may leave the scheme at their discretion.

At the end of 1999, there were 28 participants in the Multibanco sub-system.

#### 3.3.4.6 Timetable

The following table summarises the closing times (local time) of sessions at SIBS, as well as of settlements at the Banco de Portugal.

Sub-system	Closing time of sessions at SIBS	Closing time for settlement at the Banco de Portugal
Electronic funds transfers		
1st closing time	7 p.m.	9.30 a.m. <sup>(a)</sup>
2nd closing time	1.45 p.m.	3 p.m. <sup>(b)</sup>
Multibanco	8 p.m.	9.30 a.m. <sup>(a)</sup>
Bills of exchange	9.30 p.m.	9.30 a.m. <sup>(a)</sup>
Direct debits	10 p.m.	9.30 a.m. <sup>(a)</sup>
Cheques	2.30 a.m.	9.30 a.m. <sup>(b)</sup>

(a) Next day

(b) Same day

### 3.3.5 Transaction processing environment

SICOI participants use the SIBS interbank network for transmitting their transactions, which are processed in batches, with the exception of the Multibanco sub-system in which transactions are communicated in real time.

### 3.3.6 Settlement procedures

The balances assessed by SIBS at the close of multilateral netting sessions are communicated by file transfer to the Banco de Portugal, which makes the respective debit and credit entries in the accounts of the different participants during the business settlement hours given in Section 3.3.4.6.

### 3.3.7 Credit and liquidity risk

Credit facilities collateralised by securities eligible for monetary policy operations are available to participants, as are the operational facilities in the SPGT systems (i.e. the queuing mechanism) that allow for real-time credit and liquidity risk control and treasury management by each participant.

The operations processed through any of the SICOI sub-systems are final and irrevocable after settlement at the Banco de Portugal.

Uncovered obligations on account of insufficient funds in the participant's settlement account result in penalties and possibly even the exclusion of the participant.

### 3.3.8 Pricing

The pricing policy is based on a principle of self-financing. Therefore, there is mutual compensation of operating costs between participants.

The Banco de Portugal charges participants per balance and per sub-system.

There is a price list for the services provided by SIBS to SICOI participants, which charges per

transaction and according to the transaction type. The information system also establishes a list of prices for the different participants, defined on the basis of the administrative costs of the respective operations. In both cases, costs are assessed automatically by EDP and the respective invoice totals are debited on a monthly basis. There are no common regulations governing the prices to be charged by banks to their customers, although banks are obliged to display the relevant list clearly.

### 3.3.9 Statistical data

In 1999, SICOI handled 872 million operations, representing a total of PTE 64,748.1 billion (€323 billion). The cheque sub-system accounted for 28.33% of the operations and 77.56% of their value, while the Multibanco sub-system represented 69.03% and 6.99%, respectively.

### 3.3.10 Main projects and policies

The following measures are envisaged for the near future:

- substitution of the present physical exchange of non-truncated cheques and similar documents by an interbank image exchange system;
- implementation of the second closing time for cheques, enabling same-day settlement for most cheques entered into the system that day;
- banking representatives in Portugal and Spain are examining the possibility of setting up a system for the cross-border collection of cheques and for cross-border credit transfers between the two countries. The system may be based on the above-mentioned interbank image exchange system and on dematerialised transfers. Transactions will probably be settled through TARGET; and
- in the medium term, it is foreseen that part of the current bill of exchange sub-system's transactions, namely the collection of receipts, will be integrated into the direct debit sub-system.

## 4 Securities settlement systems

### 4.1 Trading

#### 4.1.1 The Lisbon and Oporto Stock Exchange

##### 4.1.1.1 Introduction

The Lisbon and Oporto Stock Exchange (BVLP) is a limited liability company formed by the conversion of the entities previously known as the Lisbon Stock Exchange Association (ABVL) and the Oporto Derivatives Exchange Association (ABDP). The transformation not only resulted in a change in the legal form of the exchange associations, but also in a merger, forming one management body and a limited liability company.

The BVLP is presently governed by the Corporate Act, the Securities Market Act, Decree-Law No. 394/99 of 13 October 1999 and the respective by-laws.

The objective of the BVLP is primarily to manage the exchanges. It also manages the market for other securities and the SSSs and provides other services, such as the issuing and trading of securities, which do not constitute intermediary activity. Besides these activities, the BVLP also provides the members of the markets that are run by it with the services necessary for them to act in markets managed by similar entities of other states with whom they have signed an agreement.

#### 4.1.1.2 Institutional and legal aspects

There are three different regulators and supervisors for the BVLP:

- i) The Ministry of Finance sets up the general framework regarding derivatives contracts on commodities, services, foreign currency, money market instruments or any other derivatives transactions not yet covered by the Securities Market Act.
- ii) The BVLP falls under the supervision of the CMVM, the authority in charge of regulating, supervising and promoting the securities market. The CMVM supervises issues regarding futures and options markets, contracts and members. It also approves, following a proposal from the BVLP, the final specifications and the introduction and/or withdrawal of all traded contracts and supervises compliance with market regulations through active monitoring. It also has disciplinary powers.
- iii) The Banco de Portugal has a special supervisory authority over money market and currency instruments and co-operates with the CMVM to co-ordinate the exercise of their respective powers of supervision and regulation. This co-operation may take the form of the preparation and approval of regulations, mutual consultations, the exchange of information, etc.

#### 4.1.1.3 Ownership/governance

The BVLP is a limited company in charge of managing regulated markets. It began operating with a share capital of €6 million. Its present shareholders include banks, brokers and dealers. As the managing body, the BVLP has regulatory and supervisory powers over the market and its members.

The Securities Market Act sets up the general legal framework for the securities market, but

certain specific regulations also take the form of Ministry of Finance rules, CMVM general regulations and BVLP circulars and technical regulations.

#### 4.1.1.4 The Lisbon Trading System

LIST, the new trading system of the BVLP, has been in operation since 1 March 1999.

This BVLP trading platform, which is fully automated and uses recent technology, was developed in close co-operation with market participants.

LIST will become a fully-fledged electronic trading system once it incorporates order-driven and quote-driven trading (continuous and multi-fixing) arrangements. This means, on the one hand, that it would automatically match the buy and sell orders introduced, comparing prices, quantities and other conditions and thus generating trades, and, on the other hand, that it would also register the trades carried out in the special telephone-based market for block trading.

LIST is a fourth generation trading system based on the NSC, the French trading system, which is also the basis for the trading systems used in other financial market-places, such as Chicago, São Paulo, Brussels and Toronto.

The disclosure in real-time of orders and trades in accordance with the full disclosure principle and the considerable increase in information relevant for transactions are two factors guaranteeing greater market transparency.

Being an open system, LIST can be connected to other similar systems, namely settlement systems and operators' back offices, and can thus access new memberships.

Presently, all the securities listed on the BVLP are traded through LIST: shares, bonds, participation units, investment trust units, rights and warrants. The system is also set to handle other securities in the future. This means that

only one platform is used for both computer trading and multi-fixing trading.

LIST also registers transactions in the special markets managed by the BVLP, namely the special market for block trading in bonds (*Mercado Especial de Operações por Grosso; MEOG*), which has been specifically set up for transacting large blocks of bonds.

From an organisational point of view, the following main characteristics should be emphasised:

- the grouping of securities by market segments, with orders being directed to their respective market;
- the new closing price formation methodology, allowing different types of closing price on different segments, e.g. price of the last deal for the most liquid securities and consolidation of offers for the less liquid securities; and
- a broad range of order types (e.g. limit, execute or cancel, hidden, all or none, minimum, stop, any price, at opening price, basket).

#### 4.1.1.5 Derivatives market

Derivatives market trading began on 20 June 1996 with two listed contracts, a long-term interest rate futures contract (OT 10 Futures, which was subsequently de-listed) and a share index futures contract (the Portuguese Stock Index PSI-20). The latter is traded on the basis of a cash share index, which was designed to become the underlying element of the futures contract in line with international standards. Since 1997 four new contracts (in telecommunications, electricity, banking and cement) have been added.

In April 1997, a newly designed repo market came into operation and then, on 21 September 1998, the BVLP introduced securities lending. Through the use of the latter two markets, the

BVLP offers members the possibility of combining strategies between standardised futures and customised OTC operations. On 19 March 1999, the options market started up, listing PSI-20 options and subsequently stock options.

#### 4.1.1.6 The trading system

For futures and options trading, the BVLP also operates an electronic trading system.

This system, known as SEND, has the following features:

- real-time access to information concerning, inter alia, margin requirements, profits or losses, marking to market, total exchange and clearing fees;
- use of an “intelligent” workstation linked to the central host computer, with most of the operational functions performed locally;
- continuous updating of information on clearing and settlement, which allows for final clearing after trading closes;
- the possibility of calculating margin requirements for a portfolio of options and futures; and
- security, speed and the efficient use of resources thanks to the local performance of operational functions.

SEND includes features ensuring protection against unauthorised access, data encryption and automatic reconnection in case of problems. Lastly, the BVLP has a trading support pool that can replicate a member’s workstation and intervene according to members’ instructions.

#### 4.1.1.7 Type of membership

BVLP derivatives market members may be brokers, dealers and banks legally established in Portugal. Branches of credit institutions or other financial institutions with their headquarters established in

another EU country may become members if legally authorised to trade futures and options in their country of origin. Branches of credit or financial institutions from non-EU countries must present their case to the Banco de Portugal. Since the implementation of the Investment Services Directive (93/22/EEC), EU financial institutions may become market members without being physically established in Portugal.

There are two different categories of market member: i) trading members, which may trade on the derivatives market through SEND (once trading has taken place, trading members must clear through a clearing member); and ii) clearing members, which may trade on the derivatives market and clear operations. Clearing members are the only legal and financial counterparties of the clearing house.

#### 4.1.2 MTS Portugal

##### 4.1.2.1 Institutional and legal aspects

MTS Portugal, formally established in Lisbon on 24 May 2000, manages the electronic trading system of the Special Government Debt Securities Market (*Mercado Especial de Dívida Pública*; MEDIP). MEDIP is the Portuguese regulated market for wholesale electronic trading of public debt securities by primary dealers, and went live on 24 July 2000. MTS Portugal is governed by a Board of Directors elected by the shareholders.

Shares in the company are held by the Primary Dealers in Portuguese Government Securities (OEVTs), by the Public Credit Management Office (Instituto de Gestão do Crédito Público; IGCP) and by MTS S.p.A.

##### 4.1.2.2 Instruments

MTS Portugal trades Portuguese government securities issued or in the process of being issued by the Government of Portugal. Currently, the only securities traded are Treasury bonds: fixed rate Treasury bonds (OTs) and floating rate Treasury bonds (OTRVs).

##### 4.1.2.3 Participants

Liquidity in the system is ensured by the participation of the OEVTs in MTS Portugal in their capacity as market-makers. Since 2 October 2000, the system has been open to all institutions wishing to become market members or market dealers who meet the criteria set out in the company's market rules.

##### 4.1.2.4 Settlement procedure

Settlements are made by Euroclear and Clearstream Banking on a gross DVP basis. The communication bridge between Euroclear and Clearstream Banking enables the automatic settlement of transactions executed by counterparties holding accounts with either agent. In line with the settlement procedures of these companies, MTS Portugal transmits payment/delivery instructions for each single transaction via SWIFT to Euroclear/Clearstream Banking on behalf of both counterparties.

## 4.2 Clearing

Clearing is covered by Interbolsa's functions, as described in Section 4.3.2.

## 4.3 Securities settlement systems: SITEME and Interbolsa

### 4.3.1 The SITEME market electronic transfer system

#### 4.3.1.1 Institutional and legal aspects

SITEME is an SSS owned by the Banco de Portugal (including a CSD, the legal framework of which is defined by Decree-Law No. 22/99 of 28 January 1999) and managed by the Markets and Reserve Management Department. It is used by the Banco de Portugal to settle its own operations, operations on behalf of the Treasury related to Treasury bills and bonds, operations between credit institutions and any operations involving money market securities deposited with the CSD.

As a non-autonomous entity, SITEME does not have its own financial resources or its own Board of Directors. However, services related to operations between participants are subject to fees, set out in a specific price list based on the principle of cost recovery.

Currently, Portuguese central bank papers and CPs are the only two types of securities deposited in SITEME. (In the past, Treasury bills were also deposited in SITEME, but these were redeemed during 1999.) SITEME remains the SSS issuer for future issues of Treasury bills. In the future, ECB debt certificates, as well as other tradable money market securities, may also be deposited with this CSD.

Participants in SITEME include institutions that are eligible for monetary policy operations and other participants authorised by the Banco de Portugal. Participants may terminate their membership of SITEME whenever they see fit simply by notifying the Banco de Portugal of their decision. The termination of liabilities is not governed by established rules, although participants are still responsible for operations that have been carried out. If a participant terminates its membership of SITEME, any outstanding operations run until maturity.

SITEME has published rules on access and exit criteria. Participants may inform themselves of these rules through the Portuguese Official Journal, where the Banco de Portugal's notice on and instructions regulating SITEME, which are also disclosed to the public, have been published.

SITEME is subject to internal audits by the Audit Department of the Banco de Portugal. These audits seek to verify the observance of rules and procedures and, where necessary, to propose changes to procedures. As a service provided by the Banco de Portugal, SITEME is subject to the supervision of its Board of Auditors and is required to undergo an external audit by a specialised audit company.

#### 4.3.1.2 Operational features

SITEME is a real-time DVP model 1 system (according to the BIS definition), providing intraday finality for all settled operations. The delivery of securities with intraday finality takes place during operating hours from 6 a.m. to 5.30 p.m. local time through the continuous RTGS system for securities transactions.

Transfers of securities (and rights of ownership) are processed on the securities accounts held with SITEME on behalf of the owners of the securities. These transfers from seller to buyer take place on a continuous real-time basis through SITEME with debiting of the seller's settlement account and crediting of the buyer's account. Final funds transfers take place as debits and credits on cash accounts held at the Banco de Portugal.

Securities and funds transfers become final once both the buyer of the securities has been successfully credited, and the receiver of the funds (for operations with cash settlement) has been successfully credited.

There are no major risks for participants in SITEME, because it is mainly a DVP system (some forms of free-of-payment operations are also possible, but their use is limited) and because no short selling is allowed and RTGS procedures are in place. Since SITEME does not provide for the lending of securities and no securities overdraft is possible, each institution wishing to sell securities must actually hold them in its securities account.

#### 4.3.1.3 Operational reliability

The systems used are totally reliable. When one workstation is down, a second one is always immediately available, except in the case of the central computer.

SITEME has prepared an analysis of potential threats, included in the manual of procedures. The major risks envisaged concern communication and the equipment for

backup systems; security of access to the system; and its technological architecture. A detailed description of the systems is available and covers the following major aspects: i) a system feasibility study; ii) the functional and technical specifications of connections with participants; iii) a logical and physical model of system data; iv) the analysis and specification of the IT component of the project; v) online help; and vi) the SITEME manual of procedures.

The instructions sent to and from participants are transmitted using a remote terminal and, as a backup, there is a point-to-point telephone line system. Participants, as well as SITEME operators, use personal keys to access SITEME. For remote access, the network uses an extranet site managed by the Banco de Portugal, where the data flows are previously encrypted.

There is a contingency plan in the event of a malfunction or breakdown.

#### **4.3.2 Interbolsa –the transferable securities centre and nationwide securities settlement clearing system**

##### *4.3.2.1 Institutional and legal aspects*

Interbolsa is the Portuguese private CSD owned by the BVLP and used by the market to settle operations involving shares, bonds and other types of securities. It is also used by the Banco de Portugal to settle Eurosystem credit operations collateralised by Treasury bonds and private paper.

Since the end of 1999, a new law – the Securities Code – has governed and defined the framework for the Portuguese capital market, endorsed by Decree-Law No. 486/99 of 13 November 1999.

Interbolsa, in its dual capacity as CSD and nationwide clearing and settlement system, is governed by the provisions of the Regulation pertaining to the CSD and the clearing and settlement system, by any applicable general legislation and by any provision which may

come to be duly enacted in the future by authorised entities.

Interbolsa's functions are:

- a) to establish, administer and operate the system for the registration and management of marketable securities, and the system for depositing, safekeeping and managing fungible securities;
- b) to clear and settle any transaction pertaining to registered or deposited securities;
- c) to provide an adequate service for the administration and servicing of securities held, including corporate events and the collection of funds from issuing entities (interest, dividends, etc.);
- d) to provide other services of general interest to the securities market which are deemed appropriate and which may come to be duly authorised at a future time; and
- e) to operate the system connecting the CSD with financial intermediaries, issuer entities, stock exchanges and the central bank, and to ensure the settlement of all stock exchange transactions.

Participation in Interbolsa is clearly defined in its regulations. To become participants, financial intermediaries are required to hold a settlement account with the central bank, which requires proper authorisation from the latter, and to have the technical capability to connect to and use the services provided. The CMVM also has to recognise the capabilities of the financial intermediary and to authorise it to operate in the securities market and hold dematerialised securities on behalf of its customers. Participants in Interbolsa are banks, brokers, foreign institutions and the Banco de Portugal and the IGCP. To relinquish participation, a financial intermediary must have settled all pending trades.

Interbolsa is supervised by the CMVM.

#### 4.3.2.2 Operational features

In order to carry out the physical operations and calculate financial amounts concerning operations as laid down in Interbolsa's regulations, three different settlement systems may be used:

- i) The general settlement system: this system processes each operation twice a day, once during the day and again overnight. It is used to settle stock exchange operations, operations from other regulated markets, operations from non-regulated markets, OTC operations and free-of-payment transfers.
- ii) The SL Plus settlement system: this is a new settlement platform for the Portuguese government bond markets used in OTC repo and cash trades. This system offers CCP services, namely for cash settlement. It runs five daily DVP settlements, without securities netting but with cash position netting. The cash settlement is carried out at the Banco de Portugal, and is irrevocable, final and almost simultaneous with the securities settlement. This system will be available in the short term for the settlement of operations involving other types of securities, such as shares and bonds.
- iii) The real-time settlement system: this system is for movements and calculations concerning operations with immediate effect, where one of the participants is the central bank or the managing entity of the futures market. It is also used for OTC operations and for the administrative transfer of securities.

Settlement finality is defined in Interbolsa's regulations in the same terms as in the new Securities Code and in the SFD. There is no possibility of revoking a settled transaction. There is no "zero hour rule" in Portuguese legislation.

Intraday DVP settlement is possible for operations with the Banco de Portugal (T+0 or T+1) and for stock exchange operations (T+3)

during operating hours, which run from 8.30 a.m. to 7.30 p.m. local time for market operations and from 6 a.m. to 7 p.m. local time for operations involving the Banco de Portugal.

DVP settlement ensures that securities are not delivered if the buyer does not pay. The securities are transferred to the buyers' accounts and remain blocked until a confirmation of successful payment is received from the SPGT, which is operated by the central bank. If no payment has been made, the operation is reversed and the securities are given back to the seller. The risk of failure on the payment side is minimised through the use of intraday credit facilities that are part of the payment system. Securities lending procedures are in place to minimise the risk arising on the failure to deliver securities.

Settlement risk is managed by the netting procedures and an automated securities lending system in the case of default on securities delivery. When securities lending is not possible, either due to insufficient quantities in the lending pool or the ineligibility of the security for lending, buy-in orders are automatically issued. These procedures are defined in Interbolsa regulations, which are legally binding on all Interbolsa participants.

There is no custody risk when using securities deposited at Interbolsa. The Portuguese Securities Code states that the securities deposited at Interbolsa cannot be considered as part of the CSD's assets. The securities are owned by the beneficiaries, not by Interbolsa.

#### 4.3.2.3 Operational reliability

The data are fully backed up each day once the overnight batch cycle is completed. A copy of this backup is kept off Interbolsa's premises, to be used in the case of disaster standby site activation. All the system's data input and output are also kept on magnetic tapes for at least five years. The disaster standby site is equipped with at least the same processing power that Interbolsa has in its own processing system.



The system's description is available in the operational and procedural documentation of the CSD. Technical documentation is available for systems analysts and programmers.

#### **4.4 The use of the securities infrastructure by the Banco de Portugal**

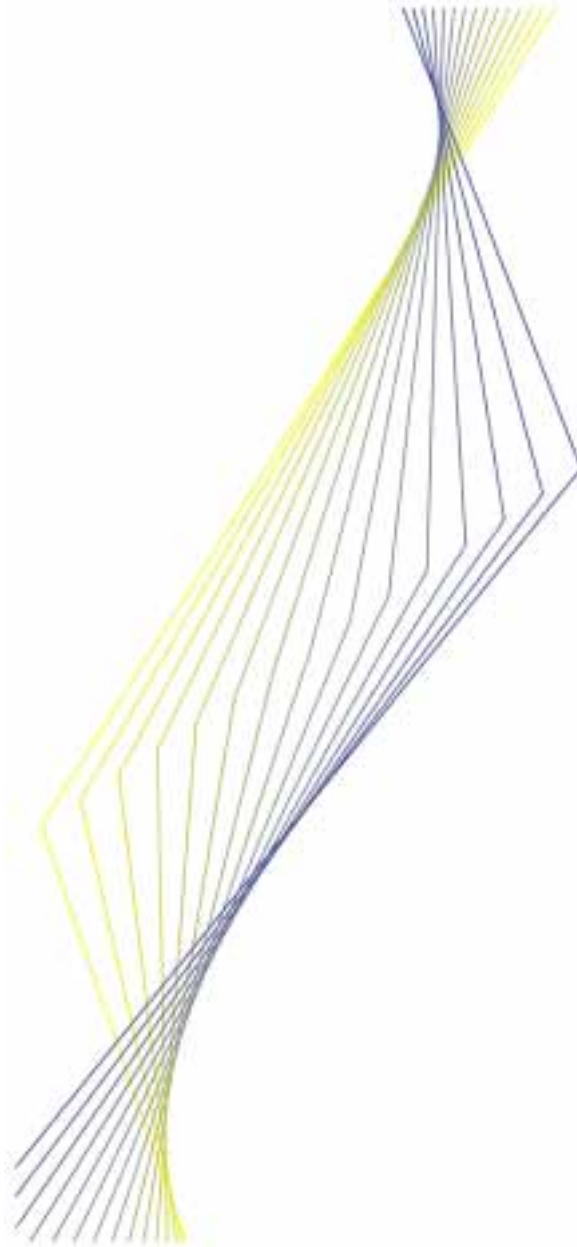
The Banco de Portugal makes use of securities infrastructures for the physical settlement of Eurosystem monetary policy operations conducted with Portuguese counterparties and also for the settlement of payment systems operations. Both SITEME and Interbolsa are used for this purpose.

When acting as a correspondent central bank within the CCBM, the Banco de Portugal also accepts the transfer of securities from custodian bank accounts in SITEME and Interbolsa to its own accounts in these SSSs, in order to allow other NCBs in the Eurosystem to grant credit to their counterparties.

In terms of collateral management, the Banco de Portugal evaluates the collateral used for Eurosystem credit operations using the reference price provided by the BVLP.



EUROPEAN CENTRAL BANK



**Finland**

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Finland

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## List of abbreviations

<b>APK</b>	Finnish central securities depository – <i>Arvopaperikeskus</i>
<b>BoF-RTGS</b>	Real-time gross settlement system operated by Suomen Pankki
<b>FSA</b>	Finnish Financial Supervision Authority
<b>HETI</b>	Trading system of the Helsinki Exchanges
<b>KATI</b>	APK's automatic clearing system
<b>OM</b>	APK's settlement system for equity securities
<b>OPK</b>	Central Association of the Finnish Co-operative Banks – <i>Osuuspankkikeskus</i>
<b>PMJ</b>	Finnish retail payment system
<b>POLT</b>	Banks' On Line Data Communication Network
<b>POPS</b>	Finnish large-value netting system for express transfers and cheques – <i>Pankkien on-line pikasiirrot ja sekut</i>
<b>RM</b>	APK's settlement system for fixed income securities
<b>SPY</b>	Finnish Bankers' Association – <i>Suomen Pankkiyhdistys</i>

## Introduction

Bank accounts and funds transfers between accounts together form the basis of payment services in Finland. The use of advanced payment technology has made the system highly efficient by substantially reducing the need for manual work. This is reflected in a high level of automation in payments between banks and their customers and especially in interbank payments.

The early introduction of postal and bank giro systems in 1939 and 1942, respectively, prevented the cheque from developing into an important payment medium and made credit transfers the main payment instrument for both retail and large-value payments. The policy of paying wages and government benefits into bank accounts, pursued since the 1960s, has fostered the development of bank account-based payment instruments. Debit cards are

widely used for retail payments. Prepaid chip cards were introduced in 1993 and electronic purses in 1994.

The Finnish interbank payment system consists of an RTGS system (BoF-RTGS), a retail payment system (PMJ) and a large-value netting system for express transfers and cheques (POPS). BoF-RTGS is operated by Suomen Pankki and the other two systems are operated by the banks participating in them.

The Finnish securities markets and the related infrastructure have been transformed by a number of horizontal and vertical mergers from a fragmented set-up into an integrated marketplace, which since 1999 has been operated by the various subsidiaries of the HEX Group. Settlement of securities trading has taken place in book-entry form since 1992.

## I Institutional aspects

### I.1 The general institutional framework

The main institutions governing and supervising the Finnish financial markets are the central bank Suomen Pankki, the Finnish Financial Supervision Authority (FSA) and the Ministry of Finance. The respective roles of these bodies are discussed in Sections 1.2 and 1.3.

There is currently no unified legislation governing payment systems in Finland. Instead of a single payment systems act, there are a number of separate acts regulating various areas of the payment systems.

Finland has a banking system which operates according to the “universal banking” approach. The Credit Institutions Act (1607/1994) lays down the general legal framework for banking and financial activities. This Act replaced the Deposit Bank Act (1268/1990) and the Financial Activities Act (1544/1991). The Act on the activities of foreign credit and financial institutions operating in Finland (1608/1993) governs the activities of branches of foreign credit institutions in Finland. These and other acts on the corporate structure of different types of banks were brought into line with the Agreement on the European Economic Area (EEA Agreement) and the Second Banking Co-ordination Directive (89/646/EEC) at the beginning of 1994.

The Act on Repeal of the Currency Act (215/1998) terminated Suomen Pankki's exclusive right to issue banknotes and coins. There are no other national provisions on the legal tender status of banknotes and coins.

The Cheque Act (244/1932), which is based on the Geneva Convention of 1931, stipulates the rules governing the use of cheques. The acts covering bills of exchange and promissory notes (242/1932) and debt securities (622/1947) contain general provisions concerning payments in these areas. The EC Directive on cross-border credit transfers (97/5/EC) was adopted in 1997 and implemented in Finland in August 1999 (821/1999).

The EC Directive on settlement finality was implemented in Finland in December 1999 with the entry into force of a new Act on Certain Conditions of Securities and Currency Trading as well as Settlement Systems (1084/1999).

There is no separate legislation governing card payments, and agreements between banks, customers and service providers in this area are based on contract law. However, the Consumer Protection Act (38/1978, as amended in 1986) includes provisions on lost, stolen and misused cards and also defines the responsibilities of card issuers and cardholders.

The Penal Code contains provisions on fraud involving payment media and money laundering (769/1990, Chapters 32 and 37). In addition, there are two separate legal acts on money laundering alone (583/1994 and 68/1998).

### I.2 The role of Suomen Pankki

#### I.2.1 Oversight of payment systems

Under the Finnish constitution, Suomen Pankki “operates under the guarantee and care of Parliament and is supervised by the Parliamentary Supervisory Council”. According to the new Act on the Bank of Finland (214/1998), the primary objective of Suomen Pankki is to maintain price stability. The Act also sets the central bank the overall objective of maintaining the reliability and efficiency of payment systems and the broader financial system. The Act identifies payment systems oversight as one of the tasks of Suomen Pankki.

The objectives of oversight are to maintain the stability of payment and settlement systems, to improve the efficiency of these systems and to safeguard the monetary policy transmission mechanism. The operational objectives of payment systems oversight are to foster the use of RTGS systems for the transfer of large payments and the application of the Lamfalussy minimum standards for large-value netting

systems. The operational objective of settlement systems oversight is to ensure that SSSs and the interconnecting links are planned, implemented and supervised effectively and efficiently.

Suomen Pankki oversees POPS, Finland's only large-value netting system. The Lamfalussy minimum standards are applied to this system and Suomen Pankki oversees compliance with these standards. Compliance with the Lamfalussy standards is also applicable, where appropriate, to the Finnish retail payment system, PMJ.

The main instruments used in oversight are recommendations and moral suasion. Suomen Pankki can issue recommendations to banks on payment systems matters, but it is not legally empowered to issue binding regulations. Participation by Suomen Pankki in the development of banks' payment systems is based on co-operation between the banks and the central bank.

Suomen Pankki has had a separate Payment Systems Division within its Financial Markets Department since 1991. This Division is responsible for the oversight of payment systems. It also co-ordinates work related to payment and securities settlement systems and their development within Suomen Pankki and provides expertise on payment matters. Further tasks include conducting research on payment and settlement systems issues, monitoring developments in domestic and international payment and securities settlement systems and preparing any changes and reforms that are deemed necessary.

### **1.2.2 Operational role**

Suomen Pankki operates BoF-RTGS, which is part of the TARGET system. Account holders maintain settlement accounts at the central bank to facilitate the settlement of their own and customers' payments. In addition to credit institutions, the State Treasury, the Helsinki Exchanges, the central securities depository (APK) and Automatia Pankkiautomaatit Oy

(a joint venture founded in 1994 by Finnish banks and banking groups to run and maintain cash dispensers in Finland) also hold settlement accounts at Suomen Pankki.

In order to promote the smooth functioning of BoF-RTGS and facilitate the settlement of payments, Suomen Pankki provides credit facilities to eligible participants. A precondition for access to these facilities is that these institutions meet the conditions laid down in Suomen Pankki's rules for counterparties and account holders and in the ECB's TARGET Guideline.

Banknotes and coins are distributed to banks via Suomen Pankki's branch network and, since autumn 2000, Automatia Pankkiautomaatit Oy.

### **1.2.3 Development of payment and settlement systems**

Suomen Pankki is responsible for the development of its RTGS system, BoF-RTGS. Other domestic payment systems are developed by the Finnish Bankers' Association (SPY) in co-operation with Suomen Pankki. The aim is to improve the efficiency of payment systems, reduce banks' exposure to risks associated with credit transfers and fulfil the EU minimum criteria for payment systems.

In the field of SSSs, Suomen Pankki holds monthly meetings with the central securities depository, the APK. The aim is to follow the APK's development projects and to improve the reliability and efficiency of securities settlement in Finland.

## **1.3 The role of other private and public sector bodies**

### **1.3.1 The Ministry of Finance**

The Ministry of Finance grants licences to credit institutions and other financial intermediaries and drafts legislation on banking and other financial activities. The Ministry has a representative on the Board of the FSA.



The State Treasury is accountable to the Ministry of Finance. It acts as the state's fiscal agent, co-ordinates its payments and acts as its cashier. The State Treasury holds an account in BoF-RTGS for the settlement of large-value payments related to financial operations. The state's bulk payments are mainly made through Sampo Pankki (formerly Leonia and before that Postipankki), the previously state-owned commercial bank. This arrangement may change in the future as the state is no longer obliged to use Sampo Pankki for effecting its payments.

### **1.3.2 Financial Supervision Authority**

The Financial Supervision Authority (FSA) is responsible for the supervision of financial markets and market participants. Since October 1993, it has functioned in connection with Suomen Pankki. It is independent in its decision-making and has its own Board.

### **1.3.3 Finnish Bankers' Association**

The Finnish Bankers' Association (SPY) has functioned as the umbrella organisation for the Finnish deposit banks since 1914, co-ordinating their joint activities and representing their common interests. Its membership base was widened in 1989-90, when co-operation between all the various banking groups started under the auspices of SPY. It operates as a general co-ordinator in the development of payment services and banking technology for the joint use of its member banks. As Finland does not have a separate ACH (transaction information is exchanged bilaterally between

the participants and settlement takes place in BoF-RTGS), SPY is involved in the development and upkeep of the payment systems, as well as in the administration of the contracts concerning the systems.

International developments have enhanced the role of SPY as the representative body of Finnish banks. SPY joined the Banking Federation of the European Community (FBE/EBF) as an associate member at the beginning of 1988.

SPY also provides information and statistics on the Finnish payment systems and participates in international co-operation through bodies such as the ECBS.

### **1.3.4 Other co-operative bodies**

The Central Association of the Finnish Co-operative Banks (Osuuspankkikeskus; OPK) co-ordinates the activities of the co-operative banks. It is also involved in developing marketing, communication, research and training activities among the member banks. The central credit institution for co-operative banks is OKO (Osuuspankkienkeskuspankki).

The Finnish Savings Banks' Association (Säästöpankkiliitto) is responsible for co-ordinating the joint banking policy of the savings banks and promotes their interests and oversees their research, planning, information and professional journals and bank security. The central credit institution for the savings banks is Aktia Säästöpankki.

## 2 Payment media used by non-banks

### 2.1 Cash payments

The monetary unit in Finland is the markka (a subdivision of the euro, €1 = FIM 5.94573), which is divided into one hundred penniä (singular: penni). Currency in circulation consists of banknotes in the denominations of FIM 20, 50, 100, 500 and 1,000, and coins in the denominations of 10 and 50 penniä and of FIM 1, 5 and 10. There is also a small stock of commemorative coins in denominations ranging from FIM 5 to 1,000. These are mostly collectors' items and are very seldom used as payment instruments. Banknotes and coins in circulation outside credit institutions at the end of 1999 amounted to FIM 16,500 million (€2,770 million).

Banknotes and coins are issued by Suomen Pankki. The notes are printed by Setec Oy, the banknote and security printing house partly owned by Suomen Pankki, and coins are manufactured by the Mint of Finland Ltd., which is owned and supervised by the Ministry of Finance.

Owing to the free circulation of cash, it is very difficult to compile precise data on the annual volume and value of cash transactions. However, some estimates have been made. On the basis of a sample survey carried out by Suomen Pankki in autumn 1992, it was estimated that about 80% of all retail transactions were made in cash. These payments are of relatively small value and cash thus plays a minor role in the payment system as a whole. However, in volume terms, it still remains the most commonly used payment medium for retail business. More recent estimates by Suomen Pankki also indicate that the use of cash has remained quite high.

The ratio of banknotes and coins held by the public to the narrow monetary aggregate M1 has averaged around 7% in recent years (see Table 2). The ratio of banknotes and coins to GDP has been slightly above 2%, which is very low by international standards. However, the cash-to-GDP ratio increased slightly in the 1990s.

At present, more than 80% of cash is withdrawn from cash dispensing ATMs. The number of ATMs increased rapidly until the early 1990s, but has fallen substantially since 1993. The ATMs have been interoperable since 1990. The average amount withdrawn per transaction has been around FIM 400 (€65) in recent years (see Table 6).

In 1994 the main banking groups founded a company, Automatia Pankkiautomaatit Oy, to run and maintain ATMs in Finland.

### 2.2 Non-cash payments

Two giro-based non-cash payment systems were introduced in Finland more than 50 years ago: the postal giro system operated by the state-owned Postipankki and the post office, and the bank giro system run by the private deposit banks. During the 1980s and 1990s, the two systems were gradually merged through a process of increased interoperability. The practice of paying wages and salaries directly into employees' bank accounts began in the 1960s and was later extended to pensions and other social benefits. These features, together with extensive co-operation between banks, have resulted in compatible credit transfer systems in the banking sector and have created a sound basis for non-cash payments.

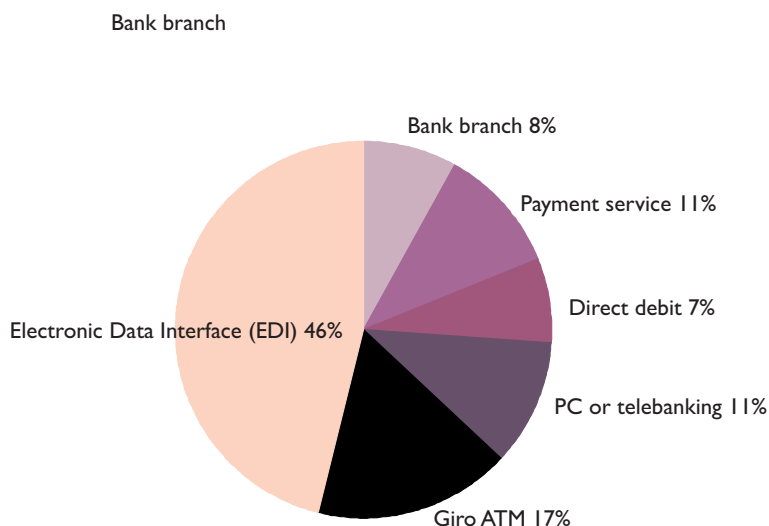
Today, Finnish banking customers hold transferable deposits in approximately 11 million accounts, i.e. a little more than two per inhabitant. These accounts are of several different types: deposit accounts, savings accounts, postal giro accounts, and transaction and cheque accounts. Some of them include an overdraft facility. Customers can make various payments from these accounts and write cheques on cheque accounts, although cheques are seldom used. Corporate customers usually have bank accounts with more than one banking group in order to facilitate swifter payments.

**2.2.1 Credit transfers**

The credit transfer (or giro) is the predominant means of making payments in Finland. Until 1993 there were separate paper forms for bank giros and postal giros, although the two giro systems had been in parallel use for a long time. In 1993, however, these forms were unified by introducing a new common giro form. At the same time, the term “giro” began to be used for both bank and postal giro payments. In a giro payment, a

customer submits an instruction to debit his/her account and to credit the payee’s account in the same or another banking group. In order to reduce the amount of paper involved and thus the expense, banks have developed electronic methods for the transmission of payment instructions to them. These include telephone banking, PC-banking (terminal software and a dial-up connection to the bank), giro ATMs, internet banking, and most recently SMS and WAP-based mobile phone banking services.

**Chart**  
**Breakdown of credit transfers by method of transmitting payment instruction in 1999**



The giro system was originally paper-based, which gave banks a strong incentive to develop electronic systems. By applying a pricing policy that approaches full-cost pricing, the banks have sought to persuade customers to make greater use of electronic transfer systems. The total number of various types of credit transfers (including recurrent payments and direct debits) was 519 million in 1999. Of the total, approximately 82% were received electronically from customers. All interbank payment instructions are normally exchanged electronically.

In order to link the payment system to companies’ billing systems, the banks have developed a reference number system. A “reference giro” is a giro with a pre-printed reference number that identifies the bill and the payer to the payee. The service enables creditor companies to receive data on incoming payments from banks quickly and safely via their own electronic banking software or alternatively as paper statements. Separate paper receipts are seldom used for individual payments and are provided only upon request.

Credit transfers between two customers using the same bank are normally processed in real time. For time-critical giro payments between banks, a special service called “Express Transfer”, enabling funds to be transferred to the beneficiary in real time, is available.

#### *Recurrent payments*

In Finland, the transfer of recurrent payments was the first electronic payment service to be developed jointly by the banks in the 1960s. This service enables corporate customers to transfer wages and salaries, pensions, payments for products and other recurrent payments in one batch to several payees from their own data processing systems to a bank’s data processing system for crediting to payees’ accounts. A corporate customer can send all information related to its recurrent payments to its own bank, which then forwards the payments to the payees’ banks. There were 89 million recurrent payment transactions in 1999, i.e. over 17 payments per inhabitant.

#### **2.2.2 Cheques**

Cheques have never been a very common payment medium in Finland and their use has decreased sharply in recent years in volume terms. In 1999 only 1.4 million cheques were written. The average value of cheques rose from FIM 4,300 (ECU 695) in 1985 to FIM 480,000 (€29,884) in 1999. Cheques are currently used solely for large-value payments by companies. Owing to the withdrawal of the cheque guarantee in 1997 and the manual work involved in processing cheques, most retailers refuse to accept cheques in shops.

Bank drafts are cheques drawn by a bank on itself whereby the bank undertakes to pay a stated sum of money on demand to named persons or to their order. All banks honour bank drafts and they are equivalent to cash in transactions.

#### **2.2.3 Direct debit**

A direct debit is a pre-authorised transaction by which the payee, through its own bank, debits the

payer’s account on the due date. This method is mostly used for regular payments of varying amounts, such as electricity and telephone bills or newspaper and magazine subscriptions. The payee must inform the payer about the bill before sending the direct debit order to enable the payer to make sure there are sufficient funds in his/her account. The payer has no right to revoke a payment once it has been debited.

Direct debits were introduced in 1978. They gained popularity in the 1990s, with average volume growth of around 25% in recent years. However, direct debiting accounted for only 7% of all credit transfers in 1999. The number of direct debit transactions totalled 39 million in 1999, i.e. approximately 8 transactions per inhabitant.

#### **2.2.4 Payment cards**

Since the late 1980s, payment cards – especially debit cards – have been increasingly used in daily retail payments, partly replacing cash and almost completely replacing cheques. In the early 1990s the number of payment cards stagnated, reflecting the slump in consumption, the recession and the tightening of risk management policies and issuance criteria for such cards. Since 1997, however, the number of payment cards in issue has been growing at an increasing pace. In 1999 there were 324 million payment card transactions, i.e. approximately 64 payment card transactions per inhabitant. The total value of transactions was FIM 85 billion (€14.3 billion), i.e. an average value of FIM 262 (€44) per transaction.

##### *(a) Debit cards*

Debit cards (usually referred to as “bank cards” in Finland) are issued by banks. These cards are furnished with payment and ATM functions, enabling customers to use them to pay for purchases in shops, to pay bills via ATMs or to withdraw cash from cash dispensing ATMs. In addition there are the “combined cards”, which are debit cards which also incorporate credit or delayed debit functions.

Finnish bank cards are valid as payment media only in Finland. Under existing agreements between banking groups, it is possible to withdraw cash from some banks elsewhere in Scandinavia and from ATMs in Spain.

*Delayed debit cards*

The most widely used delayed debit cards (other than petrol company cards), i.e. cards allowing delayed payment of up to 45 days, are mainly issued by Luottokunta (a company owned by banks and retailers). In 1999 there were over 930,000 such cards in circulation, mostly Visa and American Express cards.

No interest is charged on the credit extended via such cards. Cardholders are charged an annual fee, the size of which depends on the predetermined limit up to which the card can be used. Most cards used by companies come under this category.

At the end of 1999, the combined number of debit and delayed debit cards in circulation was approximately 3.3 million.

*(b) Credit cards*

Both domestic and international credit cards are used in Finland. The international cards in use are Eurocard/MasterCard and Diners Club. Payments using this type of card are usually larger in value than payments with other cards. At the end of 1999 there were approximately 819,000 credit cards in issue.

*(c) Retailer cards*

Retailer cards represent the largest group of cards in terms of numbers. There were 2.15 million such cards in circulation at the end of 1999. They are mainly issued by petrol companies, travel agencies, furniture stores, etc. The use of these cards has decreased slightly in recent years measured in terms of numbers of purchases.

*(d) Prepaid cards and electronic money*

Avant Finland Ltd was established by Suomen Pankki in 1992 to develop a multi-purpose electronic purse system that would eventually replace cash in low-value payments. The Avant system was launched in 1993 with the issue of telephone cards containing a fixed amount of purchasing value. In November 1995 Avant Finland Ltd was sold to Automatia, which is owned by Finland's three biggest banks. Automatia Ltd launched its second-phase product, Avant II, in 1997.

Avant chip-based e-money is available in the form of disposable cards or can be loaded onto chip cards issued by banks (the e-money function being incorporated into the same card as the debit and/or credit function). Cards can be loaded at most ATMs (Automatia Ltd's Otto-branded ATMs) or from the internet using a PC, a software application and a card reader. E-money on reloadable cards is issued by the three banks which own Automatia Ltd, while e-money on disposable cards is issued by Automatia Ltd, which is also the system operator.

At the end of 1999, e-money was accepted as a means of payment by approximately 600 different service providers, deploying a total of 9,300 payment terminals. As yet, the use of e-money is still fairly limited. At the end of 1999, there were approximately 450,000 e-money cards (both reloadable and disposable) and they were used in 510,000 payment transactions during the year. Of all reloadable e-money cards only 95,000 were active.

In addition to the Avant electronic money system, there are a number of other card-based electronic money schemes in operation. Matkahuolto Ltd, the nationwide marketing company for private coach companies, has its own prepaid cards for paying coach fares. Some municipalities issue "city cards", which can be used for paying local transport fares and some other local charges and fees, but the use of these cards is currently very limited.

*(e) ATM and POS networks*

The ATM networks in Finland are fully interoperable and operate in real time. Most terminals are operated by Automatia Pankkiautomaatit Oy (with a pool of 1,900 terminals), a company jointly owned by Merita, the co-operative banks and Sampo Pankki Oyj. A further 300 terminals connected to the network are operated by other banks. The number of ATMs decreased by 750 in the latter half of the 1990s as a result of the founding of Automatia in 1994 and reorganisations in the banking sector.

Since 1989 bank customers have been able to execute credit transfers via special bill payment (giro) ATMs. In 1999 over 81 million payments were effected through giro ATMs, which was approximately 17% of all credit transfers in that year.

In Finland EFTPOS terminals are based on an offline batch transmission system. At the end of 1999 there were 60,000 EFTPOS card readers. The terminal identifies a card inserted into it on the basis of the data stored in the magnetic strip. When the transaction is being made, the terminal checks that the card is valid and that it is accepted by the retailer. In addition, the terminal verifies that the card is not on the list of cancelled cards (known as the "hot card file"). The EFTPOS terminal does not automatically check that the customer has sufficient funds in its account or whether it is within a specified limit. However, transactions amounting to FIM 1,000 (€168) or more have to be authorised. As a further security measure, the customer must provide the retailer with identification if the transaction exceeds FIM 300 (€50). The terminal may be linked to a retailer's cash desk system or it may store customers' card transactions independently in the memory of a computer. From there, they are transmitted electronically at the end of the business day to banks and debited from customers' accounts.

**2.2.5 Other payment instruments**

Luncheon vouchers are a payment medium used by employers, who buy the vouchers from the issuer and sell them to their employees at their taxable value or give them free of charge as a fringe benefit. Employees use vouchers to pay for meals in restaurants or cafés, which submit the vouchers to the issuer which then credits their bank accounts with the respective amounts.

**2.3 Recent developments***Internet banking and mobile phone banking*

The decline in the level of payment service provision based on physical outlets in the 1990s has been counterbalanced by a significant growth in remote payment methods. There has been particularly rapid growth in the use of internet-based payment services, and mobile phone-based payment services have also come into operation.

All banks in Finland offer internet banking services. At the end of 1999 there were almost 1.6 million telebanking and internet banking agreements between banks and customers. The number of internet banking agreements has increased rapidly during the last few years. By the end of June 2000, the banks had approximately 2 million internet banking agreements with their customers.

Mobile phone-based banking services, e.g. bill payment and balance checking, have been available in Finland since 1996. The latest developments are WAP phone banking applications, which were launched in 1999 and are currently offered by three of the biggest banks. Almost all banking services are also available via mobile phone. Thus, remote access to payment services is already possible by means of fairly inexpensive equipment.

Despite the development of new service channels and terminals, the comparatively older methods, e.g. telebanking based on conventional phones and home banking using a PC and telecommunications networks, still exist.

*Online debit cards*

A new development in 2000 was the introduction of online debit cards (Visa Electron and Maestro). These are cards linked to the payer's account which basically function like conventional debit (bank) cards. The difference is that EFTPOS terminals accepting online debit cards must have an online account balance check feature which makes it impossible to overdraw an account. As a result of this feature, online debit cards may be a useful option for customers who are either ineligible for or do not wish to have debit cards.

*Electronic bill presentment*

Electronic bill presentment (EBP) is a term used to describe the delivery of bills electronically via the internet, instead of in paper form by post. In order to receive bills electronically, customers must have an internet banking agreement with their bank and then make an EBP agreement with the biller (service provider). Under an EBP agreement, bills are no longer sent in paper form by post, but are instead sent directly to the customer's bank in electronic form, i.e. to the customer's internet banking site. Finnish banks

offer customers two options for paying bills: direct debiting, whereby bills are debited from a customer's bank account on the due date, or so-called direct payment, whereby the customer logs onto the internet banking site and accepts the bill, authorising the amount to be debited. Several banks and service providers (e.g. electricity and telecommunications companies) currently offer the possibility of EBP.

*Internet payments*

Finnish banks are currently trying to encourage increased use of their existing internet services by providing e-commerce payment facilities. For online purchases, customers can pay in real time by selecting from the merchant's website the internet payment code for their own bank and accepting the bill that appears on the screen. Having done so, they are then directed to their bank's website in order to execute the payment. The arrangement requires prior agreement between the merchant and the bank (on internet payments) and between the customer and the bank (on internet banking services). For now at least, the two agreements must involve the same banking group.

### 3 Interbank exchange and settlement systems

#### 3.1 General overview

The Finnish interbank payment system consists of an RTGS system (BoF-RTGS), a retail payment system (PMJ) and a large-value netting system for express transfers and cheques (POPS). BoF-RTGS is operated by Suomen Pankki and the other two systems are operated by the banks participating in them.

#### 3.2 The BoF real-time gross settlement system

The RTGS system operated by Suomen Pankki consists of Suomen Pankki's RTGS application, an account holder interface, a SWIFT interface and an account holder application supplied to account holders by Suomen Pankki. The name of

the system is BoF-RTGS and it is a component of the TARGET system.

In 1999 the turnover of BoF-RTGS amounted to FIM 25,978 billion (€4,369 billion). The number of transactions totalled 449,000, of which 193,000 were outgoing or incoming cross-border payments. The total turnover of the system was about 36 times Finland's GDP.

##### 3.2.1 Operating rules

The rules of BoF-RTGS are part of the Agreement on the Settlement Account concluded between Suomen Pankki and each account holder. The rules are based on the ECB's TARGET Guideline (see Section 3.1 of the euro area chapter of this publication).

### 3.2.2 Participation in the system

Access criteria for BoF-RTGS comply with the TARGET Guideline. In addition to credit institutions as defined in the TARGET Guideline, Suomen Pankki may also admit as account holders the State Treasury, investment firms established in the EEA and organisations providing clearing and settlement services. Organisations providing clearing and settlement services must be subject to oversight by a competent authority and have fully paid-up capital of at least €2.5 million.

The participating institutions are required to sign an Agreement on the Settlement Account, pay a fee for opening the account and implement an electronic interface for the management of the settlement account.

An account holder participating in the retail payment system (PMJ, see Section 3.4) is required to install an account holder application supplied by Suomen Pankki or its own corresponding account holder interface which enables it to monitor the balance on its settlement account in real time and serves as a backup for sending clearing calculations to Suomen Pankki. The sending and receiving of TARGET payments requires the implementation of a SWIFT interface.

In addition to Suomen Pankki itself, there are currently 12 institutions authorised to participate in the system. These comprise the State Treasury, the APK, the Helsinki Exchanges, domestic credit institutions and local branches of foreign banks. At present no foreign credit institutions participate in the funds transfer system via remote access from abroad.

The most important indirect participants are the savings banks (39), independent co-operative banks (43) and other co-operative banks (289). These are regional banks serving either a local community or an entire economic region. Their central financial institutions – Aktia for the savings banks and independent co-operative banks and Okobank for the co-operative banks – have direct access to BoF-RTGS and thus operate as their member banks' settlement agents in the system.

### 3.2.3 Types of transaction handled

BoF-RTGS is used for the real-time gross settlement of central bank, customer and interbank transfers.

The largest group of gross transactions in terms of value are incoming and outgoing TARGET transfers. The second largest group comprises funds transfers related to settlement in ancillary systems, i.e. the APK's RM settlement system (see Section 4.3.2.2) for fixed income securities and its OM settlement system for equity instruments, and the settlement of the POPS system for express transfers and cheques and the PMJ system for retail payments. The third largest group of payments consists of domestic customer and interbank payments. The total value of payments related to central bank operations is rather modest. Although there are no restrictions on the minimum size of a payment in the system, the average value of payments in 2000 was €7 million for domestic transfers and €16 million for outgoing TARGET transfers.

### 3.2.4 Operation of the transfer system

The operating hours of BoF-RTGS are the same as for TARGET and the operating days are the same as those defined for TARGET in the TARGET Guideline.

### 3.2.5 Transaction processing environment

Payment transfers are sent to Suomen Pankki using workstations located on the premises of the account holders or via a SWIFT interface. These are linked with Suomen Pankki's settlement account database via telecommunication lines, which are leased from private telecommunications companies. In order to ensure the security of the data, all transfers are encrypted. All TARGET transactions must be sent through the SWIFT interface.

In addition to transferring payments in real time, account holders can use their workstations to monitor their liquidity position. All account entries of participants are transmitted back to their workstations in real time, thus permitting



account holders to monitor entries and balances on their account on a continuous basis. The system is able to print out various kinds of reports, the most important of which is the daily statement of account. Suomen Pankki sends updated common data and any necessary notices to the account holders.

In the event of a disruption or malfunction, a backup system is readily available, enabling the settlement process to be completed for the rest of the day.

### 3.2.6 Settlement procedures

Payment transfers entered into the system by account holders and Suomen Pankki are settled across and booked in the settlement accounts of the account holders in real time, if adequate liquidity is available and if the payment is eligible for settlement. BoF-RTGS provides immediate finality. Payment transfers entered in the system are final as soon as they are debited from the sender's account. Payments are not revocable after settlement and mistakes are corrected by making a new transfer in the opposite direction.

All payment orders entering the system are placed in a payment queue. If liquidity is available, the payments are settled directly from the queue. If liquidity is not available for direct settlement, payments are settled in FIFO order on the basis of times of receipt within a priority class. If the sending account holder has not specified a priority code for a payment order, the system will automatically assign the lowest priority code to the payment order in question. Account holders can also specify earliest settlement times for individual payments. A payment order in a queue will not be executed before this time. It is also possible to send a payment order in advance to BoF-RTGS for settlement on a future value date.

Up to now payments have only occasionally been queued because of insufficient liquidity. Some banks make daily use of the earliest settlement time feature. Other banks have their own in-house liquidity management systems and make little use of the liquidity management

facilities of BoF-RTGS. Participants do not receive information on incoming queued transfers.

An account holder can remove a payment order from its payment queue and change the order of queued payments using the account holder interface. The payment orders for the current settlement day that remain in the queue at the end of the day are automatically removed from the system (customer payments immediately after 5 p.m. C.E.T. and interbank payments after 6 p.m. C.E.T.).

BoF-RTGS periodically attempts to settle simultaneously all queued payment orders which qualify for settlement. Simultaneous settlement is made if all the queued payment orders which qualify for settlement can be executed, subject to available funds, i.e. each account holder must have sufficient funds available in its account to cover the net balance of outgoing and incoming payment orders in its queue.

### 3.2.7 Credit and settlement risk

As funds transfers in an RTGS system are executed only if there are sufficient funds to cover each transfer, the system does not involve any credit risk for the participants. Liquidity available to account holders consists of minimum reserves held in the settlement accounts and fully collateralised intraday credit provided by Suomen Pankki.

### 3.2.8 Pricing

There is a €3,000 fee for opening an account in BoF-RTGS. There is also a fixed monthly charge of €270 per account and a variable charge for individual payments submitted electronically. The cross-border payment fees are defined in the TARGET Guideline. The fees charged for domestic payments are €0.8 for each of the first 100 transactions per month, €0.45 for each of the next 900 transactions and €0.35 for each subsequent transaction in excess of 1,000.

In addition, the account holder bears all costs arising in connection with the interfaces, data

communications services and security arrangements which it uses. The account holder application supplied by Suomen Pankki costs €20,000 and there is a maintenance fee of €120 per month.

### 3.3 The POPS large-value netting system for express transfers and cheques

POPS is a real-time system operated by the participating banks on a decentralised basis. Banks participating in the system send payment messages bilaterally. The system uses both continuous netting within bilaterally agreed credit limits and gross settlement in BoF-RTGS. The total value of payments settled in the system amounted to FIM 1,895 billion (€318.7 billion) in 1999. The total number of transactions was 930,000.

#### 3.3.1 Operating rules

POPS is governed by a number of agreements between the system participants and between these participants and Suomen Pankki. The agreements determine the procedures for the transmission of payment and other related information between the participants, the procedures for settlement in BoF-RTGS, the procedures for participating in the system and issues related to the technical infrastructure. Participants also have bilateral agreements governing the bilateral credit limits granted to each other. Banks have agreed with Suomen Pankki on the maximum amount of a bilateral limit. The system rules, which are public, are part of these agreements.

#### 3.3.2 Participation in the system

Participation in the system can be either direct or indirect. Direct participation is available to deposit banks which have been granted clearing bank status. In order to obtain clearing bank status, a bank must apply for a settlement account in BoF-RTGS and must therefore fulfil the criteria for opening an account at the central bank (see Section 3.2.2).

Direct participants have to sign the agreements governing the system. A prerequisite for the participation of a foreign credit institution is an assessment of the institution's home country legislation on netting and the finality of netting. Direct participants must be members of SPY.

Indirect participation is available to customers of an existing clearing bank. Indirect participants pay the direct participants for the clearing services provided by the latter.

The participating banks own and operate the system and those that are members of SPY decide on participation. At the end of 1999 there were nine direct participants in POPS, three of which were local branches of foreign banks.

#### 3.3.3 Types of transaction handled

The system handles customer payments related to express transfers and cheques (including bank drafts).

#### 3.3.4 Operation of the transfer system

The operating hours of POPS are 7 a.m. until 3.30 p.m. C.E.T. The end-of-day settlement of bilateral net positions must take place in BoF-RTGS by 4 p.m. C.E.T. Gross payments must be settled in BoF-RTGS by 4 p.m. C.E.T.

#### 3.3.5 Transaction processing environment

POPS is designed as a bilateral continuous netting system. Banks participating in POPS exchange payment messages bilaterally, without using a centralised clearing house or a clearing operator. POPS uses a copy of the Banks' On Line Data Communication Network (or POLT) for transferring payment information. All transaction information is processed in real time between the banks and the banks credit the customer's account immediately upon receipt of the payment information.

### 3.3.6 Settlement procedures

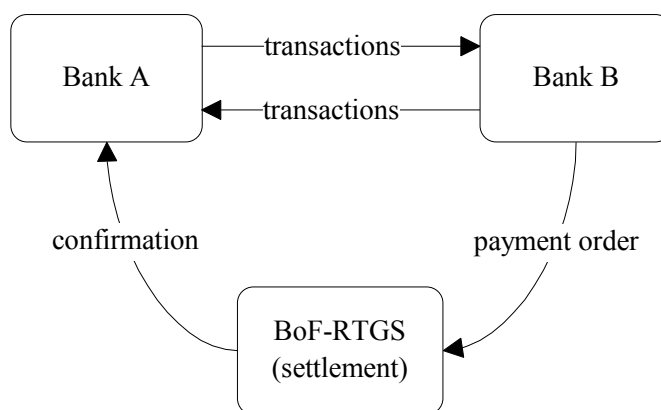
Two types of settlement procedure are used in the system: gross and net settlement. There are also two types of bilateral limit in the system: credit limits and settlement limits. Payments larger than the bilaterally agreed settlement limits are settled on a gross basis directly in BoF-RTGS. Single payments under the settlement limits are normally settled on a net basis, but can exceptionally also be settled individually in BoF-RTGS. The credit limits are used in conjunction with net settlement. The size of the credit limit for each participant is twice the bilaterally agreed settlement limit. Banks control the size of their bilateral net positions against each of the other participants through these bilateral credit limits.

The bilateral settlement limits also function as a signal which triggers the settlement of bilateral net balances during the day. Whenever the amount of a bilateral net credit position exceeds the bilateral settlement limit, the intraday settlement procedure is invoked. In this settlement procedure, the debtor party sends a settlement transaction via BoF-RTGS (see Figure 1). Intraday settlement transactions are always equal in amount to the bilateral settlement limit.

The credit limit is the maximum allowable amount for a bilateral net balance. Transactions which would result in the net balance exceeding the credit limit are rejected by the risk-taking bank. Since the credit up to these limits is not collateralised, POPS entails limited counterparty risk. At the end of the day, bilateral balances are settled to zero by transferring the balances via BoF-RTGS.

**Figure 1**

#### POPS settlement procedure



### 3.3.7 Credit and settlement risk

The overall maximum credit risk accepted by any bank is the sum of the bilateral credit limits it has been granted. The risks are in fact much smaller because of continuous debit/credit shifts in bilateral positions throughout the day and the use of gross settlement for bilateral positions and for large-value payments. Payment information on all POPS payments, both those

which are included in the banks' bilateral net position and those which are settled gross in BoF-RTGS, is exchanged directly between the banks.

### 3.3.8 Pricing

New participants are charged an entrance fee, which goes towards covering the initial investment costs of designing and implementing the system

and costs associated with subsequent changes caused by the entry of newcomers.

### 3.4 The PMJ retail payment system

PMJ is the system for retail payments in Finland. It is operated by the banks and final settlement takes place in BoF-RTGS (see Section 3.4.6).

In 1999 the total value of payment transfers in PMJ was FIM 696 billion (€117 billion). The total number of transactions was 307 million.

#### 3.4.1 Operating rules

The operating rules of the system are governed by the same agreements as those which govern the POPS system (see Section 3.3). The relationships between banks and their customers are not regulated by these agreements, but there are standard agreements concerning customers' domestic and cross-border retail payment orders.

The timetables and procedures which apply to settlements in BoF-RTGS are specified in detail in the agreement on PMJ settlements concluded between the system participants and Suomen Pankki.

#### 3.4.2 Participation in the system

Participation in the system is governed by the same agreements as those for participation in the POPS system (see Section 3.3.2).

#### 3.4.3 Types of transaction handled

PMJ handles all customer payments between banks, i.e. credit transfers (including salary and pension payments), direct debits and debit card transactions (including EFTPOS payments).

Payment information related to cash withdrawals from ATMs is transmitted via a separate online network (Banks' On Line Data Communication Network), known by the Finnish acronym POLT. The settlement for these transactions is included in the settlement of PMJ.

#### 3.4.4 Operation of the transfer system

The transfer system is operated by banks and there is no common multilateral clearing centre for the clearing of payments. All customer payments made from one bank or banking group to another are cleared bilaterally between banks and settled centrally in BoF-RTGS at the central bank.

The participating banks operate the system through their computer centres which are linked via the telecommunications network. The transmission of payment transactions in which the sender and beneficiary have accounts in different banking groups is based on direct bilateral communication links between the banks in the network.

#### 3.4.5 Transaction processing environment

Most payment instructions are now initiated by customers in electronic form (85% electronic, 15% paper). Electronic initiation is increasingly conducted outside banks by personal and corporate customers using internet-based banking applications or some other electronic means linked to the banks' systems. If paper forms are used, they are transformed into electronic messages for transmission in the sending bank branch. Payment orders involving the same bank are transmitted to the accounting system of the bank for normal booking in real time, while payment orders involving other banks are collected in the sending banks' computer centres and sent in batches two or three times a day to the receiving banks.

#### 3.4.6 Settlement procedures

Every day, each clearing bank calculates the net amount receivable or payable to each of the other banks in the system on the basis of all third-party payment instructions that it has forwarded via PMJ to the other banks. These amounts are included in the clearing calculations which each bank transmits electronically to BoF-RTGS. All clearing calculations are settled in a clearing run initiated twice a day. The automated night clearing occurs daily at 12 midnight C.E.T. (1 a.m. local time) and the second

clearing run is at 2.45 p.m. C.E.T. (the day clearing). If all banks with net payment obligations have sufficient funds on their accounts, the amounts due are simultaneously debited from and credited to the accounts of the participants in BoF-RTGS.

A PMJ settlement cannot be executed unless there are sufficient funds in the settlement accounts of the account holders concerned to settle the entries resulting from the settlement run. If the funds available during the day clearing are insufficient, the settlement is delayed and the participant that is short of liquidity is given the opportunity to acquire and provide the necessary funds. If the participant is unable to provide sufficient funds for the settlement, the participant is excluded from the settlement run and the transactions are postponed until the next settlement session. Any participants which have not sent their respective clearing calculations to Suomen Pankki or do not have sufficient funds available on their respective settlement accounts will be excluded from the automated night settlement,

and settlement will be effected between the remaining clearing participants.

Under the settlement agreement between Suomen Pankki and the banks, a precondition for settlement is that each participant has sufficient funds to meet its payment obligations.

#### 3.4.7 Credit and settlement risk

Each bank in the system receives the daily payment messages in batches from other banks prior to the interbank settlements at the central bank. The banks have agreed to credit their customers only after final interbank settlement and the system is thus free of credit risk.

Liquidity available for PMJ settlement in BoF-RTGS consists of minimum reserves plus intraday credit granted by Suomen Pankki.

#### 3.4.8 Pricing

Participation in POPS (see Section 3.3) is required. The entrance fee for POPS also covers the price for new entrants in PMJ.

## 4 Securities settlement systems

### 4.1 Trading

The Finnish securities markets comprise equity, money, bond and derivatives markets. Trading takes place in euro-denominated instruments, which are normally issued in book-entry form.

#### 4.1.1 Trading on OTC markets

Most bond trading and all money market trading in Finland takes place over the counter. Despite this, interbank trades in book-entry debt securities are normally settled through the APK, the Finnish CSD.

As at August 2000, ten primary dealers, including three domestic banks, guaranteed liquidity in the government bond market. Bidding procedures in this market became more efficient in June 1999

when the State Treasury switched from telephone auctions to an electronic auction system (the Bloomberg Auction System).

Including domestic branches of foreign banks, 11 banks act as market-makers – and counterparties to Suomen Pankki – in the Finnish money market. However, following the introduction of the euro, trading has been channelled to an increasing extent through brokers to non-local counterparties. Trading mainly takes the form of outright deals in money market deposits and CDs, whereas repurchase agreements are not very common. Other instruments, such as Treasury bills, local government paper and commercial paper (CP), have been traded on a minor scale in the secondary market. Banks also trade in FRAs based on CDs and long-term interest rate swaps.

#### 4.1.2 Organised market

In Finland, securities trading, clearing and registration and the depositing and custody of listed securities are concentrated among the various subsidiaries of the HEX Group, which has been operating in its current form since April 1999 (see Section 4.3.1 for a more detailed description of the consolidation process).

The current structure of the HEX Group is the result of a process of vertical integration whereby the Central Share Register of Finland, the Helsinki Money Market Center, the Helsinki Stock Exchange Ltd and two official derivatives exchanges have gradually been brought under a common umbrella.

Helsinki Securities and Derivatives Exchange, Clearing House Ltd (or Helsinki Exchanges) is a regulated market-place which deals in equities, bonds, options, futures and other derivative instruments. There is no CCP on the Helsinki Exchanges, except for locally traded derivative instruments. Both derivatives exchanges and traditional exchanges must be licensed by the Ministry of Finance.

HEX Securities Services specialises in the provision of value-added services to equities and derivatives markets, such as risk and collateral management, stock lending and back-office services for derivatives.

*Arvopaperikeskus* (APK), the Finnish CSD, provides participants with centralised services related to the handling, ownership, clearing and settlement of securities registered in book-entry form. It also provides book-entry register services, some of which it is required to arrange free of charge for individual investors.

The IT services of the Group are provided by HEX Securities Technology, which also manages the Group's software development projects.

The Group is owned mainly by private shareholders, while the holdings of the state and Suomen Pankki come to 4.5% and 7% respectively. The largest individual shareholder

is OM Gruppen AB (15.6%), the operator of the Stockholm Stock Exchange in Sweden.

The HEX Group is planning to obtain a listing on the Helsinki Exchanges. For this reason, it is reorganising its structure to focus on five business areas: corporate services, trading, clearing and custodial services, securities services and internet-based services (branded eHEX). Following the reorganisation, subsidiaries such as APK are likely to disappear as separate entities.

#### 4.1.3 Organised trading

The trading day of the Helsinki Exchanges starts with pre-trading. At the end of this session, opening price levels are established on the basis of single batch trading to match the bids and offers entered by brokers. Continuous trading begins at 9 a.m. C.E.T. and currently lasts until 5 p.m. C.E.T. This is followed by a short after-hours trading session during which deals can only be concluded within the price range established during continuous trading. A second after-hours trading session is organised in the morning of the following business day. The Helsinki Exchanges are planning to introduce evening trading in early 2001.

Trading members on the Helsinki Exchanges comprise 28 equity brokers and 23 derivatives brokers. Nine equity brokers and one derivatives broker are currently remote members of the Helsinki Exchanges, but the number of remote brokers is expected to increase dramatically over the next few years. The Helsinki Exchanges accept both banks and brokerage companies as members.

In August 2000 the number of companies listed on the Helsinki Exchanges' four lists (Main List, I List, NM List and Pre List) stood at 164, compared with 150 at the end of 1999. There were 28 new listings in 1999. Turnover in equities trading almost doubled to €104.8 billion in 1999 from €54.3 billion in 1998. By 2 June, turnover in 2000 had already surpassed turnover for the whole of 1999, reflecting the continued growth trend.

The performance of the market is described using the following indices: the HEX All-Share index, the HEX 20, the (weighted) portfolio index, the I List, the HEX NM List and the FOX option index. In addition, the Main List is divided into a number of sectors, each of which has its own index. Non-weighted indices are recalculated continually during continuous trading after each transaction constituting at least a round lot. Weighted indices are calculated at ten-minute intervals. HEX calculates both price and yield indices.

The bulk of derivatives trading was transferred to Eurex Frankfurt AG in September 1999 with Finnish brokers becoming non-clearing members of Eurex Clearing AG. This mainly involved Nordic equity and index derivatives. The transfer entailed a change in the obligations attached to deals as, under Eurex rules, brokers enter into a deal as a counterparty to the customer, whereas on the Helsinki Exchanges deals were based on novation (i.e. the exchange was a CCP to all trades). Only a small number of local derivatives are still listed on the Helsinki Exchanges.

The LEX stock lending contract continues to be traded only on the Helsinki Exchanges. The lending pool covers the bulk of the most actively traded shares.

Mutual fund units are not traded directly on the exchange, but the HETI information system disseminates their end-of-day valuation data.

#### **4.1.4 Trading system of the Helsinki Exchanges**

The HETI trading system was initially introduced for bond trading in 1988 and has been used for trading equities since 1989. Trading became fully electronic in April 1990 when the previous daily call auction practice was discontinued. At present, HETI provides electronic real-time trading for (outright) sales or purchases of shares, subscription rights, bonds, warrants and convertible bonds. It also allows securities lending and derivatives trading. HETI is an order-driven system, in which

outstanding bids and offers are displayed to the trading members.

#### *Order-routing system*

The technical structure of the trading system is decentralised. Orders can be initiated on HETI workstations located in members' offices or entered into the system from brokers' proprietary trading systems superimposed on the HETI interfaces. In January 2000 six brokers routed customers' orders into their own systems via the internet, which is becoming increasingly important for communication between brokers and investors.

Only limit orders can be executed in continuous HETI trading. More complex orders (at any price, all or none, stop loss, take profit, at best, stop limit, etc.) have to be managed on brokers' own systems.

Once entered into the central HETI systems, bids and offers are queued in the order of priority of the bid/offer prices. If there are two bids/offers at the same price, priority is determined on the basis of the time of entry into the system. With regard to their origin, no distinction is drawn between customer and dealer orders. An electronic order execution system executes trades centrally after having matched orders.

Orders for round lots are valid in the central system throughout the continuous trading session unless withdrawn by participants or executed. At the close of continuous trading, the best effective bids and offers for round lots constitute the closing quotations for the listed security concerned.

#### *Matching*

The HETI system matches bids and offers at the same price as trades in real time in the order in which they are entered into the system (FIFO). It then updates the outstanding number of lots underlying these bids and offers. If a trading member has several effective bids/offers for one

security at the same price, they are executed as separate trades according to the order in which they were entered into the system. This means that only one price level can be matched at a time.

For odd lots, HETI matches suitable bids and offers as trades in real time on the basis of the price for the latest round-lot trade. Odd-lot orders for book-entry securities can be given on an “all or none” basis in order to ensure that the order can be executed in full at the same time.

Matched transactions become effective as trades, which are confirmed to both parties at the end of the execution cycle.

All stock, warrant and bond trades executed on the Helsinki Exchanges are cleared centrally by the APK in its KATI system, to which trades (of book-entry securities) are automatically transferred for settlement.

## 4.2 Clearing

There are no independent clearing houses in Finland (see above).

## 4.3 Settlement

### 4.3.1 Institutional and legal aspects

The changeover from physical securities to a book-entry system began in 1992. Initially, the book-entry system was decentralised, meaning that different entities could function as book-entry registrars in different information systems, subject to licensing by the Ministry of Finance. The system for book-entry equity securities was spread between different IT environments, mostly maintained by banks, and the centralised shareholder register was maintained by the Central Share Register of Finland Co-operative. By contrast, the system for book-entry debt securities was concentrated in a single IT environment maintained by Helsinki Money Market Center Ltd. The Securities Association was set up to co-ordinate the activities of the decentralised book-entry system.

In spring 1996 the Government, Suomen Pankki and the main market participants from the private sector agreed to combine the existing Finnish book-entry systems into one institution, APK. It was established as a limited liability company and is consequently governed by the provisions of the Finnish Companies Act, unless otherwise prescribed in the Act on the book-entry system (826/1991 as amended, most recent amendment 795/2000) or in other legislation pertaining to APK. The private sector owned 60% of APK and the public sector 40%. Suomen Pankki was the largest single owner, with a holding of 24.4%.

At the end of 1996 APK acquired the business operations of the Helsinki Money Market Center and the Central Share Register of Finland Co-operative, as well as the clearing and settlement operations of the Helsinki Stock Exchange. The operations of the Securities Association were transferred to the APK under a legal reform that became effective on 1 January 1997. On the same date, APK commenced actual operations on the basis of existing systems.

At the end of 1998 the HEX Group was established as the parent company of APK, whereby all former shareholders of APK became shareholders of the parent company. The functions of APK remained unchanged. The shareholders' agreement on the HEX Group laid down that no provisions likely to hamper the conduct of monetary policy were to be included in APK's rules.

In addition to being legally designated the national CSD of Finland, APK was granted a licence to operate as a CSD by the Ministry of Finance on 30 December 1996. APK is the only CSD holding such a licence in Finland, as well as the only SSS operator.

The Ministry of Finance has the power to restrict or withdraw the licence of APK. Furthermore, it endorses APK's Rules and Regulations, including regulations on clearing, after first consulting Suomen Pankki and the FSA.



For the historical reasons outlined above, the SSS of APK consists of two technically separate sub-systems, namely:

- the RM system for settling money market instruments and most debt securities; and
- the OM system for settling shares, other equity-related securities and some debt securities.

The RM system is technically centralised and administered by APK. Trades are settled in a continuous RTGS process.

Clearing and settlement in the OM system is partially based on netting, i.e. book-entry securities are delivered in gross terms, but payments are netted. Technically, the system remained decentralised until 16 October 2000. Registrars were, however, required to use data interfaces compatible with the central systems of APK, which were necessary for the operation and proper functioning of the book-entry system. The Finnish book-entry system was still legally decentralised in the sense that book-entry registers were maintained by a number of legally independent and separate entities.

Following centralisation, the clearing and settlement of book-entry securities in the OM system now takes place in a single book-entry register owned and maintained by APK. APK grants participants the right to operate own and customer accounts in the central register, either via terminals or via the participants' own data systems through a standardised interface.

Centralisation required an amendment to the Act on the book-entry system. Under the amendment, the book-entry registers became centralised at the CSD, which meant that APK became the only book-entry registrar. Now APK grants the right to act as an account operator authorised to make entries in APK's book-entry register. The amended Act allows former book-entry registrars and other market participants to apply for the right to act as an account operator. The Ministry of Finance,

however, still grants the licence to operate as a CSD.

Other important legislation governing the functioning of the SSS are as follows:

- The operations of APK and the functioning of the book-entry system are based on special legislation enacted to allow securities dematerialisation. The Act on the book-entry system mainly contains provisions on organisational aspects of the book-entry system (including provisions on the status of APK, other book-entry registrars and international links), the responsibilities of participants in the book-entry system, financial requirements for covering liabilities and secrecy requirements.
- The Act on book-entry accounts (827/1991 as amended, most recent amendment 796/2000) contains provisions on the operation of book-entry accounts, the entries in these accounts and the legal effects of these entries, as well as provisions on the strict liability for errors in the book-entry system. The Act also contains provisions on the secured position of a bona fide buyer against the seller's creditors and other third parties.

As a statutory self-regulating organisation, APK also regulates and supervises the book-entry system. Furthermore, it is responsible for developing the book-entry system as a whole. APK and account operators (former book-entry registrars) are subject to supervision by the FSA. APK is also required to have two authorised public accountants.

A government proposal on provisions concerning clearing and settlement activities was included in the Securities Markets Act in 1998, in respect of which the EMI had delivered its Opinion. Under these provisions, clearing and settlement are subject to separate authorisation by the Ministry of Finance and supervision by the FSA. APK is legally authorised to operate as a clearing house and is required to restrict its operations to

securities administration, processing, clearing and settlement functions. As regards clearing and settlement activities, it is expressly stated in the above-mentioned Act that the other activities of a clearing house must not endanger its clearing activities. In addition, APK is legally obliged to accept its own members as clearing members in the clearing and settlement system.

APK is required by law to act as a registrar for any international links between CSDs. The Ministry of Finance drafted an amendment to the Act on the book-entry system concerning such links. The amendment came into force in 1999.

Under the amended Act, proprietary rights to securities deposited in a foreign CSD can be transferred to the Finnish book-entry system as proprietary rights. This requires a link agreement between APK and the foreign CSD, enabling foreign securities to be transferred and pledged in Finland according to the provisions governing the Finnish book-entry system without necessitating any changes in the accounting system of the foreign CSD.

According to the Act on Suomen Pankki (719/1997), the Finnish central bank has a general duty to participate in maintaining the reliability and efficiency of the payment and financial systems. Suomen Pankki thus has a role in the general oversight of APK. APK is required to inform Suomen Pankki immediately of any malfunctions and other problems and to subsequently submit a detailed follow-up report.

APK is supervised by the FSA, which operates in connection with Suomen Pankki on the basis of a separate Act, the Act on the Financial Supervision Authority (503/1993). The tasks of the FSA include supervision of compliance by the supervised entities, regulation, on-site inspections and financial market monitoring.

The FSA conducts inspections on the basis of its own guidelines. By virtue of its supervision of compliance with the Act on the book-entry system, the FSA also supervises international

links in which APK is involved. On-site inspections and ongoing supervision by the FSA are also concerned with the adequacy of and compliance with regulations.

APK assumes the counterparty risk in the netting process of the OM system according to the principles of multilateral netting by novation with a CCP. APK manages this risk by requiring the participants to collateralise their positions in full. According to the rules of APK and the pledge agreements concluded between APK and the participants, the pledged assets can be realised immediately without consulting the clearing party and without the need to comply with any formalities to cover the payment obligations of a clearing party. The position of a holder of collateral is secure in Finland. The secured creditor is under no obligation to participate in bankruptcy proceedings involving the pledger, and the pledgee may satisfy his/her claims by using the collateral quite independently of other creditors.

The rules of APK permit close-out netting and include the option to terminate the operations of a clearing party which commits an error. These rules are enforceable and clearing parties undertake to accept and comply with them in their membership agreements with APK. APK fulfils the requirements of the SFD.

#### 4.3.2 Operational aspects

All stock, warrant and bond trades effected on the Helsinki Exchanges are cleared centrally by APK. Shareholdings have been recorded in investors' book-entry accounts in the centralised book-entry register maintained by APK since October 2000.

The normal settlement period for equities and bonds is T+3, but the parties may jointly agree on other settlement conventions. As money market transactions are settled on a gross basis, they are cleared and settled on the settlement date as soon as the conditions for the settlement are fulfilled. The standard settlement period for the latter is T+2.

Partial deliveries can be accepted if the customer and the clearing party have agreed on this, except in the case of book-entry bond securities and money market instruments.

*Equity settlement*

Book-entry equity transactions are settled either in APK's OM system or as direct transfers between the relevant book-entry accounts.

- 1) Book-entry equity trades executed in the Helsinki Exchanges' HETI trading system are automatically transferred to APK's automatic clearing system KATI for settlement in the OM system.

Settlement instructions are pre-matched during S-1, i.e. all accepted settlement instructions are matched against the counterparties' instructions.

Clearing parties which have payment obligations pay the net settlement sums to APK by the deadline set by the rules of APK on the settlement day and the corresponding trades are cleared in the clearing in the OM system. The pre-payments deposited by the clearing party with APK are converted into final payments on the basis of netting. APK assumes responsibility for the fulfilment of the obligation in accordance with the calculation sent to the clearing party. Settlements are finalised when APK has matched the trade data of the book-entry registers and KATI and paid the net credit positions to the clearing parties. A precondition for this is that all the book-entry transfers between the securities accounts have been finalised. Same-day turnarounds are possible in KATI.

At present, the equities settlement system is based on batch processing and there is only one net settlement cycle per day. Therefore, intraday finality would require the use of free of payment deliveries. As the OM system can only be operated as a batch system, its operating hours, though long, do not correspond with the opening hours of the TARGET system. In principle, the OM system is open for trade entries from 10.30 p.m. the previous day to 10 p.m. C.E.T. on all domestic banking days. Transfer

instructions must be entered into the system early in the morning of the settlement day in order for them to be processed in the single batch process on the same date. The OM system is open on all TARGET days except some domestic holidays. It is planned to introduce RTGS settlement for the OM system after centralisation, but no timetable has yet been set.

- 2) Direct transfers between the relevant book-entry accounts

Settlements are finalised after APK has matched the data on trades of the book-entry registers. The settlement sum is transferred at gross value into the payment system. Same-day turnarounds must be agreed upon separately.

*Bond and money market settlement*

Book-entry bond and money market instrument operations can be settled with intraday finality in BoF-RTGS in APK's RM system. Instructions for real-time trade-for-trade settlement are accepted continuously during the operating hours of the RM system. Almost all trades in the RM system are settled by RTGS.

As is normal in RTGS systems, settlement is final immediately after the book entries have been registered in the receiver's account and the funds have been transferred to the name of the receiving party in the sub-accounting of the CSD's account in the central bank. On the settlement date the funds are transferred from the buyer's cash account with the clearing party to the buyer's account in the RM system via BoF-RTGS. The actual transfer of funds is made at the same time as the transfer of securities between the buyer's and seller's book-entry accounts in the RM system. The transfer of funds only takes place if the securities are available for delivery in the seller's account.

Under the rules of APK, the clearing party must have sufficient amounts of securities for delivery or sufficient funds for payment by 2 p.m. on the settlement day. Same-day turnarounds are possible in the RM system. At present, the

operating hours of the RM system are 7 a.m. until 6 p.m. C.E.T. on TARGET days.

#### *Recurrent events*

- Entitlements

Entitlements include dividends, subscription rights, bonus issue shares, shares resulting from stock splits, etc. Entitlements follow the trade date rule, whereby the entitlement is transferred according to the trade date of the transaction. If the trade date is prior to the ex-date, the entitlements are transferred from the seller to the buyer. Entitlements automatically follow the original trade if the trade is settled on or prior to the record date. If a trade with a trade date prior to the record date is settled after the record date (i.e. a trade is concluded cum-entitlement), the delivering party is responsible for transferring the securities together with the entitlements. If the trading parties have agreed to a settlement period other than T+3, the customers must inform the clearing party how the entitlements should be transferred.

- Interest and redemptions

Interest and redemption entitlements are paid to the holder of the bonds or money market instruments on the payment date regardless of the trade date. If a trade which has a settlement date prior to the payment date is settled on or after the payment date, the interest or redemption entitlement is transferred from the seller to the buyer.

#### *Links*

For the purpose of transferring cross-border collateral, APK established a direct link with Deutsche Börse Clearing, now Clearstream (Germany), in December 1998/January 1999. The link was limited to debt instruments (i.e. APK's RM system) in the first phase and was expanded to include equity instruments in September 1999. The link has been operated on a two-way basis since the beginning of 2000. APK also established a two-way debt

instrument link with Sicovam SA in France in September 1999. The automated two-way links for the clearing of debt instruments operating on an FOP basis have functioned very well technically. Messages concerning trades are conveyed between the securities depositories via the SWIFT network. RTGS is well-suited to the cross-border transfer of securities. APK also has a link to Necigef in the Netherlands for handling Huhtamäki van Leer shares.

The links between APK's RM system and foreign SSSs are based on real-time procedures. This ensures that a delivery is debited from the delivering party's account at the same time as it is credited to the omnibus account of the receiving SSS, and from there on to the buying party's account in the recipient country.

#### **4.4 The use of the securities infrastructure by Suomen Pankki**

The main method of collateralisation is pooling, which as a rule is applied to intraday credits. Credit operations are normally carried out against pooled assets, but Suomen Pankki can also conduct repos for credit operations.

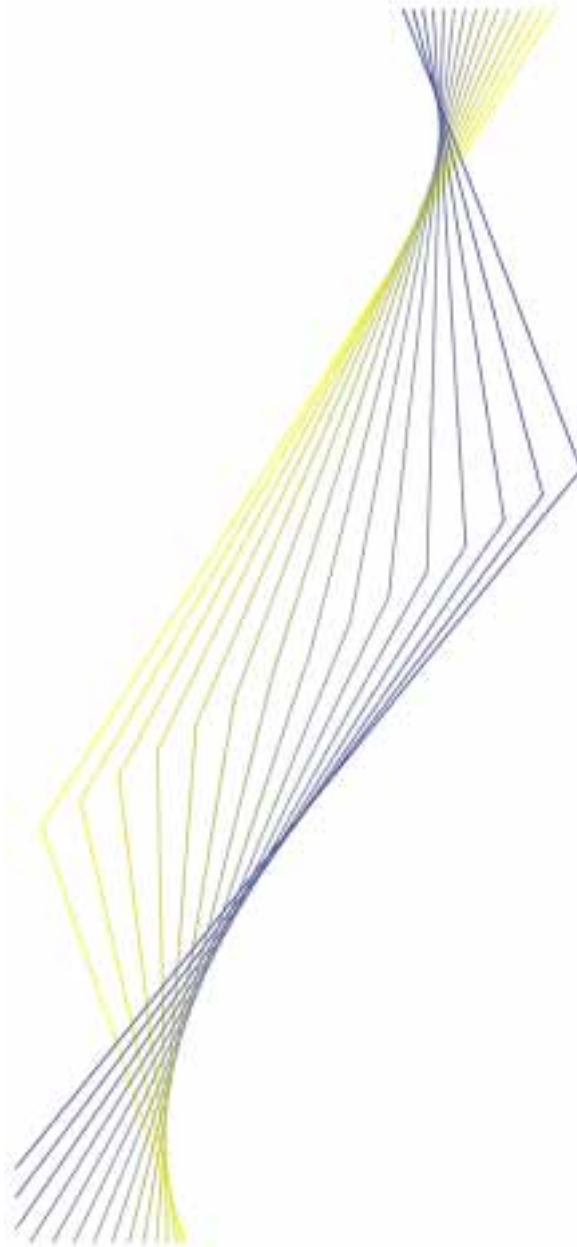
The pool of assets pledged to Suomen Pankki allows a counterparty to deliver collateral to its pool on an FOP basis and independent of any request for credit. The total collateral requirement of each individual counterparty consists of all credit operations, including interest thereon, and its intraday credit requirement after application of appropriate haircuts. APK provides the valuation service to the central bank, which only checks the total amount of collateral available in the pool.

APK acts as the depository for all eligible collateral. Foreign collateral can be delivered either through the CCBM or approved links. Use of foreign collateral by Finnish counterparties has been very limited up until now.

Finland



EUROPEAN CENTRAL BANK



**Sweden**

**June 2001**

Sweden

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Sweden

### List of abbreviations

<b>BGC</b>	Bank giro centre – Bankgirocentralen BGC AB
<b>RIX</b>	Interbank and clearing system of Sveriges Riksbank – RIX-systemet

## Introduction

The Swedish payment system is dominated by the giro systems, the Bankgirot system and the Postgirot system, which account for more than 75% of all non-cash transactions. A growing proportion of the transactions in both systems are initiated electronically – around 80% in terms of value – and both the Postgirot and the Bankgirot administer systems for credit transfers initiated electronically via the internet.

Bankgirocentralen BGC AB (BGC) has recently adopted a new clearing platform for retail payments. It is still in an early stage of implementation, but it will ultimately lead to the full integration of all systems involved in the clearing and settlement cycle. Once fully operational, the system will allow for the possibility of real-time clearing and settlement of single retail payments.

While the number of cheque transactions is now very low in Sweden, debit cards linked to bank accounts have gained in importance. Increasing automation is the main driving force, with the number of EFTPOS terminals in shops and at other points of sale increasing considerably over the past decade.

Sveriges Riksbank, the central bank of Sweden, owns and operates the RTGS system, RIX, which was implemented in 1990. Since 1999 the RIX system has consisted of two parallel but separate systems: K-RIX for settlement in Swedish kronor and E-RIX for settlement in euro. Via E-RIX, the RIX system is linked to the ECB's TARGET system.

The Swedish securities markets have undergone a process of consolidation in the course of the past few years. In 1998 OM Stockholmsbörsen AB (the OM Stockholm Exchange) was established through the merger of OM Stockholm (the derivatives exchange) and the Stockholm Stock Exchange. In the same year, OM Räntebörsen (OM Fixed Income Exchange) was established through the acquisition of Penningmarknadsinformation Pml AB (Money Market Information). OM Stockholm Exchange clears and settles derivatives.

There are also plans to integrate the Nordic financial markets (the NOREX Alliance). The OM Stockholm Exchange, the Copenhagen Stock Exchange and the Iceland Stock Exchange have been joined together in a common trading system and have adopted common rules and regulations, and the Oslo Stock Exchange has signed a letter of intent regarding participation in the Alliance.

The Swedish CSD, VPC AB (VPC), is a clearing organisation operating the SSS, i.e. the VPC system. Equities, bonds and money market instruments are all dematerialised in the VPC system.

The Riksbank has two separate roles in respect of the payment system: an oversight role and an operational role. The Riksbank was reorganised in mid-2000 in order to make the distinction between these two roles clearer. The tasks and responsibilities associated with these roles have been assigned to two separate departments. The Financial Stability Department is responsible for the oversight role, while the Market Operations Department performs the operational functions.

## I Institutional aspects

### I.1 The general institutional framework

#### I.1.1 The institutions

Sveriges Riksbank is the Swedish central bank. According to the Riksbank Act (*Lagen om Sveriges riksbank, 1988:1385*), the Riksbank shall, inter alia, promote a safe and efficient payment system. In order to achieve this, the Riksbank provides a settlement system, RIX, ensures the supply of banknotes and coins and oversees the payment arrangements in Sweden.

The Riksbank's RIX system can be seen as the hub of the Swedish payment system. In addition to the Riksbank, the participants in the RIX system are the National Debt Office, credit institutions, and the clearing houses: VPC (which clears and settles equities, bonds and money market instruments), the OM Stockholm Exchange (which clears and settles derivatives) and BGC (which clears and settles retail payments).

Finansinspektionen is the single Swedish financial supervisory authority. Finansinspektionen is responsible for the supervision of companies operating in the insurance, credit and securities markets. This includes the supervision of all clearing organisations, except for the RIX system, provided by the Riksbank. Contributing to the stability and efficiency of the Swedish financial sector is part of Finansinspektionen's overall objective. Finansinspektionen reports to the Ministry of Finance.

The Ministry of Finance is the Swedish government office responsible for, inter alia, legislation regulating the financial sector (credit institutions, securities firms, funds management, stock exchanges, clearing houses and insurance companies).

### I.1.2 The legal framework for the payment and settlement systems infrastructure

The principal laws forming the legal framework for the payment and settlement systems infrastructure are listed and described briefly below:

- The Settlement Systems Act (*Lag om system för avveckling av förpliktelser på finansmarknaden, 1999:1309*). This Act is based on the EC Directive on settlement finality in payment and securities settlement systems.<sup>1</sup> It governs the registration and approval of systems used for clearing and settling transactions with financial instruments.
- The Exchange and Clearing Operations Act (*Lag om börs- och clearingverksamhet, 1992:543*). This Act regulates the authorisation of exchanges or markets in which financial instruments can be traded. Clearing services can only be provided by Sveriges Riksbank or by institutions which have been authorised in accordance with this Act. Finansinspektionen is commissioned to grant this authorisation.
- The Financial Instruments Accounts Act (*Lag om kontoföring av finansiella instrument, 1998:1479*). This Act regulates the registration of ownership of both dematerialised financial instruments and those material instruments which have been taken out of circulation. The responsibility for maintaining the ownership register is assigned to a CSD, which is granted authorisation by Finansinspektionen.
- The Trading in Financial Instruments Act (*Lag om handel med finansiella instrument,*

<sup>1</sup> Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems.

- 1991:980). This Act specifies the disclosures to be made, the information to be provided and the procedures to be followed when transactions with securities are undertaken. The Act is based on the EC Directive on public offers.<sup>2</sup>
- The Securities Operations Act (*Lag om värdepappersrörelse, 1991:981*). This Act provides the licensing requirements for securities firms and guidelines governing the supervision of such firms and the types of business in which such firms may engage. The Act is based on the EC Directive on investment services.<sup>3</sup>
  - The Banking Business Act (*Bankrörelselagen, 1987:617*). This Act regulates the business which a bank may conduct, the prudential supervision of banks, the requirements for obtaining a banking licence and the requirements in respect of confidentiality, auditing, etc.
  - The Financing Operations Act (*Lag om finansieringsverksamhet, 1992:1610*). This Act establishes the licensing requirements, the sound operations requirements, the operating regulations and the prudential regulations for institutions engaged in financing operations.
  - The Act on cross-border payments within the EU (*Lag om betalningsöverföringar inom Europeiska ekonomiska samarbetsområdet, 1999:268*). This Act is based on the EC Directive on cross-border credit transfers<sup>4</sup> and covers payments from individuals or legal entities in Sweden to individuals or legal entities in another EEA country, as well as payments from payers in an EEA country to payees in Sweden. The Act covers payments up to the amount of €50,000.
  - The Companies Act (*Aktiebolagslagen, 1975:1385*). This Act regulates public limited companies and shareholdings.
  - The Cheque Act (*Checklagen, 1932:131*).
  - The Bankruptcy Act (*Konkurslagen, 1987:672*).
  - The Consumer Credit Act (*Konsumentkreditlagen, 1992:830*).
  - The Sveriges Riksbank Act (*Lagen om Sveriges riksbank, 1988:1385*). This Act states that the Riksbank shall, inter alia, “promote a safe and efficient payment system”. The Riksbank may provide settlement system facilities and participate in the settlement of payments. It may also grant intraday credit to participants in the system against adequate collateral. A credit institution or any other company supervised by Finansinspektionen has an obligation, upon the request of the Riksbank, to provide the Riksbank with such information as the Riksbank considers necessary in order to ensure the stability of the payment system.

### 1.1.3 The Swedish banking sector

At the end of 1999 there were 123 banks in Sweden. These banks can be divided into two categories: commercial banks including branches of foreign banks, and savings banks. The Banking Business Act contains general provisions which apply to banks in the form of limited companies as well as to traditional savings banks.

Commercial banks dominate the banking sector, as most of the larger savings banks and all co-operative banks have merged and/or been transformed into commercial banks. In 1999 more than 96% of total banking sector assets were held by commercial banks. The remaining 4% were distributed among some 90 independent savings banks, most of them very

2 Council Directive 82/298/EEC co-ordinating the requirements for the drawing-up, scrutiny and distribution of the prospectuses to be published when transferable securities are offered to the public.

3 Council Directive 93/22/EEC of 10 May 1993 on investment services in the securities field.

4 Directive of the European Parliament and of the Council of 27 January 1997 on cross-border credit transfers (97/15/EC).

small and locally oriented. Consequently, these banks play a very marginal role in the Swedish banking and payment system.

The banking sector is highly concentrated, with the four largest traditional commercial banks (SEB<sup>5</sup>, Handelsbanken, Nordbanken and FöreningsSparbanken) accounting for almost 70% of household lending, approximately 80% of corporate lending and an even higher percentage of payment activities. In addition to being the major counterparties in the RIX system, these four large banks are also the majority owners of the Bankgirot system and the SSS.

Foreign banks are allowed to operate in Sweden through branches as well as subsidiaries. At the end of 1999 there were 20 foreign banks represented on the Swedish market, 17 through branches and the other three through subsidiaries. The foreign banks accounted for around 8% of both household and corporate lending. This share has increased rapidly over the past few years.

In recent years there has been intense and sometimes indignant public debate about the banks' pricing policy, which is clearly aimed at introducing specific charges for various services in place of float-financing. This pricing strategy is also an important part of the banks' aim to encourage customers to make their payments via the internet or other electronic media.

## 1.2 The role of the central bank

### 1.2.1 General responsibilities

#### *Statutory responsibility*

With the exception of its explicit and exclusive mandate to issue banknotes and coins, the Riksbank's responsibilities in respect of the payment system and its various components are formulated in general terms in the Riksbank Act. For example, the Riksbank's role as an overseer of the payment system does not include any formal obligation to provide settlement services

to the banks, but rather allows for this possibility. The Riksbank does indeed provide interbank settlement facilities for banks, the Government, and a few other financial institutions through the RIX system, as well as providing deposit and credit facilities.<sup>6</sup> Via their accounts in the RIX system, the participants can borrow against collateral both intraday and overnight; intraday to ensure a smooth flow of payments, or overnight in the context of monetary policy.<sup>7</sup>

#### *Oversight*

The primary objective of the Riksbank with regard to the payment system – as both overseer and operator – is to identify, manage and limit systemic risks. These risks arise primarily in connection with the transfer of large-value payments between banks and other financial institutions. Therefore, from a financial stability perspective, the interest and activities of the Riksbank are concentrated on this aspect of the payment system.

Retail payment systems are, however, also included in the Riksbank's oversight responsibilities, particularly those systems directly linked to RIX. In the field of retail payments the Riksbank pays particular attention to questions of efficiency in order to encourage the adoption of efficient payment solutions.

In performing its duties as an overseer, the Riksbank meets on a regular basis with different groupings of actors in the Swedish payment system. Individual meetings are held on a regular basis with the banks and clearing organisations. The Riksbank can propose new laws and changes to existing laws directly to the Parliament, and is also asked to comment on new laws and various official reports. In addition to these activities, the Riksbank takes part in

<sup>5</sup> SEB and FöreningsSparbanken have announced their intention to merge. The relevant authorities are currently reviewing the proposed merger.

<sup>6</sup> For more information about the participants' access to the Riksbank's deposit and credit facilities, see Section 3.2.2.

<sup>7</sup> The Riksbank is allowed to grant intraday credit in euro, but not overnight credit.

public debate on issues relating to payment systems.

#### *The provision of an interbank settlement system*

The rules and regulations to be followed by the participants in the RIX system are laid down in the Rules and Regulations for Payment Settlement in RIX (see Section 3.2.1) and in the agreements which the participants conclude with the Riksbank in its capacity as holder of accounts and owner of the system. Each participant enters into three different agreements with the Riksbank: an accession agreement, an agreement on credit and deposits and, finally, a pledge agreement for credit in RIX. In addition, the participants enter into agreements with one another about cut-off times and the processing of payments in the RIX system.

#### **1.2.2 Ongoing work**

The Riksbank takes part in various international committees and working groups, organised by the BIS and the ECB, the activities of which are related to payment and securities settlement systems issues, such as the Committee on Payment and Settlement Systems and the Payment and Settlement Systems Committee.

During autumn 2000 the Riksbank initiated a domestic Payment Systems Committee, *Betalningssystemrådet*, consisting of executive representatives from the larger banks and clearing and settlement organisations in Sweden. This Committee is intended to serve as a forum for the discussion of payment systems issues at a general policy level.

In addition to the Payment Systems Committee, the Riksbank has set up a number of user groups and working groups which provide a medium for exchanging information with participants and for continuing with the development of the RIX system.

### **1.3 The role of other private and public sector bodies**

#### *The Swedish Bankers' Association*

In the private sector, the Swedish Bankers' Association, *Svenska Bankföreningen*, has standing committees which discuss and co-ordinate the banks' approaches to issues concerning the processing of payments and the technical aspects of payment systems. The Swedish Bankers' Association is also owner of one of the retail payment systems in Sweden, the Data Clearing System.

In the public sector, there are a number of authorities in addition to the Riksbank which are involved in various aspects of the payment system. These are as follows:

#### *The Swedish Competition Authority*

The Swedish Competition Authority, *Konkurrensverket*, was founded in 1992 and a new Competition Act came into force on 1 July 1993. This Act is based on the competition rules of the European Community and has two prohibitions, one against anti-competitive price collusion, the other against the abuse of a dominant position. It also contains provisions regarding merger control. The prohibition against anti-competitive price collusion has in some cases led to changes in the pricing of different retail payment services.

#### *The Swedish Consumer Agency*

The Swedish Consumer Agency, *Konsumentverket*, is the government agency responsible for consumer protection in all areas, including payment systems. In practice, the agency's role in the payment systems field mainly concerns the debit and credit card sector, where guidelines have been formulated and negotiated with the card-issuing companies.

#### *The Swedish National Debt Office*

The Swedish National Debt Office, *Riksgäldskontoret*, is an agency reporting to the Ministry

of Finance, which is responsible for financing the national debt. The Swedish National Debt Office participates in the RIX system as the

government agency responsible for the processing and management of government payments.

## 2 Payment media used by non-banks

### 2.1 Cash payments

Cash payments still account for a very large share of total payment transactions in the Swedish economy, although there are no firm statistics available to determine the precise figure.

The availability of cash has increased over the past decade as a result of the growing number of ATMs. Although there are two different brands of ATM, there is only one network in the sense that the underlying systems – some of which are proprietary, while others are owned collectively by a group of banks – are linked to one another. Individuals can thus make withdrawals, without charge, at any branch of any bank or at any ATM, irrespective of the bank at which the account is held.

In 1999 the Riksbank decided to delegate its operative involvement in the distribution of banknotes and coins throughout the country to a wholly-owned separate subsidiary called Pengar i Sverige AB. This decision was made on the basis of efficiency considerations. It was felt that costs arising from cash distribution could be cut in a number of areas, but that such cost reductions were more likely to be pursued by a profit-driven enterprise than by a public entity. Pengar i Sverige AB is not restricted to doing business only with the Riksbank, and has recently entered into an agreement with a Swedish bank to take over part of that bank's internal distribution and the counting and handling of banknotes and coins. However, the Riksbank has supervisory authority over Pengar i Sverige AB. It also retains its overall oversight responsibility for the market for cash payments. This refinement of roles – operative versus oversight roles – is also expected to contribute to the realisation of efficiency gains.

### 2.2 Non-cash payments

#### 2.2.1 Credit transfers

The bulk of non-cash payment transactions by companies and households are made through the two giro systems, the Postgirot and the Bankgirot. The two giro systems play a dominant role in the Swedish payment system, covering a wide range of transactions for both households and companies; the vast majority of Swedish enterprises and organisations hold accounts with both systems. Giro services are generally included in the package of services which banks offer their customers – households and enterprises alike – when they hold a bank account. In 1999 these two systems for credit transfers together accounted for 76% of all non-cash transactions. In value terms, around 80% of these transactions were generated electronically, while the remainder were paper-based.

The Postgirot system is a system for credit transfers between accounts held at the Postgirot Bank. At the end of 1999 there were more than 2 million accounts held at the Postgirot Bank, with a total of 458 million transactions being carried out in 1999. The intermediary activity amounted to SEK 4,064 billion (€462 billion) in value terms.

The Bankgirot system is a network for credit transfers between accounts held at the commercial banks. Funds are transferred between bank accounts by means of a giro number, which is not an account number, but an address indicating a bank account. The Bankgirot is also an open interbank system for the processing of payments and payment information, i.e. a clearing house for retail

payments. The system is collectively owned by the Swedish banks through BGC. In 1999 the Bankgirot handled around 338 million transactions with a total value of SEK 3,269 billion (€371 billion).

A growing proportion of transactions in both systems are initiated electronically; as might be expected, this tendency is more pronounced for large-value transactions. Enterprises and organisations now submit their payment orders almost exclusively by electronic media, while households more frequently send their written payment orders by post. However, even households are increasingly submitting their payment orders electronically by means of internet-based banking services. Both the Bankgirot and the Postgirot administer systems which can be used for credit transfers initiated electronically via the internet.

A number of credit transfers also go directly from bank account to bank account without the use of a giro number. These are channelled by the Data Clearing System, which was originally developed for cheque truncation. The Data Clearing System is also used when more rapid retail payment transfers are required. Account numbers and payment messages are transferred in accordance with a standardised format, which allows for straight-through processing (STP). The Data Clearing System is owned by the Swedish Bankers' Association, but operated by BGC. In 1999 78 million transactions passed through the Data Clearing System with a total value of SEK 1,511 billion (€172 billion).

### 2.2.2 Cheques

In recent years the number of cheque transactions has decreased substantially. A negligible 4 million cheque transactions were conducted in 1999, with a total value of SEK 30 billion (€3.4 billion). There are a number of possible explanations for this development. One is the growing number of ATMs, which have made cash more easily available at any time of the day, thereby reducing the need for cheques as a payment instrument. A second reason is the growing importance of

various EFTPOS systems, which, from a practical point of view, should make payment by card more attractive. A third factor, and probably the most significant, is the fact that Swedish banks have implemented a clear policy of reducing the number of cheque payments, because these are considerably more costly than alternative means of payment, such as credit cards. To this end, one of the major banks introduced a rather high charge (SEK 15 or €1.7) on all cheque transactions at the beginning of the 1990s. The other banks subsequently followed this example and also imposed heavy fees, with the result that the use of cheques has been drastically reduced.

In Sweden, all cheques are truncated, that is, the bank at which the cheque is cashed retains the physical document and the information is transmitted by electronic media to the drawee bank. The cheques are truncated in the Data Clearing System mentioned above. All cheques can be cashed at any bank branch irrespective of the bank on which they are drawn.

### 2.2.3 Direct debits

Direct debits, called *autogiro* in Sweden, still account for a rather limited share – around 8% – of the total number of non-cash transactions, although their importance is growing. Both the Postgirot and the Bankgirot systems administer direct debits. The reasons behind the modest growth in the use of direct debits have yet to be examined. Swedish consumers may be reluctant to use a system where they have the feeling that they are losing control over their payments, although this is an unfounded fear. Another reason might be that the low price for alternative payment methods means customers have no incentive to use direct debits. Alternatively, banks may not have marketed the product effectively.

### 2.2.4 Credit and debit cards

The use of cards as payment media has increased gradually over time. From the available statistics – which, however, do not give a completely reliable picture of the situation – it is fairly evident that traditional credit cards have



never played a significant role in the Swedish payment system, and, moreover, that their significance has diminished over the past few years.

Instead, debit cards have gained in importance, most notably those debit cards linked to bank accounts. Such debit cards usually combine several functions: those of a debit card for EFTPOS as well as paper-based transactions, an ATM card for cash withdrawals, and a credit card, to the extent that the bank account to which the card is linked has an overdraft facility attached to it. In addition, these cards are usually provided with a link to international card systems such as Visa or MasterCard, which also makes them useful for international travel.

A rapid structural transformation is taking place in the area of retail payments, with increasing automation as the main driving force. One important indicator of this transformation is the fast-growing number of EFTPOS terminals in shops and other points of sale. The number of terminals operated by the banks rose from 6,100 in 1990 to 81,135 in 1999. The number of EFTPOS transactions increased by more than 1,300% during this period.

Another development in this field has been the growing importance of various retailer cards over the past decade. The volume and value of transactions using these cards have risen considerably, as has the number of issuers. The growing importance of retailer cards in recent years can be partly explained by the technical development mentioned above; card payments have become cost-effective from the retailer's point of view and they eliminate the risk of theft and robbery associated with the handling of large volumes of cash. Retailer cards also open up new channels for marketing vis-à-vis customers.

### 2.2.5 Prepaid cards

There is one card-based scheme in operation – the Cash card – which is issued by the four major Swedish banks. All four banks use the same Proton technology, but continue to compete with one another by issuing their own bank-specific Cash cards. Interoperability is

ensured as all cash terminals accept cards issued by any of the four banks and all loading terminals can be used by cardholders regardless of the identity of the issuing bank.

A pilot scheme was initiated at the end of 1996, with the national rollout of the system taking place in 1998. In accordance with the results of the first evaluations of market responses, the banks decided to abandon the Cash card as a stand-alone product and to include the e-money application in the traditional bank cards, so-called multifunctional cards. In 1999 4.3 million transactions were carried out with the Cash card with a total value of SEK 241 million (€27.4 million). The average number of transactions per month increased by 77% between 1997 and 1998 and by more than 84% in 1999. It is still too early to say whether Cash cards are likely to gain widespread acceptance, but acceptance among customers has been rather low up to now. Retailers, however, have been receptive to the scheme, and there are currently 40,000 terminals which accept Cash card payments.

## 2.3 Recent developments

Internet banking has expanded very rapidly in Sweden. All banks offer internet services, which include access to account information as well as the possibility of carrying out transfers between accounts, bill payments and online securities trading. According to banking statistics, 20-25% of the private customer base has begun to use online banking services on a regular basis. During the past year, one of Sweden's major banks chose to close down 50 branches throughout the country on account of the rapid increase in the online customer base.

Bill payments still account for the largest proportion of online activity and banks are making use of their popularity in order to expand their activities into the realms of e-commerce. Two of Sweden's major banks offer their customers systems of online malls with e-payment schemes administered by the banks. The four largest banks have also begun to offer online bill presentment. Although two rival systems have emerged, it seems likely that the

two systems will be linked to each other in the near future. Mobile phone banking is the next stage of online banking development. Some of the banks have already begun to offer mobile phone banking services to their customers.

These trends may have some bearing on the future of the giro system in Sweden. It is now possible for

private customers to initiate their bill payments electronically, and this may mean that the share of credit transfers initiated electronically will increase dramatically in the future. Furthermore, transfers between accounts at different banks have become easier as a result of online banking.

### 3 Interbank exchange and settlement systems

#### 3.1 General overview

The RIX system, the settlement system operated by the Riksbank, is the hub of the Swedish payment system. The system, developed during 1988-90 and implemented in 1990, operates on an RTGS basis.

The RIX system settles payments in both Swedish kronor and euro. Until 31 December 1998, the system was used exclusively for Swedish kronor. When the Member States participating in EMU introduced the euro as a common currency on 1 January 1999, the RIX system was adjusted to handle euro payments as well. The RIX system therefore consists of two parallel but separate systems, K-RIX for settlement in Swedish kronor and E-RIX for settlement in euro.

#### 3.2 RIX

##### 3.2.1 Rules of the system

Via E-RIX, the RIX system is linked to the ECB's TARGET system. The rules for the TARGET system are issued by the ECB. On the basis of the ECB's TARGET Guideline<sup>8</sup> and the multilateral agreement on TARGET<sup>9</sup> concluded between the ECB and the NCBs of the EU, the Riksbank was obliged to implement the provisions of the Guideline and the multilateral agreement at the national level. The national regulation for Sweden is stated in the Rules and Regulations for Payment Settlement in RIX. Rules for the settlement of

payments in Swedish kronor, which takes place in K-RIX, are also included in these rules and regulations.

##### 3.2.2 Participation in the system

The Riksbank owns and operates the RIX system. An institution must be authorised by the Riksbank to be a participant in the system. The RIX system is open to the following categories of institutions: credit institutions; investment firms (provided that they are permitted to trade in financial instruments or to provide guarantees in connection with issues of securities, and are counterparties in the Riksbank's money market operations); clearing organisations; government agencies (which are responsible for central government payments and cash management); and foreign central banks. Participation in E-RIX is restricted to institutions which have their head office or a branch within the EEA.

In addition to the harmonised rules for the national payment systems in TARGET, each institution needs to fulfil certain prerequisites to participate in the RIX system, such as having sufficient technical, administrative and financial capacity in order not to cause disruptions in the

<sup>8</sup> Guideline of the European Central Bank of 16 November 1998 on a Trans-European Automated Real-time Gross settlement Express Transfer system (TARGET Guideline).

<sup>9</sup> Agreement on a Trans-European Automated Real-time Gross settlement Express Transfer system (TARGET Agreement).

RIX system. The institutions must also be participants in SWIFT.

At the end of 1999 K-RIX had 23 participants, including the Riksbank. Of these, 18 were banks, including nine branches of foreign banks. The other institutions were BGC, VPC, the OM Stockholm Exchange and the National Debt Office. A mortgage institution became a participant in 2000 and several foreign credit institutions have signalled an interest in becoming remote access participants in K-RIX.

In addition to the Riksbank, 18 of the participants in K-RIX also participated in E-RIX. Of these, 14 were banks, seven of which were branches of foreign bank companies. The other institutions were BGC, VPC, OM Stockholm Exchange and the National Debt Office.

Participants which are members of both K-RIX and E-RIX have two separate accounts, one for each currency. A credit facility can be attached to the accounts of participants which are credit institutions, securities firms or government agencies.<sup>10</sup> The Riksbank can grant intraday credit and overnight credit in Swedish kronor, but only intraday credit in euro. The Riksbank's capacity to provide participants with intraday credit in euro is, however, limited to a total amount of €500 million. Remote participants (not applicable at present) can have an intraday facility in Swedish kronor, but not in euro.

Participants can make payments on behalf of other institutions, and some smaller banks use this type of arrangement. For instance, savings banks participate indirectly in the RIX system via FöreningsSparbanken (Swedbank), which acts as their clearing bank.

### 3.2.3 Types of transaction handled

The RIX system is used to settle interbank and customer payments. Payments arising from the Riksbank's own transactions with participants, primarily the trading of securities or currencies and the deposits and withdrawals of Swedish

banknotes and coins in banks, are also settled via the RIX system.

Under an agreement between the participants in the K-RIX system, the minimum amount for individual payments, such as interbank payments and customer-related payments, is currently SEK 0.5 million (approximately €56,750). Payments below this amount are aggregated and settled at pre-determined times. However, from the point of view of the Riksbank, there is no minimum amount for the settlement of individual payments. An individual payment can be registered and subsequently settled at any time during the operating hours of the system.

The participants in the K-RIX system have also agreed on certain conditions for the settlement of bilaterally and multilaterally aggregated payments.

Bilaterally aggregated payments are divided into the following four categories:

- foreign clearing – settlement of payments to/from abroad which, at the krona stage, are to be forwarded to another bank in Sweden;
- data clearing – settlement of customer payments between banks relating to transfers, the cashing of cheques and bank drafts, and card payments;
- BGC settlements – Bankgirot transfers, etc; and
- document clearing – settlement of a very small number of transactions between banks on the basis of physical documents.

For each category, settlement takes place during a fixed and limited period of the day.

The clearing and settlement organisations, VPC and OM Stockholm Exchange, net the payment

<sup>10</sup> A government agency can only be granted intraday credit. A clearing organisation cannot be granted either intraday or overnight credit.

obligations multilaterally between the participants in the RIX system. The participants are responsible for sending payments prior to the agreed cut-off times and ensuring that sufficient liquidity is available on their accounts at that time. BGC's settlement of cash transaction withdrawals at ATMs is also carried out on a net multilateral basis.

For the settlement of aggregated payments, the related payment messages for the individual transactions are transmitted separately outside the RIX system.

In E-RIX, the participants can send cross-border and domestic payments in euro. The majority of the payments in euro are cross-border, transmitted via TARGET to the NCB with which the receiving bank has an account. Customer-related payments are rarely sent via the E-RIX system.

### 3.2.4 Operation of the transfer system

The RIX system operates on an RTGS basis. This means that payments are settled one by one, and that the funds which are transferred to the participants' accounts at the Riksbank are immediately available for new payments whenever the system is open.

The RIX system operates on a mainframe computer and is developed, owned and operated by the Riksbank. The Riksbank runs the central computer system, and the RIX participants use their own equipment in their respective offices.

Communication via the RIX system is based on the SWIFT messaging system (see also Section 3.2.5).

The RIX system has a queuing function which stores the participants' payments in a queue when there is insufficient liquidity. The payments are settled automatically when liquidity is available. This function applies the first in first out (FIFO) principle, i.e. the first payment in the queue is settled first. RIX participants can depart from the FIFO principle by changing the order of the payments in the queue.

Participants can keep track of their transactions and the status of their Riksbank accounts at all times via a dedicated, encrypted online connection.

The opening hours for K-RIX are from 7 a.m. to 5 p.m. each working day. The opening hours for E-RIX are from 7 a.m. to 6 p.m. every day except for Saturdays, Sundays and a few public holidays when TARGET is closed.

### 3.2.5 Transaction processing environment

As mentioned above, communications via the RIX system are made by means of the SWIFT messaging system. The RIX system uses a SWIFT service called SWIFT Fincopy which stores payment messages and forwards them to the recipient once settlement has been made. Messaging technology allows participants to send payment instructions directly from their own systems. Payments can be processed automatically, which facilitates the continuous settlement of payments throughout the day.

If a bank suffers a disruption, it can manually enter transactions into the RIX system via RIX online. It is also possible to fall back on the Riksbank's former online system for sending and receiving payments in the case of disruption in the SWIFT network or the communication system.

The Riksbank has backup computer facilities located at physically separate sites of operation. Communications to the computer facilities are duplicated and all production data are updated in real time. If a breakdown in operations should occur, a transfer to the RIX backup system can take place within two hours.

### 3.2.6 Settlement procedures

As mentioned in Section 3.2.3, the participants in K-RIX have agreed on a certain settlement schedule for bilaterally and multilaterally aggregated payments, while the settlement of individual payments, such as interbank and customer payments, can take place whenever the system is open (7 a.m. to 5 p.m. every

working day). E-RIX has only a few cut-off times for the settlement of aggregated payments, and its opening hours are from 7 a.m. to 6 p.m.

### 3.2.7 Credit and settlement risk

Since 1 January 1995 full collateral has been required for both intraday and overnight borrowing. The Riksbank can grant intraday credit and overnight loans in Swedish kronor, but only intraday credit in euro.

Each bank can borrow or deposit at the lending and deposit rate an amount up to 4% of its capital base or SEK 50 million, whichever is greater. As a result of the Riksbank's fine-tuning operations and interbank transactions, liquidity between the banks is equalised at the close of business.

### 3.2.8 Turnover

In 1999 the number of transactions in the K-RIX system averaged around 1,400

per day, with a daily turnover of almost SEK 400 billion (€45 billion), which corresponded to about 20% of the Swedish GNP. During the first half of 2000 the number of transactions increased to an average of around 2,000 per day. The main reason for this increase was that larger payments in the foreign clearing process were settled individually rather than in the aggregated settlement. However, the turnover remained approximately the same.

The number of transactions in the E-RIX system averaged around 200 payments sent and about 400 received per day in 1999, and the daily turnover of payments sent was some €6 billion. The first half of 2000 saw the number of transactions and the turnover increase by 40%.

### 3.2.9 Pricing

The price list below shows the fees for participation in the RIX system in 2000:

<b>Table</b>		
<b>Fees in 2000</b>	<b>K-RIX</b>	<b>E-RIX</b>
<b>Annual fees</b>		
Participants	SEK 200,000 (€22,750)	SEK 290,000 (€33,000)
Clearing houses	SEK 150,000 (€17,000)	SEK 240,000 (€27,250)
<b>Transaction fees for domestic payments</b>		
1-420 payments/month	SEK 10 (€1.14)	SEK 10 (€1.14)
421-4,200	SEK 4 (€0.45)	SEK 10 (€1.14)
4,201 +	SEK 2 (€0.23)	SEK 2 (€0.23)
<b>Transaction fees for TARGET payments</b>		
1-100 payments/month	—	€1.75
101-1,000	—	€1.00
1001 +	—	€0.80
<b>Intraday liquidity in euro</b>		
Fee for intraday liquidity	—	10 basis points, EUR

New participants in the RIX system are charged an admission fee of SEK 75,000 (€8,500).

### 3.3 Retail payment systems

#### 3.3.1 The Postgirot

The Postgirot is essentially a system for credit transfers between accounts held with what is now the Postgirot Bank. The Postgirot system handles all kinds of transactions, both low-value payments to and from households and large-value government payments.

Households make extensive use of the Postgirot system, partly as a result of the co-operation agreements which exist between some of the banks and the Postgirot system. Merita Nordbanken, one of the largest commercial banks, has established links between its system for handling salary payments to government employees and the Postgirot system. In addition, the savings banks have a large number of salary accounts linked to the Postgirot system. The fact that all post office branches throughout the country can handle transactions, and that they have longer opening hours than the banks, has of course contributed to the popularity of the system.

The Postgirot Bank has customer relations with households, with companies and with other banks which use the Postgirot Bank's services. Banks are charged according to specific arrangements between the bank in question and the Postgirot Bank. With regard to households, companies and organisations, the Postgirot Bank has price lists containing information on fees for the different services it offers.

Since 1986 the Postgirot system has been a member of the SWIFT network for international transactions. At the beginning of the 1990s the Postgirot was integrated into Euro-giro, the European network for postal giro systems for the handling of cross-border payments.

Last year the Swedish Government decided to sell the Postgirot Bank. The four major banking groups in Sweden announced their willingness to acquire the whole stock of accounts held by the Postgirot Bank. Their intention was to merge the Postgirot and the Bankgirot systems. However, the Swedish Competition Authority decided against this merger on the grounds that it would lead to the creation of a private monopoly. Although there is not yet a clear outcome on the issue of ownership, the Postgirot Bank has recently become a full member of the Bankgirot system, thus leading to full interoperability between the two systems.

#### 3.3.2 The Bankgirot

The Bankgirot system is mainly used for credit transfers between bank accounts. By contrast with the Postgirot system, there are no separate Bankgirot accounts; instead, ordinary bank accounts are given a Bankgirot number. In other words, the Bankgirot system is an "open" payment system in which customers can transfer payments from an account with one bank to an account with another bank. The Bankgirot is an ACH managed by BGC and owned by the banks. 19 banks with around 2,300 branches are currently affiliated to it. BGC manages and develops the Bankgirot system and offers its products and services to the banks on a purely subcontractual basis. A wide range of information services relating to the processing of payments is included in the services offered to banks.

The Bankgirot system mainly handles retail payments, but also processes certain large-value payments. Bankgirot payments are settled on a bilateral net basis in the RIX system, whereby payment orders between each pair of banks are calculated to a net debit or credit position. These net balances are registered in the banks' accounts at the Riksbank for settlement during the day. If one participant has liquidity problems at the time of settlement, the payment is put in a queue. The transaction is queued for no longer than 30 minutes; if the bank is still unable to settle its net position after this period, the

net position is recalculated as a pair of gross payments. In this way, a bank's liquidity problems do not hinder a counterpart from settling its own obligations. Different types of payment have different settlement schedules throughout the day. After settlement, the underlying payments are sent to the receiving bank by file transfer.

The Bankgirot system differs from the Postgirot system in that it only has customer relationships with the banks. These banks, whether they are shareholders of BGC or not, are charged at cost. Banks face a combination of fixed transaction fees and variable fees which decrease with the volume of transactions conducted.

Partly in response to the rapid development of electronic payment delivery and processing technology, such as internet payment services, BGC recently adopted a new technical platform and new clearing procedures. The development of the new clearing platform, which is still at an early stage of implementation, has led to the full integration of all systems involved in the clearing and settlement cycle, namely the RIX system, BGC's clearing information system and the clearing participants' internal systems. In addition to the existing communication channels, a new internet-based information channel and a new interface between BGC and the clearing participants have been added. These allow the participants to follow their clearing positions in real time via the internet. The system will migrate from clearing and settling batches of payments once a day to several clearing and settlement cycles every day. Once fully operational, the system will allow for the possibility of real-time clearing and settlement of single retail payments. Although this new platform is initially being used for internet-based payment services, the intention is to gradually increase the range of payment services to be processed by it. The clearing and settlement of banks' cash transactions, which was previously carried out by the Riksbank, will soon be included in the range of services provided by the new BGC system.

### 3.3.3 Credit and debit cards

The vast majority of credit and debit card transactions – except for those relating to retailer cards – are channelled through specialised data processing companies. Domestic transactions with Visa-linked cards are cleared by Visa's own system in London, while MasterCard/Europay-enabled transactions are cleared by Europay's network in Brussels.

### 3.3.4 E-money schemes

There is one e-money scheme in operation which utilises Proton technology. It is a card-based system run by the four largest Swedish banks in co-operation with one another. The co-operation between these banks covers technological development, marketing activities and brand administration. In addition to these aspects, each bank issues its own card with that bank's own logo together with the joint brand name, "Cash". However, the system allows for full interoperability in the sense that all vendor devices and loading terminals accept all Cash cards regardless of the identity of the issuing bank.

A central Proton collecting system run by one of the banks in the Cash association collects transactions stored at the POS terminals once a day. The system provides each acquiring bank with a clearing file of information on retailer accounts and the amounts with which these are to be credited. The clearing of transactions between issuing banks and acquiring banks is carried out in bilateral batches through the Data Clearing System run by BGC. According to the contract which regulates the Cash association's activities, surviving Cash banks guarantee that merchants' and cardholders' e-money holdings shall be reimbursed in the event of bankruptcy on the part of either the acquiring or the issuing bank.

## 4 Securities settlement systems

### 4.1 Trading

#### 4.1.1 Institutional and legal aspects

The Swedish securities market comprises the equities and derivatives exchange, the money and bond market, and OTC derivatives. Equities, bonds and money market instruments are all dematerialised in the VPC system, which also handles the clearing and settlement of these instruments, while OM Stockholm Exchange clears and settles derivatives. (OM Stockholm Exchange and VPC are described in more detail in Sections 4.2 and 4.3 respectively.)

Finansinspektionen is responsible for the authorisation and supervision of exchange and clearing and settlement organisations (see Section 1.3).

The Swedish securities markets have been consolidated in the past few years as a result of two mergers which occurred in 1998. The OM Stockholm Exchange was established by the merger of OM's derivative exchange – OM Stockholm – and the Stockholm Stock Exchange. In the same year, the OM Fixed Income Exchange was established through the acquisition of Penningmarknadsinformation Pml AB (Money Market Information). OM AB is a privately owned company listed on the OM Stockholm Exchange.

Computerised market-places are offered by the OM Stockholm Exchange and the OM Fixed Income Exchange. The OM Stockholm Exchange has one trading system, called SAXESS, for trading equities and derivatives. Only exchange members are allowed to trade in the SAXESS system. Prospective members must be authorised by Finansinspektionen or a home country supervisor. Furthermore, they must have equity of at least SEK 10 million (€1.1 million) and at least two employees who meet the requirements imposed on a trader for trading via SAXESS. In order to be authorised as a trader in the

SAXESS system, an employee must have at least six months' experience in securities trading in a member firm, a documented satisfactory knowledge of stock market legislation, economics, financial markets and financial analysis, and have passed the SAX training course.

At the end of 1999, members included eight banks and 49 securities firms, 12 of which were foreign-owned and 25 of which were foreign remote members, i.e. without a presence in Sweden.

The majority of trading in interest-bearing instruments is in the form of OTC trading carried out by telephone in a professional money market. At the end of the day, aggregates of the trading are reported to the OM Fixed Income Exchange. The OM Fixed Income Exchange has a system called SOX for trading bonds and money market instruments among smaller and medium-sized investors.

In addition to the two exchanges, there are two other authorised market-places offering trading facilities, Aktie Torget AB and SBI Marknadsplats AB. They both offer a primary and a secondary market for relatively small companies with growth potential. AktieTorget co-operates with the OM Stockholm Exchange and uses the SAXESS trading system, while SBI uses a different system called Tellus.

#### *Legal basis*

Trading is mainly regulated by the Exchange and Clearing Operations Act and the Trading in Financial Instruments Act.

#### *Basic quantitative aspects*

The market value of the shares listed on the OM Stockholm Exchange amounted to SEK 3,717 billion (€422 billion) at the end of 1999. The value of all transactions conducted in 1999 was SEK 2,609 billion (€296 billion). The average



per trading day was SEK 10,353 million (€1,175 million). The number of transactions amounted to 8,426,000, 6% of which was off-exchange trading (i.e. outside the SAXESS).

The turnover of dematerialised securities is much higher in the money and bond market than in the equity market. In 1999 the figure for the money and bond market was 22 times the outstanding stock, while the corresponding figure for the equity market was one. The outstanding nominal value of money and bond market instruments amounted to SEK 2,014 billion (€230 billion), while the transaction value amounted to SEK 44,376 billion (€5,038 billion).

#### 4.1.2 Operational aspects

##### *Stock and derivatives market*

Since 1999 trading on the OM exchanges has been based on the computerised trading system, SAXESS. Trading is conducted by traders who operate from their own offices via PCs connected to the SAXESS computer at the OM Stockholm Exchange. The institutional and operational aspects of using the computerised trading system for small-value bond and money market trades, SOX, are similar to those involved when trading equities. Trading in SOX is carried out through the SAXESS system, and the following description therefore also applies to this type of fixed income trading. The instruments traded include shares, bonds, premium bonds, convertibles and fixed interest securities.

SAXESS is an order-driven trading system. Bids and offers are automatically matched to generate deals when price, volume and other order conditions are met. Trade orders are executed according to price and time priority. For very large trading lots, deals may be made by telephone, but have to be entered manually into the SAXESS system.

Information about changes in the market is continuously broadcast. The information is displayed in real time in the form of order

books, market summaries, concluded deals, index information and reports of various kinds. All traders receive the information at the same time. Traders can thus enter their orders without having to be in personal contact with the other party. At the same time, they gain an instant overview of the market situation.

Most trading takes place in the trading lot market, where shares are traded in lots. In order to maintain an efficient market for small orders as well, a specific odd lot market has been developed. The two markets are integrated in such a way that the remaining odd lot portion of a larger order is automatically moved to the odd lot market if the volume of the order falls below that of a trading lot.

Automatic matching in the odd lot market can only be performed at the last paid price in the trading lot market. Deals can also be generated between trading lot orders and odd lot orders. Before continuous trading begins, there is an opening pre-trade session during which the traders can enter limit orders. The order book is not revealed during this session. The total volume of orders in each security is accumulated and the opening price is set at the level at which most shares may be traded. Once trading for a specific share opens, continuous trading begins.

There are two ways of closing a deal in the SAXESS system: automatic matching and off-exchange registration. Automatic matching and off-exchange registration are used for all instruments traded in SAXESS. Off-exchange registration occurs when two parties agree the terms over the telephone. The trader must then report the deal to SAXESS within five minutes during the trading day, or no later than 15 minutes before the start of the next trading day if the deal is made after the close of SAXESS. The same rule applies to internal crossings. For shares with the highest turnover, orders of 500 trading lots or less must be traded within the spread. For other shares, orders of 250 trading lots or less must be traded within the current spread.

### *Currencies*

Since 1999 trading on the OM Stockholm Exchange has been possible in two currencies, Swedish kronor and euro. Listed companies may choose the trading currency. There are three alternatives for listed companies – trading in Swedish kronor, trading in euro, or trading in both Swedish kronor and euro. In all cases, the registered share capital for Swedish companies remains in Swedish kronor.

### *Operating hours*

In 1999 the opening hours of the SAXESS trading system were extended by one hour. On normal working days the system is open for trading between 9.30 a.m. and 5.30 p.m.

### *Risk management*

In order to ensure a sound and transparent market, there is a membership agreement which governs members' obligations and listing agreements. The duties of the OM Stockholm Exchange include monitoring members' compliance with the agreement and ensuring that members act in a manner which fosters confidence in the securities market. The surveillance is carried out with the help of electronic systems which indicate abnormal changes in prices and volumes. Unsound, illegal or other misleading trading which contravenes existing trading rules or membership agreements is investigated and reported to Finansinspektionen.

### *Links to other systems*

The OM Stockholm Exchange, the Copenhagen Stock Exchange and the Iceland Stock Exchange have been joined together in a common trading system and have adopted common rules and regulations. Integration was effected within the framework of the NOREX Alliance, the ambition of which is to integrate the Nordic financial market-places. The Oslo Stock Exchange has signed a letter of intent regarding participation in the NOREX Alliance. Initial discussions

concerning NOREX are also being held with additional exchanges.

### *Bond and money market*

The bond and money market is organised as a dealer market, and the market-makers are authorised by the respective issuer. Primary dealers have the exclusive right to act as counterparties in the monetary operations of the Riksbank, but are at the same time obliged to be market-makers in those securities in which the Riksbank trades. A prerequisite for being accepted as a primary dealer is the authorisation of the applicant as a market-maker in government securities by the National Debt Office. A basic requirement is the authorisation by Finansinspektionen to act as a dealer or, in the case of foreign companies, the authorisation by a corresponding authority in their home country.

By August 2000 six banks and one security firm were authorised as primary dealers.

On the bond and money market the market-makers supply the liquidity at each given moment in time. The market-makers compete for investors' orders by quoting prices at which they will buy and sell. Customer trades are not made directly with another customer; instead, all trades are made with the market-maker as a counterparty. About 30% of the turnover occurs without the involvement of end-customers. Another 40% of the turnover consists of trades between primary dealers and Swedish end-customers, with the remainder comprising trades with foreign customers.

## **4.2 Clearing**

### **4.2.1 Institutional and legal aspects**

The OM Stockholm Exchange is the only clearing organisation in Sweden which acts as a central contractual party in the transactions which are cleared. The OM Stockholm Exchange is a wholly-owned subsidiary of the listed

company OM AB. By the end of 1999 the Swedish state owned close to 10% of the capital and voting rights. The shareholdings of the four largest Swedish banks totalled about 14% of the capital and voting rights. In addition to its clearing house function, the OM Stockholm Exchange is also an exchange, as described in Section 4.1.

The OM Stockholm Exchange is a private company incorporated in Sweden under the Companies Act and is an authorised exchange/clearing house operating under the Exchange and Clearing Operations Act. It is supervised by Finansinspektionen, which has established a regulatory framework for the exchange's clearing and settlement system.

Clearing membership of OM Stockholm Exchange is open to institutions authorised to deal in securities according to the Securities Operations Act, or to equivalent foreign institutions, i.e. institutions supervised by Finansinspektionen or by a corresponding agency in their home country. The minimum capital requirement is SEK 10 million, calculated as shareholder's equity after tax. There is only one type of clearing member. In September 2000 the OM Stockholm Exchange had 45 members.

The OM Stockholm Exchange has a direct relationship with each customer, i.e. the owner of a clearing account. The customer acts in relation to the OM Stockholm Exchange through one of the clearing members who is the clearing account administrator. The identity of each customer is not known to the exchange, but only to the account holder and to a special control company jointly owned by the OM Stockholm Exchange and the Swedish Securities Dealers' Association.

#### 4.2.2 Operational aspects

When a transaction is accepted for clearing, the OM Stockholm Exchange becomes a counterparty to the parties involved, i.e. the seller in relation to the buyer and the buyer in relation to the seller. A transaction is registered on a trading account of the customer carrying

out the trade. The transactions are then integrated into a clearing account or connected to a separate clearing account administered by a member of the exchange.

#### Products

The clearing activity covers both derivative products traded on the OM Stockholm Exchange and products traded outside the exchanges. The OM Stockholm Exchange does not generally clear cash market transactions (except potentially in the case of tailor-made clearing).

The following products are traded on the OM exchanges:

- futures and options on Swedish shares;
- futures and options on the Swedish share index;
- futures on Swedish government bonds;
- futures and options on Norwegian shares;
- futures and options on the Norwegian share index;
- futures and options for pulp; and
- futures on the UK electricity market.

The following products are only cleared:

- futures on Swedish government securities and securities issued by Swedish mortgage institutions;
- futures on three-month forward rate agreements (FRAs);
- Swedish index swaps;
- standardised swap contracts;
- futures on currency; and
- tailor-made clearing contracts for fixed income and equity products.

#### Risk management

For all outstanding contracts there must be sufficient collateral pledged to the OM Stockholm Exchange. Collateral can be pledged either individually by each customer, or by the clearing member for both its own and its

customer's obligations. Margin requirements are calculated at the end of each day, and additional collateral must be delivered before 11 a.m. the following day. The OM Stockholm Exchange can also make intraday margin calls. A margin is calculated for each separate clearing account, but, within an account, potential covariance between positions and products is accepted.

The OM Stockholm Exchange accepts different types of assets as collateral, such as cash in 19 currencies, government securities from seven countries, certain other Swedish fixed income securities and certain Swedish, Danish, Finnish and Norwegian listed shares. Collateral is to be deposited with one of the custodian institutions accepted by the exchange, of which there were 11 in November 2000. Collateral is held separately from OM Stockholm Exchange assets.

The total outstanding contracts or the total margin amount can be limited by monitoring the largest positions.

In the event of default by customers, the OM Stockholm Exchange has its own financial resources in addition to the collateral received from customers. These include some SEK 1 billion in shareholder's equity, SEK 1 billion in credit insurance and a credit facility for another SEK 1 billion.

Disaster backup procedures have been established. Computer and communication facilities are duplicated on a real-time basis.

#### *Connections to trading systems and settlement*

Derivative transactions which are traded on the OM Stockholm Exchange are automatically transferred to the clearing system. Other transactions are fed into the system through interfaces with members' in-house systems.

All fund settlements (option premiums, variation margins, fees and maturing contracts) are made via the OM Stockholm Exchange account in the RIX system on a multilateral net

basis. Settlements take place on a daily basis.<sup>11</sup> All clearing members which have an account with the RIX system in Swedish kronor or euro, directly or through a settlement bank, register their net debit or credit transactions in this account no later than 11.30 a.m. The OM Stockholm Exchange confirms these transactions at 11.45 a.m., at which time they are settled simultaneously and finalised. As a party to all transactions, the OM Stockholm Exchange guarantees settlement and replaces defaulting members in the settlement process.

#### *Operating hours*

The OM Stockholm Exchange system is open for clearing registration from 8 a.m. to 6.30 p.m., and for trading from 9.30 a.m. to 5.30 p.m.

## **4.3 Settlement**

### **4.3.1 Institutional and legal aspects**

VPC is the only clearing and settlement organisation in Sweden operating an SSS – the VPC system – and providing the services of a CSD. The four largest Swedish banks own 98.6% of its shares and voting rights in equal parts. Minor banks and investment firms own the remaining 1.4%.

VPC is a joint stock company with limited liability incorporated in Sweden under the Companies Act. VPC is operated on a for-profit basis and is authorised and supervised by Finansinspektionen as a clearing organisation operating under the Exchange and Clearing Operations Act, as operator of a designated settlement system under the Settlement Systems Act and as a CSD under the Financial Instruments Accounts Act.

<sup>11</sup> Option premiums and fees are settled on a daily basis, as are variation margins for a few government bond futures. Variation margins on futures on fixed income securities and FRAs are settled on a monthly basis, while the variation margins for other products are settled upon maturity of the contract.

### *Membership*

Public rules on access and exit criteria are outlined in VPC's Rules and Regulations, which are available to participants. Clearing membership of VPC is open to institutions authorised to deal in securities according to the Securities Operations Act or similar foreign institutions, i.e. institutions supervised by Finansinspektionen or by a corresponding agency in their home country. In addition, Swedish and foreign clearing organisations and CSDs, as well as central banks, may become members. The capital requirements for financial institutions other than clearing organisations and CSDs are limited to the minimum capital requirements, including capital adequacy, according to the respective domestic regulation. For clearing organisations, CSDs and non-financial institutions participating in money market clearing, the capital requirement is SEK 1 billion. In addition to capital requirements, there are organisational requirements. In the case of money market clearing, an indirect participant takes part in the clearing through a clearing member.

Clearing membership can be restricted to either stock market clearing or money market clearing, or can cover both. In addition, the RTGS functions are open to all clearing members. Clearing membership is divided into two categories: either Swedish kronor or euro, or both. In September 2000 VPC had 50 clearing members, of which 48 participated in the guarantee clearing procedure (see below under the section entitled Risk management), 22 in the money market clearing procedure and only one in the RTGS clearing procedure.

### *Participation in the system*

The participants in the VPC system are issuers, account operators, authorised nominees, clearing members, settlement banks and account holders. Issuers may issue shares, debt instruments, certain types of derivatives or other types of financial instrument. In September 2000 securities issued by 976 issuers were handled in the guarantee clearing

facility. This term is explained further below. In the money market clearing facility there were securities issued by 120 issuers. Account operators are technically affiliated to the VPC system and are the only entities, apart from VPC itself, which are directly involved in entering book-entry registrations in the system. In general they represent the investors, although some account operators act on their own account only. In September 2000 there were 48 account operators, primarily banks and investment firms, but also a few issuers and large investors. Account operators are approved by VPC. The requirements are similar to those for clearing membership. For account operators, however, there are technical requirements, but no capital requirements. Investors can have their securities holdings registered either in an account opened in their own name in the VPC system (there are 3.7 million such accounts held by 3.2 million individuals) or under a nominee registration in a nominee account opened in the name of a nominee authorised by VPC.

### *Legal basis*

The legal framework for the registration of dematerialised securities is found in the Financial Instruments Accounts Act. The finality of settlement is supported by the Swedish implementation of the EC Directive on settlement finality through the Settlement Systems Act.

### **4.3.2 Operational aspects**

#### *Settlement processes*

There are three main clearing and settlement processes: real-time gross settlement, net settlement for the money market and net settlement for the stock market.

In the case of an RTGS process, cash is moved from the cash account operated by VPC to the seller's cash account at the Riksbank at the same time as the securities are moved from the seller's securities account to the buyer's

securities account within the VPC system. The settlement is then final.

In net settlement processes securities are registered and delivered gross, while payments are netted on a multilateral basis with the net amounts being reported. Settlement banks with a net payment obligation debit the amount from their own cash accounts and credit the cash account operated by VPC at the Riksbank. Securities and payments are then settled simultaneously and irrevocably at 12.45 p.m. These net processes are run once a day. The settlement of euro transactions is made separately from the settlement of transactions in Swedish kronor, but in a similar way and at the same time.

One major difference between money market clearing and clearing for the stock market is that in the latter case there is no possibility of entering transactions on the settlement day. In the case of money market clearing, this possibility exists. The delivery capacity check starts at 1.15 p.m. on the day before the settlement day for money market clearing, while for stock market clearing this check is made continuously from the time at which the transaction is entered in the system by the account operator.

#### *Cash settlement and delivery versus payment*

Cash settlement is made in central bank money via Riksbank accounts in the RIX system. VPC clearing members, who have no access to the RIX system, must use a settlement bank which is a member of the RIX system. For each clearing procedure one net amount per currency is calculated for each settlement bank. This net amount includes payments for the settlement bank's own transactions as well as other clearing members' payments.

The cash settlement takes place at the same time as the settlement of securities, and DVP is thus achieved. The settlement immediately becomes final and irrevocable.

#### *Links to other settlement systems*

As at September 2000 VPC had direct CSD links to the Danish system, VP, for government bonds, as well as to the British system, Crest, for AstraZeneca shares and to the Swiss system, SIS, for ABB shares.

#### *Risk management*

VPC is not a party to any transaction to be settled and does not offer any custody services. It does not offer any credit or stock lending facilities. The account it holds at the Riksbank is in the name of its customers and its balance should be zero after settlement has been executed.

All Swedish book-entry instruments are issued directly via VPC. For some foreign instruments, depositories are used. Depositories are highly reputable commercial banks (custodians).

In order to minimise the risk of insufficient funds, the guarantee clearing procedure contains a requirement that the stock market have a basic guarantee from a settlement bank for those clearing members not settling the cash leg in the RIX system. This basic guarantee is based on the historical average net settlement amounts. In addition, there should be a supplementary guarantee for amounts not covered by the basic guarantee. The basic guarantee may not be withdrawn with less than seven days' notice. The supplementary guarantee must be in place by 10 a.m. on the settlement day.

In the event that there are not enough securities to cover all sales, transactions are cancelled. In this context, in the case of money market clearing, certain clearing members (in particular primary dealers) have been assigned special responsibilities to prevent further disturbances in the settlement process by covering their emerging shortages.

In the event of insufficient funds or a lack of a supplementary guarantee (in the case of

guarantee clearing), all transactions by the defaulting participant (clearing member or indirect participant) are unwound and a delayed settlement routine is activated, whereby non-defaulting participants take over the failed trades. In the money market clearing procedure, the participants have an obligation to participate actively in this process through repos or securities lending transactions. The issuers also have an obligation to issue new securities, should this prove necessary.

#### *Operating hours*

VPC is open for registration and settlement (RTGS) from 7 a.m. to 6 p.m. Transactions may be entered outside these hours, but in such cases are not formally registered.

## **4.4 The use of the securities infrastructure by Sveriges Riksbank**

### **4.4.1 Collateral management**

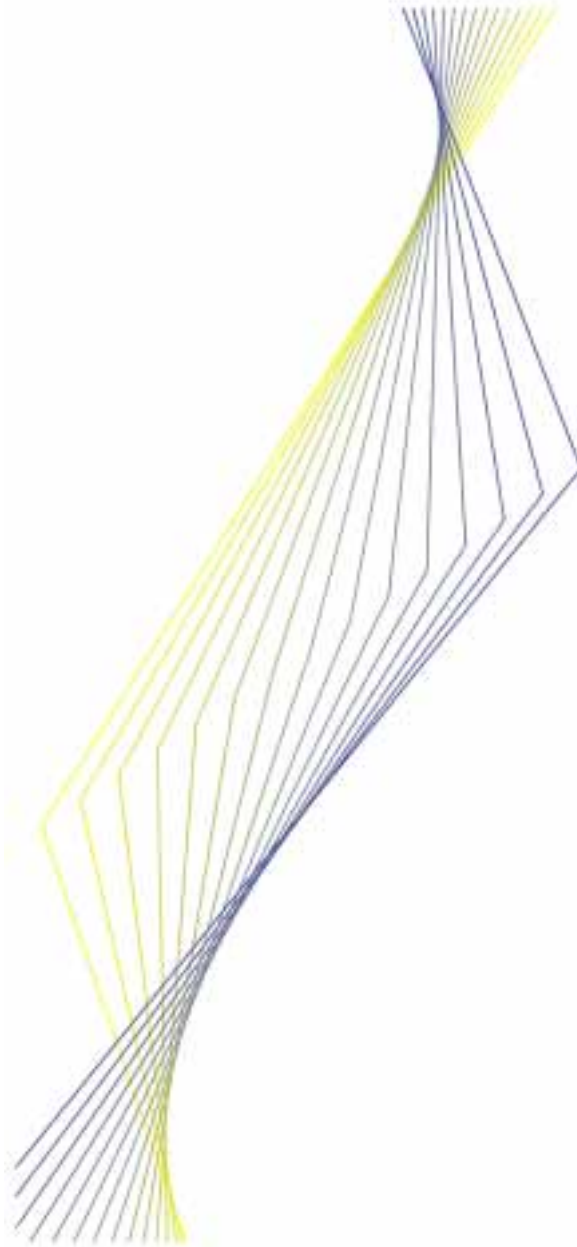
The Riksbank uses the VP system to receive collateral for monetary policy and payment systems credit operations, and as a correspondent for other central banks. The Riksbank previously used a valuation service provided by VPC for this purpose. This service was replaced in January 2001 by an in-house collateral information system, as developed by the Riksbank.

### **4.4.2 Other uses of systems**

The Riksbank registers its holdings of Swedish securities with VPC and uses VPC for settlement when carrying out operations directly related to monetary policy.



EUROPEAN CENTRAL BANK



**United Kingdom**

**June 2001**



United Kingdom

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## List of abbreviations

<b>AIM</b>	Alternative Investment Market
<b>APACS</b>	Association for Payment Clearing Services
<b>BACS</b>	Bankers' Automated Clearing Services
<b>CDI</b>	CREST Depository Interest
<b>CDL</b>	CREST Depository Limited
<b>CGO</b>	Central Gilts Office
<b>CHAPS</b>	Clearing House Automated Payment System
<b>CMO</b>	Central Moneymarkets Office
<b>FMIRs</b>	Financial Markets and Insolvency (Settlement Finality) Regulations 1999
<b>FS Act 1986</b>	Financial Services Act 1986
<b>FSA</b>	Financial Services Authority
<b>FSMA 2000</b>	Financial Services and Markets Act 2000
<b>FTSE</b>	Financial Times Stock Exchange (share index)
<b>FPSD</b>	Future Payment Systems Development (project)
<b>IBDE</b>	Interbank Data Exchange
<b>IPE</b>	International Petroleum Exchange
<b>LCH</b>	London Clearing House
<b>LIFFE</b>	London International Financial Futures Exchange
<b>LME</b>	London Metal Exchange
<b>OMLX</b>	OM London Securities and Derivatives Exchange
<b>PPS</b>	Protected Payment System
<b>RCH</b>	Recognised Clearing House
<b>RIE</b>	Recognised Investment Exchange
<b>SEAQ</b>	Stock Exchange Automated Quotation system
<b>SEAQI</b>	SEAQ International
<b>SETS</b>	Stock Exchange Electronic Trading Service
<b>SLRC</b>	Stock Lending and Repo Committee
<b>USRs 1995</b>	Uncertificated Securities Regulations 1995

**NB** All figures quoted in the text are in nominal terms.

## Introduction

The allocation of responsibilities amongst the UK authorities has changed considerably in recent years. Responsibility for the supervision of banks has been transferred to a newly created regulatory body, the Financial Services Authority (FSA), with the UK Parliament's adoption of the Financial Services and Markets Act 2000 (FSMA 2000). Under the Bank of England Act 1998, the Bank of England, as the central bank of the United Kingdom, is responsible for maintaining the stability of the financial system as a whole, whilst ensuring the effectiveness of the UK's financial services. The responsibilities of both the Bank of England and the FSA, along with those of Her Majesty's (HM) Treasury, are laid out in a Memorandum of Understanding establishing a framework for co-operation in the field of financial stability.

The Association for Payment Clearing Services (APACS) was set up in 1985 as a non-statutory association of major banks and building societies and has become the umbrella body for the UK payments industry. APACS provides a forum for banks and building societies to discuss non-competitive issues relating to money transmission. One of APACS's principal tasks is to manage the major UK payment clearing systems and to maintain their operational efficiency and financial integrity. This task is currently carried out by three operational clearing companies: CHAPS Clearing Company, BACS Ltd. and Cheque and Credit Clearing Company Ltd.

The United Kingdom's interbank clearing system, the CHAPS (Clearing House Automated Payment System) RTGS system, is designed for high-value wholesale payments, although as there is no lower limit on transaction values it can be used for retail transactions when same-day finality is required. CHAPS offers two separate clearings: one operating in sterling, the other operating in euro. CHAPS sterling was developed into an RTGS system in April 1996 and, in terms of both volume and value, the service is now the second largest RTGS system

in the world. On 4 January 1999 CHAPS euro began operations, providing an RTGS domestic euro service for payments between member banks, as well as the United Kingdom's connection to TARGET (the system linking national euro RTGS systems within the EU).

Two retail-oriented payment clearing arrangements exist: the Bankers' Automated Clearing Services (BACS) offers ACH services including direct credits and debits, whilst the Cheque and Credit Clearing Company processes paper items such as cheques and paper credit vouchers.

For all of these clearings, there is a two-tier access structure with direct settlement members and indirect participants. Settlement between direct members occurs over accounts at the Bank of England.

There is a range of payment card schemes in the United Kingdom. Credit cards are predominantly issued through the Visa and MasterCard schemes and the main debit card issuers are SWITCH and Visa debit. In the United Kingdom, ATMs are connected via the LINK system, a reciprocal agreement allowing customers to access their accounts from any of the participating institutions.

The United Kingdom currently has three Recognised Investment Exchanges (RIEs) for securities, with one further application pending. By far the largest is the London Stock Exchange, which operates order and quote-driven markets in UK equities, international equities, UK government and commercial sterling bonds, eurobonds, medium-term notes, depository receipts and exchange-traded funds. Tradepoint, an electronic stock exchange, operates an order-driven market in the majority of UK listed securities and the largest European stocks and is working together with SWX Swiss Exchange to develop virt-x, a new pan-European market. COREDEAL, which was launched in 2000, offers

<sup>1</sup> This Directive consolidated various EC banking-related Directives, including the First and the Second Banking Co-ordination Directives.

an electronic central limit order book for transactions in investment-grade corporate debt and supranational and sovereign debt. Jiway, a hybrid order/quote-driven trading system which matches low-value buy and sell orders in a wide range of US and European equities, has also applied for RIE status in the United Kingdom. Its application is being considered by the FSA.

The United Kingdom has two Recognised Clearing Houses (RCHs): the London Clearing House (LCH) and CREST. The LCH provides CCP services to the London International Financial Futures Exchange (LIFFE), the London Metal Exchange (LME), the International Petroleum Exchange (IPE) and Tradepoint. It also clears cash and repo transactions in Belgian and German government bonds and OTC interest rate swap transactions (with other instruments to be added to both services). From February 2001, the LCH will provide a CCP service for equities traded on the London Stock Exchange's Stock Exchange Electronic Trading Service (SETS) system. The LCH has also been asked to provide a CCP service for equities traded via the virt-x initiative between Tradepoint and the SWX Swiss Exchange.

CREST is the United Kingdom's principal settlement system. It was inaugurated in 1996 and currently settles transactions in equities, government bonds and corporate fixed interest stocks held in dematerialised form. The system is operated by CRESTCo, a private sector company owned by a wide range of financial institutions operating in the securities markets. In 1999 control of the Bank of England's settlement systems CGO (for gilts and non-British government sterling debt) and CMO (for money market instruments) was transferred to CRESTCo, although the Bank of England continues to provide depository services to CRESTCo for CMO instruments. Settlement of gilts and non-

British government sterling debt was successfully absorbed into an enhanced CREST in July 2000; the integration of CMO instruments into CREST, to create a single unified UK SSS, is planned for the first half of 2002. CREST has also established links to other settlement systems in Europe and North America to enable transactions in foreign securities to be settled in CREST.

The Bank of England's role in payment systems is fivefold. First, it is a full member and shareholder of the three main clearing companies and of APACS. Second, it maintains the settlement accounts and the processor which applies RTGS payments and multilateral settlement amounts to those accounts. Third, in order to allow for the smooth flow of payments through the CHAPS system, the Bank of England provides the CHAPS banks with additional intraday liquidity through repo agreements. Fourth, the Bank of England maintains an active policy interest in payment systems. Finally, the Bank is responsible for the oversight of UK payment systems and as such for ensuring that sufficient weight is given to risk reduction and management in payment systems' design and operation.

With the transfer of CGO and CMO to CRESTCo, the Bank of England now has only limited direct involvement in trading, clearing and settlement. As well as being a participant in the money, bond and foreign exchange markets, it has non-executive Directors on the Boards of the London Stock Exchange and CREST. It also provides a settlement bank service for customers in CREST and CMO.

Finally, the Bank of England has a responsibility to monitor the stability and effectiveness of the financial sector as a whole, in which payment and settlement systems play a vital role.

## I Institutional aspects

### I.1 The general legal and regulatory framework

The UK payment clearing systems described below have evolved through the actions of commercial institutions and are not, in the main, the subjects of specific legislation or regulatory provisions. The most widely used clearings in value terms are owned and controlled by their members through clearing companies under the APACS umbrella. Until recently, the Bank of England had statutory responsibility for listing money market institutions under Section 171 of the Companies Act 1989, which (pursuant to various other statutory regulations) entitles those listed institutions to certain kinds of protection against the operation of the usual features of UK insolvency law and which are available under Part VII of that Act. The Bank of England exercised these regulatory powers only briefly with regard to the Exchange Clearing House Organisation (ECHO), a foreign exchange clearing house which operated between 1995 and 1999. The powers provided under this Act were transferred to the FSA following the Bank of England Act 1998.

A large majority of the settlement members of the APACS clearings are authorised as banks under the Banking Act 1987 (to be replaced by the FSMA 2000) and they account for a very large proportion of the flows through these systems. The Banking Act requires an institution to have prior authorisation before carrying on a deposit-taking business in the United Kingdom. Certain institutions, the activities of which are regulated by other legislation, such as building societies supervised by the Building Societies Commission (under the Building Societies Act 1986), are exempted from the provisions of the 1987 Act. In addition, credit institutions incorporated and authorised in other EEA Member States are entitled to carry out activities listed in the Credit Institutions Directive<sup>1</sup> in the United Kingdom and are not required to be authorised under the Banking Act. Such credit institutions are supervised by their home state

supervisory authority, and the FSA retains only a limited role as a host supervisor. Finally, the APACS rules were changed in 2000 to allow the inclusion as members of institutions wholly owned by the UK Government; the Post Office has since joined APACS.

There is other statute law which relates to payment services in the United Kingdom. The four statutes comprising the main body of this law deal with the technical usage of paper-based cheques and other bills of exchange. The Bills of Exchange Act 1882 is a comprehensive codification of the previous law on bills of exchange, while the Cheques Acts, 1957 and 1992, modify the general principles of the 1882 Act as applied to cheques. More recently, the Deregulation (Bills of Exchange) Order 1996 allowed for the truncation of cheques.

UK competition law relevant to APACS is largely embodied in the Competition Act 1998. The clearing systems which operate within the APACS framework and the membership criteria of APACS are (in addition to any EU competition law aspects) therefore subject to the provisions of this Act and the scrutiny of the Director General of Fair Trading exercising the various powers available under that Act.

UK law also implements the Directive on cross-border credit transfers (implemented through the Cross-border Credit Transfers Regulations 1999), which clarifies the responsibilities of institutions participating in the sending, processing and receipt of cross-border credit transfers, and the EC e-money Directives adopted by the European Parliament and the EU Council in June 2000, setting out a prudential regime for issuers of electronic money.

Statutes relevant to the issuance and transfer of securities other than bills of exchange include the Companies Act 1985, under which all companies must maintain a register of members (i.e. shareholders). Some listed bonds are also registered. Commercial registrars generally

undertake the task of recording ownership. The Bank of England acts as registrar for UK government stock and some other government guaranteed and overseas government stocks. The Uncertificated Securities Regulations 1995 (USRs 1995), made under the Companies Act 1989 and providing for the dematerialisation of UK equities, enabled the CREST book-entry transfer system to be introduced in July 1996. CREST is subject to regulation by the FSA, both as an RCH under the Financial Services Act 1986 (FS Act 1986) (soon to be replaced by the FSMA 2000) and as the operator of a relevant system under the USRs 1995.

The statutory framework for the regulation of financial institutions is currently undergoing change. The FSMA 2000 will, once implemented, make the FSA, launched in October 1997, the single statutory regulator for all financial markets in the United Kingdom. The target for completion of the various statutory instruments and regulations required to implement the FSMA 2000 is mid-2001. The new legislation supersedes the FS Act 1986.

The FSA is already responsible for the recognition of UK RIEs and RCHs. Together with the three securities RIEs and the applicant mentioned in the introduction, LIFFE, the IPE, the LME and the OMLX (OM London Securities and Derivatives Exchange) are RIEs. The LCH and CRESTCo are RCHs. RIEs and RCHs are required to meet a range of criteria relating to the provision of orderly markets and to maintain adequate arrangements and resources for the effective monitoring and enforcement of their rules, in return for which they are exempted from many of the requirements applied to investment firms by the FS Act 1986. The FSA's objectives in regulating markets are the maintenance of confidence in the financial system, the protection of consumers, the promotion of understanding of the financial system and protection against financial crime.

Under Part VII of the Companies Act 1989, special protection is available for transactions carried out on RIEs and cleared through RCHs.

Market contracts, the provision of margin, market charges levied by an RIE or RCH, and action taken under the default rules of an RIE or RCH are protected from certain provisions of insolvency law. The forms of protection provided for in the Companies Act were extended to cleared OTC transactions in 1998. The transposition into UK law of the EC SFD through the UK Financial Markets and Insolvency (Settlement Finality) Regulations 1999 (FMIRs) has provided similar protection for payment and securities settlement systems by protecting their rules from the operation of insolvency procedures. The protection under the UK SFD Regulations is conferred upon those payment and settlement systems which are formally designated under the FMIRs. The Bank of England is responsible for designating payment systems and the FSA for designating SSSs. (In the case of embedded payment systems – i.e. those SSSs through which payment transfer orders are effected – the FSA is obliged to consult with the Bank of England.) So far, only CHAPS sterling and CHAPS euro have been designated.

In addition to the UK's seven (prospectively eight) RIEs, there is a wide range of alternative trading systems operating in the United Kingdom, including the likes of Brokertec, EuroMTS and Instinet. These systems choose to be authorised as brokers rather than exchanges.

The UK listing authority was transferred from the London Stock Exchange to the FSA on 1 May 2000. The move was triggered in November 1999 by the announcement of plans by the London Stock Exchange to demutualise, since it would not be appropriate for a commercial company to undertake the listing function. The FSA now undertakes the role under Part IV of the FS Act 1986.

## 1.2 The role of the Bank of England

### *Statutory and oversight responsibilities*

The Bank of England's responsibilities are laid out in a statement of its three core purposes and a

Memorandum of Understanding between the Bank of England, the FSA, and HM Treasury following the transfer of banking supervision responsibilities to the FSA in 1998 (refer to <http://www.bankofengland.co.uk/financialstability/mou.htm>). As mentioned in Section I.1, the Bank of England has certain powers and responsibilities under the provisions of the UK SFD Regulations. Furthermore, the Bank of England Act 1998 and the Memorandum of Understanding between the Bank of England, the FSA, and HM Treasury both recognise the Bank of England's oversight function with respect to payment systems.

The Bank of England does not currently own or manage any payment clearing systems, although it operates the real-time processor which is at the centre of the CHAPS systems and which performs final settlement of the BACS system, Cheque and Credit Clearings and LINK. The Bank of England has, however, a clear interest in the quality of interbank payment systems. First, the discharge of its responsibilities for the implementation of monetary policy and for the stability of markets in the United Kingdom, presupposes reliable and efficient clearing and settlement procedures. Second, the Bank of England has a direct operational interest in the main clearings in its capacity as banker to the settlement banks, as well as being itself a member of APACS and the clearing companies. Third, the nature and extent of risks incurred by participants in payment and settlement systems, arising from their own and their customers' transactions, are of interest to the Bank of England in its capacity as an overseer of payment systems.

#### *Banking activities*

The Bank of England's banking business largely comprises the work undertaken on behalf of government customers and the issuance of banknotes. The Bank of England is not in the business of commercial lending.

Government departments are not, in general, obliged to hold their accounts with the Bank of England. A number of major departments, however,

do so in order to facilitate the efficient operation of central government banking operations. The Bank of England also acts as the clearing agent for the large number of government payable orders<sup>2</sup> issued through the Office of the Paymaster General (a government department with close links to HM Treasury), the Inland Revenue, the Board of Customs and Excise and National Savings.

The Bank of England also provides a wide range of other banking services, including accounts and foreign currency payments, to a number of public sector bodies, UK and international financial institutions (such as building societies and other central banks) and also to its own staff. It also holds the settlement accounts of all the members of the APACS clearings, but there is no general requirement for other banks to hold operational accounts with the Bank of England.

#### *1.2.1 Provision of cash settlement facilities*

##### *Use of Bank of England accounts for payment purposes*

Members of each of the APACS clearing companies must have a settlement account at the Bank of England in order to participate in the clearing process. Banks wishing to become members of one or more of these clearing companies must apply formally to the Bank of England for a settlement account. Institutions which belong to more than one clearing company maintain a single account through which their clearing obligations are settled (although since January 1999 the Bank of England has provided separate settlement accounts for sterling and euro clearings). The Bank of England also provides accounts to facilitate certain settlement arrangements external to the APACS clearings, such as those relating to the settlement of obligations arising from organisations participating in LINK.

<sup>2</sup> These instruments are orders informing the payee that the public sector body issuing the order will pay the sum shown upon presentation thereof by a bank or building society; they are therefore similar to cheques.



The high-value settlement accounts held at the Bank of England are operated on an RTGS basis. Since April 1996 all credits and debits arising from payments in the CHAPS sterling system, and since its inception in January 1999 in the CHAPS euro system, have been applied to settlement accounts in real time; settlement of the other APACS clearings is achieved by posting multilaterally-netted amounts to these accounts at specific times during the day. Each credit and debit applied to a settlement account is final and irrevocable from the time it is posted.

#### *Provision of credit facilities*

The Bank of England has never given any explicit or implicit undertaking to underwrite the settlement operations of the UK clearings (see Section 3.2.7 for details of the Bank of England's role in providing intraday funding).

#### *Pricing policies*

The Bank of England's charging policy in respect of its general banking operations is based on the principle of fully recovering the costs of the banking services it provides.

### **1.2.2 The role in securities settlement**

#### *Provision of settlement facilities*

The Bank of England has no general statutory responsibility for the establishment or operation of settlement or clearing systems. Since the transfer of the CGO and CMO to CRESTCo in 1999, the Bank of England no longer provides facilities for British government stock and money market instruments (see Section 4.4). Nor does it own or operate any clearing house facilities for equities, foreign exchange or derivative products. The Bank of England retains its role as the registrar for government stock and also acts as a settlement bank in the CREST and CMO systems for a number of its customers.

### **1.2.3 Participation in other fora**

The Bank of England is represented on a number of committees and working groups organised by the ECB, the BIS and the European Commission.

Domestically, in addition to having non-executive Directors on the Boards of CREST, the London Stock Exchange and the APACS Council, the Bank of England has representatives in numerous groups such as the Stock Lending and Repo Committee (SLRC), which it chairs.

## **1.3 The role of other private and public sector bodies**

### **1.3.1 Association for Payment Clearing Services**

APACS and three clearing companies operating under the umbrella of APACS are responsible for the provision of the main interbank payment clearing mechanisms in the United Kingdom, and for co-ordinating developments in these systems. This means running clearings for handling large-value automated transfers (CHAPS sterling and CHAPS euro), as well as for bulk electronic debits and credits (BACS) and cheques and paper credits (Cheque and Credit Clearing).

APACS was established in 1985 following a review of the organisation, membership and control of the UK clearing systems by the Child Committee, set up in 1984 by the banks then participating in the Bankers' Clearing House. The results of the review were set out in the report entitled "Payment Clearing Systems" published in December 1984 (the Child Report). The report's two main recommendations advocated a new structure for the organisation of payment clearing systems and new rules regarding membership of such systems.

Following this report, three separate companies were set up under the APACS umbrella to own and manage the clearings. The shareholders of these companies were the settlement members of the relevant clearings. By separating the clearings into three distinct companies, it became possible

for an institution to be a member of one without having to be a member of another. Membership of a clearing company carries with it membership of APACS. There are currently 31 members of APACS.

CHAPS Clearing Company Ltd. is responsible for large-value electronic RTGS clearing. CHAPS sterling has 14 members and CHAPS euro 20 members (all members of both clearings are banks).

BACS Ltd. (known as Bankers' Automated Clearing Services Ltd. until 1986) is an ACH, which provides electronic bulk clearing for direct debits, standing orders and other non-urgent, automated credit transfers. It has 15 members: 14 banks and one building society.

The Cheque and Credit Clearing Company is responsible for the bulk paper clearing of cheques and credits in England, Wales and (since December 1996) Scotland; paper clearing in Northern Ireland is not included in the APACS structure. It has 12 members: 11 banks and one building society.

The rules governing the operations of each of the United Kingdom's main interbank clearing systems are laid down by their members through the relevant clearing company and APACS. The Bank of England is a member of APACS and of the individual clearing companies as of right, as well as by virtue of the banking business it conducts, and is entitled to appoint a Director to the Boards of each of the clearing companies and to participate in all of APACS's policy-making committees. The legal powers the Bank of England enjoys from this representation are no greater than those of other members.

Any institution applying for membership of these systems must agree to pay an entry fee and a share of the relevant system's operating costs. It must meet the technical and operational requirements of the clearing and the applicant must also obtain explicit agreement from the Bank of England to provide settlement account facilities for the purpose of settling obligations arising in these clearings.

APACS co-ordinates the discussion of issues of a non-competitive nature with regard to the payment card industry through the Card Payments Group. Membership of the Group, and of APACS, is open to any credit institution issuing more than 1 million credit, debit, ATM or cheque guarantee cards in the United Kingdom, and there are currently 16 members of this Group. From an operational point of view, however, debit card schemes operate independently of APACS and there are also separate arrangements in respect of credit cards and ATM interoperability.

APACS also plays a leading role in standards development for payment systems, both domestically for the APACS clearings and internationally within various industry and public domain fora, such as the United Nations, the International Organisation for Standardisation, the Comité Européen de Normalisation (the European standards body) and the European Committee for Banking Standards. This standards activity is primarily focused on messaging standards (for areas ranging from e-commerce for the personal and SME sectors through to major corporates and cross-border payments) and on security (for example, public key infrastructure (PKI), digital signatures and digital certificates). The Bank of England is involved in this work through its membership of various APACS committees.

### ***1.3.2 Bank and building society ombudsmen***

Ombudsmen (officials employed to investigate public complaints) for both banks and building societies have been appointed in the United Kingdom. The Banking Ombudsman is able to deal with complaints which have arisen since January 1986, while the Building Society Ombudsman's remit extends back to July 1987. Membership of the Banking Ombudsman scheme is voluntary, whereas membership of the Building Society Ombudsman scheme is compulsory. Both ombudsmen deal with unresolved complaints from private customers concerning the provision of financial services, including money transmission services. In addition, since January 1993, the

Banking Ombudsman has dealt with complaints from small businesses. Complaints are resolved either by agreement or by the ombudsmen making recommendations or awards.

The Banking Ombudsman is able to impose binding awards of up to GBP 100,000 on participating banks. The Building Society Ombudsman's awards are not binding and building societies have the option of publishing their reasons for not complying with their Ombudsman's awards. As part of the changes to the United Kingdom's regulatory framework following the creation of the FSA, a single Financial Services Ombudsman's scheme is now being developed in place of the current structure.

### 1.3.3 Codes of best practice

A committee to review banking services law (the Jack Committee) was appointed in 1987 by HM Treasury in association with the Bank of England. Its 1989 report, entitled "Banking Services: Law and Practice" recommended that banks and building societies in the United Kingdom draw up a Code of Banking Practice, which would set out the standards of good banking practice to be observed in dealings with personal customers in the United Kingdom. The Code was established in 1991 and the most recent edition was published in September 2000 and took effect from 1 January

2001. The vast majority of banks and building societies providing a retail service have agreed to adopt the provisions of the Code. The Code is concerned with a wide range of banking activities and includes references to certain payment systems services, including electronic funds transfers. The Code is produced by the British Bankers' Association (BBA), the Building Societies' Association (BSA) and APACS. Compliance by the subscribers to the Code is monitored by the Banking Code Standards Board (BCSB).

A similar code setting out standards of good banking practice to be observed in dealings with business customers is currently under preparation and is expected to be released in 2001.

Activities in the securities markets are similarly supported by a range of widely endorsed codes and legal documentation. Equity Repo and Gilt Repo Codes of Best Practice, drawn up under the aegis of the SLRC chaired by the Bank of England, set out standards of best practice for repo activity in UK equities and government stock. The SLRC Code of Guidance for stock borrowing and lending sets out the basic procedures which UK-based participants in stock lending/borrowing of both UK domestic and overseas securities should observe as a matter of best practice.

## 2 Payment media used by non-banks

### 2.1 Cash payments

The Bank of England has the sole right to issue banknotes in England and Wales, under the Bank Charter Act 1844. The Bank of England currently prints and issues banknotes in four denominations – GBP 5, 10, 20 and 50 – and these banknotes circulate freely throughout the United Kingdom. Three banks in Scotland and four banks in Northern Ireland retain the right to issue their

own sterling banknotes, but, apart from a very small fiduciary issue, these must be covered by holdings of Bank of England banknotes, or of approved coins.<sup>3</sup> New banknotes are withdrawn

<sup>3</sup> This is subject to the provisions of the Bankers (Northern Ireland) Act 1845 and the Bank Notes (Scotland) Act 1845. Bank of England banknotes may be regarded as legal tender in England and Wales and coins are legal tender throughout the United Kingdom subject to certain limits as specified in the Currency Act 1983. Banknotes issued by banks in Scotland and Northern Ireland are not legal tender.

by commercial banks from the Bank of England for distribution through their own cash centres. Surplus banknotes can be removed from circulation either by returning them to the Bank of England or by holding them off-balance-sheet to the order of the Bank of England at specified cash centres (owned by the commercial banks). However, at these cash centres the banknotes are sorted by the commercial banks prior to re-issuance.

The Royal Mint (a government agency) is responsible for the production and issue of coins throughout the United Kingdom. Coins are currently in general issue in eight denominations: 1 penny, 2, 5, 10, 20 and 50 pence, and GBP 1 and 2. A millennium commemorative GBP 5 crown was also issued in 1999. The Royal Mint meets demand by delivering coins to bank cash centres against payment by the banks.

Discussions between the wholesalers of cash (the commercial banks and the Post Office) and the Bank of England and the Royal Mint are held under the auspices of the APACS Cash Services Group, the industry body for cash-related issues. Its work covers all non-competitive issues concerning banknotes and coins.

In February 2000, the value of banknotes in circulation totalled GBP 25.1 billion. Figures produced by APACS show that, in 1999, cash payments accounted for 73% of all transactions by volume (down from around 86% in 1984).

## 2.2 Non-cash payments

### 2.2.1 Credit transfers

The usage of paper-based credit transfers has tended to fall in recent years. The total volume of interbank paper credits cleared in the United Kingdom, for example, declined from 188 million items in 1990 to 177 million in 1999, while the values processed declined from GBP 117 billion to GBP 94 billion. Paper-based credits are often used for making consumer payments to large organisations, such as utilities and mail-order companies. They can also be

used for payments to individuals, but this is increasingly rare.

CHAPS remains the main vehicle for transferring high-value automated credits which need to be settled on a same-day basis. A general rise in the number of transfers and values processed by this system has continued in recent years; average daily traffic through CHAPS sterling rose from 31,000 items, valued at GBP 75 billion, in 1990 to 78,500 items, valued at GBP 177 billion, in 1999. On a peak day, CHAPS sterling has processed over 160,000 payments and has handled daily values of over GBP 287 billion (the equivalent of over one-third of annual UK GDP). In its first year of operation, CHAPS euro handled a daily average volume of around 5,900 domestic and cross-border payments with a value of around €78 billion. CHAPS euro is currently the second largest cross-border component of the TARGET system by both volume and value.

The great majority of interbank electronic credits (including standing orders) are processed by BACS Ltd., although these are mainly small and medium-value items. Standing orders are used largely by individuals for the payment of regular fixed sums. There has been a decline in the total volume of such orders processed by BACS since 1990, as companies and other institutions have encouraged customers to make greater use of direct debits (although this decline has been partially offset by the increased use of standing orders to transfer funds from transaction accounts to personal savings accounts). The number of standing orders processed fell from 242 million in 1990 to 235 million in 1999. In contrast, there has been an appreciable rise in the number (and value) of credits other than standing orders handled by BACS, which rose from 514 million items in 1990 to 998 million in 1999. In the past, such credits tended to be used mainly for the disbursement of regular bulk payments such as salaries and wages. Increasingly, however, they are also being used for other transactions, such as one-off payments to business suppliers, and to make consumer

payments initiated through telephone and PC banking.

BACS has also developed a separate credit transfer system for domestic euro transactions, which operates in a similar way to its sterling direct credit service. Separate files are transmitted for sterling and euro payments and BACS members now offer the euro service to their corporate customers. However, the number of payments cleared through the BACS euro scheme remains very low, with annual volumes in 1999 of around 3,200 (with a total value of around €105 million).

### 2.2.2 Cheques

As with paper-based credit transfers, the volume of payments cleared by means of cheques has fallen both in absolute and in relative terms since 1990. The number of interbank and inter-branch items processed in the United Kingdom fell from 3,210 million cheques in 1990 to 2,408 million in 1999. Cheques nevertheless still accounted for almost 21% (by volume) of non-cash payments in 1999 and the values processed annually between 1990 and 1999 have actually risen from GBP 1,329 billion to GBP 1,467 billion.

Payment by cheque to retailers is generally acceptable at the point of sale only if the drawer presents a cheque guarantee card issued by the institution on which the cheque is drawn. At the end of 1999, over 54 million cards with a domestic cheque guarantee function had been issued in the United Kingdom by 60 institutions co-operating within the Domestic Cheque Guarantee Card Scheme. The standard maximum guarantee limit on these cards was GBP 50 until 1989, when two higher limits of GBP 100 and GBP 250 were introduced (the amount is printed on the card). Individual institutions are free to decide whether and how to offer these higher limits to their customers, although cards with upper limits of GBP 250 are relatively rare. The same card may function as a cheque guarantee card, a debit card and an ATM card. The use of cheques at the point of sale has declined dramatically since the widespread

introduction of debit cards, but they are still used frequently for the remote payment of utility bills and for business-to-business payments.

Many building societies now offer cheque book facilities to their customers, combining interest-bearing transaction accounts with automatic transfer facilities and additional features including direct debits, standing orders, ATM and debit card access and automatic overdrafts. The Cheque and Credit Clearing Company has developed a euro bulk paper clearing which handles UK-issued cheques drawn in euro and presented in the UK cheque clearing. However, the number of payments cleared through the euro scheme remains very low, with annual volumes in 1999 of around 74,000 (with a total value of around €716 million).

### 2.2.3 Direct debits

Direct debits allow recipients of large numbers of payments, such as insurance companies and service utilities, to collect these payments automatically from bank or building society accounts after the account holder has provided a mandate to their bank or building society to pay specified direct debits for either a regular fixed sum or a variable amount. Interbank transfers originating from the direct debit process are cleared through BACS. Under the rules of the Direct Debit Scheme, should any money be taken in error, then the customer's bank or building society must, on request, make an immediate refund to the customer's account – this is the Direct Debit Guarantee. This covers situations where the originator has not given the required advance notice regarding a change of amount or date. It also protects customers should an incorrect amount be debited, or if a debit occurs earlier than the specified agreed date, or in error.

The use of direct debits grew rapidly in the late 1980s, with the increase in the number of direct debits processed amounting to around 20% per annum. The annual growth in volumes has slowed since 1990, but was still 7.3% in 1999. In that year, direct debits accounted for 1,863

million items worth GBP 485 billion, up from 846 million items with a total value of GBP 250 billion in 1990. In order to have greater control over their receipts and to reduce administrative costs, many companies have encouraged their customers (sometimes via financial inducements) to switch from standing orders to direct debits. A high-profile annual TV advertising campaign by BACS promotes the use of direct debits for regular bill payments.

#### 2.2.4 Payment cards

There has been major growth in EFTPOS in the United Kingdom in recent years. At the end of 1999, there were around 700,000 EFTPOS terminals in the United Kingdom (double the number in 1994), which accepted, variously, credit cards, debit cards and travel and entertainment cards, and further growth is expected. A competitive market still exists in both the issuing and acquiring of payment cards.

##### *Debit cards*

Various debit card products were first introduced in the late 1980s and a large number of UK banks and building societies now provide their customers with debit card facilities. UK debit cards enable cardholders to make payments which are automatically debited from their current accounts, usually one or two days after the transaction has taken place.

In the United Kingdom, there are two main debit card schemes. The SWITCH scheme was launched in October 1988. By the end of 1999, 23 million SWITCH cards had been issued by UK banks and building societies, up from 11.4 million in 1990. In addition, Visa Delta was launched in February 1991, though UK-issued Visa debit cards had existed under different brand names since late 1987. At the end of 1999, there were 23 million Visa debit cards in circulation, up from 7.5 million in 1990. Both SWITCH and Visa debit cards can be used at EFTPOS terminals and remotely (by phone, mail or internet). Although these schemes allow cardholders to make payments overseas, they

are primarily domestic schemes. By contrast, MasterCard edc/Maestro debit cards were introduced in the United Kingdom in 1993 and so far these cards have been primarily targeted at UK residents wishing to make payments overseas.

The total volume of debit card transactions has risen markedly in recent years and reached 2,062 million payments in 1999, up from 192 million in 1990. The number of debit card transactions now exceeds both credit card usage and the number of guaranteed cheques drawn at the point of sale. The average size of debit card domestic transactions (approximately GBP 32 in 1999) tends, however, to be lower than those where payment is effected with credit cards (approximately GBP 57 in 1999). A number of retailers offer "cash back" facilities operated through the electronic point-of-sale systems in their stores. These facilities enable debit cardholders to obtain cash as well as goods. It is estimated that there were 164 million cash back transactions in 1999.

A relatively recent development is the introduction of completely online debit cards: Visa Electron and SWITCH Solo. Both of these products operate in the same way as conventional UK debit cards, except that they require every transaction made to be authorised online, regardless of value. This allows them to be issued to customers who would not normally qualify for a debit card.

##### *Credit cards*

Credit cards issued by banks and building societies generally have a credit facility with a pre-set limit ranging from GBP 200 upwards. Customers' credit card accounts are separate from their bank accounts, which may well be with another bank or building society, and cardholders receive a statement of the outstanding balance on their credit card account on a regular basis (usually monthly). Cardholders may either pay off the full amount of the balance, or they may choose to pay a portion (usually a minimum of 5%) of the total amount outstanding. Where the full balance

is not settled each month, interest is generally charged on the outstanding balance from the date the transaction appears on the cardholder's statement, although the specific interest charging arrangements vary between credit card companies. From February 1990, a number of banks also started to charge their credit card-holding customers a flat-rate annual fee, although this is often waived when a certain level of annual usage is achieved.

Until 1988 individual banks issued either Visa (currently 37 UK issuers) or MasterCard (currently 26 UK issuers) credit cards. In that year, four banks (Barclays, Lloyds, Midland and National Westminster) took up direct membership of both Visa and MasterCard, sometimes offering customers a choice of different terms for repayment. The credit card market is now very open, with a large number of new entrants in recent years. Of particular note is the number of specialist US credit card-issuing banks, which are now offering a range of different cards aimed at different payment behaviours.

Following a report in 1989 by the Monopolies and Mergers Commission on credit card schemes, retailers were permitted, from early 1991, to charge differential prices according to the customer's method of payment; differential pricing has not, however, been widely adopted.

By the end of 1999, there were some 41 million credit cards in issue. During that year there were over 1,300 million credit card transactions, valued at around GBP 70 billion. There were also 1.8 million travel and entertainment cards in issue to UK residents at the end of 1999.

#### *Retailer cards*

Many retailers issue their own "in-store" cards. These typically only serve one store group and many operate on the basis of a monthly subscription and a revolving credit facility, which is a significant multiple of this amount. Other retailer cards operate in the same way as travel and entertainment cards or bank charge

cards. A recent trend is for retailers, particularly supermarkets, to offer banking services, either in their own right by obtaining a banking licence (for example, Marks and Spencer and Sainsbury), or in conjunction with a commercial bank. An example of the latter is the Tesco supermarket group: in partnership with the Royal Bank of Scotland, Tesco now offers a Visa credit card, an instant access savings account, insurance products and an account which allows withdrawals at ATMs and debit card payments.

#### *Electronic money*

The majority of prepaid cards which exist in the United Kingdom are single-purpose cards, such as phonecards. The use of multi-purpose prepaid cards (i.e. those which can be used to purchase a range of goods and services) is limited at present. Two card-based e-money schemes are being trailed in the United Kingdom. The first is Mondex and the second is the VisaCash scheme.

Mondex: a trial in Swindon (a town in the south-west of England) operated between July 1995 and July 1998. At its peak, there were approximately 13,000 cardholders and the cards could be used at town centre merchants, in parking meters and public telephones, and on buses. The maximum value which could be stored on a card was GBP 500; the card could be loaded from an ATM, with a special telephone (public or at home), or by a card-to-card transfer using an "electronic wallet". The majority of transactions were for less than GBP 20 and the average load amount was GBP 28. Mondex uses MULTOS to provide a secure, multi-application operating system for its cards.

Pilot schemes are now under way on university campuses in Exeter, York, Nottingham, Sheffield and Birmingham. In these pilot schemes, the cards are used for other functions besides payment, such as access control, library ticketing and identification. The campus cards are limited to storing a maximum of GBP 100

each and the average load amount is GBP 9. The banks participating in these pilots are NatWest, HSBC and Bank of Scotland.

In all the pilots, payments to retailers and refunds to customers are made by inserting the card into a terminal. On the retailer's instructions, the terminal debits the amount due from the card and automatically credits the retailer; the retailer's card accumulates the total value of all transactions made with Mondex cards. Periodically (usually daily) the terminal automatically contacts the retailer's bank via a telephone line and transmits the stored value to the bank for redemption.

VisaCash: this scheme was launched in October 1997 in the city of Leeds in the north of England. The participating banks are Barclays, Lloyds TSB, Royal Bank of Scotland, the Co-operative Bank, Abbey National and Halifax. VisaCash, Visa debit and Visa credit can all be incorporated into one card. The cards are smart cards, using public-key cryptography, and are reloadable, with a maximum value of around GBP 50. The value is only transferable to retailers – not to other cardholders. Around 60,000 cards have been issued. Points of sale accepting the card include car parks, public transport, fast food outlets, newsagents and vending machines.

At the end of each day, merchants transmit a full record of the transactions made during the day to their bank. Their account is credited and the transaction data passed to Visa for clearing, settlement and archiving. This means that issuers have access to a full record of all transactions made on each card in issue.

#### *Automated teller machines*

At the end of 1999, over 28,000 ATMs were in service in the United Kingdom, compared with around 18,000 machines at the end of 1991. Almost all of these are connected via the LINK interchange network, which allows customers of participating banks and building societies access to their accounts through the ATMs of any

member institution. In 1999, there were almost 2 billion ATM withdrawals, totalling around GBP 108 billion.

In addition to cash withdrawals, some ATMs enable their users to order new cheque books or statements and make balance enquires and deposits. More advanced ATMs allow customers to make bill payments, funds transfers, standing order enquiries and to order mini statements.

The majority of ATMs are located within banking halls or in the external fabric of banks' and building societies' branches. There is, however, a trend towards the remote siting of ATMs in locations such as motorway service areas, railway stations and supermarkets. Such sites now represent over 26% of all ATM locations (as at end-1999).

#### **2.2.5 Postal instruments**

Cashless payments can also be made through the Post Office. Small-value payments can be made using postal orders, which are particularly convenient for those who do not have a bank account.

### **2.3 Recent developments**

The Bank of England and the CHAPS Company have now embarked on a programme called NewCHAPS, which is scheduled for delivery in the third quarter of 2001, after a period of testing from April 2001. NewCHAPS will be the enhanced replacement RTGS service for CHAPS sterling and will support infrastructural and member requirements via a SWIFT platform, central scheduling and functionality, together with a workstation based on SWIFTNet. The CHAPS sterling clearing will then operate on the same technical platform as CHAPS euro. This change has been motivated by the desire to achieve technological and cost efficiencies, to ensure sufficiently flexible infrastructure to meet requirements for possible EMU entry, to prepare for full implementation of DVP in the United Kingdom by the beginning of 2002 and to promote wider access to direct membership of the system.



APACS has also been discussing with its members the future of the UK payments industry more generally, looking ahead to likely scenarios and requirements in five to ten years time (the so-called Future Payment Systems Development (FPSD) project). The aim is to move away from the current scheme-specific arrangements and to develop a payments systems infrastructure, or "engine", using common elements of hardware, software and network, which is both generic (capable of supporting a number of new and existing payments schemes) and modular (allowing individual members to select the functionality they wish to be performed centrally). This infrastructure will not constrain the service features which can be offered within a payment scheme (e.g. speed, opening hours, message formats, currencies, etc.). Indeed, the intention is to achieve a separation of scheme and infrastructure. Another part of the project is aimed at establishing a faster electronic retail payments mechanism providing same-day final settlement. Thus, although the FPSD's focus is primarily on the retail side, it is not excluded that a faster payments mechanism would lead to some migration of the low-value traffic currently using CHAPS. The technical specifications as well as related issues such as ownership and governance are still being debated, after which building work is expected to commence.

LINK, the United Kingdom's principal cash machine network, has recently opened up membership to non-financial institutions (without a sponsoring bank), prompting a number of independent ATM providers to join the network. Between them these firms plan to set up as many as 11,000 new convenience cash machines in the United Kingdom over the next three years. Each new member has had to meet stringent technical and security criteria before being permitted to join the network. The new machines will be situated in a variety of locations which are convenient for the consumer, most of which will be "low traffic" sites which have not previously justified a cash machine. Any decision on charging will be up to the machine owners, as is the case for bank-owned ATMs.

APACS and a number of member banks are developing a new initiative entitled the "E-Commerce Identification and Payments Scheme" (ECIPS) which is an authentication mechanism based on digital certificates, or electronic identities, which will be unique to individual businesses. Certificates will be issued by the participating banks on behalf of their business customers, providing them with unique proof of identification similar to a passport. In an online transaction, trading partners will exchange certificates which can be verified instantaneously by participating banks. This scheme will also provide additional services including an interface with existing payment mechanisms, assured payments and secure e-mail. The scheme is based on a PKI and will utilise smart cards containing digital IDs. The underlying security arrangements for the scheme will be based on Identrus. Identrus is a bank-owned scheme designed to set up an international PKI among financial institutions. The financial institutions can use its framework to offer services to their customers (such as secure payments and secure e-mail), building on the assurance of identity (i.e. binding the identity of a particular individual/company to a digital certificate) and associated arrangements such as legal agreements and warranties which Identrus provides.

Home-banking systems, allowing bank customers to examine the details of their accounts from their homes/offices, have been available for some time. However, as well as schemes relying on telephone calls or a direct computer link and proprietary software, several banks and building societies now offer some services via the internet, and a number of UK banks are also developing digital television banking services: through this, customers are able to view their account balances and recent transactions, move money between their accounts, pay bills, set up, amend or cancel standing orders and regular payments, and request and amend overdraft facilities. Similar services are being developed as part of banks' WAP (Wireless Application Protocol) mobile telephone-based personal banking facilities.

Finally, two trials of chip card technology were undertaken in the United Kingdom between the autumn of 1997 and the summer of 1998. These APACS-sponsored trials were separate from the e-money projects mentioned above and tested the practicality of replacing magnetic strip cards with chip cards for conventional debit, credit and charge card applications. A decision was

then taken to roll out the technology nationwide and this commenced in spring 1999. The platform chosen is compliant with EMV specifications and has been implemented in such a way as to keep costs to a minimum. Individual issuers are able to extend the functionality of their cards by building on the basic set of applications if they so desire.

### 3 Interbank exchange and settlement systems

#### 3.1 General overview

This section provides a detailed description of the main interbank payment networks operating within the APACS framework: CHAPS (sterling and euro), BACS and the Cheque and Credit Clearings.

The two CHAPS clearings are RTGS systems primarily designed for high-value payments, although there is no lower (or upper) limit on the value of payments which may pass through the clearings. Three other major interbank payment systems (BACS and the cheque and credit clearings) deal with high volumes of relatively small-value payments, although they are able to accommodate non-urgent large-value transfers if required. All three “retail” clearings work on a three-day processing cycle and are not suited for use by those wholesale financial markets (e.g. foreign exchange and money markets) which are geared to shorter settlement cycles. As a result, the average value of transactions in these clearings is much smaller than those processed through either of the CHAPS clearings. The average value of individual payments passing through the clearings in 1999 ranged from GBP 569 for BACS to an average value for CHAPS sterling items of around GBP 2.3 million (and around €13.2 million for CHAPS euro).

In order to facilitate the operational side of making payments, a nationwide system of unique codes is employed to identify clearing members and, at each clearing member’s discretion, their branches and major customers.

These sort codes are printed, together with a code identifying the customer’s account, on such instruments as cheques and giro credits in machine-readable form.

#### 3.2 CHAPS

CHAPS started operating in 1984 as a nationwide, electronic interbank system for sending irrevocable, guaranteed and unconditional sterling credit transfers from one settlement member to another for same-day value operating on an end-of-day multilateral net settlement basis. In April 1996, CHAPS developed into an RTGS system which handles nearly all large-value same-day sterling payments between banks, other than those which are specifically related to the settlement of purchases of UK government securities or money market instruments. Although CHAPS sterling is primarily used for large-value payments, it is also used for a growing number of retail payments, where there is a particular need for same-day finality. The average value of payments passing through the CHAPS sterling system was GBP 177 billion per day in 1999 and, on a peak day, CHAPS has been responsible for processing transfers with a total value of over GBP 287 billion. In January 1999, a second CHAPS system – for euro-denominated payments – began operations. This system connects to the EU-wide TARGET system and is entirely separate from the original CHAPS sterling system (although both are run by the CHAPS Clearing Company Ltd). As described above, the NewCHAPS project will align the two clearings more closely (see Section 2.3). Membership of the two CHAPS clearings is also independent: although 12 banks (including the Bank of England) are

members of both, ten further banks are members of only one.<sup>4</sup>

### 3.2.1 Operating rules

The CHAPS Clearing Company Ltd. sets the operational rules for the CHAPS clearings and is responsible for the development of the network. The settlement members of CHAPS are involved in setting these rules through their membership of the Board of the CHAPS Clearing Company and its committees. Members are also obliged to abide by the rules laid down by APACS (see Section 1.3.1).

### 3.2.2 Participants in the system

The direct members of the clearings are the institutions responsible for settling all transfers, and consequently all interbank obligations arising through this system. There are also around 425 institutions with CHAPS sterling indirect member status, which by virtue of agency agreements with settlement members (of which there are currently 14), can have CHAPS payments addressed directly to themselves through their agency account. They can also, subject to intraday limits imposed by their settlement members, initiate outgoing CHAPS payments, either by a direct terminal link to their settlement bank's payment system, or by a request to a branch of the bank to make the payment, or by using SWIFT to pass payment instructions to a CHAPS settlement bank. Their settlement members are responsible for these activities and settle on their behalf. In addition, a large number of major corporate customers can, by virtue of account arrangements with one of the settlement members, or with a participant, be advised online of the receipt of CHAPS payments for their account and can initiate outgoing CHAPS payments. Access to CHAPS euro operates on a similar basis and there are currently 20 direct members and approximately 100 indirect members (also known as "participants").

### 3.2.3 Types of transaction handled

There is no restriction on the type (or value) of transaction handled provided it is an unconditional

sterling payment (or euro payment for CHAPS euro). A significant proportion of CHAPS payments, by value, originate in the foreign exchange market and other wholesale markets owing to their requirement for a prompt settlement service. It is, however, also used to facilitate same-day transfers arising from a range of other activities (e.g. general commercial transactions and the purchase of domestic property), and some transfers can be quite small.

### 3.2.4 Operation of the transfer system and the transaction processing environment

The CHAPS sterling system was established as a distributed network in which electronic payment messages were passed directly from the sending settlement member to the receiving settlement member without being routed via a central processing unit or clearing house. All incoming and outgoing transfers for a particular member pass through its gateway, the special-purpose software which acts as the interface between each member's internal payment system and the CHAPS network. All payment messages passing through the system are subject to authentication and encryption procedures. The CHAPSNET contract (a fully managed network provided by British Telecommunications Syncordia Solutions) signed in March 1996 provides connectivity and service for CHAPS payment, security and enquiry links.

The CHAPS systems (both sterling and euro) currently open for normal service at 6 a.m. (UK time). CHAPS banks can initiate transfers on behalf of themselves and their customers until 4 p.m. Most settlement members will, however, negotiate cut-off points with their customers so that any requests to make CHAPS transfers received after a set deadline will be handled on a "best efforts" basis. (After the 4 p.m. cut-off, settlement members can make transfers on their own behalf or on behalf of other credit institutions and certain money market

<sup>4</sup> CHAPS sterling has 14 members and CHAPS euro 20 members.

participants for the purpose of settling their end-of-day positions; they cannot process normal customer payments after this time.) The CHAPS sterling day ends at 4.20 p.m. (as does the participant period in CHAPS euro). After this time, CHAPS sterling settlement banks can use the Enquiry Link to make transfers under the Late Transfer Scheme (until 5 p.m.) and the sterling end-of-day transfer scheme (until 5.25 p.m.).

Each CHAPS payment is settled at the Bank of England before details are sent to the receiving bank. The gateway software is designed so that, for each payment instruction generated by a sending bank, a settlement request (a subset of the information contained in the main message) is first sent to the Bank of England, while the main message is retained in the sending bank's gateway. Only if the sending bank has sufficient funds on its account does the Bank of England settle the transaction by debiting the account and crediting the receiving bank. The Bank of England then returns a confirmation message to the sending bank. As soon as this confirmation is received, the main message containing the full payment details is released automatically to the receiving bank, which has the assurance that it has received final and irrevocable funds on its account at the Bank of England.

As a rule, banks should only forward settlement requests to the Bank of England when they have sufficient funds on their settlement account to allow the transaction to be processed immediately. The CHAPS banks therefore schedule their payment streams within their own systems during the business day. The form of queue management adopted is a matter for each settlement member to decide. Additional facilities, however, have been developed to assist them in meeting this requirement. Each CHAPS bank, for example, is able to obtain details of its account balance, a summary of its CHAPS payments settled and a listing of various non-CHAPS items it has paid or received by making use of an Enquiry Link terminal connected to the Bank of England's RTGS accounting system. A circles processing (or optimisation) facility is also provided by the Bank

of England as a form of contingency for both of the CHAPS clearings. This allows queued payments held at two or more banks to be forwarded to the central RTGS accounting system at the Bank of England and settled simultaneously (although still in gross form). This is a useful mechanism to address situations where there may be insufficient liquidity to allow each payment in a given set to settle sequentially, but where the available funds would permit these to be settled collectively. While this facility assists in preventing blockages from arising, it is not used routinely during the course of each day, given that the CHAPS banks have access to additional intraday liquidity to ensure that all payments can be made.

In order to guard against contingency situations, the Bank of England's real-time accounting system is duplicated at a remote standby site. All entries to accounts held at the main site are copied to this second location and the standby site is able to take over the functions of the main site if its ability to operate is impaired. As a final resort, the CHAPS systems (sterling and euro) have the ability to operate as net end-of-day systems in the unlikely event that both the primary and secondary sites are rendered inoperable.

Each settlement member has its own contingency arrangements to address the possibility of an internal systems failure during the day. These may take a variety of forms and are the responsibility of the settlement member.

### 3.2.5 Settlement procedures

When CHAPS sterling first came on stream, it was a net settlement system and its rules required that each payment which was sent and acknowledged by the receiving bank should be irrevocable and unconditional. In addition, it was a requirement that each transfer delivered be guaranteed by both the sending and the receiving bank. This meant that once a settlement member put its name to a message by allowing it to pass through its gateway, that institution committed to the transfer, even if at the end of the day the originating customer did not have a sufficient balance available to fund

that payment. Prior to RTGS, the system automatically calculated multilateral net figures in respect of each settlement member's obligations and entitlements and sent these to the Bank of England for settlement at the end of the CHAPS day. These figures were subsequently posted to the settlement accounts of the relevant banks along with various other banking transactions later the same day. Under RTGS, interbank settlement, as well as the transfer of payment messages between banks, occurs in real time. Moreover, the CHAPS systems only permit a transfer to be passed to a receiving settlement member if it has already been irrevocably settled across accounts maintained at the Bank of England.

There are no provisions in the CHAPS clearings' rules for revocability, but where a payment has been made in error, the receiving settlement member is required to send an offsetting transfer back to the original sender by no later than 12 noon the next day. Such arrangements worked while CHAPS sterling operated on a net basis and this approach has been continued now that the RTGS system is in place. The only modification to the previous arrangements is the addition of a facility within the central systems at the Bank of England which support the RTGS system to allow settlement requests which have been forwarded in error (but which have not yet been settled) to be cancelled. These cancellation procedures are undertaken by the Bank of England at the request of the sending bank.

### **3.2.6 Credit and liquidity risks and their management**

After the introduction of RTGS, there was no longer any requirement for banks to set either net bilateral receiver limits (NBRLs) or net sender limits (NSLs) given that interbank exposures no longer arose as a result of participating in CHAPS sterling. NBRLs were introduced in stages from the first half of 1992 to allow each member of CHAPS to limit for the first time the extent to which the value of incoming CHAPS instructions from any other

member could exceed the value of its own outward instructions to that bank; NSLs were adopted in 1993 to restrict the extent to which the value of payments made by any one bank to all other members could exceed the value of incoming transfers to it. The ability of banks to process payments is now only constrained by the availability of funds on their settlement accounts.

### **3.2.7 Provision of credit facilities**

The Bank of England has never given any explicit or implicit undertaking to underwrite the settlement operations of the UK clearings. Banks and building societies holding settlement accounts are expected to keep them in credit and a penalty is applied where banks incur an overdraft. The Bank of England does not pay interest on balances held on these accounts. The Bank of England does, however, provide intraday funds to the members of CHAPS through an intraday sale and repurchase (repo) facility for eligible assets (a list of which is maintained on the Bank of England's website at <http://www.bankofengland.co.uk/markets/money/eligiblesecurities.htm>). At the end of the day, the Bank of England unwinds these repos when the banks which sold assets as repo collateral earlier in the day repurchase those assets. The provision of intraday funds to these banks through repos is regarded as necessary for the efficient operation of the CHAPS system, and for the management of settlement accounts generally, as the funds which the clearing banks typically hold on their settlement accounts on an overnight basis only represent a very small proportion of the total values which pass through CHAPS and the other clearings each day. The ability to obtain liquidity from the Bank of England through intraday repos is only available to settlement members of the CHAPS system. These institutions are able to sell assets to the Bank of England at any point during the business day. They are also able to reverse existing repos at any time during the day, provided they have sufficient funds on their settlement accounts, and to substitute new assets if they wish to do so. The Bank of England

does not impose any interest charge or fee in respect of funds extended as part of normal RTGS repo operations.

Banks in the United Kingdom are not subject to reserve requirements for monetary policy purposes. They are obliged to hold cash ratio deposits (CRDs) with the Bank of England, but these are a means of financing the Bank of England's operations. CRDs are non-interest-bearing deposits which are calculated as a percentage of each bank's eligible liabilities (currently 0.15% of all liabilities in excess of GBP 400 million). These amounts are recalculated twice a year. Prior to the introduction of RTGS, these sums were not available for use in the settlement process, but in order to provide some additional liquidity the CHAPS sterling banks are now allowed to make payments against these deposits during the day. They are required to reinstate them by the time the RTGS system closes. Shortly before the RTGS system closes at the end of each day, each bank must first reinstate its CRDs and thereafter repurchase all assets sold under RTGS repo agreements.

The Bank of England, as a non-euro area national central bank, provides collateralised intraday credit in CHAPS euro subject to certain criteria determined on the basis of the Governing Council of the ECB's decisions made prior to the start of TARGET. Those conditions stipulate, inter alia, that the maximum amount of credit permitted per participant is €1 billion.

### 3.2.8 Pricing policies

The fee a settlement member charges its participants or customers for a CHAPS transfer is a matter for commercial negotiation between the parties concerned. These charges may be on a per-item basis or as part of a package negotiated by the bank with its customer.

Settlement banks which are members of either of the CHAPS systems have to pay an entry fee to the CHAPS Clearing Company upon joining the system and also an annual charge to CHAPS

to cover their share of the system's operating costs (this charge is normally fixed in proportion to each bank's share of the total volumes processed through the system). Settlement members do not have to pay any per-item fees to the CHAPS Clearing Company for the use of the CHAPS system.

In addition, since the introduction of RTGS, the Bank of England has charged a per-item tariff in respect of each CHAPS sterling transfer settled and an annual fee for settlement accounts in order to cover the costs of running its real-time accounting system. The costs of the Enquiry Link are recovered by an annual charge levied on each terminal connection. Similar principles are applied to domestic CHAPS euro payments. However, cross-border TARGET payments (including those initiated via CHAPS euro) are subject to a separate framework whereby there is a degressive per-item charge determined by the Governing Council of the ECB.

### 3.2.9 Future developments

The Bank of England and the CHAPS Company are working on the enhanced replacement RTGS service for CHAPS sterling, called NewCHAPS (see Section 2.3).

## 3.3 BACS

BACS is an ACH responsible for clearing bulk electronic transfers in both debit and credit form. The clearing is operated by BACS Ltd. The BACS service (which began operating in 1968 as the Interbank Computer Bureau) was established to provide a more efficient method of handling interbank transfers by means of magnetic tape rather than paper instruments. BACS transfers are now exclusively input through telecommunications links. BACS processes the great majority of electronic interbank funds transfers in the United Kingdom. Recent projects in BACS include the introduction of an extended message service called REMIT, which allows originators to include much more information in their messages. BACS has also developed a separate credit transfer system for domestic euro transactions, which operates in a

similar way to its sterling direct credit service (see Section 2.2.1).

### **3.3.1 Operating rules**

BACS Ltd. sets operational rules for users and for the banks and building societies which act as settlement members of BACS. Settlement members are involved in setting these rules through their membership of the Board of BACS Ltd. and its committees. BACS operates under the umbrella of APACS.

### **3.3.2 Participation in the system**

The membership of BACS consists of 14 banks, including the Bank of England, and one building society. These credit institutions are shareholders of BACS and are responsible for settling all settlement obligations arising from the BACS clearing process. Settlement members of BACS are able to sponsor other organisations as users of the BACS service. Users are allocated a BACS user number by their sponsor, but are able to submit payment instructions directly to BACS. There are in the region of 35,000 users including a wide range of commercial and public sector bodies. Settlement members must meet the membership criteria set by BACS Ltd and APACS.

### **3.3.3 Types of transaction handled**

BACS processes direct debits and is also used for direct crediting of payments (including standing orders). A high proportion of the transfers handled represent regular disbursements such as the payment of wages, salaries and pensions or the payment of utility bills, insurance premiums or subscriptions. Various types of payment can be accommodated and there is no general restriction on the purpose of the underlying transaction. Similarly, there are no restrictions on the size of transactions handled, but most transfers are retail payments and average per-item values tend to be small compared with the CHAPS clearings.

### **3.3.4 Transaction processing environment**

Users submit payment data to the BACS clearing house through BACSTEL, a telecommunications service which offers direct connection to the BACS computer centre. Some of the major users of BACS use direct high-speed links. BACS sets common standards for the format in which payment information is supplied. Users may submit payment instructions to BACS from between 2 and 71 days ahead of the date for payment.

### **3.3.5 Operation of the system**

Payments submitted to BACS are subject to a three-day clearing and settlement cycle. The deadline for receipt of payment information from users is 9 p.m. (UK time) on Day 1 of the cycle. These data are then sorted into bank order at BACS and transmitted onward to destination credit institutions. A destination bank may be either a receiving bank or a paying bank depending on whether the transaction under consideration is a credit or a debit. This process should be completed by 6 a.m. the following day (i.e. Day 2). The paying bank receives a report confirming each submission on Day 2. On Day 3, transfers are debited/credited to respective payer/payee accounts, usually at the beginning of the operating day.

### **3.3.6 Settlement procedures**

The interbank obligations which arise in BACS are settled at the Bank of England on a multilateral net basis on Day 3 of the clearing cycle. This settlement occurs at 9.30 a.m. daily by posting the multilateral net amounts directly to the settlement accounts using the RTGS processing system.

### **3.3.7 Credit and liquidity risks**

Each settlement member is responsible for settling the payments generated by the users it sponsors. There is no system of limits or other controls within BACS itself to inhibit the numbers or value of payments for which a

particular settlement member is responsible. The extent to which a user can initiate BACS transfers and its arrangements for funding the resultant outflow are a matter to be decided bilaterally with its settlement bank.

### 3.3.8 Pricing

BACS Ltd. applies tariffs to the sponsoring banks of users in respect of both incoming and outgoing messages. The sponsoring banks negotiate independently with users and other customers the charges which they will incur as a result of generating BACS transfers or receiving credits through this medium.

### 3.3.9 Future developments

BACS is currently involved in talks with APACS over the future development of the clearing into NewBACS. This project is closely connected with the FPSD project (see Section 2.3) and it is likely that the two enhancements will seek to capture any possible synergies. BACS also continues to improve and further automate procedures for amending, cancelling and returning payment requests.

## 3.4 Cheque and credit clearings

### 3.4.1 Operating rules

The Cheque and Credit Clearing Company, which operates under the umbrella of APACS, is responsible for the cheque and credit clearings for England, Wales and (since December 1996) Scotland. While both payment systems are managed by the same body and have the same set of settlement members, these are distinct clearings subject to their own rules. A separate clearing operates in Northern Ireland under local paper clearing arrangements, with its own rules and membership criteria, which falls outside the APACS structure.

The usage and clearing of cheques in the United Kingdom is somewhat different from other forms of payment instruments insofar as it is governed to a degree by statute. The key

legislation in this area consists of the Bills of Exchange Act 1882 and the Cheques Acts, 1957 and 1992, and the Deregulation (Bills of Exchange) Order 1996.

### 3.4.2 Participation in the system

The Cheque and Credit Clearing Company has 12 direct settlement members<sup>5</sup> which settle all interbank items passing across the two clearing arrangements organised by it. The settlement members comprise 11 banks and one building society. Other banks and building societies can have access to both clearings through agency arrangements with the direct members. Settlement members must meet the membership criteria set by the Company and APACS.

### 3.4.3 Types of transaction handled

The cheque clearing and the credit clearing systems handle paper debit items (i.e. cheques) and credit items (i.e. bank giro transfers) respectively, and operate within rules set by the Cheque and Credit Clearing Company. Cheques processed through the cheque clearing and paper credits passed through the credit clearing must meet the physical specifications (relating to layout and paper specifications) laid out in the relevant clearing rules. There are, however, no restrictions on the value of individual transfers or on the nature of the original transaction.

### 3.4.4 Operation of the system and transaction processing environment

The cheque and credit clearings both operate on a three-day payment and settlement cycle, though an additional day is sometimes required for items requiring cross-border clearing between England and Scotland. In the case of the cheque clearing, a cheque presented to a branch of a member bank during banking hours will usually be processed by the collecting bank that day. This may involve the magnetic encoding of the value of the cheque in

<sup>5</sup> Members of the Company operate as settlement members of both the cheque clearing and the credit clearing; they do not have the option of being a member of only one of these two payment systems.



the pre-existing codeline at the bottom of the cheque, although members are now increasingly adopting new technologies to circumvent the need for this, such as image reading, which replaces the use of magnetic encoding techniques. The following day, cheques are sent to the collecting bank's clearing centre. At the clearing centre, the cheques are automatically "read" by machines, which evaluate the codeline and sort the cheques by drawing bank. Cheques are then sent by the collecting bank to the Clearing Exchange Centre where they are passed to the paying bank. In parallel with this, the codeline data is transmitted over the Inter-Bank Data Exchange (IBDE) network between the two banks. This data is currently used as a check on the paper delivery, but allows the paying bank to begin processing before the paper items arrive. The collecting bank's clearing centre then processes the cheques to ascertain the value of settlement between itself and other settlement members and to sort the cheques between its own branches. The cheques are then packaged ready for delivery to the individual branches on which they are drawn, although a change in the law in 1996 removed the requirement for cheques to be presented physically. Electronic data is now an acceptable form of presentation and many banks are using exclusively electronic data internally, retaining the paper instruments at their head office (known as issuing bank truncation). Some banks update customer accounts from the IBDE data file and some members truncate the paper centrally at their clearing centres or head office. Whether in physical or electronic form, the instruments will arrive at the relevant branch by the third day of the clearing cycle, and branch staff will review them to see whether the instruments in question should be accepted or returned (e.g. due to insufficient funds being available to meet the value of the cheque). The point at which the collecting bank credits funds to the payee's account and allows the payee to draw against these is a commercial decision and varies between banks.

Paper credits follow a reverse process to cheques, in which the collecting bank is generally the payer's bank. The processing procedures for the credit clearing are very

similar to those employed in the cheque clearing. However, while pre-printed codeline details on credits are more comprehensive than on cheques, this data is not transmitted over the IBDE network. Also, settlement figures for the credit clearing are ascertained by receiving banks once they have read the codeline data.

In January 1999, a euro bulk debit clearing was introduced by the members of the Cheque and Credit Clearing Company (see Section 2.2.2). This is a manual operation and processing is based on the pre-IBDE clearing (although settlement figures are collected by collecting banks). There is no euro paper credit clearing service available in the United Kingdom.

#### **3.4.5 Settlement procedures**

The interbank settlement of items processed through the cheque and credit clearings occurs on the third day of the cycle. In respect of each clearing, multilateral net amounts for each member are posted to settlement accounts at the Bank of England, no later than 12.30 p.m. Settlement is effected by multilateral net entries to settlement accounts at the Bank, although since the development of an RTGS system, postings have taken place in real time during the day rather than at the end of the day.

#### **3.4.6 Credit and liquidity risks**

There is no system of limits to control the interbank settlement obligations which arise in the cheque and credit clearings. By contrast with CHAPS, settlement members of these clearings are considered to be acting as agents of their customers rather than as principals, and the value of interbank settlement obligations is typically much smaller.

#### **3.4.7 Pricing**

The Cheque and Credit Clearing Company does not impose a per-item charge on cheques or credits handled; its costs are met through direct contributions by shareholders (the settlement members). Banks negotiate charges with their

business customers for processing debits and credits arising from paper instruments; most banks do not impose such direct fees on their personal customers.

#### 3.4.8 Future developments

As mentioned above, some participants in the cheque clearing have introduced “paying bank truncation” (whereby the paper instruments are retained at the head office of the paying bank). A major project in the future will be the introduction of collecting bank truncation, although because of the need to examine endorsements and signatures on cheques this is unlikely to occur until cost-effective and sufficiently rapid imaging technology is available.

### 3.5 Currency clearings

The domestic clearings described above relate to payments in sterling or euro, but under the APACS umbrella there are also foreign currency clearings for a number of major currencies (including the euro) in London, through which it is possible to transfer value between foreign currency accounts with banks in the United Kingdom. There are currently five members of the currency clearings which each handle all currencies and which act as settlement agents. They do not handle items drawn on banks outside the United Kingdom – those items have to be sent to the countries concerned for collection or negotiation.

The currency clearings handle cheques, drafts, banker’s payments and mandated currency debits drawn on, or payable at, UK branches of members and participants. Bank-to-bank wholesale payments are excluded. The main currency handled is the US dollar, for which, along with the Canadian dollar, a same-day payment service is available. The other currencies handled are the Australian dollar, Japanese yen and Swiss franc, along with the euro (which has now replaced, inter alia, the French franc, Deutsche Mark, Italian lira, Dutch guilder and Spanish peseta, which were previously handled by the currency clearings). Instruments denominated in these currencies follow a three-day clearing cycle.

The volumes handled in the currency clearings are quite small compared with the other APACS clearings and in 1999 totalled around 478,000 items, of which around 38% were US dollar transactions. The total value of all items cleared was GBP 4.9 billion, of which almost 75% represented US dollar-denominated items.

For each of these clearing arrangements, one member acts as the system’s settlement agent, with net settlement between it and the other banks being effected across accounts held in the country of issue of the currency concerned. In the case of the US dollar clearing, each member bank acts as overall settlement agent for a two-month period.

## 4 Trading, clearing and settlement

### 4.1 General overview and recent developments

#### *UK markets*

The United Kingdom has major securities markets in UK government stock, domestic and international equities, debt securities (including eurobonds) and money market instruments. There is also a highly developed market in derivatives based on these and other instruments. The most active participants in these markets are domestic and international banks and securities houses, as well as institutional investors such as pension funds and insurance companies.

Equities, debentures, loan stocks and other securities listed in the United Kingdom are mainly traded through the London Stock Exchange, but some volumes also go through Tradepoint. Both exchanges also offer trading facilities in a range of overseas securities. UK government stock is mainly traded through gilt-edged market-makers, subject to the rules of the London Stock Exchange. Eurobonds and short-term euro-currency paper are generally listed in the United Kingdom or on the Luxembourg Stock Exchange, but are traded OTC under the rules of the International Securities Markets Association (ISMA). A significant proportion of all eurobond trading takes place in London.

There is also a very large volume of OTC derivatives activity in London and standardised derivatives contracts are traded on LIFFE, the LME, the IPE and the OMLX. LIFFE's contracts comprise futures and options on UK and foreign government bonds, short-term interest rates, equity indices and individual equities. The LME and IPE offer contracts on metals and energy products respectively. The OMLX primarily trades Swedish equity derivatives contracts on an automated trading system linked to that of its parent.

Sterling and euro-denominated money market instruments are traded OTC.

#### *The trading infrastructure*

UK exchanges, clearing houses and settlement systems have undergone significant change since the publication of the last Blue Book and change continues at a rapid pace. Like many of their European counterparts, the UK's exchanges have responded in a variety of ways to the opportunities offered and challenges posed by the integration of (particularly European) capital markets, technological advances, member consolidation and increases in global cross-border trade.

Both the London Stock Exchange and LIFFE have introduced electronic trading systems. Around 190 securities are traded on the London Stock Exchange's SETS electronic order book, although a significant proportion of trading in these securities continues to take place over the telephone or via automated systems provided by the major market liquidity providers and in particular the so-called retail service providers. Trading in most of the remainder of London Stock Exchange securities is facilitated by a screen-based quotation system called SEAQ (Stock Exchange Automated Quotation), which displays two-way prices from competing market-makers. For less liquid and AIM (Alternative Investment Market) securities a hybrid market of quotes and orders is used. The London Stock Exchange also supports the SEATS Plus trading system, a hybrid quote-driven/order-matching system which is used for less liquid securities in addition to securities listed on AIM. Tradepoint and the OMLX continue to offer electronic order books. The vast majority of LIFFE contracts are now traded on LIFFEConnect. Furthermore, both the IPE and LME are assessing their members' needs in this respect and plan the limited introduction or expansion of existing screen trading facilities.

The London Stock Exchange, LIFFE and the IPE have demutualised to become for-profit, shareholder-owned institutions. The LME is also considering demutualisation. Demutualisation

should enable these exchanges to respond more efficiently to commercial pressures in an increasingly competitive environment. Tradepoint is a public limited company and its shares are traded on the London Stock Exchange's AIM. The OMLX is a part of the OM Group, which is listed on the Swedish Stock Exchange. Demutualisation may bring further changes in the exchanges' ownership. LIFFE shareholders are currently considering a proposal to offer non-member investment firms a sizeable stake in the exchange. At the time of writing, the London Stock Exchange was subject to a takeover bid from the OM Group.

UK exchanges are at the heart of moves to rationalise Europe's market infrastructure. Tradepoint has announced plans with SWX Swiss Exchange to create virt-x, a pan-European market based in London offering trading in European blue chip equities. It will use the EBS platform developed and owned by SWX. The London Stock Exchange recently announced plans to merge with the Deutsche Börse to create the iX exchange, but these plans were subsequently abandoned in the wake of the OM Group's takeover bid.

The opportunities offered by these developments have encouraged a number of new and prospective entrants into the UK equity markets. Jiway, which has applied for authorisation as an RIE, intends to offer execution facilities to brokers and other financial intermediaries for transactions below a certain size limit, based on a central order book supported by firm quotes provided by market-makers. Agency brokers such as Instinet and Posit provide matching facilities to institutional investors and brokers. E\*Crossnet provides a crossing service to institutional investors. Market-makers and institutional brokers continue to expand the range of crossing and order-routing facilities available to customers.

Similar trends are being seen in the fixed interest markets. Recent years have seen the introduction of a range of electronic interdealer and dealer-customer execution and quotation systems.

COREDEAL (an RIE) and authorised financial intermediaries such as BrokerTec, EuroMTS and Cantor/E\*Speed provide interdealer execution in a wide range of eurobond and European government bond cash trades and repos. For the time being, UK government bond trading remains largely telephone-based, with market-makers' quotes being distributed over a variety of quote vendor systems. However, the UK Debt Management Office is discussing the introduction of an electronic interdealer system with market participants.

For brevity, the more detailed descriptive sections which follow only describe RIEs (including Jiway, which has applied for RIE status) and not authorised financial intermediaries.

#### *Clearing*

The LCH remains the UK's principal CCP clearing house, although the OMLX and, prospectively, Jiway, operate in-house clearing facilities.

The LCH continues to provide CCP services for LIFFE, the LME, the IPE and Tradepoint. But its activities have broadened since the last Blue Book to encompass clearing of cash and repo trades in European (Belgian and German at present, with more planned) government bonds ("Repoclear") and plain vanilla swaps ("Swapclear"). The LCH is also developing a clearing service for the London Stock Exchange in co-operation with CRESTCo and for the virt-x initiative between Tradepoint and the Swiss Stock Exchange.

As with trading, consolidation is under way amongst European clearing houses, reflecting the potential operational and capital/margin savings from integration. The LCH is in discussions with both Clearnet, the French clearing house, and with Eurex Clearing to assess the potential for merger and integration.

#### *Settlement*

Settlement is also undergoing a process of consolidation, both domestically and internationally. Again, this process reflects the

considerable operational savings and efficiencies and the potential reductions in risk available from rationalisation.

In the United Kingdom, CRESTCo now owns and operates the UK's two remaining settlement systems, CREST and the CMO. Opened in 1996, CREST initially settled UK and Irish equities and corporate bonds. In July 2000, UK government debt was integrated into the system and the CGO was closed. As a result, values settling through CREST now average close to GBP 200 billion per day, with peaks in the region of GBP 220 billion. Money market instruments continue to settle in the CMO, but work is under way to integrate them into CREST.

CRESTCo has, in addition, established direct links to CSDs in Belgium (Euroclear), Switzerland (SIS SegalInterSettle) and the United States (DTCC), enabling CREST members to hold securities which settle in those systems. It also has a link to Germany (Clearstream Frankfurt) through its sub-custody arrangement with Dresdner Bank AG.

The CSDs from the following countries have established links to CREST: Switzerland (SIS SegalInterSettle); Sweden (VPC); the Netherlands (Necigef); Belgium (Euroclear); and Australia (CHESS).

## 4.2 Trading

### 4.2.1 London Stock Exchange

#### *Ownership and governance of the system*

The London Stock Exchange's membership endorsed its demutualisation into a for-profit limited liability public company in March 2000. Shares in "London Stock Exchange plc" are transferable through a matched bargain facility, operated by a broking firm, Cazenove & Co. The articles of association of the exchange prohibit individuals or corporations (or connected groups thereof) from retaining an interest in shares which carries more than 4.9% of the total votes attached to shareholdings. Shareholdings in excess of this limit may be

refused for registration by the Board of the exchange. The exchange remains predominantly owned by its members (the bank and broker community).

The London Stock Exchange's Board of Directors consists of its Chairman, Deputy Chairman, Chief Executive and ten other members, including a Director of the Bank of England. The committees of the Board which are concerned with governance of the exchange are the Senior Appointments and Remuneration Committee and the Audit Committee. The exchange's day-to-day management is conducted by the Management Committee which is chaired by the Chief Executive and consists of senior stock exchange executives. The Management Committee reports regularly to the Board on the implementation of strategy and the management of the business.

#### *Regulatory status*

The London Stock Exchange is an RIE under the FS Act 1986. Until recently, it was also the UK's competent listing authority under EU Council Directive 93/22/EEC on investment services in the securities field (the ISD); but, for the reasons outlined above, regulation of the UK's primary market for raising capital is now conducted by the FSA's UK Listing Authority. The London Stock Exchange is also designated a "regulated market" under the above-mentioned Directive.

#### *Participation*

The London Stock Exchange has approximately 300 member firms. In order to trade on the exchange a firm must become an authorised member or a SETS participant. London Stock Exchange membership allows access to all London Stock Exchange markets, whereas SETS participants only have access to the electronic order book for automated trading (see the *System operating procedures* section).

An applicant for membership must be:

- authorised under the FS Act 1986;

- an exempted person under the FS Act 1986;
- a person whose activities constitute “excluded activities” under the FS Act 1986, whether such activities are carried out in the United Kingdom or elsewhere in the EU;
- an “overseas person” as defined by the FS Act 1986; or
- a “European institution” as defined by the Banking Co-ordination (Second Council Directive) Regulations 1992 and the Investment Services Regulations 1995;
- and, if a sole trader, must designate a person as being responsible for protecting the interests of the firm’s customers in the event of the firm ceasing to carry on business.

The London Stock Exchange will also assess the applicant’s suitability for membership by considering the scope of the applicant’s business activities, internal procedures and controls, etc.

An applicant for approval as a SETS participant must:

- be a member of an investment exchange in the European Union with which the London Stock Exchange has specialised information-sharing and surveillance arrangements;
- be regulated by its home EU Member State in accordance with the ISD;
- satisfy the exchange’s suitability requirements; and
- have arrangements for the clearing and settlement of its trades.

Following the introduction of a CCP (see below), membership will be divided into clearing and non-clearing members. Clearing members will have to satisfy the LCH’s membership criteria (see below).

#### *Types of security*

The following classes of security are admitted to trading on the London Stock Exchange:

- UK equities;
- international equities;
- shares and fixed interest stocks of companies admitted to AIM, which was set up in 1995 for young and fast-growing businesses;
- securities issued by the UK Government (gilts);
- sterling bonds issued by companies or local authorities;
- eurobonds and medium-term notes issued by UK and international companies;
- depository receipts and negotiable certificates; and
- exchange-traded funds.

In 1999, over 335 billion UK equity shares were traded on the London Stock Exchange, representing a turnover value of approximately GBP 1,400 billion. In the same period, approximately 725 billion international equity shares traded on the exchange, with a corresponding turnover value of GBP 2,420 billion.

#### *System operating procedures*

Around 190 stocks are traded on SETS, the exchange’s electronic order book. The order book includes the FTSE (Financial Times Stock Exchange) 100, the most liquid FTSE 250 securities, equities which have a LIFFE-traded equity option and Irish stocks. Limit orders, anonymous until execution, match continuously throughout the trading day on the basis of price/time priority. Unmatched limit orders and market orders are submitted for auction at the start and end of each SETS trading day, with orders

executed at the clearing price which is set to enable the maximum volume of shares to be traded. Non-SETS securities are traded on a quote-driven market, supported by a number of market display mechanisms. The majority of UK equities are quoted on the SEAQ system, with international stocks and depository receipts quoted on SEAQ International (SEAQI). SEAQ and SEAQI are quote-display systems used as the reference point for telephone execution between market participants and competing registered market-makers (who are required to quote bid/offer prices). For some larger stocks, this quote-driven market is supplemented by two intraday blind auctions. Stocks listed on AIM, some small listed stocks and covered warrants have quotes and/or firm orders displayed on the Stock Exchange Alternative Trading Service (SEATS PLUS).

#### *Clearing/settlement*

Transactions executed on the London Stock Exchange order book SETS are protected against counterparty default by a guarantee scheme. The scheme is operated by the London Stock Exchange and backed by insurance cover. The London Stock Exchange, CRESTCo and the LCH are developing a CCP service for trades executed on SETS, which is due to be implemented in February 2001. The intention is to expand this service in 2001-02 to implement settlement netting and to include less liquid UK stocks and, as the service is exchange-independent, European stocks, including those traded on the Irish Stock Exchange.

Trades in UK equities settle through CREST. The standard settlement cycle is five days, which will be reduced to three days in February 2001. Participants may agree to use a different cycle for individual trades, however, ranging from same-day to 25-day settlement. Trades in overseas equities settle through the relevant domestic or international CSD in accordance with local market deadlines.

#### *Operating hours*

Trades can be reported to the exchange from 7.15 a.m. to 5.15 p.m. London time. Trades executed outside of these hours are reported when the system next opens.

The SETS Order Book execution period operates from 8 a.m. to 4.30 p.m. London time.

The SETS opening auction call period runs from 7.50 a.m. to 8 a.m. and the closing auction call period from 4.30 p.m. to 4.35 p.m. (with a random close in each case to discourage market manipulation).

SEAQ International Mandatory Quote Periods run mostly from 9.30 a.m. to 3.30 p.m., although these vary slightly between markets.

#### **4.2.2 Tradepoint**

##### *Ownership and governance of system*

The Tradepoint Consortium (made up of 11 banks, securities houses and other intermediaries) owns 56% of Tradepoint Financial Networks plc (Tradepoint). The remaining 44% is owned by a range of private shareholders, including venture capitalists.

##### *Regulatory status*

Tradepoint is an RIE under the FSMA. It is also designated a "regulated market" under the ISD. Unlike the London Stock Exchange, Tradepoint has never been a competent listing authority for the United Kingdom.

##### *Participation*

Tradepoint can be accessed by regulated financial institutions from the EEA, Switzerland, Hong Kong and the United States. It currently has approximately 130 member firms.

*Transactions handled*

All fully listed UK securities and a range of European stocks are admitted to trading on Tradepoint.

*System operating procedures*

Tradepoint provides an electronic order-driven market, with transactions executed, anonymously, continuously throughout the day. Orders are matched automatically on the basis of price/time priority. Orders remain anonymous both pre and post-execution. Users typically access the market through a Tradepoint Workstation, or through third party or proprietary trading solutions.

*Clearing/settlement*

The LCH acts as CCP for all order book transactions through Tradepoint. Trades in UK and Irish equities settle through CREST five days after execution (decreasing to three days in February 2001). Trades in other securities are on a T+3 settlement cycle.

*Connections to other systems*

Subject to approval from Tradepoint shareholders, SWX Swiss Exchange and Tradepoint plan to create a new pan-European blue chip exchange, to be called virt-x (expected to commence trading around the end of the first quarter of 2001). SWX and the Tradepoint Consortium will each own 39% of virt-x, with the balance owned by Tradepoint's minority shareholders. Virt-x will be a UK-registered publicly quoted company run on a for-profit basis. Tradepoint Financial Networks plc will be renamed virt-x plc and will continue to be an RIE. It will offer trading in the constituents of major pan-European indices, including all trading in Swiss blue chips. Trading will be via an electronic central limit order book using the EBS electronic trading system developed by SWX. Trades will clear through the LCH, with the holding company of SegalInterSettle AG (a subsidiary of the Swiss Financial Services Group) acting as a general clearing member of the LCH for SIS users. Settlement will be effected through SIS,

CREST and Euroclear.

*Operating hours*

Tradepoint's trading hours are from 7 a.m. to 5.30 p.m. London time.

**4.2.3 COREDEAL***Ownership and governance of the system*

COREDEAL Ltd. is 58%-owned by ISMA, with the balance owned by 13 major financial institutions from across Europe (who are also members of ISMA). The Board of COREDEAL Ltd. currently comprises nine members, four of whom are drawn from those institutions.

*Regulatory status*

COREDEAL is an RIE under the FS Act 1986. The exchange has also been designated as a regulated market by the FSA for the purposes of the EU ISD.

*Participation in the system (number/classes of members, legal basis, access rules)*

Membership of COREDEAL is open to members of the ISMA's Council of Reporting Dealers, a name ascribed by ISMA to its member firms that make markets in international securities. There is, however, no obligation on member firms to make markets in particular securities on COREDEAL.

There are plans to extend access to COREDEAL beyond its current user community to encompass ISMA's wider membership. The expansion of the system will be supported by the introduction of CORETRADE, an additional module to the COREDEAL system intended to serve, in a fully electronic environment, as an alternative to the current phone-based communication between securities dealers and their customers.

*System operating procedures*

COREDEAL operates an anonymous electronic central limit order book with orders matched



on the basis of price, quantity and time priority. It is an open-architecture system capable of being accessed via a range of bespoke applications.

*Types of transaction handled and currency availability*

Securities admitted to trading on COREDEAL include investment-grade corporate debt and supranational and sovereign debt. The exchange also offers trading in a number of euro-denominated domestic government debt securities. Spread trading against benchmark securities (currently US Treasuries and in future sterling and euro benchmarks) is also available.

*Clearing/settlement procedures*

Trades are executed against a CCP, TradeGO, which assumes counterparty risk. It manages this risk primarily through the provision of margin by its counterparties. Positions are revalued on a daily basis. Clearing members must satisfy a minimum capital requirement of €250 million.

Eurobond transactions settle in Clearstream or Euroclear three days after execution and trades in US Treasuries settle in Fedwire the day after the trade is struck. Trades settle gross on a trade-by-trade basis.

*Connections to other systems*

There are no connections between COREDEAL and any other trading platforms.

*Operating hours*

COREDEAL operates from 7 a.m. to 6 p.m. London time.

**4.2.4 Jiway**

*Ownership and governance of system*

Jiway is 60%-owned by the OM Group and 40%-owned by Morgan Stanley Dean Witter.

*Regulatory status*

Jiway has applied to the FSA to become an RIE. If successful, the six European and two US markets it intends to cover will be introduced through a gradual roll-out commencing in November 2000. Brokers from the United Kingdom, Sweden and Germany will be able to access the market from the go-live date, while those in France, Holland, Italy and Switzerland will be able to join during the first half of 2001.

*Participation*

Jiway's user base ("trading partners") will comprise brokers and other financial intermediaries regulated in their local markets, supported by a range of market-makers.

*Transactions handled*

Orders of up to €50,000 on 6,000 US and European equities will be handled.

*System operating procedures*

Jiway will be a hybrid order/quote-driven market. Orders, routed through broker-members of the exchange, will be executed in Jiway's order book, either against other customer orders, or against firm quotes provided by a market-maker, provided the latter are at least as good as the best available price on the relevant local exchange. Jiway will use a version of the CLICK exchange trading system, developed by OM Technology, which has been modified to suit Jiway's business model.

*Clearing/settlement*

Trades are executed against Jiway which will itself operate as the CCP.

Jiway offers external settlement through designated settlement systems or internal settlement through accounts in its own books. For external settlement, delivery of securities and payment arrangements will be made by each participant in accordance with the requirements

of the relevant designated settlement system. Internal settlement takes place across cash and securities accounts in Jiway. If brokers agree, securities can be held in a central nominee account provided by a sister company, Jiway Broker Services AB in Sweden.

#### *Operating hours*

Jiway will mirror local exchanges' trading hours.

### **4.3 Clearing**

#### **4.3.1 London Clearing House**

The LCH acts as CCP to all trades executed on LIFFE, the LME, the IPE and Tradepoint. From February 2001, the LCH will act as CCP for trades executed on the London Stock Exchange's SETS system. The LCH has also been asked to provide a CCP service for the virt-x initiative between Tradepoint and SWX Swiss Exchange. Users of exchange markets served by the LCH must either be LCH members or have a direct or indirect clearing relationship with an LCH member. The LCH has recently added cash and repo trades in European (Belgian and German at present, with more planned) government bonds ("Repoclear") and plain vanilla swaps ("Swapclear").

#### *Major legislation and regulation governing the system*

The LCH is an RCH subject to the supervision of the FSA under the FSMA 2000.

#### *Ownership and governance*

The LCH is a public limited company and undertook a major restructuring of ownership and capital in October 1996. It is owned by its members (75% of the share capital) and LIFFE, the LME and the IPE (25% of the share capital in total) and is run on a not-for-profit basis.

#### *Financial resources*

The LCH assumes default risk when it accepts trades into clearing and it covers that risk by

requiring payment of margin. Initial margin, which is collected on all trades, is intended to protect the LCH against the maximum potential loss of a defaulter's positions before close-out. The LCH also collects variation margin to re-establish this protection at close of business and, if necessary in fast-moving markets, makes intraday calls for more margin. Variation margin must be provided in cash for most contracts, whilst initial margin may be provided in cash or acceptable non-cash collateral. The LCH receives and makes cash margin payments via the Protected Payment System, or PPS (see below). It restricts, mainly to government bonds, cash and bank guarantees, the types and amounts of collateral that it will accept as initial margin. Clearing members allocate business to house accounts (for the members' own trades, related companies and non-segregated customers, if any) and to customer accounts (for segregated customers, if they have any), and the two accounts are maintained and margined independently.

In the event that a default by a clearing member leads to the LCH incurring a loss greater than the defaulter's margin, the LCH has the following financial resources at its disposal:

- a cash-based default fund, to which all LCH members contribute (over GBP 192 million as at September 2000);
- up to GBP 10 million of the LCH's current year's profits;
- GBP 100 million of insurance cover, in the event of losses of GBP 150 million or more; and
- own funds of over GBP 50 million.

#### *Credit and liquidity risk control measures*

In addition to the above, the LCH sets minimum capital requirements for clearing members. These members also have to satisfy the LCH regarding their ability to meet day-to-day operational requirements, including the adequacy of their back

office and banking arrangements. Trading levels and patterns are monitored throughout the day.

#### *Participation in the LCH's Protected Payment System*

Margin payments are made via the LCH's PPS. Every clearing member maintains an account with at least one participating bank and the LCH maintains accounts with all participating banks. Margin calls are made on the morning of T+1. Once a bank has confirmed to the LCH that it will make the margin payment required on the member's behalf, it is irrevocably committed to do so. Payments are made by internal branch transfers between the accounts of the clearing members and the LCH at each participating bank, with final cash settlement taking place by 9 a.m. T+1. Intraday margin calls must be paid within an hour using the same process.

#### *Transaction processing environment*

The LCH is linked electronically to the exchanges for which it acts as a CCP. SWIFT messages are used to transmit details of margin requirements to members' PPS banks.

## **4.4 Securities settlement systems**

### **4.4.1 CREST**

#### *4.4.1.1 Institutional and legal aspects*

##### *Ownership and governance*

CREST was inaugurated on 15 July 1996. CREST is owned and operated by a private sector company, CRESTCo. CRESTCo is owned by 97 investing institutions, which represent the full range of CREST users. A rebalancing exercise is undertaken at regular intervals (the last being in the first half of 2000) to ensure that the ownership of CREST broadly reflects usage of the system.

The CREST Board comprises 17 Directors, of whom 15 are non-executive. Of the latter, 13

represent shareholder entities and two are outside appointments drawn from the financial services industry. Seven board committees exist dealing with Audit and Compliance, Finance, Gilts and Money Markets, Project Review, Settlement Discipline, Strategy, and Staff.

#### *Major legislation and regulation governing the system*

The dematerialisation of equities and other corporate securities was made possible by regulations made under Section 207 of the Companies Act 1989. Those regulations were amended in June 2000 to permit the integration of UK government stock (gilts) into CREST (replacing the dematerialisation of gilts within the CGO in 1986, which took place under the Stock Transfer Act 1982).

CREST is subject to regulation by the FSA, both as an RCH under the FS Act 1986 (soon to be replaced by the FSMA 2000) and as the operator of a relevant system under the USRs 1995.

#### *Types of transaction handled*

CREST settles the purchase, sale, loan and repo of UK and Irish equities and UK government and corporate debt. Moreover, through its links to other settlement systems in Europe and the United States, members are able to hold foreign securities. The regulations governing CREST permit only the holding of securities governed by English, Scottish and Northern Irish laws (securities governed by Irish, Jersey and Guernsey laws are held pursuant to the laws of those jurisdictions). Accordingly, a transferee of a foreign security receives a CREST Depository Interest (CDI), an English law instrument representing the holder's proprietary interest in the underlying foreign security, which is held on his behalf in the issuer SSS by a special-purpose CREST nominee. A deed poll executed by CREST Depository Limited (CDL) sets out the holder's right against the CDL to the underlying securities. The CDI holder has legal title to the CDI and beneficially owns the underlying foreign security.

CREST has the capacity to settle in multiple currencies and currently provides for settlement against sterling, euro and US dollars.

#### *Participation in the system*

Membership is open to bodies corporate and individuals regardless of domicile or location (except as mentioned below). Its membership comprises most firms active in the UK and Irish equity markets and the gilt market (or their custodians), and a large number of individuals.

In CREST terminology, there is a distinction between “participants” and “users”. Participants are those who hold securities in CREST (“members”) or who provide payment services (“settlement banks”) or registration services (“registrars”). Users are those who communicate with CRESTCo on behalf of participants. CRESTCo requires users to locate their gateway computers (the secure equipment used for sending and receiving electronic messages to CREST) in the United Kingdom, Ireland, the Isle of Man or, with the prior consent of CRESTCo, in another EU Member State.

Most corporate members maintain and operate their own securities accounts in CREST (“direct members”). “Personal members” (mainly individuals) maintain accounts in their own name, but use the facilities of a user (a “sponsor”) to communicate with CREST. Sponsors are required to be authorised under the FS Act 1986. Non-members of CREST which are active participants in the equity or gilt markets typically hold their accounts with custodians or brokers who are direct members of the system, although individuals often choose to hold their securities outside the system altogether, in paper form.

Applicants must enter a contractual agreement with CREST and arrange a daylight credit limit for payments settlement with an approved settlement bank. CRESTCo may require participants and users incorporated or resident outside the United Kingdom to provide a legal opinion confirming the participant’s or user’s ability to be bound by the terms of the

agreement executed by CRESTCo and the participant or user.

#### *4.4.1.2 Operational aspects*

##### *Operation of the transfer system*

CREST accepts transfer instructions only from those legally entitled to give them; this is either the actual or intended legal owner of the assets in question, or somebody who has exhibited what is in effect a power of attorney from that owner. The terms of the transfer must be confirmed by both the transferor and the transferee, who input independent instructions to CREST which are matched before proceeding to settlement. The settlement process is continuous between 5.30 a.m. and 4.30 p.m. London time, with settlement against payment ceasing at 4.05 p.m. The system remains open for input and matching of forward-dated transactions until 8 p.m. These timings are under constant review.

##### *Transaction processing environment*

All communication between CREST and members must currently occur via one of the two competing accredited network providers – SWIFT or BT Syntegra.

##### *Settlement procedures*

Securities in CREST are transferred continuously in real time. CREST creates equitable title at the point of settlement in exchange for an assured payment obligation which is assumed by one of a small number of banks which provide payment facilities for CREST members. The purchasing member’s obligation to the selling member is extinguished at the point of settlement in CREST. The assured payment structure is supported by a multilateral contractual framework. Equitable title is replaced by full legal title at the point at which the issuer’s registrar registers the movement of title, although stock is available for onward transfer before registration. Service standards stipulate that registration should occur within two hours of settlement in CREST, although this usually takes place within minutes.

Following the introduction of Electronic Transfer of Title in 2001, CREST records will be able to act as the register for dematerialised securities. This will mean that full legal title will transfer at the point of settlement in CREST.

The assured payment obligations generated in CREST are unconditional and irrevocable. Banks generally (but need not) provide finality to their customers in respect of such payments on an intraday basis. Banks which provide payment facilities in CREST settle their net obligations to each other across accounts at the Bank of England at the end of each day. Work is currently under way to introduce real-time settlement of payment obligations in central bank money in the fourth quarter of 2001.

#### *Credit and liquidity risk control measures*

CREST settlement banks are bound by contract to settle debts incurred in the CREST system by their customers. The settlement banks provide their customers with intraday credit in CREST, limiting their exposure by setting up debit caps within the system; CREST itself provides no credit facilities. The debit cap represents the maximum debit position which a settlement bank is willing to assume for a given customer and is a combination of unsecured credit and credit advanced in return for charge over securities held by their customer in CREST.

#### *Pricing policies*

CRESTCo sets prices to cover its costs, including the cost of capital. Shareholders receive a fixed dividend on their shares. Users of the system have received rebates from CRESTCo in recent years.

### **4.4.2 The Central Moneymarkets Office**

#### *4.4.2.1 Institutional and legal aspects*

Major legislation and regulation governing the system

Ownership of the CMO system was transferred from the Bank of England to CRESTCo in September 1999. CRESTCo is regulated by the FSA as an RCH.

#### *Participation in the system*

Membership is open to all London money market participants subject to arrangements being made with a settlement bank to make payments on their behalf. There are currently 31 members of the CMO, which are drawn from a wide range of UK and overseas institutions. Over 200 firms also participate indirectly in the CMO through agency arrangements with CMO members.

Before joining the CMO service, each prospective member must enter into contractual agreements similar to those described in the case of CREST. CMO members have a book-entry account in their own name and make arrangements for a settlement bank to make and receive payments on their behalf for instruments transferred from and to other direct members.

#### *Types of transaction handled*

The CMO provides safekeeping and settlement facilities for sterling and euro-denominated Treasury bills, local authority bills, bank bills, trade bills, bank and building society CDs and commercial paper. All of these instruments are immobilised in the CMO depository (which is operated on CRESTCo's behalf by the Bank of England), except for CDs, which are dematerialised using a contractual structure. Settlement occurs in real time by means of book-entry transfer between accounts in the CMO system.

#### *4.4.2.2 Operational aspects*

##### *Operation of the transfer system*

Processing is continuous between 8.30 a.m. and 4.45 p.m. London time, with settlement against payment finishing at 4.15 p.m. Delivery of instruments is effected in real time following positive acceptance by the taker of the

settlement instruction input by the giver (provided that the giver has the designated instruments on his CMO account).

#### *Transaction processing environment*

All communication between CMO members and the CMO system is by means of secure authenticated and encrypted electronic messages carried by Cable and Wireless.

#### *Settlement procedures*

Where a transaction is carried out against payment, the transfer of instruments between members simultaneously generates an instruction to the taker's settlement bank to pay the agreed consideration to the giver's settlement bank into the giver's account. All such instructions are transmitted to the settlement banks following the payment deadline. Payment instructions generated by the CMO are not assured and may, in exceptional circumstances, be rejected by the paying member's settlement bank, although this has not happened to date. Reversal of such payments is effected by an adjustment to the final end-of-day settlement calculation, provided notice is given to the Bank of England by 5 p.m. London time on the day the payment is due to be made, after which it is not possible to reverse a payment. Transfers of instruments cannot be reversed.

#### *Delivery versus payment arrangements*

The final transfer of instruments and the generation of any corresponding payment instructions occurs simultaneously in real time throughout the day. Transfer of funds only becomes final, however, once the net credits and debits of the settlement banks are applied to their RTGS accounts at the Bank of England. With the introduction of CMO instruments into CREST, planned for 2002, CMO instruments will become subject to CREST DVP arrangements.

#### *Credit and liquidity risk control measures*

Arrangements for the settlement of payment instructions received and given by a settlement

bank are for the member and its settlement bank to determine. In the event that a settlement bank fails or refuses to meet a payment instruction, the associated transfer of instruments will not be reversed by the CMO, which has no role in any subsequent negotiations between the parties to the transaction.

#### *Pricing policies*

CRESTCo sets prices to cover its costs, including the cost of capital. Shareholders receive a fixed dividend on their shares. Users of the system have received rebates from CRESTCo in recent years.

## **4.5 The use of the securities infrastructure by the Bank of England**

#### *Monetary policy operations and securities settlement systems*

CREST and the CMO are used by the Bank of England to settle its daily open market operations and to hold RTGS collateral provided by its market counterparties.

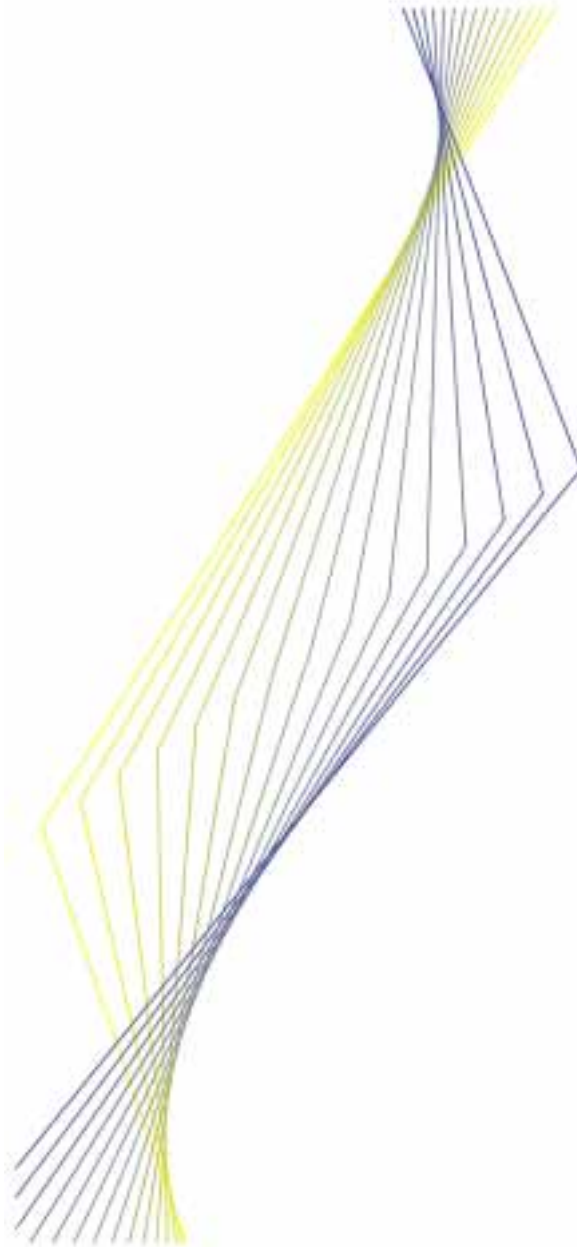
#### *Main projects and policies being implemented*

Settlement in central bank money for UK settlement participants will be introduced in the last quarter of 2001, when CREST will be linked to the RTGS processor at the Bank of England. A steering group is overseeing the progress of the project, acting upon a High-Level Design which was published in 1999. Once that project is complete, delivery in CREST will be coincident with payment between members' settlement banks across accounts at the Bank of England.

United Kingdom



EUROPEAN CENTRAL BANK



**Annex I**  
**Comparative tables**

**June 2001**





## Annex I Comparative tables\*

**Table I****Banknotes and coins in circulation outside credit institutions***(end of year)*

	Total (EUR millions)		Value per inhabitant (EUR)		As a percentage of GDP (%)		As a percentage of narrow money <sup>1)</sup> (%)	
	1998	1999	1998	1999	1998	1999	1998	1999
Belgium	10,802	12,001	1,059	1,174	4.80	5.14	23.6	20.4
Denmark	4,600	4,950	868	930	2.96	3.03	-	-
Germany	123,203	130,277	1,502	1,576	6.39	6.58	23.3	23.4
Greece	6,670	8,293	635	788	6.15	7.08	42.1	38.8
Spain	50,459	54,740	1,282	1,389	9.59	9.72	20.7	-
France	41,254	45,081	683	743	3.16	3.35	13.0	13.9
Ireland <sup>2)</sup>	3,297	3,970	890	1,060	4.29	4.53	27.6	22.9
Italy	59,270	65,807	1,029	1,142	5.55	5.99	16.0	15.2
Luxembourg <sup>3)</sup>	586	548	1,365	1,257	3.55	3.02	18.2	1.3
Netherlands	17,000	17,317	1,083	1,095	4.80	4.63	14.6	13.2
Austria	12,549	13,288	1,553	1,642	6.63	6.74	35.1	32.1
Portugal	4,536	5,620	455	563	4.55	5.29	12.0	12.4
Finland	2,474	2,780	480	538	2.13	2.29	6.5	6.8
Sweden	8,735	9,896	987	1,117	4.09	4.37	-	-
United Kingdom	34,474	38,816	582	653	2.74	2.87	4.5	4.6
EU <sup>4)</sup>	379,909	413,385	1,009	1,093	3.94	4.14	14.5	13.4
Euro area <sup>4)</sup>	-	351,430	-	1,195	-	4.33	-	17.5

1) M1, except for the United Kingdom: M2.

2) Prior to 1999 M1 was calculated for Irish residents only. From 1999 M1 is calculated on a euro area-wide basis.

3) Prior to 1999 M1 was calculated for Luxembourg residents only. From 1999 M1 is calculated on a euro area-wide basis.

4) Weighted average without countries where data are not available (except Total, which is in EUR millions).

\* Figures have been converted into euro for all countries using the exchange rate shown in Table I of the respective country chapters.

**Table 2****Points of entry into the payment system***(end of year)*

	Number of institutions offering payment services <sup>1)</sup>		Number of central bank branches <sup>1)</sup>		Number of bank branches <sup>1)</sup>		Number of post office branches <sup>1),2)</sup>		Others <sup>1)</sup>		Total number of branches offering payment services <sup>1)</sup>		Number of accounts on which payments can be made (per capita)	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
Belgium	12	12	1.3	1.1	703	682	137	136	-	-	841	819	1.39	1.34
Denmark	36	36	...	...	448	447	226	218	-	-	674	665	1.70	1.73
Germany	39	36	1.3	1.8	703	674	-	-	-	-	733	676	1.00	1.02
Greece	6	6	9.0	9.0	230	239	12	12	-	-	255	261	0.13	0.15
Spain	7	7	1.3	1.3	984	989	-	-	-	-	986	990	1.82	1.83
France	-	28	3.6	3.5	432	411	289	279	-	-	793	759	1.11	1.09
Ireland	16	18	...	...	392	294	516	511	27	24	935	829	2.49	2.91
Italy	16	15	1.7	1.7	456	471	242	243	-	-	698	715	-	.
Luxembourg	499	487	-	-	910	792	-	-	-	-	910	792	-	-
Netherlands	8	8	0.6	0.3	289	255	148	142	-	-	437	397	1.34	1.33
Austria	120	118	0.9	1.0	566	565	289	289	-	-	856	855	0.76	0.76
Portugal	23	23	1.1	1.1	470	502	107	107	-	-	578	610	2.00	2.00
Finland	67	67	0.8	0.8	309	299	92	91	-	-	401	391	1.82	2.13
Sweden	12	12	1.1	-	413	404	-	-	-	-	414	404	-	-
United Kingdom	9	9	-	-	225	219	319	316	42	40	586	575	2.50	2.59
EU <sup>3)</sup>	23	23	2.0	2.1	518	507	249	245	-	-	706	686	1.48	1.51
Euro area <sup>3)</sup>	-	27	-	1.9	-	580	-	235	-	-	-	733	-	1.30

1) *Per 1,000,000 inhabitants.*2) *If the post offices offer payment services. In Germany: Postbank AG as a fully-fledged credit institution appears with its branches under "Number of bank branches", including post office branches which are entrusted with the semi-cashless payment systems on behalf of Postbank AG.*3) *Weighted average without countries where data are not available.*

**Table 3****Cards with a cash function and ATMs**

	Number of ATMs per 1,000,000 inhabitants (end of year)		Number of transactions per capita		Average value per transaction (EUR)		Increase in the number of ATMs (%)		Increase in the number of transactions (%)		Increase in the value of transactions (%)	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
Belgium	564	606	15.6	17.4	106	105	15	8	-0.2	11	1	10
Denmark	481	496	-	-	-	-	7	4	-	-	-	-
Germany	556	563	17.1	18.4	152	146	10	1	-	8	-	3
Greece	206	290	7.5	9.1	168	206	-1	41	26	21	39	47
Spain	962	1,062	16.2	16.8	83	87	12	10	5	4	7	9
France	487	535	15.0	16.9	58	61	9	10	9	13	7	18
Ireland	332	381	28.2	33.6	70	81	17	16	20	20	35	38
Italy	487	524	8.5	8.7	160	161	10	8	18	2	17	3
Luxembourg	662	711	11.2	12.2	114	116	22	9	9	10	8	12
Netherlands	418	424	27.1	33.5	86	74	3	2	5	25	5	6
Austria	591	660	11.3	11.9	137	137	11	12	5	5	7	5
Portugal	710	886	26.1	28.9	67	70	13	25	20	11	16	16
Finland	428	422	44.8	46.1	68	69	-3	-1	4	3	5	5
Sweden	281	291	37.6	35.0	97	94	5	4	7	-7	15	-10
United Kingdom	415	476	31.2	33.1	78	83	6	15	6	6	9	10
EU <sup>1)</sup>	533	578	18.8	20.2	110	111	-	-	-	-	-	-
Euro area <sup>1)</sup>	-	620	-	17.6	-	113	-	-	-	-	-	-

1) Weighted average without countries where data are not available.

**Table 4****Cards with a debit function and accepting terminals**

	Number of accepting terminals per 1,000,000 inhabitants (end of year)		Number of transactions per capita		Average value per transaction (EUR)		Increase in the number of accepting terminals (%)		Increase in the number of transactions (%)		Increase in the value of transactions (%)	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
Belgium	9,121	9,746	29.2	34.7	52	51	9	7	23	19	21	16
Denmark	12,936	13,155	64.2	69.7	42	43	9	2	12	9	11	12
Germany	2,815	3,663	4.4	5.2	80	79	42	30	61	18	95	18
Greece	5,263	7,096	.	1.6	.	114	86	35	.	.	48	27
Spain	18,351	18,902	5.4	6.5	39	39	10	3	16	21	17	22
France <sup>1)</sup>	11,976	13,181	43.4	48.6	48	46	6	11	12	13	12	9
Ireland	3,990	4,951	1.6	6.4	2	50	187	25	-	300	-	8,545
Italy	6,001	7,551	3.0	4.3	82	77	23	26	40	45	31	36
Luxembourg	11,817	12,701	20.0	23.2	66	65	9	9	12	17	12	16
Netherlands	8,564	9,209	37.9	44.3	43	46	12	8	23	18	23	24
Austria	2,381	3,554	4.8	7.2	52	54	44	49	62	50	54	58
Portugal	7,077	8,111	29.8	37.1	28	28	18	15	26	25	36	23
Finland	11,062	11,617	45.6	51.1	42	43	6	5	7	12	9	14
Sweden	8,406	9,160	18.1	22.2	68	68	8	9	32	23	26	22
United Kingdom	10,299	11,778	29.8	35.3	47	48	15	15	16	19	20	20
EU <sup>2)</sup>	8,565	9,659	19.4	22.1	58	60	-	-	-	-	-	-
Euro area <sup>2)</sup>	-	9,274	-	19.3	-	60	-	-	-	-	-	-

1) Data for the volume and value of transactions refer to both debit and credit functions.

2) Weighted average without countries where data are not available.

**Table 5****Cards with a credit function and accepting terminals**

	Number of accepting terminals per 1,000,000 inhabitants (end of year)		Number of transactions per capita		Average value per transaction (EUR)		Increase in the number of accepting terminals (%)		Increase in the number of transactions (%)		Increase in the value of transactions (%)	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
Belgium	-	-	4.3	4.8	100	101	-	-	12	10	14	11
Denmark	11,993	12,216	1.9	2.1	107	115	12	2	15	13	14	22
Germany <sup>1), 2)</sup>	13,411	14,619	-	4.0	-	110	4	9	-	-	5	7
Greece	-	-	-	-	-	-	-	-	-	-	-	-
Spain	18,351	18,902	4.8	5.6	59	59	10	3	15	16	17	17
France	11,976	13,181	-	-	-	-	6	11	-	-	-	-
Ireland	-	4,519	-	12.6	-	87	-	-	-	-	-	-
Italy	.	.	3.0	3.8	91	93	.	.	33	25	21	29
Luxembourg	11,671	12,447	27.3	29.1	74	69	9	8	11	9	10	2
Netherlands	-	-	3.1	3.4	90	94	-	-	1	9	-2	14
Austria	.	.	3.0	3.3	109	111	.	.	19	9	11	11
Portugal	7,077	8,111	10.7	14.3	41	39	18	15	42	34	44	28
Finland	11,062	11,617	12.0	11.6	49	50	6	5	17	12	13	0
Sweden	8,406	9,160	6.0	6.4	110	108	8	9	10	8	13	4
United Kingdom	10,299	11,778	23.0	25.1	82	90	15	15	9	9	11	17
EU <sup>3)</sup>	12,656	13,646	9.5	8.9	81	92	-	-	-	-	-	-
Euro area <sup>3)</sup>	-	14,432	-	5.0	-	91	-	-	-	-	-	-

1) Cards with a delayed debit function.

2) Until 1998 payments by debit and credit cards together.

3) Weighted average without countries where data are not available.

**Table 6****Cards with an e-money function and accepting terminals**

	Electronic money cards (thousands)		Average value per reloading (EUR)		Number of purchase terminals		Average value per transaction (EUR)	
	1998	1999	1998	1999	1998	1999	1998	1999
Belgium	5,606	7,898	29	26	45,649	63,993	4.0	3.7
Denmark	651	995	20	20	4,383	7,876	0.9	1.1
Germany	60,700	60,700	54	40	60,000	59,732	6.6	3.6
Greece	-	-	-	-	-	-	-	-
Spain	5,691	8,089	16	17	99,335	131,702	2.8	2.8
France	-	-	-	-	-	-	-	-
Ireland	3	4	-	-	338	406	-	-
Italy	56	32	54	28	3,910	3,605	5.3	2.7
Luxembourg	-	270	-	42	-	1,223	-	5.8
Netherlands	17,900	20,000	-	-	141,916	145,000	-	-
Austria	3,456	4,805	49	52	19,118	29,564	7.9	5.3
Portugal <sup>1)</sup>	411	3,400	16	13	72,429	83,098	1.9	1.2
Finland	324	454	20	20	3,627	5,272	2.0	1.7
Sweden	205	540	35	32	33,938	43,921	6.3	6.4
United Kingdom	140	160	16	13	1,642	1,921	-	-
EU <sup>2)</sup>	18,323	18,926	37	27	42,825	48,635	5.1	3.2
Euro area <sup>2)</sup>	-	24,831	-	31	-	61,684	-	3.1

1) In 1998 the number of cards which were loaded at least once.

2) Weighted average without countries where data are not available.

**Table 7****Number of cards***(end of year)*

	Number of cards per 1,000 inhabitants									
	Cards with a cash function		Cards with a debit function		Cards with a credit function		Cards with a debit function issued by retailers		Cards with an e-money function	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
Belgium	1,177	1,308	1,063	1,182	268	282	153	156	549	773
Denmark	619	597	582	525	37	72	-	-	123	187
Germany	-	1,201	989	1,099	187	200	61	97	740	739
Greece	325	424	134	378	144	191	-	-	-	-
Spain	1,000	1,103	981	1,085	328	400	-	-	145	205
France	561	619	561	552	17	20	-	-	-	-
Ireland	845	751	188	154	305	304	-	-	1	1
Italy	325	369	305	351	176	214	.	.	1	1
Luxembourg	1,234	1,310	582	619	653	691	-	-	-	619
Netherlands	1,528	1,531	1,267	1,272	261	259	-	-	1,140	1,265
Austria	740	849	567	731	199	207	-	-	428	594
Portugal <sup>1)</sup>	934	1,084	934	1,084	231	258	-	-	41	340
Finland	1,049	1,066	607	647	471	575	-	-	63	88
Sweden	785	831	591	606	185	194	-	-	23	61
United Kingdom	1,792	1,882	718	775	702	755	-	-	2	3
EU <sup>2)</sup>	924	1,039	723	790	263	292	71	104	312	351
Euro area <sup>2)</sup>	-	904	-	818	-	209	-	-	-	454

1) In 1998 the number of cards which were loaded at least once.

2) Weighted average without countries where data are not available.



**Table 8****Use of cards***(end of year)*

	Average number of							
	Cash withdrawals per card with a cash function		Payments per card with a debit function		Payments per card with a credit function		Payments per card with an e-money function	
	1998	1999	1998	1999	1998	1999	1998	1999
Belgium	13	13	28	29	16	17	5.0	5.8
Denmark	-	-	110	133	51	30	11.2	7.9
Germany	-	15	-	4	-	20	0.2	0.3
Greece	23	21	.	4	-	-	-	-
Spain	16	15	5	6	15	14	0.4	0.3
France	27	27	77	88	-	-	-	-
Ireland	33	45	9	42	.	41	.	.
Italy	26	23	10	12	17	18	5.5	11.8
Luxembourg	9	9	34	37	42	42	-	1.0
Netherlands	18	22	30	35	12	13	-	-
Austria	15	14	8	10	15	16	0.3	0.5
Portugal <sup>1)</sup>	28	27	32	34	46	56	12.5	1.5
Finland	43	43	75	79	26	20	0.5	1.1
Sweden	48	42	31	37	32	33	11.3	7.9
United Kingdom	17	18	42	46	33	33	-	-
EU <sup>2)</sup>	17	17	36	33	23	23	3.1	4.0
Euro area <sup>2)</sup>	-	21	-	29	-	20	-	3.7

1) In 1998 the number of cards which were loaded at least once.

2) Weighted average without countries where data are not available.

**Table 9****Major interbank funds transfer systems in the European Union***(end of year)***(1) Large-value systems**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Name of the system	Number of transactions (thousands)		Value of transactions (EUR billions)		Average value of transactions (EUR millions)	
									1998	1999	1998	1999	1998	1999
EU	CB	RTT	RTGS	RM	D	F	18.00	TARGET <sup>a)</sup>	-	42,258	-	239,472	-	5.67
DK	CB	RTT	RTGS	RM	C	F	18.00	DN Inquiry and Transfer system	384	368	2,887	2,816	7.52	7.65
SE	CB	RTT	RTGS	RM	C	F	17.00	K-RIX	313	343	10,285	11,459	32.86	33.41
UK	CB+B	RTT	RTGS	RM	D	F	18.00	CHAPS Sterling	18,012	19,786	61,356	67,836	3.41	3.77
EU	B	RTT	SOS	RM	C	F	16.00	Euro 1 (EBA)	-	17,646	-	44,215	-	2.51
DE	CB	RTT	N/GS	RM	C	F	16.00	EAF <sup>b)</sup>	22,521	12,097	96,253	39,041	4.27	3.23
FR	B	RTT	N/BN/RTGS	RM	C	F	16.00	PNS <sup>c)</sup>	5,529	5,197	36,160	24,041	6.54	4.63
ES	B	RTT	N	O	C	F	16.00	SPI <sup>d)</sup>	2,200	1,102	9,926	941	4.51	0.85
FI	B	RTT	N/GS	RM	D	F	16.30	POPS	907	1,174	247	319	0.27	0.27

*(1) Country**(2) Owner/manager: B = banks; CB = central banks.**(3) Processing method: M = manual; ACH = Automated Clearing House (offline); RTT = Real-Time Transmission.**(4) N = multilateral netting; BN = bilateral netting; RTGS = real-time gross settlement; GS = other gross settlement; SOS = single obligation structure.**(5) O = open membership (any bank can apply) or RM = restricted membership (subject to criteria).**(6) Geographical access to the system: C = centralised (one processing centre only) or D = decentralised.**(7) Fees charged to participants: F = full costs (including investments); V = variable costs; S = symbolic (below variable cost); N = no costs.**(8) Closing time for same-day transactions (C.E.T.).**a) The RTGS systems of the countries which have adopted the euro and the ECB payment mechanism are integral parts of the TARGET system. The euro RTGS systems of Denmark, Greece, Sweden and the United Kingdom were allowed to connect to TARGET on the basis of a decision taken by the Governing Council of the ECB in July 1998.**b) Elektronische Abrechnung Frankfurt, formerly known as EAF 2.**c) Since 1997.**d) Large-value net settlement service performed at the Madrid Clearing House (Servicio Español de Pagos Interbancarios).*

**Table 9 (continued)****(2) Individual TARGET components**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Name of the system	Number of transactions (thousands) <sup>a)</sup>		Value of transactions (EUR billions) <sup>a)</sup>		Average value of transactions (EUR millions) <sup>a)</sup>	
									1998	1999	1998	1999	1998	1999
BE	(a)	RTT	RTGS	RM	C	F	18.00	ELLIPS	-	1,523	-	11,992	-	7.88
DE	CB	RTT	RTGS	RM	C	F	18.00	ELS <sup>b)</sup>	-	18,706	-	46,946	-	2.51
ES	CB	RTT	RTGS	RM	C	F	18.00	SLBE <sup>c)</sup>	-	2,277	-	30,713	-	13.49
FR	CB	RTT	RTGS	RM	C	F	18.00	TBF <sup>d)</sup>	-	2,284	-	66,183	-	28.98
IE	CB	RTT	RTGS	RM	C	F	18.00	IRIS RTGS System	-	423	-	3,595	-	8.49
IT	CB	RTT	RTGS	RM	C	F	18.00	BI-REL	-	10,202	-	24,634	-	2.41
LU	CB	RTT	RTGS	RM	C	F	18.00	LIPS-Gross	-	214	-	2,827	-	13.21
NL	CB	RTT	RTGS	RM	C	F	18.00	TOP	-	3,193	-	18,150	-	5.68
AT	CB	RTT	RTGS	RM	C	F	18.00	ARTIS	-	957	-	4,026	-	4.21
PT	CB	RTT	RTGS	RM	C	F	18.00	SPGT	-	509	-	2,325	-	4.57
FI	CB	RTT	RTGS	RM	C	F	18.00	BOF-RTGS	-	311	-	2,799	-	9.00
EU	CB	RTT	RTGS	RM	C	F	18.00	EPM	-	14	-	2,336	-	171.14
DK	CB	RTT	RTGS	RM	C	F	18.00	DEBES	-	61	-	1,223	-	20.03
GR	CB	RTT	RTGS	RM	C	F	18.00	HERMES euro	-	31	-	331	-	10.65
SE	CB	RTT	RTGS	RM	C	F	18.00	E-RIX	-	47	-	1,446	-	30.66
UK	CB+B	RTT	RTGS	RM	C	F	18.00	CHAPS euro	-	1,506	-	19,948	-	13.25

(1) Country.

(2) Owner/manager: B = banks; CB = central banks.

(3) Processing method: M = manual; ACH = Automated Clearing House (offline); RTT = Real-Time Transmission.

(4) N = multilateral netting; BN = bilateral netting; RTGS = real-time gross settlement; GS = other gross settlement; SOS = single obligation structure.

(5) O = open membership (any bank can apply) or RM = restricted membership (subject to criteria).

(6) Geographical access to the system: C = centralised (one processing centre only) or D = decentralised.

(7) Fees charged to participants: F = full costs (including investments); V = variable costs; S = symbolic (below variable cost); N = no costs.

(8) Closing time for same-day transactions (C.E.T.).

a) Domestic and cross-border transactions sent.

b) Elektronischer Schalter (ELS) formerly known as the EIL-ZV.

c) Servicio de liquidación del Banco de España, formerly known as the STMD.

d) Since 1997.

Table 9 (continued)

## (3) Retail systems

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Name of the system	Number of transactions (millions)		Value of transactions (EUR billions)		Average value of transactions (EUR)	
									1998	1999	1998	1999	1998	1999
BE	a)	b)	N	O	C	F	15.00	CEC	929	937	483	476	519	508
BE	CB	M	N	O	D	S	15.00	Clearing House of Belgium	5.75	4.95	119	112	20,715	22,686
DK	CB	ACH	N	O	C/D	S	9.00	DN Retail clearing	714	754	491	514	688	682
DE	CB	c)	GS	O	D	V	NO	Machine-optical voucher reading procedure (MAOBE)	28	11	111	75	4,021	6,762
DE	CB	ACH	GS	O	D	V	NO	Elektronischer Massenzahlungsverkehr (EMZ) <sup>e)</sup>	2,239	2,176	2,187	2,236	977	1,028
DE	CB	M	N	O	D	V	13.00	Daily local clearing <sup>h)</sup>	100	-	44	-	444	-
GR	B	ACH	N	O	C	V	19.00	DIAS	12	23	34	46	2,890	1,979
GR	B	M	N	O	D	V	16.00	Athens Clearing Office	6	5	643	783	105,868	142,621
ES	CB	RTT	BN	RM	C	V	NO	SNCE	790	862	1,006	1,108	1,274	1,286
FR	B/CB	M	N	O	D	N	11.00	Clearing Houses	3,600	3,382	2,128	1,948	591	576
FR	CB	ACH	N	O	D	V	12.00	CREIC	297	305	25	28	84	92
FR	B	RTT	BN	O	D	F	13.30	Interbank Teleclearing System (SIT)	5,411	5,913	2,234	2,348	413	397
IE	B	d)	N	RM	C	F	NO	Dublin Bankers' Clearing <sup>i)</sup>	202	316	342	817	1,692	2,583
IE	B	RTT	GS	RM	C	S	15.00	Special Presentations	0.001	0.001	0.8	4.7	761,843	4,698,031
IT	CB	RTT <sup>e)</sup>	N	O	D	V	12.00	Local Clearing	183	104	987	710	5,404	6,830
IT	CB	ACH	N	O	C	F	NO <sup>j)</sup>	Retail	826	960	1,124	1,364	1,362	1,421
IT	CB	RTT	N	O	C	F	15.30	Ingrosso (SIPS) <sup>k)</sup>	303	-	1,293	-	4,266	-
IT	CB	RTT	N	O	C	V	13.30	Electronic Memoranda <sup>k)</sup>	317	-	4,617	-	14,563	-
LU	B	M	N	O	C	F	14.00	LIPS-Net	11	12	25	36	2,372	3,071
NL	B	ACH	N	O	C	F	11.30	Interpay	2,012	2,153	1,240	1,347	616	626
PT	B	RTT	N	RM	C	V	NO	SICOI	768	872	376	323	490	370
PT	CB	M	GS	O	C	F	18.00	SLOD	0.03	0.02	42	38	1,398,297	1,913,638
FI	B	f)	BN	RM	D	F	14.30	PMJ	282	307	232	117	823	382
SE	B	ACH	N	O	C	F	NO	Bank Giro System	-	-	-	-	-	-
UK	B	ACH	N	RM	C	F	NO	BACS	2,905	3,096	2,368	2,674	815	864
UK	B	M	N	RM	D	F	NO	Cheque and Credit Clearings	2,241	2,158	2,173	2,235	970	1,036

(1) Country.

(2) Owner/manager: B = banks; CB = central banks.

(3) Processing method: M = manual; ACH = Automated Clearing House (offline); RTT = Real-Time Transmission.

(4) N = multilateral netting; BN = bilateral netting; RTGS = real-time gross settlement; GS = other gross settlement.

(5) O = open membership (any bank can apply) or RM = restricted membership (subject to criteria).

(6) Geographical access to the system: C = centralised (one processing centre only) or D = decentralised.

(7) Fees charged to participants: F = full costs (including investments); V = variable costs; S = symbolic (below variable cost); N = no costs.

(8) Closing time for same-day transactions.

a) Owner: B; Manager: CB.

b) ACH and RTT.

c) ACH for paper-based instruments.

d) M and ACH.

e) Transactions can also be submitted on floppy disc.

f) Batch processing and transmission.

g) Formerly paperless exchange data media (DTA).

h) Since the introduction of the full EZU requirement in June 1997, only collection items are processed.

i) The Dublin Bankers' Clearing was replaced by three functional clearing companies in December 1999. These three companies provide clearing facilities for PAPER DEBITS, PAPER CREDITS and ELECTRONIC DEBITS and CREDITS. The data in this table for 1999 under the heading of Dublin Bankers' Clearing represent the total activity of the three clearing companies.

j) Except for credit transfers entered before 10 a.m. which are settled on the same day.

k) Replaced by the RTGS system BI-REL as from 1998.

**Table 10****Use of cashless payment instruments***(total number of transactions, in millions)*

	Cheques		Payments by credit/debit cards <sup>3)</sup>		Credit transfers		Direct debits		Card-based e-money		Total	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
Belgium	87	80	342	403	675	723	117	142	28	45	1,250	1,394
Denmark	71	61	350	382	193	202	113	122	7	8	734	775
Germany	656	591	691	759	6,880	7,387	5,391	5,880	14	21	13,631	14,636
Greece	2	2	-	-	-	10	-	3	-	-	-	-
Spain	221	209	402	476	251	284	837	991	2	2	1,713	1,962
France	4,826	-	2,621	2,950	1,952	-	1,578	-	-	-	10,976	-
Ireland <sup>1)</sup>	124	157	.	71	37	70	41	50	.	.	202	348
Italy	649	665	347	467	971	1,003	226	277	0.3	0.4	2,194	2,413
Luxembourg	0	0	20	23	-	-	2	2	-	0.3	22	25
Netherlands	47	27	644	753	1,072	1,092	692	761	-	-	2,454	2,633
Austria	22	16	63	85	480	466	217	237	1	2	783	806
Portugal <sup>2)</sup>	286	283	316	392	45	53	66	99	5	5	718	832
Finland	2	1	297	324	496	519	31	39	...	1	826	883
Sweden	4	4	213	254	633	712	74	85	3	5	927	1,060
United Kingdom	2,986	2,855	2,960	3,406	1,659	1,730	1,736	1,863	-	-	9,341	9,854
EU total <sup>4)</sup>	9,982	4,951	9,266	10,745	15,343	14,251	11,121	10,549	61	90	45,771	37,620
Euro area <sup>4)</sup>	-	2,030	-	6,702	-	11,597	-	8,477	-	77	-	25,932

1) For credit transfers and direct debits, items processed intra-branch are excluded.

2) For this table, data related to bills of exchange have not been included.

3) Includes charge cards for the United Kingdom.

4) Sum without countries where data are not available.

**Table I I****Use of cashless payment instruments***(number of transactions per inhabitant)*

	Cheques		Payments by credit/debit cards		Credit transfers		Direct debits		Card-based e-money		Total	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
Belgium	9	8	34	39	66	71	12	14	2.76	4.45	122	136
Denmark	13	11	66	72	36	38	21	23	1.37	1.48	138	146
Germany	8	7	8	9	84	90	66	72	0.17	0.25	166	178
Greece	0	0	-	-	-	1	-	0	-	-	-	-
Spain	6	5	10	12	6	7	21	25	0.06	0.05	44	50
France	80	-	43	49	32	-	26	-	-	-	181	-
Ireland <sup>1)</sup>	33	42	.	19	10	19	11	13	.	.	55	93
Italy	11	12	6	8	17	17	4	5	0.01	0.01	38	42
Luxembourg	0	0	47	52	-	-	4	5	-	0.60	51	58
Netherlands	3	2	41	48	68	69	44	48	-	-	156	167
Austria	3	2	8	10	59	58	27	29	0.14	0.27	97	100
Portugal <sup>2)</sup>	29	28	32	39	5	5	7	10	0.51	0.50	72	84
Finland	0	0	58	63	96	100	6	7	...	0.10	160	171
Sweden	0	0	24	29	72	80	8	10	0.32	0.59	105	120
United Kingdom	50	48	50	57	28	29	29	31	-	-	158	166
EU total <sup>3)</sup>	27	16	26	29	42	45	30	33	0.27	0.39	125	123
Euro area <sup>3)</sup>	-	9	-	23	-	50	-	36	-	0.36	-	112

1) For credit transfers and direct debits, items processed intra-branch are excluded.

2) For this table, data related to bills of exchange have not been included.

3) Average without countries where data are not available.

**Table 12****Use of cashless payment instruments***(as a percentage of total number of transactions)*

	Cheques (%)		Payments by credit/debit cards (%)		Credit transfers (%)		Direct debits (%)		Card-based e-money (%)	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
Belgium	7.0	5.8	27.4	28.9	54.0	51.9	9.4	10.2	2.25	3.26
Denmark	9.7	7.9	47.7	49.4	26.2	26.0	15.4	15.7	0.99	1.01
Germany	4.8	4.0	5.1	5.2	50.5	50.5	39.5	40.2	0.10	0.14
Greece	-	-	-	-	-	-	-	-	-	-
Spain	12.9	10.7	23.5	24.3	14.7	14.5	48.9	50.5	0.13	0.10
France	44.0	-	23.9	-	17.8	-	14.4	-	-	-
Ireland <sup>1)</sup>	61.4	45.1	.	20.4	18.3	20.1	20.3	14.4	.	.
Italy	29.6	27.6	15.8	19.4	44.3	41.6	10.3	11.5	0.01	0.02
Luxembourg	0.5	0.4	92.1	90.8	-	-	7.4	8.4	-	1.04
Netherlands	1.9	1.0	26.2	28.6	43.7	41.5	28.2	28.9	-	-
Austria	2.8	2.0	8.1	10.5	61.3	57.8	27.7	29.4	0.15	0.28
Portugal <sup>2)</sup>	39.6	33.9	43.7	46.9	6.2	6.3	9.2	11.8	0.71	0.60
Finland	0.2	0.2	36.0	36.7	60.0	58.8	3.8	4.4	-	0.06
Sweden	0.4	0.3	23.0	24.0	68.3	67.2	8.0	8.0	0.30	0.49
United Kingdom	32.0	29.0	31.7	34.6	17.8	17.6	18.6	18.9	-	-
EU total <sup>3)</sup>	21.8	13.2	20.2	20.7	33.5	37.9	24.3	28.0	0.13	0.24
Euro area <sup>3)</sup>	-	7.8	-	14.5	-	44.7	-	32.7	-	0.30

1) For credit transfers and direct debits, items processed intra-branch are excluded.

2) For this table, data related to bills of exchange have not been included.

3) Average without countries where data are not available.

Table 13

## Features of selected securities settlement systems in the European Union

Country	BE	DK	DE	GR	ES	FR	IE	IT	NL	AT	PT	FI	SE	UK
Name of the system	NBB BXS-CIK Clearing	VP	Clearstream Banking Frankfurt	BOGS ASE <sup>3</sup> CSD	CADE <sup>7)</sup> SCLV SCLV AIAF	RGV RELIT	CBISSO	LDT	Necige <sup>8)</sup>	DS System	SITEME INTER-BOLSA	APK Money Market APK Shares (derivatives)	VPCAB	CMO CREST
Type of securities <sup>1)</sup>	G, O, CDs S, B	G, B, S, O, G, S, B	G	B, S, O	G, C S, B B	B, C, G, O B, C, G, O, S, G		G, S, B, O	G, S, B	G, C, B, S, C, G, O	B, S, O	G, C, O, B, S	G, S, B, C	G, C, O, BS
Owner/manager <sup>2)</sup>	CB B	VP	SE	CB SE, O	CB SE SE	Euroclear France Euroclear France	CB	CB	SE	B	CB	CB, B, O CB, B, O B, O	B, O	CB CB B, S, E, O
Number of participants	166	approx. 264	322	93	253	167	35	284	55	126	56	15	51	378
Number of participants of which direct participants	166	approx. 264	322	93	253	-	35	284	55	126	56	15	-	-
Settlement of cash leg <sup>3)</sup>	GS	N	N, RTGS	GS N	RTGS N N	RTGS N	N	N	RTGS	N	RTGS N	RTGS, N N N	N, RTGS N	N N N
Securities settlement (delivery)	GS N	N	RTGS, GS	GS GS	RTGS GS GS	RTGS GS	GS	N	RTGS	GS	RTGS/ INTER-BOLSA	RTGS, N GS N, GS	GS, RTGS	RTGS RTGS RTGS
Delivery lag	T+2, T+3 <sup>9)</sup>	T+3	T+0-40	T+3	T T+3 T+1	From T to T+100 T+30	T+3	T+3 G, B <sup>10)</sup> /T+5 S, O	T+3	From T to T+60	T+3 T+3	T+2, T+3	T+2, T+3, RTGS T	T+5
DVP mechanism <sup>4)</sup>	DVP 1 DVP 1	DVP3	DVP 1 + 2	DVP1 -	DVP 1 DVP 2 DVP 2	DVP 1 DVP 2	DVP 2 <sup>5)</sup>	DVP 3	DVP 1	DVP 2	DVP 1 DVP 3	DVP 1+ DVP 2 + 3	DVP 2 <sup>3)</sup> /DVP 1	DVP 2 DVP 2
Intraday finality <sup>5)</sup>	Y	Y	Y	Y	Y N N N	Y N	Y	N	Y	Y	Y N	Y Y N	Y	Y Y Y
Central securities depository	NBB CIK	VP	Clearstream Banking Frankfurt	BOGS ACSD	CADE SCLV SCLV	Euroclear France Euroclear France	CBISSO	Bi-CAT G Monie/Tirol S, B, O	Necige <sup>8)</sup>	OeKB	CB/ INTER-BOLSA	APK Money Market	VPC	CMO n.a.
Cash settlement agent <sup>6)</sup>	CB CB	CB, B	CB	CB B	CB <sup>11)</sup> CB <sup>11)</sup> CB <sup>11)</sup>	CB CB	CB	CB	CB, B	B, CB	CB CB	CB CB B	CB	CB CB B



Table I 3 (continued)

Number of transactions (thousands)	121	243	3,500	73,158	117	22,908	2,360	16,110	20,680	2,249	25,503	31,343	38,553	2,357	275,012	1	5,174	65	2,263	3,364	8,914	2,062	334	43,237
Value of transactions (EUR billions)	2,261	75	2,953	14,400	518	165	45,558	541	34	33,034	5,858	332	31,086	620	335	13	198	486	102	2,008	10,034	50,297	3,546	14,375
Ratio of value of transactions to GDP (at annual rate)	9.68	0.32	18.10	3.72	4.43	1.41	80.91	0.96	0.03	24.52	4.35	3.79	28.28	1.65	1.70	0.13	1.86	4.01	0.84	16.54	44.30	37.20	2.62	10.63

Footnotes to Table I 3:

- 1) B = bonds; C = CDs; G = government securities; S = shares; O = others.
- 2) B = banks; CB = central banks; SE = stock exchange; O = others.
- 3) GS = gross settlement; N = net; RTGS = real-time gross settlement.
- 4) DVP schemes as defined by the G10 group:
  - DVP 1: In model 1, transfer instructions for both securities and funds are settled on a trade-by-trade basis, with final transfer of the securities from the seller to the buyer (delivery) occurring at the same time as final transfer of the funds from the buyer to the seller (payment).
  - DVP 2: In model 2, securities transfer instructions are settled on a gross basis with final transfer of securities from the seller to the buyer (delivery) occurring throughout the processing cycle, but funds transfer instructions are settled on a net basis, with final transfers of funds from the buyer to the seller (payment) occurring at the end of the processing cycle.
  - DVP 3: In model 3, transfer instructions for both securities and funds are settled on a net basis, with final transfers of both securities and funds occurring at the end of the processing cycle.
- 5) Y = yes; N = no.
- 6) B = banks; CB = central banks; SE = stock exchange; O = others.
- 7) Central de Anotaciones de Deuda Española, formerly known as the SACDE.
- 8) T+2 for Treasury bills, T+3 for bonds.
- 9) The seller keeps the initiative of delivering securities.
- 10) T+2 for government bills.
- 11) Servicio de Liquidación del Banco de España, formerly known as the STMD.

**Table 14****Geographical breakdown of SWIFT message flows***(in 1999)*

	Messages sent			Messages received		
	Total	To domestic users (% of total)	To other EU countries (% of total)	Total	From domestic users (% of total)	From other EU countries (% of total)
Belgium	45,648,537	20.32	52.10	37,396,390	24.80	49.15
Denmark	11,402,262	17.44	50.28	10,870,193	18.30	50.06
Germany	73,862,434	9.46	49.62	74,156,362	9.42	51.54
Greece	7,712,974	26.53	47.20	6,298,068	32.49	43.70
Spain	20,917,032	12.05	54.95	17,439,725	14.45	53.38
France	58,996,665	28.48	42.53	58,649,419	28.65	40.39
Ireland	5,654,511	22.30	49.16	7,120,387	17.71	51.06
Italy	33,624,951	7.51	58.32	33,854,013	7.45	58.58
Luxembourg	24,698,190	23.30	46.23	25,871,872	22.24	47.36
Netherlands	36,397,480	19.40	50.68	32,974,754	21.42	49.55
Austria	16,123,133	24.35	47.02	14,686,906	26.73	42.44
Portugal	5,511,820	5.58	69.00	4,620,064	6.66	67.92
Finland	7,616,708	8.13	62.45	4,996,927	12.39	55.74
Sweden	17,692,144	17.23	52.58	13,946,816	21.86	47.29
United Kingdom	139,153,660	28.08	30.28	157,514,525	24.81	36.58
Total: EU	505,012,501	20.44	44.80	500,396,421	20.62	45.21
Total: non-EU	553,823,924	20.69	10.18	558,440,004	20.52	10.09
Total: all countries	1,058,836,425	20.57	26.69	1,058,836,425	20.57	26.69

Table I 5

## SWIFT traffic: intra-EU message flows

(in 1999, number of messages)

From/To	BE	DK	DE	GR	ES	FR	IE	IT	LU	NL	AT	PT	FI	SE	UK	Total EU	Non-EU	All countries
Belgium	9,276,141	280,943	2,992,681	191,551	751,750	2,830,566	462,562	1,360,810	2,158,031	3,409,286	310,184	262,321	193,233	333,401	8,247,188	33,060,648	12,587,889	45,648,537
Denmark	361,457	1,988,932	1,344,422	42,657	140,923	318,340	46,720	295,344	237,052	381,873	99,033	52,263	215,737	836,030	1,361,444	7,722,227	3,680,035	11,402,262
Germany	2,746,245	1,135,223	6,989,098	685,071	1,728,653	4,129,797	445,004	4,197,979	2,382,379	3,262,501	2,901,609	522,940	415,218	900,391	11,200,442	43,642,550	30,219,884	73,862,434
Greece	234,100	44,062	589,108	2,046,017	93,603	295,212	15,974	503,811	182,528	120,233	54,023	19,859	10,441	42,333	1,435,234	5,686,538	2,026,436	7,712,974
Spain	701,314	144,917	1,854,651	83,813	2,520,088	1,628,155	106,000	1,273,872	405,779	511,621	130,860	576,048	44,431	141,484	3,890,978	14,014,011	6,903,021	20,917,032
France	2,410,495	315,689	4,560,591	202,044	1,530,402	16,805,026	196,721	3,265,301	1,433,101	1,488,080	350,349	456,466	141,829	338,612	8,400,297	41,895,003	17,101,662	58,996,665
Ireland	204,318	38,904	389,481	15,593	86,684	186,505	1,260,904	137,839	102,348	216,987	34,223	22,726	15,817	40,587	1,287,542	4,040,458	1,614,053	5,654,511
Italy	1,191,375	252,031	3,721,079	285,734	896,817	3,655,998	143,407	2,523,665	1,249,782	721,855	701,057	173,620	64,215	206,492	6,347,487	22,134,614	11,490,337	33,624,951
Luxembourg	1,914,014	195,259	2,186,665	153,698	221,405	1,575,657	63,496	1,218,647	5,753,549	1,097,454	168,710	144,424	73,861	240,816	2,162,704	17,170,359	7,527,831	24,698,190
Netherlands	3,197,048	290,732	4,038,345	96,717	462,635	1,455,236	224,579	776,069	909,288	7,061,960	298,784	144,471	121,670	292,588	6,138,820	25,508,942	10,888,538	36,397,480
Austria	270,454	107,148	3,799,896	68,679	139,382	383,314	42,546	921,599	145,060	349,860	3,925,717	41,781	46,562	117,822	1,146,820	11,506,640	4,616,493	16,123,133
Portugal	245,485	47,586	559,429	20,932	771,112	543,469	23,263	355,710	97,165	172,734	42,624	307,703	13,774	43,189	866,478	4,110,653	1,401,167	5,511,820
Finland	368,533	324,152	753,637	15,350	88,654	174,562	21,373	159,208	173,724	217,126	61,111	23,376	619,052	788,781	1,587,329	5,375,968	2,240,740	7,616,708
Sweden	681,485	953,897	1,330,470	75,998	199,954	424,370	70,992	350,792	459,944	405,276	138,353	66,938	594,804	3,048,118	3,548,926	12,350,317	5,341,827	17,692,144
United Kingdom	3,855,488	1,310,944	10,101,267	814,129	2,197,785	6,086,044	1,773,298	5,014,974	2,318,012	3,983,299	941,762	630,564	833,782	2,273,607	39,077,059	81,212,014	57,941,646	139,153,660
Total: EU	27,657,952	7,430,419	45,210,820	4,797,983	11,829,847	40,492,251	4,896,839	22,355,620	18,007,742	23,400,145	10,158,399	3,445,500	3,404,426	9,644,251	96,698,748	329,430,942	175,581,559	505,012,501
Total: non-EU	9,738,438	3,439,774	28,945,542	1,500,085	5,609,878	18,157,168	2,223,548	11,498,393	7,864,130	9,574,609	4,528,507	1,174,564	1,592,501	4,302,565	60,815,777	170,965,479	382,858,445	553,823,924
Total: all countries	37,396,390	10,870,193	74,156,362	6,298,068	17,439,725	58,649,419	7,120,387	33,854,013	25,871,872	32,974,754	14,686,906	4,620,064	4,996,927	13,946,816	157,514,525	500,396,421	558,440,004	1,058,836,425

**Table I 6****SWIFT members, sub-members and participants**

	Number of users of the SWIFT network			
	Members	Sub-members	Participants	Total number of users
Belgium	24	37	17	78
Denmark	21	9	18	48
Germany	119	102	43	264
Greece	18	20	5	43
Spain	41	60	13	114
France	65	98	86	249
Ireland	9	31	24	64
Italy	147	52	41	240
Luxembourg	21	133	16	170
Netherlands	23	39	17	79
Austria	47	16	22	85
Portugal	26	17	8	51
Finland	7	6	4	17
Sweden	7	11	13	31
United Kingdom	53	243	134	430
Total: EU	628	874	461	1,963
Total: non-EU	1,586	1,889	1,359	4,834
Total: all countries	2,214	2,763	1,820	6,797

**Table 17****Relative share of EU countries in SWIFT traffic, membership and shareholding**

	Share of messages		Share of total		Share of equity holding	
	sent (%)	received (%)	members (%)	users (%)	quantity	percentage (%)
Belgium	4.33	3.53	1.04	1.15	2,199	2.53
Denmark	1.08	0.85	1.00	0.71	1,081	1.25
Germany	7.00	6.96	5.35	3.88	6,735	7.76
Greece	0.73	0.79	0.83	0.63	546	0.63
Spain	1.98	1.65	1.87	1.68	1,996	2.30
France	5.59	5.56	3.05	3.66	6,737	7.77
Ireland	0.54	0.67	0.52	0.94	524	0.60
Italy	3.19	3.23	6.44	3.53	3,251	3.75
Luxembourg	2.34	2.45	1.04	2.50	1,222	1.41
Netherlands	3.45	3.10	1.04	1.16	4,089	4.71
Austria	1.53	1.39	2.09	1.25	1,712	1.97
Portugal	0.52	0.43	1.13	0.75	677	0.78
Finland	0.72	0.45	0.30	0.25	754	0.87
Sweden	1.68	1.25	0.30	0.46	1,531	1.76
United Kingdom	13.19	14.94	2.48	6.33	5,575	6.43
Total: EU	47.86	47.23	28.48	28.88	38,629	44.52
Total: non-EU	52.14	52.77	71.52	71.12	48,127	55.48
Total: all countries	100.00	100.00	100.00	100.00	86,756	100.00

**Table A(1)****Direct participants in EU RTGS systems**

	BE ELLIPS	DK DN- Inquiry	DK DEBES	DE ELS <sup>2)</sup>	ES SLBE	FR TBF	GR EURO- HERMES	IE IRIS	IT BI- REL	LU LIPS Gross	NL TOP	AT ARTIS	PT SPGT	FI BOF System	SE K-RIX	SE E-RIX	UK CHAPS Sterling	UK CHAPS Euro
<b>Direct participants</b>	20	105	34	2,662	227	269	30	24	723	31	124	77	45	15	23	19	14	20
Credit institutions	18	95	34	2,661	199	254	30	22	710	30	108	72	43	11	18	14	13	19
<i>Branches of other EU banks</i>	3	6	4	57	23	6	24	4	29	1	10	5	7	5	7	5	2	3
<i>Branches of non-EU banks</i>	2	2	1	32	13	3	6	0	16	0	10	0	2	0	2	2	1	7
<i>Remote participants</i>	1	0	0	23	0	1	0	0	1	0	0	1	0	0	0	0	0	2
Central bank	1	0	0	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1
Non-banks	1	10	0	0	27	14	0	1	13	0	10	1	1	3	4	4	0	0
<i>Public authorities</i>	0	4	0	0	3	0	0	1	0	0	6	0	1	1	1	1	0	0
<i>Postal administration</i>	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
<i>Supervised financial institutions</i>	0	6	0	0	24	14	0	0	9	0	4	1	0	2	3	3	0	0
Institutions not meeting Principle 1 <sup>1)</sup>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1) Principle 1 of the "Report on minimum common features for domestic payment systems" (1993): Direct access to IFTS. As a rule, only central banks and credit institutions, as defined under the Second Banking Co-ordination Directive, can be admitted as direct participants in funds transfer systems which process third party payments. As exceptions, with the approval of the central bank, certain other bodies authorised to hold accounts for customers may also be direct participants in such systems, provided that their public nature ensures little risk of failure or they are supervised by a recognised competent authority.

2) Elektronischer Schalter (ELS), formerly known as the EIL-ZV.

**Table A(2)****Direct participants in EU large-value payment systems**

	DE	ES	FR	FI	EU
	EAF <sup>1)</sup>	SPI <sup>2)</sup>	PNS	POPS	Euro 1 (EBA)
<b>Direct participants</b>	68	39	25	9	72
Credit institutions	68	38	24	9	72
Branches of other EU banks	13	3	5	3	- <sup>3)</sup>
Branches of non-EU banks	7	3	2	0	8
Remote participants	3	0	0	0	0
Central bank	0	1	0	0	0
Non-banks	0	0	1	0	0
Public authorities	0	0	0	0	0
Postal administration	0	0	1	0	0
Supervised financial institutions	0	0	0	0	0
Institutions not meeting Principle <sup>1)</sup>	0	0	0	0	0

1) Transformed into a hybrid system (risk situation comparable to that of a gross settlement system), formerly known as the EAF 2.

2) Spanish Interbank Payment Service, the large-value net settlement system based at the Madrid Clearing House.

3) Euro 1 is an EU-wide system.

**Table A(3)****Direct participants in EU retail IFTSs**

	BE	DK	DE	DE	GR	GR	ES	FR	FR	IE	IT	LU	PT	PT	NL	FI	UK	UK	
	CEC	DN Retail Clearing	MAOBE	EMZ <sup>2)</sup>	ACO	DIAS	SNCE	CH and CREIC <sup>4)</sup>	SIT	DBC <sup>5)</sup>	Retail system	Local clearing	LIPS Net	SICOI	SLOD	Interpay	PMJ	BACS	Cheque and Credit Clearing
<b>Direct participants</b>	23	69	-	4,814 <sup>3)</sup>	56	36	28	267	19	7	211	135	11	47	163	72	9	15	12
Credit institutions	20	68	-	4,813	53	33	27	263	17	6	209	132	10	45	15	71	9	14	11
<i>Branches of other EU banks</i>	4	5	-	57	11	9	0	0	0	2	14	3	0	7	2	7	3	0	0
<i>Branches of non-EU banks</i>	1	2	-	32	9	5	0	0	1	0	7	0	0	2	0	7	0	0	0
<i>Remote participants</i>	1	0	-	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Central bank	1	1	-	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	1
Non-banks	2	0	-	0	2	2	0	3	1	0	1	2	1	1	148	0	0	0	0
<i>Public authorities</i>	1 <sup>1)</sup>	0	-	0	0	0	0	2	0	0	0	1	0	1	0	0	0	0	0
<i>Postal administration</i>	1	0	-	0	1	1	0	1	1	0	1	1	1	0	0	0	0	0	0
<i>Supervised financial institutions</i>	0	0	-	0	1	1	0	0	0	0	0	0	0	0	148	0	0	0	0
<i>Institutions not meeting Principle<sup>1)</sup></i>	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1) *Rediscount and Guarantee Institute, a semi-official market-maker in discount bills.*

2) *EMZ (Elektronischer Massenzahlungsverkehr), formerly known as the DTA.*

3) *Number of accounts at the Deutsche Bundesbank of participating credit institutions.*

4) *Truncated cheque system.*

5) *The Dublin Bankers' Clearing was replaced by three functional clearing companies in December 1998. These three companies provide clearing facilities for PAPER DEBITS, PAPER CREDITS and ELECTRONIC DEBITS and CREDITS. The data in this table for 1999, under the heading Dublin Bankers' Clearing, represent the total activity of the three clearing companies.*



**Table B(1)****Access criteria to EU RTGS systems**

	BE	DK	DE	ES	FR	GR	IE	IT	LU	NL	AT	PT	FI	SE	SE	UK
	ELLIPS	DN- Inquiry	ELS <sup>2)</sup>	SLBE	TBF	EURO- HERMES	IRIS	BI-REL	LIPS Gross	TOP	ARTIS	SPGT	BoF- RTGS	K-RIX	E-RIX	CHAPS
Access criteria																
Written rules	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Minimum level of data or ratios representative of the financial strength	+	-	-	+	-	+	-	-	-	-	-	-	+	+	+	-
Minimum number of transactions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Payment of an entry fee	+	+	-	-	+	-	+	-	+	-	-	+	+	-	-	+
Approval from the owner/manager or the direct participants	+	+	+ <sup>1)</sup>	+ <sup>1)</sup>	+ <sup>1)</sup>	+	+ <sup>1)</sup>	+ <sup>1)</sup>	+	+ <sup>1)</sup>	+ <sup>1)</sup>	+ <sup>1)</sup>	+ <sup>1)</sup>	+ <sup>1)</sup>	+ <sup>1)</sup>	+
Approval from the local central bank	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Technical requirements	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Removal rules	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Key: + = Yes, - = No.

1) The owner/manager is the central bank.

2) Elektronischer Schalter (ELS), formerly known as the EIL-ZV.

**Table B(2)****Access criteria of other EU large-value payment systems**

	DE	ES	FR	FI	EU
	EAF <sup>1)</sup>	SPI <sup>2)</sup>	PNS	POPS	Euro 1(EBA)
Access criteria					
Written rules	+	+	+	+	+
Minimum level of data or ratios representative of the financial strength	-	+	-	-	+
Minimum number of transactions	+	-	+	-	-
Payment of an entry fee	-	+	+	+	+
Approval from the owner/manager or the direct participants	+ <sup>3)</sup>	+	+	+	+
Approval from the local central bank	+	+	+	+	-
Technical requirements	+	+	+	+	+
Removal rules	+	+	+	+	+

Key: + = Yes, - = No.

1) *Elektronische Abrechnung Frankfurt, formerly known as the EAF 2.*

2) *Spanish Interbank Payment Service, the large-value net settlement system based at the Madrid Clearing House.*

3) *The owner/manager is the central bank.*

**Table C****Risk control measures in EU large-value NSSs**

	DE	ES	FR	FI	EU
	EAF	SPI	PNS	POPS	Euro 1 (EBA)
<b>1. Settlement in central banks' accounts</b>		+	+	+	+
<b>2. Same-day settlement</b>		+	+	+	+
<b>3. Compliance with Lamfalussy standards</b>		+	+	+	+
1. Legal framework					
<i>contractual (+) or advisory (-) netting</i>		+	+	+	+ <sup>2)</sup>
<i>if contractual: legally enforceable (+) or not (-)</i>		+	+	+	+
2. Participants' awareness		+	+	+	+
	Transformed into a hybrid system in March 1996 <sup>1)</sup>		Hybrid system since April 1999 <sup>1)</sup>		
3. Risk management		+		+	
<i>monitoring of intraday balance</i>		+	+	+	+
<i>multilateral limits</i>		+	+	- <sup>3)</sup>	+
<i>collateral requirements</i>		+	-	-	+
<i>intraday closures</i>		-	-	+	-
4. Timely settlement completion		+	+	<sup>4)</sup>	+
<i>risk-sharing agreements</i>		+	-	-	+
<i>full collateralisation of the largest debit position</i>		+	-	-	+
5. Fair open access		+	+	+	+
6. Technical reliability		+	+	+	+

Key: + = Yes, - = No.

1) The risk situation is comparable to that of a gross settlement system.

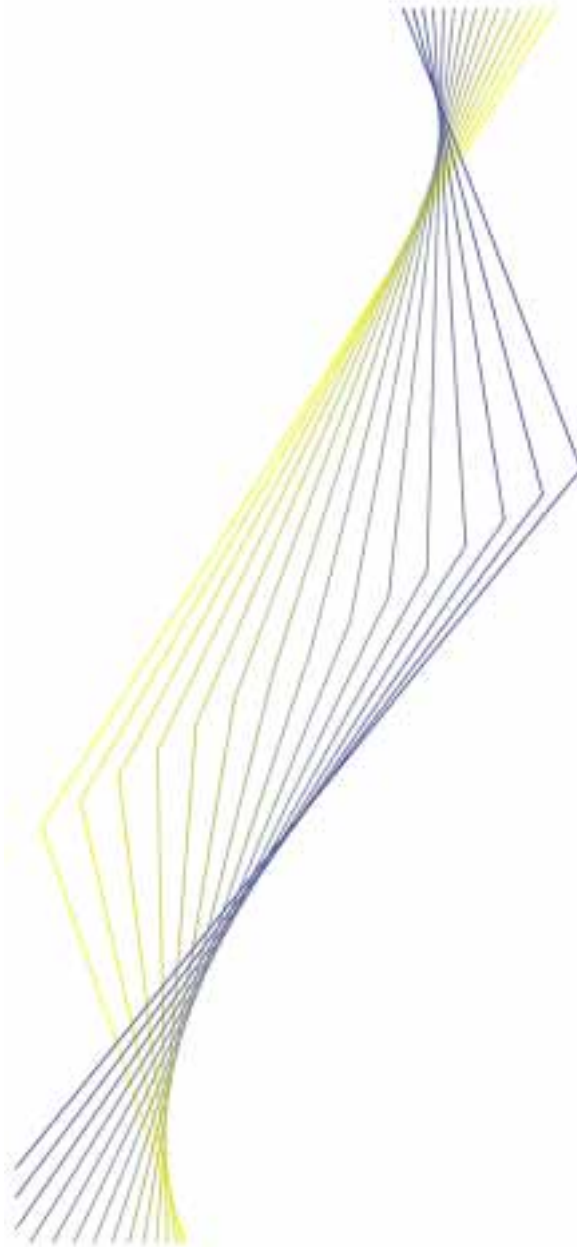
2) Euro 1 relies on a special legal framework, the single obligation structure (SOS).

3) Since June 1998 the settlement method applied to POPS payments has depended on the value of the transfer. Payments exceeding the interbank bilateral limit – the RTGS limit – are settled on a gross basis in the BoF-RTGS system. Smaller payments are netted bilaterally so that banks' net positions vis-à-vis each other are updated constantly during the day by the exchange of payment clearing data. When an interbank bilateral net debit cap nears its limit, the indebted bank is obliged to effect a covering transfer in the BoF-RTGS system to clear the limit. At the end of the day funds transfers are effected to clear bilateral debt positions.

4) Risk-sharing agreements have not been implemented owing to the small number of participants and the possibility of reducing risks by adjusting the bilateral limits. Collateralisation has not been implemented owing to the bilateral structure. The POPS limits are small and incorporated into overall interbank limits.



EUROPEAN CENTRAL BANK



**Annex 2**  
**Country tables**

**June 2001**

Annex 2 Country tables

## Belgium

**Table 1****Basic statistical data**

	1995	1996	1997	1998	1999
Population <sup>1)</sup> (thousands)	10,137	10,155	10,180	10,203	10,222
Gross domestic product (EUR billions)	201.6	206.4	216.3	225.1	233.6
Exchange rate vis-à-vis ECU/euro <sup>2)</sup>	38.5519	39.2986	40.5332	40.6207	40.3399

1) End of year.

2) Average for the year until 1998; irrevocable conversion rates were adopted with the introduction of the euro on 1 January 1999.

**Table 2****Settlement media used by non-banks**

(end of year)

	1995	1996	1997	EUR billions	
	1995	1996	1997	1998	1999
Banknotes and coins	10.32	10.80	10.94	10.88	12.00
Transferable deposits	27.5	28.5	30.4	34.8	46.9
Narrow money supply (M1)	37.9	39.3	41.3	45.7	58.9
Transferable deposits in foreign currencies <sup>1)</sup>	3.59	4.81	5.68	7.09	3.72
Outstanding value on electronic money schemes	-	0.003	0.016	0.028	0.038
<i>of which:</i>					
<i>on card-based products</i>	-	0.003	0.016	0.028	0.038
<i>on network-based products</i>	-	-	-	-	-

1) All deposits made by Belgian residents in Belgium in foreign currencies until 1998, and in non-euro area currencies from 1999.

**Table 3****Settlement media used by deposit-taking institutions**

(end of year)

	1995	1996	1997	EUR billions	
	1995	1996	1997	1998 <sup>1)</sup>	1999
Required reserves held at central bank	-	-	-	0.82	7.29
Free reserves held at central bank <sup>2)</sup>	0.05	0.06	0.03	0.02	0.05
Transferable deposits at other institutions <sup>3)</sup>	3.20	4.08	4.51	4.60	6.46

1) In preparation for the introduction of the euro, the NBB carried out tests on required reserves in September 1998.

2) Until 1998: average of end-of-month figures; 1999: end-of-year figures.

3) Payment means held by Belgian credit institutions with other credit institutions (sight accounts, BEF and foreign currencies, in Belgium).

**Table 4****Banknotes and coins***(total value, end of year)*

	BEF billions				
	1995	1996	1997	1998	1999
Total banknotes issued	445.8	464.7	478.6	482.9	541.9
<i>of which:</i>					
BEF 10,000	206.1	225.7	220.1	230.4	269.7
BEF 5,000 <sup>1)</sup>	0.8	-	-	-	-
BEF 2,000	124.2	134.6	159.2	155.6	166.2
BEF 1,000	86.2	75.0	68.6	65.7	72.7
BEF 500	13.5	13.6	14.3	14.7	16.0
BEF 200 <sup>2)</sup>	-	4.9	5.6	6.0	6.5
BEF 100	15.0	10.9	10.8	10.5	10.8
Total coins issued	20.1	21.5	22.5	23.0	24.1
<i>of which:</i>					
BEF 500	0.2	0.2	0.2	0.2	0.2
BEF 250	0.1	0.1	0.1	0.1	0.1
BEF 50	8.1	8.7	9.1	9.3	9.8
BEF 20	7.2	7.6	7.9	8.0	8.3
BEF 5	2.8	3.0	3.2	3.3	3.5
BEF 1	1.4	1.6	1.7	1.8	1.9
BEF 0.5	0.3	0.3	0.3	0.3	0.3
Banknotes and coins held by credit institutions	49.7	50.4	59.8	67.1	81.9
Banknotes and coins in circulation outside credit institutions	416.2	435.8	441.3	438.8	484.1

1) The BEF 5,000 banknotes ceased to be legal tender on 1 December 1994.

2) The issuance of the BEF 200 banknote began on 25 January 1996.

**Table 5****Institutional framework***(end of 1999)*

Categories	Number of institutions	Number of branches	Number of accounts (thousands)	Number of internet-linked accounts <sup>1)</sup>	Value of accounts (EUR billions)
Central bank	1	11	2	-	0.02
Credit institutions <sup>2)</sup>	119	6,975	13,649	-	46.42
Postal institution <sup>3)</sup>	1	1,386	7	-	0.46
Total	121	8,372	13,658	-	46.90
<i>of which virtual institutions</i>	-	-	-	-	-
Branches of foreign banks	44	-	-	-	-
<i>of which EU-based</i>	30	-	-	-	-

1) Number of accounts relating to internet services (credit transfers, payment of bills, etc. carried out via the internet).

2) Number of branches: non-full-size branches excluded.

3) Accounts: public authorities' accounts only; other accounts included in those belonging to credit institutions.

**Table 6****Payment card functions and accepting devices***(end of year)*

	1995	1996	1997	1998	1999
<b>Cash function</b>					
Cards with a cash function (thousands)	9,461	10,591	11,361	12,014	13,375
Number of ATMs with a cash dispensing function	3,460	4,026	5,003	5,757	6,199
<i>open access</i>	1,144	1,169	1,144	1,145	1,161
<i>limited access</i>	2,316	2,857	3,859	4,612	5,038
Volume of transactions (millions)	144.9	153.8	159.6	159.3	177.4
<i>at ATMs with open access</i>	100.7	97.5	97.2	85.6	90.4
<i>at ATMs with limited access</i>	44.2	56.3	62.4	73.7	87.0
Value of transactions (EUR billions)	14.61	15.81	16.69	16.93	18.55
<i>at ATMs with open access</i>	9.60	9.43	9.50	8.58	8.87
<i>at ATMs with limited access</i>	5.01	6.38	7.19	8.34	9.69
Number of ATMs with a giro transfer function <sup>1)</sup>	-	-	-	-	-
<i>volume of transactions</i>					
<i>value of transactions</i>					
<b>Debit function</b>					
Cards with a debit function (thousands)	8,411	9,520	10,176	10,841	12,083
<i>of which retailer cards</i>	1,221	1,379	1,428	1,564	1,591
Number of terminals	72,892	81,331	85,727	93,061	99,624
Volume of transactions (millions)	185.85	213.45	241.95	298.15	354.25
<i>of which transactions with retailer cards</i>	18.93	20.90	23.47	25.00	27.19
Value of transactions (EUR billions)	9.49	11.19	12.79	15.42	17.93
<i>of which transactions with retailer cards</i>	0.91	1.06	1.20	1.24	1.36
<b>Credit function</b>					
Cards with a credit function (thousands)	2,271	2,450	2,613	2,737	2,883
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals	-	-	-	-	-
Volume of transactions (millions)	32.23	35.87	39.62	44.34	48.65
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (EUR billions)	3.12	3.46	3.89	4.43	4.92
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Electronic money function</b>					
Cards with an e-money function (thousands)	30	159	1,035	5,606	7,898
Number of payment terminals	1,109	6,743	21,000	45,649	63,993
Number of purchase transactions (millions)	0.73	1.53	9.44	28.17	45.47
Value of purchase transactions (EUR billions)	0.003	0.006	0.039	0.114	0.170
Number of loading transactions (millions)	-	0.27	1.61	4.35	6.86
Number of loading terminals	-	1,425	6,438	18,198	72,076
Value of money loaded (EUR billions)	-	0.009	0.052	0.126	0.180
Float (EUR billions)	-	0.003	0.016	0.028	0.038

1) Most ATMs with limited access have a giro transfer function.



**Table 7****Number of payment cards in circulation***(end of year)*

	1995	1996	1997	1998	1999
					thousands
Total number of cards in circulation					
<i>of which:</i>					
<i>cards with a combined debit, cash and e-money function</i>	-	159	1,035	5,606	7,898
<i>cards with a credit function</i>	2,271	2,450	2,613	2,737	2,883
<i>cards with a debit function issued by retailers</i>	1,221	1,379	1,428	1,564	1,591

**Table 8****Payment instructions handled by selected interbank funds transfer systems: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	1999
					millions
<b>ELLIPS <sup>2)</sup></b>	-	<b>0.21</b>	<b>0.96</b>	<b>1.01</b>	<b>1.97</b>
<i>of which:</i>					
<i>domestic</i>	-	0.21	0.96	1.01	0.95
<i>cross-border</i>	-	-	-	-	1.02
<b>Clearing house</b>	<b>14.45</b>	<b>11.57</b>	<b>6.78</b>	<b>5.75</b>	<b>4.95</b>
Securities clearing balances	...	...	-	-	-
Postal drafts and money orders	3.72	3.28	2.85	2.40	2.03
Debits	5.11	4.14	3.57	3.30	2.90
Credit transfers	5.62	4.15	0.36	0.05	0.02
Others	-	-	-	-	-
<b>CEC</b>	<b>826.21</b>	<b>867.92</b>	<b>880.60</b>	<b>929.10</b>	<b>937.19</b>
Direct debits	71.95	76.11	84.86	91.90	99.54
<i>of which:</i>					
<i>ordinary direct debits</i>	69.37	73.27	81.56	88.09	95.14
<i>refunds</i>	0.63	0.67	0.65	0.86	1.06
<i>unpaid direct debits</i>	1.95	2.17	2.65	2.95	3.34
Other debit operations	337.06	351.33	334.43	340.79	306.81
<i>of which:</i>					
<i>truncated cheques</i>	77.47	72.08	65.79	61.47	52.57
<i>ATMs and POS</i>	259.21	278.84	268.24	278.96	253.89
<i>unpaid cheques</i>	0.38	0.41	0.40	0.36	0.35
Credit transfers	416.03	439.61	458.38	490.65	525.41
<i>of which:</i>					
<i>credit transfers</i>	337.03	352.67	368.72	388.04	405.43
<i>counterparty postal</i>	2.70	2.48	2.17	1.82	1.65
<i>counterparty ATM-POS</i>	57.01	64.96	67.75	82.93	102.15
<i>money order transfers</i>	19.30	19.50	19.74	17.86	16.18
Large-value or urgent transfers	1.17	0.87	1.84	2.50	2.49
Others <sup>3)</sup>	-	-	1.09	3.28	2.94
<b>Concentration ratio CEC <sup>4)</sup></b>	<b>64%</b>	<b>64%</b>	<b>63%</b>	<b>69%</b>	<b>76%</b>

1) The table contains both customer and interbank transactions.

2) ELLIPS, the Belgian RTGS system, went live on 24 September 1996.

3) Bills of exchange.

4) Market share of the five largest participants in each payment system, based on the total volume of transactions.

**Table 9**  
**Payment instructions handled by selected interbank funds transfer systems: value of transactions <sup>1)</sup>**

	EUR billions				
	1995	1996	1997	1998	1999
<b>ELLIPS <sup>2)</sup></b>	-	<b>1,798</b>	<b>8,495</b>	<b>9,349</b>	<b>19,430</b>
<i>of which:</i>					
<i>domestic</i>	-	1,798	8,495	9,349	3,608
<i>cross-border</i>	-	-	-	-	15,822
<b>Clearing house</b>	<b>8,288.4</b>	<b>6,027.3</b>	<b>134.2</b>	<b>119.1</b>	<b>112.3</b>
Securities clearing balances <sup>3)</sup>	310.4	250.2	-	-	-
Postal drafts and money orders	1.0	1.5	1.5	1.2	1.2
Debits	369.0	377.5	124.7	117.7	111.0
Credit transfers	7,608.0	5,398.2	7.9	0.1	0.05
Others	-	-	-	-	-
<b>CEC</b>	<b>659.1</b>	<b>660.9</b>	<b>457.6</b>	<b>482.55</b>	<b>476.24</b>
Direct debits	10.9	11.8	14.9	14.7	16.5
<i>of which:</i>					
<i>ordinary direct debits</i>	10.4	11.3	14.2	13.9	15.5
<i>refunds</i>	0.15	0.15	0.17	0.22	0.26
<i>unpaid direct debits</i>	0.37	0.42	0.52	0.59	0.65
Other debit operations	46.1	46.7	46.7	47.3	50.1
<i>of which:</i>					
<i>truncated cheques</i>	27.8	27.0	25.9	24.6	24.7
<i>ATMs and POS</i>	17.9	19.3	20.5	22.4	25.1
<i>unpaid cheques</i>	0.30	0.32	0.30	0.27	0.28
Credit transfers	257.1	262.3	264.4	284.2	303.4
<i>of which:</i>					
<i>credit transfers</i>	234.0	237.8	238.6	257.0	273.7
<i>counterparty postal</i>	0.92	0.87	0.74	0.62	0.56
<i>counterparty ATM-POS</i>	17.8	19.2	20.5	22.4	25.1
<i>money order transfers</i>	4.4	4.5	4.5	4.1	4.0
Large-value or urgent transfers	345.0	340.1	127.6	122.0	94.9
Others <sup>4)</sup>	-	-	4.0	14.4	11.3
<b>Concentration ratio CEC <sup>5)</sup></b>	-	-	<b>63%</b>	-	<b>73%</b>

1) The table contains both customer and interbank transactions.

2) ELLIPS, the Belgian RTGS system, went live on 24 September 1996.

3) As from 1 October 1996, participants' end-of-day balances are directly registered on their accounts with the NBB.

4) Bills of exchange.

5) Market share of the five largest participants in each payment system, based on the total value of transactions.

**Table 10**  
**Indicators of the use of various cashless payment instruments: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	millions 1999
Volume of transactions	1,108.2	1,168.6	1,202.0	1,249.7	1,393.8
Cheques	117.1	109.7	95.8	86.9	80.2
<i>of which:</i>					
<i>paper-based</i>	117.1	109.7	95.8	86.9	80.2
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit card	185.9	213.5	242.0	298.2	354.3
<i>of which:</i>					
<i>face-to-face</i>	185.9	213.5	242.0	298.2	354.3
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit card	32.2	35.9	39.6	44.3	48.7
<i>of which:</i>					
<i>face-to-face</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	668.5	694.6	697.3	674.7	723.0
<i>of which:</i>					
<i>paper-based <sup>2)</sup></i>	447.9	451.5	446.3	411.6	412.1
<i>electronic (via PC or other terminal) <sup>3)</sup></i>	220.6	243.1	251.0	263.1	310.9
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	104.5	113.5	117.9	117.4	142.3
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	104.5	113.5	117.9	117.4	142.3
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	-	1.53	9.44	28.17	45.47
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) Paper-based payment orders.

3) Payment orders submitted to the bank in electronic format.

**Table I I****Indicators of the use of various cashless payment instruments: value of transactions <sup>1)</sup>**

	1995	1996	1997	EUR billions	
				1998	1999
Value of transactions	10,305	9,841	10,063	11,130	15,348
Cheques <sup>2)</sup>	305	285	289	358	98
<i>of which:</i>					
<i>paper-based</i>	305	285	289	358	98
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit card	9	11	13	15	18
<i>of which:</i>					
<i>face-to-face</i>	9	11	13	15	18
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit card	3	3	4	4	5
<i>of which:</i>					
<i>face-to-face</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	9,964	9,514	9,728	10,719	15,186
<i>of which:</i>					
<i>paper-based <sup>3)</sup></i>	9,054	6,922	1,487	1,625	2,184
<i>electronic (via PC or other terminal) <sup>4)</sup></i>	910	2,592	8,241	9,094	13,002
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	24	27	29	32	41
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	24	27	29	32	41
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	-	0.01	0.04	0.11	0.17
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) Some large-value debit operations were no longer considered as cheques in 1999.

3) Paper-based payment orders.

4) Payment orders submitted to the bank in electronic format.

**Table 12****Number of participants in trading, clearing and securities settlement systems <sup>1)</sup>***(end of 1999)*

	1995	1996	1997	1998	1999
<b>Regulated off-exchange market (trading systems)</b>	-	-	<b>216</b>	<b>199</b>	<b>203</b>
Banks	-	-	148	137	136
<i>of which:</i>					
<i>domestic</i>	-	-	90	80	73
<i>foreign</i>	-	-	58	57	63
Brokers/dealers	-	-	66	60	65
<i>of which:</i>					
<i>domestic</i>	-	-	60	52	52
<i>foreign</i>	-	-	6	8	13
Others					
National Bank of Belgium (central bank)	1	1	1	1	1
Institut de Réescoute et de Garantie (bill rediscounter)	1	1	1	1	1
<b>BXS (trading system)</b>					
Members (stock exchange + derivatives exchange)	112	115	103	102	130
<i>of which:</i>					
<i>domestic</i>	106	106	93	88	86
<i>foreign</i>	6	9	10	14	44
<b>Easdaq (trading system)</b>	-	<b>19</b>	<b>60</b>	<b>69</b>	<b>79</b>
Banks	-	2	16	13	14
<i>of which:</i>					
<i>domestic</i>	-	1	1	0	0
<i>foreign</i>	-	1	15	13	14
Brokers/dealers	-	17	44	56	65
<i>of which:</i>					
<i>domestic</i>	-	5	7	9	11
<i>foreign</i>	-	12	37	47	54
<b>BXS-Clearing (clearing house)</b>	-	-	-	-	<b>76</b>
Banks	-	-	-	-	35
<i>of which:</i>					
<i>domestic</i>	-	-	-	-	31
<i>foreign</i>	-	-	-	-	4
Brokers/dealers	-	-	-	-	41
<i>of which:</i>					
<i>domestic</i>	-	-	-	-	41
<i>foreign</i>	-	-	-	-	-
<b>NBB SSS (securities settlement system)</b>	<b>209</b>	<b>209</b>	<b>183</b>	<b>188</b>	<b>166</b>
Banks	121	121	112	108	88
<i>of which:</i>					
<i>domestic</i>	-	-	-	-	-
<i>foreign</i>	-	-	-	-	-
Brokers/dealers	73	73	51	51	41
<i>of which:</i>					
<i>domestic</i>	-	-	-	-	-
<i>foreign</i>	-	-	-	-	-
Others:					
Securities settlement systems	2	2	2	2	5
Ministry of Finance	5	2	2	3	3
Public bodies	8	11	16	24	29
<b>BXS-CIK (securities settlement system)</b>	<b>163</b>	<b>151</b>	<b>140</b>	<b>124</b>	<b>113</b>
Banks	73	70	68	65	57
<i>of which:</i>					
<i>domestic</i>	-	-	-	-	43
<i>foreign</i>	-	-	-	-	14
Brokers/dealers	79	72	63	54	52
<i>of which:</i>					
<i>domestic</i>	-	-	-	-	48
<i>foreign</i>	-	-	-	-	4
Securities settlement systems	11	9	9	5	4

1) As a result of mergers and the creation of new companies, figures are not always available.

**Table 13****Instructions handled by trading platforms, clearing houses and securities settlement systems <sup>1)</sup>***(volume of transactions)*

	1995	1996	1997	1998	1999
<b>Regulated off-exchange market <sup>2)</sup></b>					
Volume of transactions	-	-	112,788	88,279	68,543
<b>BXS</b>					
Volume of transactions (in number of securities)	485,272,132	735,145,725	770,027,669	1,323,874,856	2,086,762,794
<b>Easdaq</b>					
Volume of trades	-	1,329	22,575	160,589	157,273
<b>BXS-Clearing</b>					
Volume of transactions cleared	-	-	-	-	-
<b>NBB SSS</b>					
Volume of settlement instructions	198,608	229,789	199,807	156,876	121,174
<b>BXS-CIK</b>					
Volume of settlement instructions (EMSS)	-	-	-	-	242,733

1) As a result of mergers and the creation of new companies, figures are not always available.

2) Including transactions made on MTS Belgium.

**Table 14****Instructions handled by trading platforms, clearing houses and securities settlement systems <sup>1)</sup>***(market value of transactions)*

	1995	1996	1997	1998	1999
				EUR billions	
<b>Regulated off-exchange market <sup>2)</sup></b>					
Value of transactions	-	-	1,799	1,932	1,815
<b>BXS</b>					
Value of transactions	13.55	20.05	30.47	55.82	55.56
<b>Easdaq</b>					
Value of transactions	-	0.05	0.90	3.89	4.46
<b>BXS-Clearing</b>					
Value of transactions cleared (cash market)	-	-	-	-	35
<b>NBB SSS <sup>3)</sup></b>					
Value of settlement instructions	2,108	2,304	2,564	2,702	2,261
<b>BXS-CIK</b>					
Value of settlement instructions (EMSS)	-	-	-	-	75

1) As a result of mergers and the creation of new companies, figures are not always available.

2) Including transactions made on MTS Belgium.

3) Nominal value.

**Table 15a****Outstanding securities <sup>1)</sup>***(end of year)*

	1995	1996	1997	1998	1999
<b>Regulated off-exchange market <sup>2)</sup></b>					
Value of stocks listed (EUR billions)	-	-	-	-	-
Value of other securities listed (EUR billions)	160	172	177	180	191
Number of stocks listed	-	-	-	-	-
Number of other securities listed	-	-	-	-	-
<b>BXS</b>					
Value of stocks listed (EUR billions)	74.23	94.61	127.61	209.20	183.71
Value of other securities listed (EUR billions)					
<i>of which:</i>					
<i>domestic equity warrants</i>	0.14	0.25	0.30	0.50	1.04
<i>foreign companies</i>	-	-	-	2,589	3,651
Number of stocks listed	294	291	287	298	308
Number of other securities listed	-	-	-	-	-
<b>Easdaq</b>					
Value of stocks listed (EUR billions)	-	-	-	-	-
Value of other securities listed (EUR billions)	-	0.71	4.23	13.1	42.9
Number of stocks listed	-	-	-	-	-
Number of other securities listed	-	4	23	39	56
<b>NBB SSS</b>					
Value of stocks issued (EUR billions)	-	-	-	-	-
Value of other securities issued (EUR billions)	186	223	235	239	252
Number of stocks issued	-	-	-	-	-
Number of other securities issued	-	-	-	-	-
<b>BXS-CIK</b>					
Value of stocks issued (EUR billions)	-	-	-	-	164
Value of other securities issued (EUR billions)	-	-	-	-	-
Number of stocks issued	-	-	-	-	-
Number of other securities issued	-	-	-	-	-

1) As a result of mergers and the creation of new companies, figures are not always available.

2) Including transactions made on MTS Belgium.

**Table 15b****Netting ratio in clearing systems <sup>1)</sup>**

	1995	1996	1997	1998	1999
<b>BXS-Clearing</b>					
Netting ratio for cash over year	-	-	-	-	-
Netting ratio for securities over year	-	-	-	-	-

1) As a result of mergers and the creation of new companies, figures are not always available.

**Table 16****Participation in SWIFT by domestic institutions**

	1995	1996	1997	1998	1999
SWIFT users	72	75	76	79	78
<i>of which:</i>					
<i>members</i>	32	32	32	29	24
<i>sub-members</i>	37	37	39	41	37
<i>participants</i>	3	6	5	9	17
Memorandum item:					
Total SWIFT worldwide (institutions connected)	5,229	5,632	6,176	6,557	6,797
<i>of which:</i>					
<i>members</i>	2,845	3,014	3,700	3,052	2,214
<i>sub-members</i>	2,107	2,500	2,621	2,781	2,763
<i>participants</i>	277	404	681	938	1,820

**Table 17****SWIFT message flows to/from domestic users**

	1995	1996	1997	1998	1999
Total messages sent	23,796,106	26,928,329	31,355,971	36,454,886	45,808,989
<i>of which:</i>					
<i>category I</i>	6,660,281	6,845,391	7,170,089	7,825,972	10,057,882
<i>category II</i>	5,606,480	6,307,048	7,009,454	6,859,838	5,397,995
<i>sent to/received from domestic users</i>	4,452,493	5,283,148	6,138,563	6,999,929	9,275,820
Total messages received	21,003,109	24,324,277	27,950,457	31,617,702	37,434,987
<i>of which:</i>					
<i>category I</i>	8,197,728	6,441,304	6,665,892	7,108,235	9,207,639
<i>category II</i>	4,457,184	5,202,993	5,771,831	5,715,306	5,017,388
Memorandum item:					
Global SWIFT traffic	603,575,374	687,785,294	812,117,556	937,039,995	1,058,836,425

*Definitions:*

- *Sub-members: domestic users sponsored by members abroad;*
- *Participants: users which are not SWIFT shareholders; their message traffic over the network is restricted;*
- *Category I: customer (funds) transfers;*
- *Category II: bank (funds) transfers.*



Annex 2 – Belgium

## Denmark

**Table 1****Basic statistical data**

	1995	1996	1997	1998	1999
Population <sup>1)</sup> (thousands)	5,222	5,256	5,280	5,303	5,321
Gross domestic product (DKK billions)	1,009.8	1,060.9	1,112.0	1,163.8	1,215.8
Exchange rate vis-à-vis ECU/euro <sup>1)</sup>	7.32804	7.35934	7.4836	7.4993	7.454

1) Average for the year.

**Table 2****Settlement media used by non-banks**

(end of year)

	1995	1996	1997	DKK billions	
	1995	1996	1997	1998	1999
Banknotes and coins	30.59	31.60	33.20	34.50	36.90
Transferable deposits <sup>1)</sup>	253.00	278.44	295.14	316.81	334.64
of which held by:					
households <sup>2)</sup>	124.00	135.79	149.60	162.17	165.64
corporate sector <sup>3)</sup>	113.36	127.32	133.45	142.29	155.76
other (public sector)	15.64	15.34	12.09	12.35	13.24
Outstanding value on electronic money schemes <sup>4)</sup>	15.00	21.00	15.12	18.50	20.00
of which:					
on card-based products <sup>4)</sup>	15.00	21.00	15.12	18.50	20.00
on network-based products	-	-	-	-	-

1) Sight deposits held by residents in DKK and in foreign currencies.

2) Non-business sector.

3) Business sector.

4) DKK millions.

**Table 3****Settlement media used by deposit-taking institutions**

(end of year)

	1995	1996	1997	DKK billions	
	1995	1996	1997	1998	1999
Required reserves held at central bank	-	-	-	-	-
Deposits on current accounts	2.02	7.90	18.45	12.40	5.94
Transferable deposits at other institutions	-	-	-	-	-

**Table 4****Banknotes and coins***(total value, end of year)*

	DKK billions				
	1995	1996	1997	1998	1999
Total banknotes issued	31.43	33.19	35.08	37.20	42.43
<i>of which:</i>					
DKK 1,000	18.24	19.28	19.59	19.79	22.98
DKK 500	5.31	5.82	6.56	8.09	9.27
DKK 200	-	-	1.62	2.18	2.53
DKK 100	6.76	6.93	6.12	5.88	6.34
DKK 50	0.74	0.78	0.80	0.85	0.90
DKK 20	-	-	-	-	-
DKK 10	-	-	-	-	-
Other <sup>1)</sup>	0.39	0.38	0.40	0.41	0.41
Total coins issued <sup>2)</sup>	3.22	3.43	3.63	3.82	3.95
<i>of which:</i>					
DKK 20	1.12	1.21	1.30	1.37	1.42
DKK 10	0.70	0.74	0.77	0.81	0.84
DKK 5	0.44	0.46	0.48	0.50	0.52
DKK 2	0.25	0.28	0.31	0.34	0.36
DKK 1	0.39	0.39	0.40	0.41	0.42
50 øre	0.11	0.12	0.13	0.13	0.14
25 øre	0.15	0.16	0.16	0.11	0.17
Banknotes and coins held by credit institutions	4.06	5.01	5.51	6.52	9.48
Banknotes and coins in circulation outside credit institutions	30.59	31.60	33.20	34.50	36.90

1) Special banknotes in circulation in the Faroes. Since 1993 DKK 20 and DKK 10 banknotes are also included.

2) Includes DKK 200 commemorative coins and DKK 2 coins in circulation until the end of 1959.

**Table 5****Institutional framework***(end of 1999)*

Categories	Number of institutions	Number of branches <sup>1)</sup>	Number of accounts (thousands)	Number of internet-linked accounts <sup>2)</sup>	Value of accounts (DKK billions)
Central bank	1	...	...	-	-
Commercial banks and savings banks	168	2,356	-	-	-
Co-operative and rural banks	23	23	-	-	-
Post office	...	1,160	-	-	-
Total	192	3,539	9,228	-	395
<i>of which virtual institutions</i>	-	-	-	-	-
Branches of foreign banks	15	15	-	-	-
<i>of which EU-based</i>	13	13	-	-	-

1) Number of branches: non-full-size branches excluded.

2) Number of accounts relating to internet services (credit transfers, payment of bills, etc. carried out via the internet).

**Table 6****Payment card functions and accepting devices***(end of year)*

	1995	1996	1997	1998	1999
<b>Cash function</b>					
Cards with a cash function (thousands)	2,941	3,073	3,018	3,281	3,176
Number of ATMs with a cash dispensing function	2,033	2,209	2,387	2,549	2,641
<i>open access</i>	2,033	2,209	2,387	2,549	2,641
<i>limited access</i>	-	-	-	-	-
Volume of transactions (millions)	-	-	-	-	-
<i>at ATMs with open access</i>	-	-	-	-	-
<i>at ATMs with limited access</i>	-	-	-	-	-
Value of transactions (DKK billions)	-	-	-	-	-
<i>at ATMs with open access</i>	-	-	-	-	-
<i>at ATMs with limited access</i>	-	-	-	-	-
Number of ATMs with a giro transfer function	-	-	-	-	-
<i>volume of transactions</i>	-	-	-	-	-
<i>value of transactions</i>	-	-	-	-	-
<b>Debit function</b>					
Cards with a debit function (thousands)	2,765	2,889	2,825	3,085	2,794
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals	26,214	41,911	63,000	68,600	70,000
Volume of transactions (millions)	240.9	274.4	304.9	340.5	371.06
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (DKK billions)	70.19	82.76	95.76	106.07	118.90
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Credit function</b>					
Cards with a credit function (thousands)	176	184	193	196	382
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals	34,000	40,000	56,800	63,600	65,000
Volume of transactions (millions)	7.11	7.88	8.69	10.01	11.32
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (DKK billions)	5	6	7	8	10
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Electronic money function</b>					
Cards with an e-money function (thousands)	295	390	518	651	995
Number of terminals accepting the card	586	2,413	2,732	4,383	7,876
Number of purchase transactions (thousands)	2,138	3,657	5,450	7,290	7,860
Value of purchase transactions (DKK millions)	8	19	34	49	63
Number of loading transactions (thousands)	-	-	1.6	9.4	13.33
Value of money loaded (DKK millions)	-	-	0.2	1.4	2.00
Float (DKK millions)	15.00	21.00	15.12	18.50	20.00

**Table 7****Number of payment cards in circulation***(end of year)*

	1995	1996	1997	1998	1999
					thousands
Total number of cards in circulation	2,941	3,073	3,018	3,281	3,176
<i>of which:</i>					
<i>cards with a debit function</i>	2,765	2,889	2,825	3,085	2,794
<i>cards with a credit function</i>	176	184	193	196	382
<i>cards with a debit function issued by retailers</i>	-	-	-	-	-

**Table 8****Payment instructions handled by selected interbank funds transfer systems: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	1999
					millions
<b>DN Inquiry and Transfer system</b>	<b>0.349</b>	<b>0.426</b>	<b>0.369</b>	<b>0.384</b>	<b>0.368</b>
<b>Retail clearing</b>	<b>595.649</b>	<b>605.007</b>	<b>656.027</b>	<b>713.880</b>	<b>754.309</b>
Cheques	73.654	67.075	61.743	57.940	48.621
Direct debits	86.966	96.423	105.129	112.763	121.619
Paperless credit transfers	187.059	159.268	175.599	192.715	201.697
Payments by debit card	240.865	274.364	304.862	340.453	371.055
<i>of which:</i>					
<i>by EFTPOS</i>	189.412	217.504	243.972	272.755	296.579
<i>by paperslip</i>	51.453	22.849	16.504	10.910	9.450
Payments by credit card	7.105	7.877	8.694	10.009	11.317
<b>Concentration ratio <sup>2)</sup></b>	-	-	-	-	<b>56%</b>

1) The table contains both customer and interbank transactions.

2) Market share of the five largest participants, based on the total volume of transactions for the DN Inquiry and Transfer system.

**Table 9****Payment instructions handled by selected interbank funds transfer systems: value of transactions <sup>1)</sup>**

	1995	1996	1997	1998	1999
					DKK billions
<b>DN Inquiry and Transfer system</b>	<b>18,875</b>	<b>16,642</b>	<b>18,119</b>	<b>21,654</b>	<b>20,988</b>
<b>Retail clearing</b>	<b>2,854</b>	<b>3,038</b>	<b>3,250</b>	<b>3,682</b>	<b>3,834</b>
Cheques	1,018	959	931	940	810
Direct debits	227	223	241	290	323
Paperless credit transfers	1,522	1,754	1,965	2,325	2,563
Payments by debit card	82	96	106	119	129
<i>of which:</i>					
<i>by EFTPOS</i>	62	84	100	113	123
<i>by paperslip</i>	20	12	6	6	5
Payments by credit card	5	6	7	8	10
<b>Concentration ratio <sup>2)</sup></b>	-	-	-	-	<b>73%</b>

1) The table contains both customer and interbank transactions.

2) Market share of the five largest participants, based on the total value of transactions for the DN Inquiry and Transfer system.

**Table 10****Indicators of the use of various cashless payment instruments: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	millions 1999
Volume of transactions	617.63	626.09	676.33	734.33	774.55
Cheques	93.5	84.5	76.6	71.1	61.0
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit card	240.87	274.36	304.86	340.45	371.06
<i>of which:</i>					
<i>paper-based</i>	51.453	22.849	16.504	10.910	9.450
<i>electronic (via PC or other terminal)</i>	189.41	217.50	243.97	272.76	296.58
<i>electronic (via mobile phone)</i>					
Payments by credit card	7.11	7.88	8.69	10.01	11.32
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	187.06	159.27	175.60	192.72	201.70
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	86.966	96.423	105.13	112.76	121.62
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money (thousands)	2,138	3,657	5,450	7,290	7,860
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

**Table I I**  
**Indicators of the use of various cashless payment instruments: value of transactions <sup>1)</sup>**

	DKK billions				
	1995	1996	1997	1998	1999
Value of transactions					
Cheques	1,276	1,186	1,259	1,237	955
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit card	82	96	106	119	129
<i>of which:</i>					
<i>paper-based</i>	20	12	6	6	5
<i>electronic (via PC or other terminal)</i>	62	84	100	113	123
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit card	5	6	7	8	10
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	1,522	1,754	1,965	2,325	2,563
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	227	223	241	290	323
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money (DKK millions)	8	19	34	49	63
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

**Table I 2****Number of participants in trading, clearing and securities settlement systems***(end of 1999)*

	1999
<b>Copenhagen Stock Exchange Ltd</b>	
Banks	25
<i>of which:</i>	
<i>domestic</i>	18
<i>foreign (branches and remote participants)</i>	7
Brokers/dealers	9
<i>of which:</i>	
<i>domestic</i>	4
<i>foreign</i>	5
Total	34
<b>VP A/S - The Danish Securities Centre</b>	
Banks, brokers, dealers	approximately 200
Remote members	12
Central bank	1
Mortgage banks	17
Securities settlement system	1
Institutional investors	23
Others	
Total approximately	264



**Table I3****Instructions handled by trading platforms, clearing houses and securities settlement systems***(volume of transactions)*

	1995	1996	1997	1998	1999
<b>Copenhagen Stock Exchange Ltd</b>					
Volume of transactions (thousands)					
Shares	571	746	1,019	1,102	1,274
Bonds	1,243	1,528	1,574	1,546	1,365
<b>VPA/S</b>					
Number of trade transactions (millions)	3.5	2.5	3.3	3.4	3.5
Number of other transactions (millions) <sup>1)</sup>	12.8	13.8	12.9	12.7	12.9

1) Dividend payments, interest payments, drawing payments, reduction of account holdings and administrative account transactions.

**Table I4****Instructions handled by trading platforms, clearing houses and securities settlement systems***(market value of transactions)*

	1995	1996	1997	1998	1999
				DKK billions	
<b>Copenhagen Stock Exchange Ltd</b>					
Value of transactions					
Shares	157	217	310	448	464
Bonds	5,770	6,775	7,112	8,649	7,156
<b>VPA/S</b>					
Clearing of trade amounts	-	15,291	16,060	22,992	22,010
Turnover of shares, etc. (nominal amount)	68	99	135	172	229
Turnover of bonds (nominal amount)	17,754	21,299	23,276	28,287	26,794

**Table I5a****Outstanding securities***(end of year)*

	1995	1996	1997	1998	1999
<b>Copenhagen Stock Exchange Ltd</b>					
Value of stocks listed (DKK billions)	381	499	775	809	1,074
Value of bonds listed (DKK billions)	1,871	1,959	1,997	2,057	1,972
Number of stocks listed	386	377	378	374	384
Number of bonds securities listed	2,358	2,454	2,464	2,439	2,432
<b>VPA/S</b>					
Shares, units in investment funds, etc.					
<i>number of ISINs</i>	-	622	644	655	693
<i>nominal amount (DKK billions)</i>	78	89	110	141	185
<i>market value (DKK billions)</i>	-	-	-	737	954
<i>number of share units (billions)</i>	-	1.7	2.1	2.4	3.1
Bonds					
<i>number of ISINs</i>	-	2,431	2,442	2,388	2,372
<i>nominal amount (DKK billions)</i>	1,627	1,710	1,785	1,823	1,845
<i>market value (DKK billions)</i>	-	-	-	2,088	2,012
<i>number of bond units (billions)</i>	-	1.9	2.4	2.3	1.9
Number of accounts (millions)	2.5	2.5	2.6	2.5	2.5
Number of account holdings (millions)	4.5	4.2	4.4	4.5	4.8

**Table 15b****Netting ratio in clearing systems**

	1995	1996	1997	1998	1999
Netting ratio for cash over the year	-	-	-	-	-
Netting ratio for securities over the year	-	-	-	-	-

**Table 16****Participation in SWIFT by domestic institutions**

	1995	1996	1997	1998	1999
SWIFT users	36	39	43	48	48
<i>of which:</i>					
<i>members</i>	31	33	34	36	21
<i>sub-members</i>	5	6	8	9	9
<i>participants</i>	-	-	1	3	18
Memorandum item:					
Total SWIFT worldwide	5,229	5,632	6,165	6,557	6,797
<i>of which:</i>					
<i>members</i>	2,259	2,874	2,969	3,052	2,214
<i>sub-members</i>	2,259	2,404	2,590	2,720	2,763
<i>participants</i>	277	354	606	785	1,820

**Table 17****SWIFT message flows to/from domestic users**

	1995	1996	1997	1998	1999
Total messages sent	7,180,779	7,797,385	8,664,841	9,961,742	11,402,262
<i>of which:</i>					
<i>category I</i>	2,359,033	2,578,542	2,910,867	3,348,400	3,882,765
<i>category II</i>	2,118,840	2,234,460	2,436,291	2,689,158	2,778,597
<i>sent to/received from</i>					
<i>domestic users</i>	1,053,617	1,132,180	1,226,964	1,503,964	1,988,750
Total messages received	6,397,247	6,929,831	7,892,844	9,130,548	10,871,940
<i>of which:</i>					
<i>category I</i>	2,062,300	2,242,872	2,457,573	2,729,086	2,997,764
<i>category II</i>	1,400,163	1,511,502	1,583,669	1,824,054	2,140,736
Memorandum item:					
Global SWIFT traffic	582,192,512	687,785,294	812,117,556	937,039,995	1,058,836,425

*Definitions:*

- *Sub-members: domestic users sponsored by members abroad;*
- *Participants: users which are not SWIFT shareholders; their message traffic over the network is restricted;*
- *Category I: customer (funds) transfers;*
- *Category II: bank (funds) transfers.*



## Germany

**Table 1****Basic statistical data**

	1995	1996	1997	1998	1999
Population <sup>1)</sup> (thousands)	81,661	81,896	82,053	82,024	82,087
Gross domestic product (EUR billions)	1,801.7	1,833.9	1,879.4	1,942.6	1,979.5
Exchange rate vis-à-vis ECU/euro <sup>2)</sup>	1.87375	1.90954	1.96438	1.96910	1.95583

1) Average for the year.

2) Average for the year until 1998; irrevocable conversion rates were adopted with the introduction of the euro on 1 January 1999.

**Table 2****Settlement media used by non-banks**

(end of year)

	1995	1996	1997	EUR billions	
	1995	1996	1997	1998	1999
Banknotes and coins	121.4	126.2	126.3	124.0	130.3
Transferable deposits	297.0	346.0	353.4	409.4	420.4
<i>of which held by:</i>					
<i>households</i>	180.0	201.3	211.6	240.7	254.6
<i>corporate sector</i>	100.9	125.9	125.5	292.1	142.1
<i>other</i>	16.1	18.8	16.3	19.4	23.7
Narrow money supply (M1)	417.3	468.8	479.6	532.8	556.8
Outstanding value on electronic money schemes	-	.	0.04	0.06	0.05
<i>of which:</i>					
<i>on card-based products</i>	-	.	0.04	0.06	0.05
<i>on network-based products</i>	-	.	.	.	.

**Table 3****Settlement media used by deposit-taking institutions**

(end of year)

	1995	1996	1997	EUR billions	
	1995	1996	1997	1998	1999
Required reserves held at central bank	18.7	19.8	21.0	23.4	33.0
Free reserves held at central bank	0.4	0.4	0.4	0.3	0.3
Transferable deposits at other institutions	186.1	205.1	218.6	241.6	114.4

**Table 4****Banknotes and coins<sup>1)</sup>***(total value, end of year)*

	1995	1996	1997	DEM billions	
				1998	1999
Total banknotes issued	248.4	260.4	260.7	255.3	274.1
<i>of which:</i>					
DEM 1,000	81.1	86.6	88.5	86.6	93.5
DEM 500	26.1	27.8	27.7	26.5	27.8
DEM 200	10.8	10.1	9.3	8.4	8.0
DEM 100	95.9	100.1	99.5	98.2	106.4
DEM 50	21.1	21.9	21.6	21.4	23.0
DEM 20	8.1	8.5	8.6	8.7	9.5
DEM 10	5.0	5.1	5.2	5.2	5.6
DEM 5	0.3	0.3	0.3	0.3	0.3
Total coins issued	15.1	15.4	15.6	15.6	15.8
<i>of which:</i>					
DEM 10	2.3	2.4	2.5	2.6	2.6
DEM 5	5.6	5.7	5.7	5.7	5.7
DEM 2	2.2	2.2	2.3	2.3	2.4
DEM 1	2.3	2.3	2.3	2.3	2.3
DEM 0.50	1.1	1.1	1.1	1.1	1.1
DEM 0.10	1.0	1.0	1.0	1.0	1.1
DEM 0.05	0.3	0.3	0.3	0.3	0.3
DEM 0.02	0.1	0.1	0.2	0.1	0.2
DEM 0.01	0.2	0.2	0.2	0.2	0.2
Banknotes and coins held by credit institutions	26.0	28.9	29.2	28.4	35.2
Banknotes and coins in circulation outside credit institutions	237.5	246.8	247.0	242.6	254.8

1) Differences between sums and individual figures are due to rounding.

**Table 5****Institutional framework***(end of 1999)*

Categories	Number of institutions	Number of branches	Number of accounts (thousands) <sup>1)</sup>	Number of internet-linked accounts (thousands) <sup>4)</sup>	Value of accounts (EUR billions)
Credit institutions:					
Central bank <sup>2)</sup>	1	146	36	...	0.5
Commercial banks <sup>3)</sup>	364	21,207	20,887	5,100	170.2
Savings banks	591	18,322	38,864	3,100	161.4
Co-operative and rural banks	2,039	15,817	24,000	2,000	88.5
Total	2,995	55,492	83,787	10,200	420.5
<i>of which virtual institutions</i>	1	-	6	6	-
Branches of foreign banks	88	72	.	.	3.22

1) Partly estimated.

2) As a legal entity, the Deutsche Bundesbank comprises the Central Office (in Frankfurt am Main) and nine Land Central Banks, as well as 129 branches (in November 2000).

3) Including mortgage banks, installment sales with special functions and Deutsche Postbank AG.

4) Number of accounts relating to internet services (credit transfers, payment of bills, etc. carried out via the internet).

**Table 6****Payment card functions and accepting devices***(end of year)*

	1995	1996	1997	1998	1999
<b>Cash function</b>					
Cards with a cash function (millions)	-	-	-	-	98.6
Number of ATMs with a cash dispensing function	35,700	37,600	41,397	45,615	46,200
<i>open access</i>	35,700	37,600	41,397	45,615	46,200
<i>limited access</i>	-	-	-	-	-
Volume of transactions (millions)	1,100	1,251.8	-	1,405.5	1,513.2
<i>at ATMs with open access</i>	1,100	1,251.8	-	1,405.5	1,513.2
<i>at ATMs with limited access</i>	-	-	-	-	-
Value of transactions (EUR billions)	158.5	177.9	-	214.2	221.6
<i>at ATMs with open access</i>	158.5	177.9	-	214.2	221.6
<i>at ATMs with limited access</i>	-	-	-	-	-
Number of ATMs with a giro transfer function	-	-	-	-	-
<i>volume of transactions</i>	-	-	-	-	-
<i>value of transactions</i>	-	-	-	-	-
<b>Debit function</b>					
Cards with a debit function (millions)	67.4	71.8	76.0	81.1	90.2
<i>of which retailer cards</i>	4.8	4.9	5.0	5.0	8.0
Number of terminals	70,048	115,000	162,794	230,880	300,682
Volume of transactions (millions) <sup>1)</sup>	149.4	214.2	225.8	363.4	430.0
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (EUR millions) <sup>1)</sup>	10,481.5	16,719.2	14,827.5	28,939.1	34,051.0
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Credit function <sup>2)</sup></b>					
Cards with a credit function (millions)	11.8	13.0	14.3	15.3	16.4
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals (millions)	0.9	1.0	1.1	1.1	1.2
Volume of transactions (millions)	-	-	-	-	328.6
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (EUR billions)	27.2	30.0	32.1	33.8	36.0
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Electronic money function</b>					
Cards with an e-money function (millions)	-	22	35	60.7	60.7
Number of terminals accepting the card	-	1,000	50,000	60,000	59,732
Number of purchase transactions (millions)	-	0.2	4.2	13.6	20.7
Value of purchase transactions (EUR millions)	-	2.9	43.5	89.5	73.7
Number of loading transactions (millions)	-	...	1.6	2.4	3.1
Value of money loaded (EUR millions)	-	5.3	-	128.9	123.5
Float (EUR millions)	-	-	-	-	59.8

1) Only POS and POZ procedures.

2) Cards with a delayed debit function.

**Table 7****Number of payment cards in circulation***(end of year)*

	1995	1996	1997	1998	millions 1999
Total number of cards in circulation	79.14	85.35	90.20	96.35	106.61
<i>of which:</i>					
<i>cards with a combined debit, cash and e-money function</i>	-	-	-	60.7	60.7
<i>cards with a credit function</i>	11.8	13.1	14.3	15.3	16.4
<i>cards with a debit function issued by retailers</i>	4.8	4.9	5.0	5.0	8.0

**Table 8****Payment instructions handled by selected interbank funds transfer systems: volume of transactions <sup>1) 2)</sup>**

	1995	1996	1997	1998	millions 1999
<b>Retail payments</b>	<b>2,272.2</b>	<b>2,276.1</b>	<b>2,244.9</b>	<b>2,250.4</b>	<b>2,176.2</b>
Maschinell-optische Beleglesung (MAOBE) <sup>3)</sup>	115.3	77.9	27.7	11.1	-
<i>of which:</i>					
<i>collection items <sup>4)</sup></i>	26.7	20.2	16.8	11.1	-
<i>credit transfers <sup>5)</sup></i>	88.6	57.7	10.9	-	-
Retail Payment System (RPS) <sup>6)</sup>	2,156.9	2,198.1	2,217.2	2,239.3	2,176.2
<i>of which:</i>					
<i>collection items <sup>4)</sup></i>	1,499.1	1,473.3	1,469.9	1,499.6	1,398.0
<i>credit transfers</i>	657.8	724.8	747.3	739.7	778.2
<b>Large-value payments</b>	<b>33.1</b>	<b>30.0</b>	<b>33.9</b>	<b>36.1</b>	<b>28.1</b>
Gross-settlement procedures	13.6	10.3	11.2	13.5	16.0
<i>of which:</i>					
<i>Euro Link System (ELS) <sup>7)</sup></i>	5.5	7.2	10.6	13.5	16.0
<i>Platzüberweisungsverkehr <sup>5), 8)</sup></i>	8.1	3.1	0.6	-	-
Net settlement procedures	19.5	19.7	22.7	22.6	12.1
Konventionelle Abrechnung <sup>9), 10)</sup>	1.7	1.0	0.3	0.1	...
<i>of which:</i>					
<i>collection items (conventional)</i>	0.7	0.5	0.2	0.1	...
<i>local credit transfers (conventional) <sup>5)</sup></i>	1.0	0.5	0.1	-	-
Euro Access Frankfurt (EAF) <sup>11)</sup>	17.8	18.8	22.4	22.5	12.1
<b>Concentration ratio <sup>12)</sup></b>	-	-	-	-	-

1) The table contains both customer and interbank transactions.

2) This table does not include figures relating to IFTSs which are not operated by the Deutsche Bundesbank.

3) Machine-optical voucher reading, excluding payments (cheques, direct debits and credit transfers) submitted in a paper-based form which have been truncated and passed on in a paperless form by the bank.

4) Introduction of a general truncation obligation for all direct debits in 1993 and for cheques for amounts < DEM 5,000 (BSE cheques) in 1998. Cheques for amounts ≥ DEM 5,000 (GSE cheques) are truncated exclusively by the Bundesbank.

5) System closed due to the introduction of a general truncation obligation for all credit transfers in 1997.

6) Formerly DTA. Paperless exchange of data media, including payments submitted in a paper-based form which have been truncated and passed on in a paperless form by the bank (see footnote 3).

7) Formerly EIL-ZV (express electronic credit transfer system).

8) Express paper-based local credit transfer system.

9) Daily local clearing system.

10) Statistical recording changed in 1995: settled delivery envelopes (clearing items) are recorded instead of individual payments therein.

11) Formerly EAF2.

12) Market share of the five largest participants in each payment system, based on the total volume of transactions.

**Table 9****Payment instructions handled by selected interbank funds transfer systems: value of transactions<sup>1) 2)</sup>**

	EUR billions				
	1995	1996	1997	1998	1999
<b>Retail payments</b>	<b>2,402.8</b>	<b>2,366.5</b>	<b>2,321.5</b>	<b>2,267.2</b>	<b>2,241.0</b>
Maschinell-optische Beleglesung (MAOBE) <sup>3)</sup>	136.5	123.1	111.9	75.6	-
<i>of which:</i>					
<i>collection items<sup>4)</sup></i>	122.7	114.8	110.1	75.6	-
<i>credit transfers<sup>5)</sup></i>	13.8	8.3	1.8	-	-
Retail Payment System (RPS) <sup>6)</sup>	2,266.3	2,243.4	2,209.7	2,191.6	2,241.0
<i>of which:</i>					
<i>collection items<sup>4)</sup></i>	1,675.6	1,622.6	1,556.8	1,522.8	1,508.0
<i>credit transfers</i>	590.7	620.8	652.8	668.8	733.0
<b>Large-value payments</b>	<b>96,105.9</b>	<b>97,121.3</b>	<b>111,522.6</b>	<b>116,426.7</b>	<b>61,416.0</b>
Gross-settlement procedures	16,462.1	16,675.0	18,085.8	20,129.1	22,375.0
<i>of which:</i>					
<i>Euro Link System (ELS)<sup>7)</sup></i>	13,808.7	14,696.1	17,074.8	20,129.1	22,375.0
<i>Platzüberweisungsverkehr<sup>5) 8)</sup></i>	2,653.4	1,978.9	1,011.0	-	-
Net settlement procedures	79,643.8	80,446.3	93,436.8	96,297.7	39,041.0
Konventionelle Abrechnung <sup>9) 10)</sup>	3,774.5	2,009.3	551.1	44.5	...
<i>of which:</i>					
<i>collection items (conventional)</i>	342.5	317.4	140.7	44.5	...
<i>local credit transfers (conventional)<sup>5)</sup></i>	3,432.0	1,691.9	410.5	-	-
Euro Access Frankfurt (EAF) <sup>11)</sup>	75,869.3	78,437.0	92,885.7	96,253.2	39,041.0
<b>Concentration ratio<sup>12)</sup></b>	-	-	-	-	-

1) The table contains both customer and interbank transactions.

2) This table does not include figures relating to IFTSs which are not operated by the Deutsche Bundesbank.

3) Machine-optical voucher reading, excluding payments (cheques, direct debits and credit transfers) submitted in a paper-based form which have been truncated and passed on in a paperless form by the bank.

4) Introduction of a general truncation obligation for all direct debits in 1993 and for cheques for amounts < DEM 5,000 (BSE cheques) in 1998. Cheques for amounts ≥ DEM 5,000 (GSE cheques) are truncated exclusively by the Bundesbank.

5) System closed due to the introduction of a general truncation obligation for all credit transfers in 1997.

6) Formerly DTA. Paperless exchange of data media, including payments submitted in a paper-based form which have been truncated and passed on in a paperless form by the bank (see footnote 3).

7) Formerly EIL-ZV (express electronic credit transfer system).

8) Express paper-based local credit transfer system.

9) Daily local clearing system.

10) Statistical recording changed in 1995: settled delivery envelopes (clearing items) are recorded instead of individual payments therein.

11) Formerly EAF2.

12) Market share of the five largest participants in each payment system, based on the total value of transactions.



**Table 10**  
**Indicators of the use of various cashless payment instruments: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	millions 1999
Volume of transactions	11,566.7	11,990.1	12,807.6	13,631.2	14,635.8
Cheques	812.0	772.0	729.0	656.1	590.5
<i>of which:</i>					
<i>paper-based</i>	650.0	625.0	597.8	590.5	590.5
<i>electronic (via PC or other terminal)</i>					-
<i>electronic (via mobile phone)</i>					-
Payments by debit card <sup>2)</sup>	416.1	504.1	529.2	690.8	430.0
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit card <sup>2)</sup>	-	-	-	-	328.6
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	5,634.0	5,885.0	6,152.0	6,879.7	7,386.5
<i>of which:</i>					
<i>paper-based</i>	1,126.8	588.5	615.2	-	-
<i>electronic (via PC or other terminal)</i>	4,507.2	5,296.5	5,536.8	6,879.7	7,386.5
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	4,704.6	4,828.8	5,393.2	5,391.0	5,879.5
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	-	0.2	4.2	13.6	20.7
Network-based electronic money	-	-	-	-	...

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) Until 1998 payments by debit and credit cards together.

**Table I I****Indicators of the use of various cashless payment instruments: value of transactions <sup>1)</sup>**

	EUR billions				
	1995	1996	1997	1998	1999
Value of transactions	22,820.03	24,099.85	25,887.07	27,124.64	37,996.07
Cheques	2,323.31	2,114.19	2,047.72	1,945.36	1,653.56
<i>of which:</i>					
<i>paper-based</i>	464.66	634.26	819.09	972.68	1,653.56
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit card <sup>2)</sup>	33.54	41.87	41.77	57.52	34.05
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit card <sup>2)</sup>	27.19	30.02	32.11	33.78	36.04
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	18,088.48	19,099.82	20,534.50	21,428.70	29,455.29
<i>of which:</i>					
<i>paper-based</i>	8,049.37	5,729.95	4,106.90	-	-
<i>electronic (via PC or other terminal)</i>	10,039.11	13,369.87	16,427.60	21,428.70	29,455.29
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	2,374.70	2,843.96	3,263.06	3,692.96	6,817.06
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	-	...	...	0.09	0.07
Network-based electronic money	-	-	-	-	...

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) Until 1998 payments by debit and credit cards together.

**Table I2****Number of participants in trading, clearing and securities settlement systems***(end of 1999)*

Clearstream Banking Frankfurt	322
Banks	253
<i>of which:</i>	
<i>domestic</i>	241
<i>foreign</i>	12
Brokers/dealers	42
<i>of which:</i>	
<i>domestic</i>	35
<i>foreign</i>	7
Others	
CSDs, global and local custodians	17
<i>domestic</i>	5
<i>foreign</i>	12
Central banks, government institutions	10
<i>domestic</i>	10
<i>foreign</i>	-

**Table I3****Instructions handled by trading platforms, clearing houses and securities settlement systems***(volume of transactions)*

	1995	1996	1997	1998	1999
<b>Clearstream Banking Frankfurt</b>					
Volume of trades cleared (millions)	23.4	20.6	31.2	58.0	73.2

**Table I4****Instructions handled by trading platforms, clearing houses and securities settlement systems***(market value of transactions)*

	1995	1996	1997	1998	1999
<b>Clearstream Banking Frankfurt</b>					
Value of trades cleared (EUR billions)	6,073	8,201	9,638	12,853	14,400

**Table 15a****Outstanding securities***(end of year)*

	1995	1996	1997	1998	1999
<b>Clearstream Banking Frankfurt</b>					
Value of stocks under custody (EUR billions)	-	-	-	-	1,386.60
Value of other securities under custody (EUR billions)	-	-	-	-	4,122.80
Number of stocks under custody (millions)	-	-	-	-	71.50
Number of other securities under custody (millions)	-	-	-	-	94.90

**Table 15b****Netting ratio in clearing systems**

	1995	1996	1997	1998	1999
<b>Clearstream Banking Frankfurt</b>					
Netting ratio for cash over the year	-	-	-	-	-
Netting ratio for securities over the year	-	-	-	-	-

**Table 16****Participation in SWIFT by domestic institutions**

	1995	1996	1997	1998	1999
SWIFT users	253	253	262	268	264
<i>of which:</i>					
<i>members</i>	152	155	153	154	119
<i>sub-members</i>	97	94	101	104	102
<i>participants</i>	4	4	8	10	43
Memorandum item:					
Total SWIFT worldwide	5,229	5,632	6,165	6,557	6,797
<i>of which:</i>					
<i>members</i>	2,259	2,874	2,969	3,052	2,214
<i>sub-members</i>	2,259	2,404	2,590	2,720	2,763
<i>participants</i>	277	354	606	785	1,820

**Table 17**  
**SWIFT message flows to/from domestic users**

	1995	1996	1997	1998	1999
Total messages sent	43,824,742	47,803,674	55,873,558	61,963,751	45,808,989
<i>of which:</i>					
<i>category I</i>	15,580,557	16,493,249	17,731,609	19,351,531	10,057,882
<i>category II</i>	8,373,229	8,564,736	9,177,317	9,690,958	5,397,995
<i>sent to/received from</i>					
<i>domestic users</i>	6,734,317	6,834,054	7,396,209	7,572,070	9,275,820
Total messages received	56,505,445	59,246,442	66,287,028	72,099,434	37,434,987
<i>of which:</i>					
<i>category I</i>	17,759,489	18,627,409	20,146,525	21,958,781	9,207,639
<i>category II</i>	24,441,740	25,231,632	28,261,324	29,076,972	5,017,388
Memorandum item:					
Global SWIFT traffic	582,192,512	687,785,294	812,117,556	937,039,995	1,058,836,425

*Definitions*

- *Sub-members: domestic users sponsored by members abroad;*
- *Participants: users which are not SWIFT shareholders; their message traffic over the network is restricted;*
- *Category I: customer (funds) transfers;*
- *Category II: bank (funds) transfers.*

## Greece

**Table 1****Basic statistical data**

	1995	1996	1997	1998	1999
Population <sup>1)</sup> (thousands)	10,454	10,476	10,499	10,511	10,528
Gross domestic product (GRD billions)	26,883.5	29,697.7	32,752.2	35,676.6	38,147.2
Exchange rate vis-à-vis ECU/euro <sup>1)</sup>	302.989	305.546	309.355	330.731	325.760

1) Average for the year.

**Table 2****Settlement media used by non-banks**

(end of year)

	1995	1996	1997	1998	1999
				GRD billions	
Banknotes and coins	1,863.5	1,941.4	2,182.7	2,205.9	2,701.5
Transferable deposits <sup>1)</sup>	1,854.6	2,354.4	2,634.7	3,039.9	4,260.3
<i>of which held by:</i>					
<i>households</i>	492.5	598.6	690.7	823.2	-
<i>corporate sector</i>	478.2	628.8	697.5	1,078.9	-
<i>other</i> <sup>2)</sup>	883.9	1,127.0	1,246.5	1,137.8	-
Narrow money supply (M1)	3,718.1	4,295.8	4,817.4	5,245.8	6,961.8
Outstanding value on electronic money schemes	-	-	-	-	-
<i>of which:</i>					
<i>on card-based products</i>	-	-	-	-	-
<i>on network-based products</i>	-	-	-	-	-

1) Total sight deposits (in local currency).

2) Including non-bank financial institutions, public entities and public enterprises.

**Table 3****Settlement media used by deposit-taking institutions**

(end of year)

	1995	1996	1997	1998	1999
				GRD billions	
Required reserves held at central bank <sup>1)</sup>	1,231.9	1,460.5	1,818.7	2,214.3	2,599.3
<i>of which can be used for settlement</i>	-	-	-	-	-
Free reserves held at central bank	-	-	-	-	-
Transferable deposits at other institutions	280.1	367.8	607.5	471.6	881.1

1) Primary and secondary reserve requirements.

**Table 4****Banknotes and coins***(total value, end of year)*

	GRD millions				
	1995	1996	1997	1998	1999
Total banknotes issued	2,018,137	2,205,992	2,404,012	2,469,767	3,101,229
<i>of which:</i>					
GRD 10,000	358,018	576,867	1,063,054	1,374,178	2,070,070
GRD 5,000	1,522,079	1,480,441	1,184,457	942,710	868,344
GRD 1,000	100,503	106,771	110,104	103,977	111,334
GRD 500	26,034	28,457	29,569	30,131	31,943
GRD 200	-	1,985	5,529	7,409	8,063
GRD 100	9,889	9,706	9,376	9,632	9,614
GRD 50	1,614	1,765	1,923	1,730	1,861
Total coins issued	42,817	45,075	47,449	49,652	52,874
Banknotes and coins held by credit institutions	197,402	309,705	268,741	313,556	452,649
Banknotes and coins in circulation outside credit institutions	1,863,552	1,941,362	2,182,720	2,205,863	2,701,454

**Table 5****Institutional framework***(end of 1999)*

Categories	Number of institutions	Number of branches	Number of accounts (thousands) <sup>2)</sup>	Number of internet-linked accounts (thousands) <sup>3)</sup>	Value of accounts (GRD billions)
Central bank <sup>1)</sup>	1	95	2.1	-	16.5
Commercial banks	38	2,443	1556.7	-	4018.5
Shipping banks	1	1	-	-	-
Co-operative banks	13	38	3.9	-	8.9
Specialised credit institutions	4	39	19.9	-	232.2
Postal Savings Bank	1	131	-	-	-
Total	58	2,747	1,583	-	4276.8
Branches of foreign banks	22	130	70.5	-	289.7
<i>of which EU-based</i>	13	57	31.2	-	138.8

1) There are 27 full branches and 67 agencies of the Bank of Greece (which offer payment services only).

2) Including head offices.

3) Number of accounts relating to internet services (credit transfers, payment of bills, etc. carried out via the internet).

**Table 6****Payment card functions and accepting devices***(end of year)*

	1995	1996	1997	1998	1999
<b>Cash function</b>					
Cards with a cash function (thousands)	2,398	2,400	2,459	3,417	4,469
Number of ATMs with a cash dispensing function	1,350	1,936	2,190	2,168	3,054
<i>open access</i>	1,350	1,936	2,190	2,168	3,054
<i>limited access</i>	-	-	-	-	-
Volume of transactions (thousands)	40,720	58,605	62,536	78,524	95,336
<i>at ATMs with open access</i>	40,720	58,605	62,536	78,524	95,336
<i>at ATMs with limited access</i>	-	-	-	-	-
Value of transactions (GRD millions)	1,683,639	2,377,010	3,141,534	4,356,267	6,395,917
<i>at ATMs with open access</i>	1,683,639	2,377,010	3,141,534	4,356,267	6,395,917
<i>at ATMs with limited access</i>	-	-	-	-	-
Number of ATMs with a giro transfer function	-	-	-	-	-
<i>volume of transactions</i>	-	-	-	-	-
<i>value of transactions</i>	-	-	-	-	-
<b>Debit function</b>					
Cards with a debit function (thousands)	361	1,518	1,553	1,413	3,975
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals	11,316	18,812	29,719	55,318	74,705
Volume of transactions (thousands)	8,410	8,590	14,048	-	16,364
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (GRD millions)	163,125	195,632	321,293	476,909	606,558
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Credit function</b>					
Cards with a credit function (thousands)	1,058	1,060	1,526	1,513	2,014
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals	-	-	-	-	-
Volume of transactions	-	-	-	-	-
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions	-	-	-	-	-
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Electronic money function</b>					
Cards with an e-money function	-	-	-	-	-
Number of terminals accepting the card	-	-	-	-	-
Number of purchase transactions	-	-	-	-	-
Value of purchase transactions	-	-	-	-	-
Number of loading transactions	-	-	-	-	-
Value of money loaded	-	-	-	-	-
Float	-	-	-	-	-



**Table 7****Number of payment cards in circulation***(end of year)*

	1995	1996	1997	1998	1999
					thousands
Total number of cards in circulation	-	-	-	-	-
<i>of which:</i>					
<i>cards with a combined debit, cash and e-money function</i>	-	-	-	-	-
<i>cards with a credit function</i>	1,058	1,060	1,526	1,513	2,014
<i>cards with a debit function issued by retailers</i>	-	-	-	-	-

**Table 8****Payment instructions handled by selected interbank funds transfer systems: volume of transactions<sup>1)</sup>**

	1995	1996	1997	1998	1999
					thousands
Athens Clearing Office	10,847	8,801	7,477	6,071	5,488
<i>cheques in GRD and exchange</i>	10,796	8,747	7,426	6,021	5,450
<i>other (money market loan)</i>	51	54	51	50	38
DIAS SA	6,629	9,349	11,194	11,904	23,139
<i>cheques</i>	5,052	8,127	10,152	11,083	11,714
<i>eurocheques</i>	1,577	1,222	1,042	821	618
<i>DIASPAY</i>	-	-	-	-	10,800
<i>DIASTRANSFER</i>	-	-	-	-	7
<b>Concentration ratio<sup>2)</sup></b>					
Athens Clearing Office	-	-	-	-	53%
Cheques in GRD and exchange	-	-	-	-	53%
Other (Money Market Loan)	-	-	-	-	26%
DIAS SA	-	-	-	-	81%

1) The table contains both customer and interbank transactions.

2) Market share of the five largest participants in each payment system, based on the total volume of transactions.

**Table 9****Payment instructions handled by selected interbank funds transfer systems: value of transactions<sup>1)</sup>**

	GRD billions				
	1995	1996	1997	1998	1999
Athens Clearing Office	120,028.6	174,596.9	194,873.0	212,568.0	254,974
<i>cheques in GRD and exchange</i>	41,002.2	49,678.9	58,577.0	66,448.0	89,923
<i>other (money market loan)</i>	79,026.4	124,918.0	136,296.0	146,120.0	165,051
DIAS SA	3,739.9	6,969.7	9,713.0	11,379.4	14,916
<i>cheques</i>	3,677.3	6,920.9	9,672.0	11,344.0	12,980
<i>eurocheques</i>	62.6	48.8	41.0	35.4	27
<i>DIASPAY</i>	-	-	-	-	1,900
<i>DIASTRANSFER</i>	-	-	-	-	9
<b>Concentration ratio<sup>2)</sup></b>					
	1995	1996	1997	1998	1999
Athens Clearing Office	-	-	-	-	44%
Cheques in GRD and exchange	-	-	-	-	61%
Other (money market loan)	-	-	-	-	34%
DIAS SA	-	-	-	-	72%

1) The table contains both customer and interbank transactions.

2) Market share of the five largest participants in each payment system, based on the total value of transactions.

**Table 10**  
**Indicators of the use of various cashless payment instruments: volume of transactions<sup>1)</sup>**

	1995	1996	1997	1998	millions 1999
Volume of transactions					
Cheques	2.92	3.34	1.99	1.90	2.22
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit card	-	-	-	-	-
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit card	-	-	-	-	-
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	-	-	6.32	-	10.49
<i>of which:</i>					
<i>paper-based</i>	-	-	0.68	0.55	1.09
<i>electronic (via PC or other terminal)</i>	3.33	3.28	5.64	-	9.40
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	0.85	1.09	1.12	-	2.93
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	-	-	-	-	-
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

**Table I I****Indicators of the use of various cashless payment instruments: value of transactions<sup>1)</sup>**

	GRD billions				
	1995	1996	1997	1998	1999
Value of transactions					
Cheques	8,440	15,457	15,771	17,616	26,594
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit card	-	-	-	-	-
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit card	-	-	-	-	-
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	-	-	418,598	-	1,033,342
<i>of which:</i>					
<i>paper-based</i>	-	-	49,360	42,496	65,858
<i>electronic (via PC or other terminal)</i>	269,082	394,191	369,238	-	967,485
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	-	-	407	-	521
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	-	-	-	-	-
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

**Table 12****Number of participants in trading, clearing and securities settlement systems***(end of 1999)*

<b>HDAT</b>	<b>35</b>
Banks	33
<i>of which:</i>	
<i>domestic</i>	18
<i>foreign</i>	15
Special purpose credit institutions	2
<b>BOGS</b>	<b>93</b>
Banks	37
<i>of which:</i>	
<i>domestic</i>	18
<i>foreign</i>	19
Brokers/dealers	54
<i>of which:</i>	
<i>domestic</i>	54
<i>foreign</i>	-
Special purpose credit institutions	2
<b>ASE's CSD</b>	<b>127</b>
Banks	38
<i>of which:</i>	
<i>domestic</i>	-
<i>foreign</i>	-
Brokers/dealers	89
<i>of which:</i>	
<i>domestic</i>	-
<i>foreign</i>	-

**Table 13****Instructions handled by trading platforms, clearing houses and securities settlement systems***(volume of transactions)*

	1995	1996	1997	1998	1999
<b>HDAT</b>					
Volume of transactions	-	-	-	5,072	13,117
<b>Athens Stock Exchange (ASE)</b>					
Volume of transactions (in thousands)	-	-	-	-	8,114,120
<b>BOGS</b>					
Volume of settlement transactions	3,784	19,334	32,492	57,992	116,892
<i>of which primary market</i>	774	930	1,431	2,232	2,874
<b>ASE's CSD</b>					
Volume of transactions (in thousands)	-	1,052	3,747	7,480	22,908

**Table I 4****Instructions handled by trading platforms, clearing houses and securities settlement systems***(market value of transactions)*

	GRD billions				
	1995	1996	1997	1998	1999
<b>HDAT</b>					
Value of transactions	-	-	-	2,794	14,134
<b>Athens Stock Exchange (ASE)</b>					
Value of transactions	-	-	-	-	58,954,508
<b>BOGS</b>					
Value of settlement transactions	3,105	10,723	30,277	81,385	168,845
<i>of which primary market</i>	2,417	5,536	11,187	19,305	19,045
<b>ASE's CSD</b>					
Value of transactions	-	1,988	5,164	14,051	53,707

**Table I 5a****Outstanding securities***(end of year)*

	1995	1996	1997	1998	1999
<b>HDAT</b>					
Value of securities listed (GRD billions)	-	-	-	18,489	27,017
Number of securities listed	-	-	-	107	383
<b>Athens Stock Exchange</b>					
Value of stocks listed (GRD billions)	-	-	-	-	67,311
Value of other securities listed (GRD billions)	-	-	-	-	26,190
Number of stocks listed	-	-	-	-	297
Number of other securities listed	-	-	-	-	-
<b>BOGS</b>					
Value of securities issued (GRD billions)	1,710	5,571	12,311	21,191	28,356
Number of securities issued	36	90	126	149	180
<b>ASE's CSD</b>					
Value of securities listed (GRD billions)	-	-	-	-	-
Number of securities listed	-	-	-	-	-

**Table I 5b****Netting ratio in clearing systems**

	1995	1996	1997	1998	1999
<b>Athens Clearing Office</b>					
Netting ratio for cash over the year	-	-	-	-	32%
<b>DIAS SA</b>					
Netting ratio for cash over the year	-	-	-	-	19%

**Table 16**  
**Participation in SWIFT by domestic institutions**

	1995	1996	1997	1998	1999
SWIFT users	44	44	43	44	43
<i>of which:</i>					
<i>members</i>	24	23	22	22	18
<i>sub-members</i>	20	20	21	21	20
<i>participants</i>	-	-	-	1	5
Memorandum item:					
Total SWIFT worldwide	5,229	5,632	6,165	6,557	6,797
<i>of which:</i>					
<i>members</i>	2,259	2,874	2,969	3,052	2,214
<i>sub-members</i>	2,259	2,404	2,590	2,720	2,763
<i>participants</i>	277	354	606	785	1,820

**Table 17**  
**SWIFT message flows to/from domestic users**

	1995	1996	1997	1998	1999
Total messages sent	3,054,343	3,653,816	4,749,696	6,087,598	7,712,974
<i>of which:</i>					
<i>category I</i>	995,550	1,156,158	1,540,709	1,711,688	1,946,686
<i>category II</i>	1,099,905	1,279,116	1,625,045	2,032,025	2,114,493
<i>sent to/received</i>					
<i>from domestic users</i>	-	868,701	1,157,566	1,643,201	2,046,016
Total messages received	2,982,371	3,489,556	4,247,397	5,411,163	6,301,570
<i>of which:</i>					
<i>category I</i>	873,179	978,375	1,110,972	1,306,175	1,549,645
<i>category II</i>	526,311	700,031	1,030,760	1,584,059	1,929,463
Memorandum item:					
Global SWIFT traffic	603,575,374	687,785,294	812,117,556	937,039,995	1,058,836,425

*Definitions:*

- *Sub-members: domestic users sponsored by members abroad;*
- *Participants: users which are not SWIFT shareholders; their message traffic over the network is restricted;*
- *Category I: customer (funds) transfers;*
- *Category II: bank (funds) transfers.*

## Spain

**Table 1****Basic statistical data**

	1995	1996	1997	1998	1999
Population <sup>1)</sup> (thousands)	39,210	39,270	39,323	39,371	39,418
Gross domestic product (EUR billions)	437.8	464.3	493.2	526.2	563.1
Exchange rate vis-à-vis ECU/euro <sup>2)</sup>	163	160.748	165.887	167.184	166.386

1) Average for the year.

2) Average for the year until 1998; irrevocable conversion rates were adopted with the introduction of the euro on 1 January 1999.

**Table 2****Settlement media used by non-banks <sup>1)</sup>**

(end of year)

	1995	1996	1997	EUR billions	
	1995	1996	1997	1998	1999
Banknotes and coins	45	48	50	51	55
Transferable deposits	136	145	166	198	219
Narrow money supply (M1)	178	191	213	244	-
Outstanding value on electronic money schemes	-	0.0004	0.0009	0.01	0.02
<i>of which:</i>					
<i>on card-based products</i>	-	0.0004	0.0009	0.01	0.02
<i>on network-based products</i>	-	-	-	-	... <sup>2)</sup>

1) Including non-bank financial institutions.

2) Although there are no estimations, values are presumably negligible.

**Table 3****Settlement media used by deposit-taking institutions**

(end of year)

	1995	1996	1997	EUR billions	
	1995	1996	1997	1998	1999
Required reserves held at central bank	6.02	6.21	6.33	6.44	8.67
<i>of which can be used for settlement</i>	6.02	6.21	6.33	6.44	8.67
Free reserves held at central bank	0.08	0.06	0.06	0.07	0.05
Transferable deposits at other institutions	2.34	1.77	1.79	1.29	1.38



**Table 4****Banknotes and coins***(total value, end of year)*

	ESP billions				
	1995	1996	1997	1998	1999
Total banknotes issued	7,708	8,147	8,638	8,773	9,807
<i>of which:</i>					
ESP 10,000	4,003	4,314	4,684	4,887	5,569
ESP 5,000	3,093	3,206	3,297	3,206	3,450
ESP 2,000	354	378	407	434	526
ESP 1,000	253	246	246	246	262
Other	5	4	4	-	-
Total coins issued	360	371	354	382	405
<i>of which:</i>					
ESP 2000	28	33	37	39	41
ESP 500	93	96	101	106	111
ESP 200	21	19	14	16	15
ESP 100	115	119	124	135	146
ESP 50	11	11	6	6	6
ESP 25	44	46	39	43	45
ESP 10	3	4	4	4	4
ESP 5	25	26	16	19	22
ESP 2	0.1	0.1	-	-	-
ESP 1	7	7	2	2	2
Other	11	12	12	12	13
Banknotes and coins held by credit institutions	532	577	613	719	1,104
Banknotes and coins in circulation outside credit institutions	7,535	7,941	8,378	8,436	9,108

**Table 5****Institutional framework***(end of 1999)*

Categories	Number of institutions	Number of branches	Number of accounts <sup>1)</sup> (thousands)	Number of internet-linked accounts <sup>2),3)</sup>	Value of accounts (EUR billions)
Central bank	1	52	-	.	-
Commercial banks	144	16,884	27,414	.	100
Savings banks	50	18,342	39,369	.	105
Co-operative and rural banks	92	3,740	5,484	.	14
Post Office	-	-	-	.	-
Total	287	39,018	72,267	.	219
<i>of which virtual institutions</i>	-	-	-	.	-
Branches of foreign banks	52	125	54	.	1.2
<i>of which EU-based</i>	40	105	49	.	1.0

1) *The accounts of foreign branches of Spanish banks are included.*2) *Number of accounts relating to internet services (credit transfers, payment of bills, etc. carried out via the internet).*3) *Although there are no figures available, most credit institutions offer internet services to their customers.*

**Table 6****Payment card functions and accepting devices***(end of year)*

	1995	1996	1997	1998	1999
<b>Cash function</b> <sup>1), 2)</sup>					
Cards with a cash function (thousands)	31,753	33,189	35,770	39,385	43,476
Number of ATMs with a cash dispensing function	26,680	30,437	33,940	37,893	41,871
Volume of transactions (millions)	565	582	605	638	660
Value of transactions (EUR billions)	46	48	49	53	58
Number of ATMs with a giro transfer function <sup>3)</sup>	-	-	-	-	-
<i>volume of transactions (millions)</i>	-	-	-	-	-
<i>value of transactions (EUR billions)</i>	-	-	-	-	-
<b>Debit function</b> <sup>4)</sup>					
Cards with a debit function (thousands)	31,753	33,076	35,275	38,606	42,778
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals <sup>5)</sup>	481,280	575,325	656,325	722,498	745,065
Volume of transactions (millions)	161	156	183	212	257
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (EUR billions)	5.22	6.00	6.98	8.18	10.01
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Credit function</b> <sup>6)</sup>					
Cards with a credit function (thousands)	10,491	10,645	11,634	12,922	15,772
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals <sup>7)</sup>	481,280	575,325	656,325	722,498	745,065
Volume of transactions (millions)	149	138	165	189	219
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (EUR billions)	7.27	8.07	9.52	11.09	12.92
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Electronic money function</b>					
Cards with an e-money function (thousands)	-	1,344	3,502	5,691	8,089
Number of terminals accepting the card	-	48,524	77,092	99,335	131,702
Number of purchase transactions (millions)	-	0.05	1.92	2.23	2.02
Value of purchase transactions (EUR millions)	-	0.23	6.02	6.22	5.71
Number of loading transactions (millions)	-	0.15	1.11	1.38	1.27
Value of money loaded (EUR millions)	-	2.18	17.72	22.48	21.54
Float (EUR millions)	-	0.42	0.88	10.28	15.06

1) *Cash operations at ATMs initiated by any kind of card.*2) *The number of limited access ATMs in Spain is negligible.*3) *In most cases, the possibility of making transfers at an ATM depends on the credit institution, not on the card network.*4) *Volume and value of transactions initiated at EFTPOS terminals with debit cards.*5) *EFTPOS terminals accepting debit cards.*6) *Volume and value of transactions initiated at EFTPOS terminals with credit cards.*7) *EFTPOS terminals accepting credit cards.*

**Table 7****Number of payment cards in circulation <sup>1)</sup>***(end of year)*

	1995	1996	1997	1998	1999
					thousands
Total number of cards in circulation	31,753	33,511	36,379	40,380	45,181
<i>of which:</i>					
<i>cards with a credit function</i>	10,491	10,645	11,634	12,922	15,772
<i>cards with a combined credit &amp; debit function</i>	31,753	33,076	35,275	38,606	42,778
<i>cards with a cash function</i>	31,753	33,189	35,770	39,385	43,476
<i>cards with an e-money function</i>	-	1,344	3,502	5,691	8,089

1) The figures given in this table are estimations based on the information provided by the card networks.

**Table 8****Payment instructions handled by selected interbank funds transfer systems: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	millions 1999
<b>Clearing house <sup>2)</sup></b>	<b>63.8</b>	<b>15.5</b>	<b>2.1</b>	<b>2.2</b>	<b>1.1</b>
Retail payments <sup>3)</sup>	61.9	13.5	-	-	-
<i>cheques</i>	8.5	1.6	-	-	-
<i>paper-based credit transfers</i>	-	-	-	-	-
<i>direct debits</i>	17.9	1.5	-	-	-
<i>bills of exchange</i>	35.5	10.4	-	-	-
Large-value payments	1.92	2.04	2.10	2.20	1.10
<i>foreign exchange transactions <sup>4)</sup></i>	0.13	0.10	0.10	0.10	0.05
<i>cross-border transfers <sup>5)</sup></i>	1.79	1.90	2.00	2.10	1.06
<b>SNCE</b>	<b>582.7</b>	<b>663.9</b>	<b>735.8</b>	<b>789.9</b>	<b>861.9</b>
Computer link	194.7	237.2	522.6	677.7	853.1
<i>cheques</i>	124.8	129.1	128.3	131.4	139.7
<i>credit transfers</i>	69.9	81.3	96.1	121.6	150.3
<i>direct debits</i>	-	26.5	296.0	379.4	481.4
<i>petrol cheques</i>	-	-	-	-	17.0
<i>bills of exchange</i>	-	0.3	2.2	45.3	64.7
Magnetic tape	388.0	426.7	213.2	112.2	8.8
<i>cheques</i>	16.9	16.1	14.5	11.3	0.9
<i>credit transfers</i>	18.8	20.3	20.2	11.2	0.6
<i>direct debits</i>	269.6	291.3	76.5	40.5	3.9
<i>petrol cheques</i>	20.1	19.0	21.7	18.8	2.1
<i>bills of exchange</i>	62.6	80.0	80.3	30.4	1.3
<b>SLBE <sup>6)</sup></b>	<b>0.86</b>	<b>1.13</b>	<b>1.38</b>	<b>2.21</b>	<b>2.70</b>
Interbank loans market	0.25	0.26	0.24	0.19	0.13
Book-entry debt market	0.59	0.69	0.69	0.70	0.60
Cross-border bank transfers	-	-	-	-	0.57
Domestic interbank transfers	0.02	0.17	0.45	0.65	0.77
Others	-	-	-	0.67	0.63
<b>Concentration ratio <sup>7)</sup></b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
Clearing house	-	-	58.80%	57.01%	51.44%
SNCE	53.41%	55.35%	52.78%	58.45%	63.24%
SLBE	-	-	-	-	-

1) The table contains both customer and interbank transactions.

2) The large-value net settlement service performed at the Madrid Clearing House is called SPI (Servicio Español de Pagos Interbancarios).

3) From January 1997 onwards, retail payments are processed entirely through the SNCE system.

4) Peseta leg of foreign exchange transactions.

5) Large-value transfers from/to non-residents denominated in pesetas.

6) Due to the changes in the system, a new source of data has been used since 1998 and the concept "Others", has been added.

7) Market share of the five largest participants in each payment system, based on the total volume of transactions.

<b>Table 9</b>					
<b>Payment instructions handled by selected interbank funds transfer systems: value of transactions <sup>1)</sup></b>					
	EUR billions				
	1995	1996	1997	1998	1999
<b>Clearing house <sup>2)</sup></b>	<b>7,579</b>	<b>9,067</b>	<b>9,874</b>	<b>9,926</b>	<b>939</b>
Retail payments <sup>3)</sup>	137.6	46.6	-	-	-
<i>cheques</i>	32.9	8.2	-	-	-
<i>paper-based credit transfers</i>	-	-	-	-	-
<i>direct debits</i>	9.2	1.6	-	-	-
<i>bills of exchange</i>	95.5	36.8	-	-	-
Large-value payments	7,441	9,021	9,874	9,926	939
<i>foreign exchange transactions <sup>4)</sup></i>	1,112	1,064	968	551	186
<i>cross-border transfers <sup>5)</sup></i>	6,329	7,957	8,906	9,375	753
<b>SNCE</b>	<b>646.8</b>	<b>775.1</b>	<b>899.1</b>	<b>1,006</b>	<b>1,108</b>
Computer link	412.3	466.8	598.4	840.2	1,099
<i>cheques</i>	313.2	341.3	376.3	435.7	498.8
<i>credit transfers</i>	99.2	117.8	144.7	218.9	325.9
<i>direct debits</i>	-	6.7	69.1	102.8	137.3
<i>petrol cheques</i>	-	-	-	-	0.4
<i>bills of exchange</i>	-	1.1	8.3	82.8	136.5
Magnetic tape	234.5	308.3	300.7	165.8	9.6
<i>cheques</i>	68.1	65.3	68.6	51.4	3.3
<i>credit transfers</i>	66.6	76.9	81.5	46.8	2.4
<i>direct debits</i>	50.3	61.5	20.4	9.6	0.9
<i>petrol cheques</i>	0.3	0.3	0.5	0.5	0.04
<i>bills of exchange</i>	49.2	104.4	129.6	57.4	3.0
<b>SLBE <sup>6)</sup></b>	<b>14,748</b>	<b>18,776</b>	<b>20,001</b>	<b>32,525</b>	<b>35,227</b>
Interbank loans market	4,583	5,573	5,857	5,545	4,109
Book-entry debt market	9,910	12,128	12,630	21,528	18,815
Cross-border bank transfers	-	-	-	-	7,720
Domestic interbank transfers	255.0	1,075	1,514	2,038	2,401
Others	-	-	-	3,414	2,181
<b>Concentration ratio <sup>7)</sup></b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
Clearing house	-	-	65.00%	62.06%	59.54%
SNCE	55.40%	55.46%	55.71%	54.94%	58.36%
SLBE	-	-	-	-	-

1) The table contains both customer and interbank transactions.

2) The large-value net settlement service performed at the Madrid Clearing House is called SPI (Servicio Español de Pagos Interbancarios).

3) From January 1997 onwards, retail payments are processed entirely through the SNCE system.

4) Peseta leg of foreign exchange transactions.

5) Large-value transfers from/to non-residents denominated in pesetas.

6) Due to the changes in the system, a new source of data has been used since 1998 and the concept "Others" has been added.

7) Market share of the five largest participants in each payment system, based on the total value of transactions.

**Table 10****Indicators of the use of various cashless payment instruments: volume of transactions** <sup>1), 2)</sup>

	1995	1996	1997	1998	millions 1999
Volume of transactions	1,370.1	1,398.0	1,556.1	1,712.9	1,962.1
Cheques	222.8	204.9	216.8	220.5	209.4
<i>of which:</i>					
<i>paper-based</i>	222.8	204.9	216.8	220.5	209.4
<i>electronic (via PC or other terminal)</i>	...	...	...	...	...
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Payments by debit card	161.2	155.5	183.1	212.3	256.9
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	161.2	155.5	183.1	212.3	256.9
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Payments by credit card	149.3	138.1	164.7	189.4	219.0
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	3.7
<i>electronic (via PC or other terminal)</i>	-	-	-	-	215.3
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Credit transfers	204.7	228.4	236.4	251.4	283.8
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	51.7
<i>electronic (via PC or other terminal)</i>	-	-	-	-	232.1
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Direct debits	632.1	671.0	753.2	837.1	991.0
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	20.8
<i>electronic (via PC or other terminal)</i>	-	-	-	-	970.2
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Card-based electronic money	-	0.1	1.9	2.2	2.0
Network-based electronic money	-	-	-	-	...

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) All figures in this table have been estimated based on a survey carried out with a small number of credit institutions.

<b>Table I I</b>					
<b>Indicators of the use of various cashless payment instruments: value of transactions<sup>1), 2)</sup></b>					
	EUR billions				
	1995	1996	1997	1998	1999
Value of transactions	1,681	1,884	1,960	1,726	1,871
Cheques	631.3	590.5	688.0	726.1	723.2
<i>of which:</i>					
<i>paper-based</i>	631.3	590.5	688.0	726.1	723.2
<i>electronic (via PC or other terminal)</i>	...	...	...	...	...
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Payments by debit card	5.2	6.0	7.0	8.2	10.0
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	5.2	6.0	7.0	8.2	10.0
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Payments by credit card	7.3	8.1	9.5	11.1	12.9
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	0.6
<i>electronic (via PC or other terminal)</i>	-	-	-	-	12.3
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Credit transfers	908.6	1,145.2	1,089.7	797.0	883.0
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	135.3
<i>electronic (via PC or other terminal)</i>	-	-	-	-	747.7
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Direct debits	128.6	134.3	165.7	183.4	241.6
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	22.5
<i>electronic (via PC or other terminal)</i>	-	-	-	-	219.1
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Card-based electronic money	-	0.0002	0.01	0.01	0.01
Network-based electronic money	-	-	-	-	...

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) All figures in this table have been estimated based on a survey carried out with a small number of credit institutions.

<b>Table I 2</b>	
<b>Number of participants in trading, clearing and securities settlement systems</b>	
<i>(end of 1999)</i>	
Trading platforms	Participants
<b>Stock Exchange (includes the four exchanges)</b>	<b>59</b>
Banks	-
<i>of which:</i>	
<i>domestic</i>	-
<i>foreign</i>	-
Brokers/dealers	59
<i>of which:</i>	
<i>domestic</i>	59
<i>foreign</i>	-
<b>INFOMEDAS</b>	<b>31</b>
Banks	21
<i>of which:</i>	
<i>domestic</i>	18
<i>foreign</i>	3
Brokers/dealers	10
<i>of which:</i>	
<i>domestic</i>	1
<i>foreign</i>	9
Others	-

	Settling securities	Holding securities accounts on behalf of customers	Settling cash directly in CB accounts
<b>CADE</b>	<b>253</b>	<b>103</b>	<b>246</b>
Banks	188	75	188
<i>of which:</i>			
<i>domestic</i>	156	64	156
<i>foreign</i>	32	11	32
Brokers/dealers	33	27	42
<i>of which:</i>			
<i>domestic</i>	23	26	32
<i>foreign</i>	10	1	10
Others:	32	1	16
Securities settlement systems (DBC and SICOVAM)	2	0	2
Central banks of the ESCB	16	0	0
Other financial institutions	14	1	14
<b>SCLV</b>	<b>107</b>	<b>107</b>	<b>53</b>
Banks	46	46	43
<i>of which:</i>			
<i>domestic</i>	40	40	37
<i>foreign</i>	6	6	6
Brokers/dealers	60	60	10
<i>of which:</i>			
<i>domestic</i>	60	60	10
<i>foreign</i>	-	-	-
Others:	1	1	0
Securities settlement systems (Monte Titoli)	1	1	0
<b>SCLV AIAF (formerly Espaclear)</b>	<b>87</b>	<b>87</b>	<b>65</b>
Banks	64	64	55
<i>of which:</i>			
<i>domestic</i>	58	58	49
<i>foreign</i>	6	6	6
Brokers/dealers	23	23	10
<i>of which:</i>			
<i>domestic</i>	23	23	10
<i>foreign</i>	-	-	-



**Table I3****Instructions handled by trading platforms, clearing houses and securities settlement systems***(volume of transactions)*

	1995	1996	1997	1998	millions 1999
<b>Trading platforms</b>					
<b>Stock exchange</b>	<b>2.69</b>	<b>3.22</b>	<b>6.56</b>	<b>11.52</b>	<b>11.00</b>
Shares (SIBE)	2.69	3.22	6.56	11.52	11.00
Bonds	.	.	.	.	.
<b>INFOMEDAS</b>	<b>0.05</b>	<b>0.08</b>	<b>0.06</b>	<b>0.06</b>	<b>0.04</b>
Government bonds	0.05	0.08	0.06	0.06	0.04
<b>Securities settlement systems</b>					
<b>CADE</b>	<b>2.10</b>	<b>2.39</b>	<b>2.55</b>	<b>2.76</b>	<b>2.36</b>
Government securities	2.00	2.31	2.49	2.71	2.33
<i>of which futures and options</i>	<i>0.06</i>	<i>0.08</i>	<i>0.06</i>	<i>0.05</i>	<i>0.05</i>
CDs issued by the Banco de España	0.10	0.08	0.06	0.05	0.03
<b>SCLV</b>	<b>4.10</b>	<b>5.24</b>	<b>6.53</b>	<b>19.26</b>	<b>16.11</b>
Bonds	0.10	0.18	0.21	0.74	0.10
Shares	4.00	5.06	6.32	18.52	16.01
<i>of which futures and options</i>	<i>0.09</i>	<i>0.13</i>	<i>0.14</i>	<i>0.66</i>	<i>1.06</i>
<b>SCLV AIAF (formerly Espaclear)<sup>1)</sup></b>	<b>8.90</b>	<b>14.60</b>	<b>23.00</b>	<b>27.20</b>	<b>20.68</b>
Bonds	6.90	12.60	19.30	21.20	17.02
Commercial paper	2.00	2.00	3.70	6.00	3.65

1) Figures for SCLV AIAF are in thousands.

**Table I4****Instructions handled by trading platforms, clearing houses and securities settlement systems***(market value of transactions)*

	1995	1996	1997	1998	EUR billions 1999
<b>Trading platforms</b>					
<b>Stock exchange</b>	<b>72.1</b>	<b>134.2</b>	<b>185.2</b>	<b>269.7</b>	<b>287.7</b>
Shares (SIBE)	46.4	75.9	160.9	267.8	286.0
Bonds	25.7	58.3	24.3	1.8	1.7
<b>INFOMEDAS</b>	<b>211.7</b>	<b>292.7</b>	<b>234.6</b>	<b>216.4</b>	<b>193.2</b>
Government bonds	211.7	292.7	234.6	216.4	193.2
<b>Securities settlement systems</b>					
<b>CADE</b>	<b>12,468.8</b>	<b>17,920.6</b>	<b>19,081.1</b>	<b>31,555.0</b>	<b>45,558.8</b>
Government securities	11,057.0	16,543.6	17,652.9	30,736.3	45,161.8
<i>of which futures and options</i>	<i>3.6</i>	<i>4.7</i>	<i>3.8</i>	<i>3.1</i>	<i>4.9</i>
CDs issued by the Banco de España	1,411.9	1,377.0	1,428.2	818.8	397.1
<b>SCLV</b>	<b>105.1</b>	<b>160.7</b>	<b>165.7</b>	<b>262.3</b>	<b>540.9</b>
Bonds	10.3	11.7	12.8	1.6	4.8
Shares	94.8	148.9	153.0	260.7	536.1
<i>of which futures and options</i>	<i>0.1</i>	<i>0.2</i>	<i>0.3</i>	<i>0.9</i>	<i>1.7</i>
<b>SCLV AIAF (formerly Espaclear)</b>	<b>11.5</b>	<b>25.9</b>	<b>21.2</b>	<b>49.5</b>	<b>34.0</b>
Bonds	9.6	21.2	17.8	38.6	28.0
Commercial paper	1.9	4.7	3.4	10.9	6.0

**Table 15a****Outstanding securities***(end of year)*

	EUR billions				
	1995	1996	1997	1998	1999
<b>Trading platforms</b>					
<b>Stock exchange</b>	<b>158.9</b>	<b>209.8</b>	<b>286.3</b>	<b>359.6</b>	<b>440.7</b>
Shares (capitalisation, market value)	137.6	189.8	266.0	342.8	425.6
Bonds (capitalisation, market value)	21.2	20.0	20.2	16.8	15.1
<b>INFOMEDAS<sup>1)</sup></b>	-	-	-	-	-
<b>Securities settlement systems</b> (nominal values)					
<b>CADE</b>	<b>205.1</b>	<b>233.1</b>	<b>246.9</b>	<b>251.8</b>	<b>279.7</b>
Value of public debt securities (ESP billions)	191.1	221.5	237.8	245.4	276.4
Value of CDs issued by the Banco de España (ESP billions)	14.0	11.7	9.1	6.3	3.3
<b>SCLV</b>	<b>44.1</b>	<b>44.8</b>	<b>46.7</b>	<b>50.1</b>	<b>108.0</b>
Value of shares	26.3	17.5	17.8	15.5	42.4
Value of bonds	17.8	27.3	28.9	34.7	65.6
<b>SCLV AIAF (formerly Espaclear)</b>	<b>21.4</b>	<b>21.1</b>	<b>26.9</b>	<b>29.9</b>	<b>17.4</b>
Value of bonds	16.9	18.7	23.9	23.3	14.4
Value of short-term instruments	4.5	2.3	3.0	6.6	3.1

1) There is no data as it is a decentralised market.

**Table 15b****Netting ratio in clearing systems**

	1995	1996	1997	1998	1999
Netting ratio for cash over the year	-	-	-	-	-
Netting ratio for securities over the year	-	-	-	-	-

**Table 16****Participation in SWIFT by domestic institutions**

	1995	1996	1997	1998	1999
SWIFT users	119	114	115	115	114
<i>of which:</i>					
<i>members</i>	54	54	53	53	41
<i>sub-members</i>	64	58	60	58	60
<i>participants</i>	1	4	2	4	13
Memorandum item:					
Total SWIFT worldwide	5,229	5,632	6,165	6,557	6,797
<i>of which:</i>					
<i>members</i>	2,259	2,874	2,969	3,052	2,214
<i>sub-members</i>	2,259	2,404	2,590	2,720	2,763
<i>participants</i>	277	354	606	785	1,820

**Table 17****SWIFT message flows to/from domestic users**

	1995	1996	1997	1998	1999
Total messages sent	13,927,485	15,716,791	17,723,342	20,494,319	20,917,032
<i>of which:</i>					
<i>category I</i>	3,151,216	3,488,406	3,961,209	4,934,156	5,805,158
<i>category II</i>	4,458,351	4,724,488	5,127,961	5,299,941	3,584,165
<i>sent to/received from</i>					
<i>domestic users</i>	-	3,842,649	4,195,726	4,149,673	2,520,076
Total messages received	13,528,503	15,041,769	17,485,986	19,309,880	17,444,352
<i>of which:</i>					
<i>category I</i>	3,334,738	3,710,237	4,235,230	4,891,081	5,617,343
<i>category II</i>	4,594,871	4,979,247	5,271,626	5,363,135	2,678,113
Memorandum item:					
Global SWIFT traffic	603,575,374	687,785,294	812,117,556	937,039,995	1,058,836,425

*Definitions*

- *Sub-members: domestic users sponsored by members abroad;*
- *Participants: users which are not SWIFT shareholders; their message traffic over the network is restricted;*
- *Category I: customer (funds) transfers;*
- *Category II: bank (funds) transfers.*

## France

**Table 1****Basic statistical data**

	1995	1996	1997	1998	1999
Population <sup>1)</sup> (thousands)	59,622.4	59,888.3	60,150.7	60,404.7	60,656.2
Gross domestic product (EUR billions)	1,181.8	1,212.2	1,251.2	1,301.4	1,344.4
Exchange rate vis-à-vis ECU/euro <sup>2)</sup>	6.5251	6.4930	6.6126	6.6014	6.55957

1) Average for the year.

2) Average for the year until 1998; irrevocable conversion rates were adopted with the introduction of the euro on 1 January 1999.

**Table 2****Settlement media used by non-banks**

(end of year)

	1995	1996	1997	EUR billions	
	1995	1996	1997	1998	1999
Banknotes and coins	39.0	39.3	39.7	40.4	45.1
Overnight deposits <sup>1)</sup>	248.8	250.2	272.2	280.3	308.9
<i>of which held by:</i>					
<i>households</i>	136.9	133.0	136.6	140.3	160.3
<i>corporate sector</i>	72.9	75.8	83.3	87.3	93.5
<i>other</i>	38.9	41.3	52.3	52.7	55.2
Narrow money supply (M1) <sup>2)</sup>	271.7	292.8	294.4	317.1	325.3
Memorandum item:					
Outstanding value on electronic money schemes	-	-	-	-	-
<i>of which:</i>					
<i>on card-based products</i>	-	-	-	-	-
<i>on network-based products</i>	-	-	-	-	-

1) Excluding deposits in foreign currencies.

2) Narrow money supply (M1): coins, French franc-denominated sight deposits held by non-banks (French overseas territories excluded).

**Table 3****Settlement media used by deposit-taking institutions**

(end of year)

	1995	1996	1997	EUR billions	
	1995	1996	1997	1998	1999
Required reserves held at central bank <sup>1)</sup>	0.9	1.0	0.8	4.2	18.1
<i>of which can be used for settlement</i>	-	-	-	-	-
Free reserves held at central bank	0.2	0.2	0.4	0.7	0.2
Transferable deposits at other institutions <sup>2)</sup>	518.7	549.9	593.5	619.9	627.9
Memorandum item:					
Broad money aggregate	841.2	818.2	861.1	870.8	946.5

1) December monthly average.

2) Time deposits with an initial maturity of up to two years and deposits redeemable at notice with an initial maturity of up to three months.

**Table 4****Banknotes and coins***(total value, end of year)*

	FRF billions				
	1995	1996	1997	1998	1999
Total banknotes issued	268.9	270.4	273.0	277.2	303.4
<i>of which:</i>					
FRF 500	124.3	129.2	133.4	143.2	154.5
FRF 200	87.3	85.8	85.2	84.1	96.1
FRF 100	49.8	48.3	47.1	42.6	45.2
FRF 50	6.5	6.1	6.3	6.3	6.6
FRF 20	1.0	1.0	1.0	1.0	1.0
Total coins issued	18.2	18.5	19.0	19.4	20.0
Banknotes and coins held by credit institutions	17.3	18.1	20.0	22.6	27.6
Banknotes and coins in circulation outside credit institutions	268.1	269.2	270.4	272.3	295.7
Memorandum item:					
Banknotes held in French overseas territories	14.3	12.9	11.3	-	-

**Table 5****Institutional framework***(end of 1999)*

Categories	Number of institutions	Number of branches	Number of accounts (thousands)	Number of internet-linked accounts <sup>1)</sup>	Value of accounts (EUR billions)
Central bank	1	212	81	-	0.8
Commercial banks	342	9,799	19,759	-	104.7
Savings banks	34	4,258	10,059	-	11.5
Mutual or co-operative banks	121	10,793	25,298	-	72.7
Municipal credit banks	21	82	77	-	.
Financial companies	601	-	-	-	.
Specialised financial institutions	24	-	-	-	.
Investment firms	528	-	-	-	.
Post Office	1	16,926	10,095	-	27.3
Treasury	1	3,970	820	-	34.1
Total	1,674 <sup>2)</sup>	46,040	66,189	-	251.1
<i>of which virtual institutions</i>	-	-	-	-	-
Branches of foreign banks	89	-	-	-	-
<i>of which EU-based</i>	56	-	-	-	-

1) Number of accounts relating to internet services (credit transfers, payment of bills, etc. carried out via the internet).

2) The apparent shift from 489 institutions at the end of 1998 to 1,674 at the end of 1999 is mainly the result of the inclusion in the table of the financial companies (601) and investment firms (528).

**Table 6****Payment card functions and accepting devices<sup>1)</sup>***(end of year)*

	1995	1996	1997	1998	1999
<b>Cash function</b>					
Cards with a cash function (thousands)	24,431	27,218	30,061	33,861	37,563
Number of ATMs with a cash dispensing function	22,852	24,531	27,077	29,407	32,445
<i>open access</i>	6,822	14,473	18,368	21,440	24,808
<i>limited access</i>	16,030	10,058	8,709	7,967	7,637
Volume of transactions (millions)	718	766	835	906	1,026
<i>at ATMs with open access</i>	.	.	.	.	.
<i>at ATMs with limited access</i>	.	.	.	.	.
Value of transactions (EUR billions)	43	46	50	53	63
<i>at ATMs with open access</i>	.	.	.	.	.
<i>at ATMs with limited access</i>	.	.	.	.	.
Number of ATMs with a giro transfer function	...	...	...	...	...
<i>volume of transactions</i>	...	...	...	...	...
<i>value of transactions</i>	...	...	...	...	...
<b>Debit function</b>					
Cards with a debit function (thousands)	23,617	30,268	27,803	33,861	33,499
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals	652,866	662,950	680,413	723,388	799,530
Volume of transactions (millions) <sup>2)</sup>	1,889	2,103	2,334	2,621	2,950
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (EUR billions) <sup>2)</sup>	92	102	112	125	137
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Credit function</b>					
Cards with a credit function (thousands)	654	735	880	1,038	1,220
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals	652,866	662,950	680,413	723,388	799,530
Volume of transactions	-	-	-	-	-
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (EUR billions)	-	-	-	-	-
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Electronic money function</b>					
Cards with an e-money function	-	-	-	-	-
Number of terminals accepting the card	-	-	-	-	-
Number of purchase transactions	-	-	-	-	-
Value of purchase transactions	-	-	-	-	-
Number of loading transactions	-	-	-	-	-
Value of money loaded (EUR billions)	-	-	-	-	-
Float (EUR billions)	-	-	-	-	-

1) The data refer to the activity within the Groupement des Cartes Bancaires network.

2) These data refer both to debit and credit functions.

**Table 7****Number of payment cards in circulation***(end of year)*

	1995	1996	1997	1998	1999
					thousands
Total number of cards in circulation	24,431	27,218	30,061	33,861	37,563
<i>of which:</i>					
<i>cards with a combined debit, cash and e-money function</i>		-	-	-	-
<i>cards with a credit function</i>	654	735	880	1,038	1,220
<i>cards with a debit function issued by retailers</i>		-	-	-	-

**Table 8****Payment instructions handled by selected interbank funds transfer systems: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	1999
					millions
Clearing houses <sup>2)</sup>	3,588.4	3,633.8	3,623.0	3,600.4	3,381.9
<i>Cheques</i>	3,582.1	3,630.3	3,620.7	3,599.2	3,381.9
<i>Credit transfers</i>	1.6	0.3	0.1	1.1	-
<i>Avals de trésorerie</i>	0.3	0.2	0.1	-	-
<i>Large-value credit transfers</i>	4.4	3.0	2.1	0.1	-
CREIC <sup>2), 3)</sup>	281.8	293.0	285.2	296.7	304.5
Système Interbancaire de Télécompensation (SIT) <sup>2)</sup>	2,590.5	3,940.2	4,919.7	5,410.8	5,913.8
<i>Credit transfers</i>	1,081.3	1,166.4	1,242.4	1,322.6	1,383.2
<i>LCR and paperless bills of exchange</i>	129.3	129.3	124.8	125.2	121.2
<i>Direct debits</i>	850.4	927.8	987.2	1,098.9	1,219.2
<i>Titres Interbancaires de Paiement</i>	91.1	114.4	122.6	129.7	131.6
<i>Telepayments</i>	0.2	0.2	0.2	0.3	0.4
<i>Card payments</i>	1.9	1,130.1	1,922.2	2,164.7	2,443.5
<i>ATM withdrawals</i>	436.3	472.0	520.3	569.4	614.6
Cartes Bancaires <sup>2), 4)</sup>	1,872.6	775.0	-	-	-
<i>ATM withdrawals</i>	7.7	10.5	-	-	-
<i>Card payments</i>	1,864.9	764.5	-	-	-
Banque de France <sup>5)</sup>	29.4	15.0	1.6	0.4	-
<i>Public Treasury transfers</i>	27.3	13.8	0.5	-	-
<i>Interbank credit transfers</i>	0.4	-	-	-	-
<i>Large-value credit transfers</i>	0.9	0.7	0.6	0.1	-
<i>Telegraphic credit transfers</i>	0.8	0.5	0.5	0.3	-
SAGITTAIRE <sup>5)</sup>	4.5	4.7	4.7	1.3	-
TBF (domestic)	-	-	0.1	0.6	1.4
PNS	-	-	0.5	5.5	5.2
<b>Concentration ratio TBF (domestic) <sup>6)</sup></b>	-	-	-	-	<b>50%</b>

1) The table contains both customer and interbank transactions.

2) Automated clearing houses.

3) Centres Régionaux d'Echanges d'Images-Chèques (truncated cheques).

4) In 1996 the exchange of card payments and ATM withdrawals was transferred to the SIT.

5) This system closed during 1998.

6) Market share of the five largest participants in TBF.

**Table 9****Payment instructions handled by selected interbank funds transfer systems: value of transactions <sup>1)</sup>**

	EUR billions				
	1995	1996	1997	1998	1999
Clearing houses	20,948.4	20,024.8	13,759.7	2,127.7	1,948.3
<i>Cheques</i>	1,680.8	1,773.0	1,760.8	1,862.2	1,920.4
<i>Credit transfers</i>	200.1	18.9	1.6	30.0	27.9
<i>Bills of exchange</i>	-	-	-	-	-
<i>Avals de trésorerie</i>	9,492.0	8,375.9	4,934.9	27.6	-
<i>Large-value credit transfers</i>	9,575.6	9,857.0	7,062.4	207.8	-
CREIC <sup>2), 3)</sup>	23.6	24.6	23.9	25.0	28.1
Système Interbancaire de Télécompensation (SIT) <sup>2)</sup>	1,467.4	1,881.3	2,107.7	2,235.2	2,348.1
<i>Credit transfers</i>	786.4	1,119.7	1,298.8	1,378.0	1,459.2
<i>LCR and paperless bills of exchange</i>	449.8	449.4	437.3	449.8	444.2
<i>Direct debits</i>	190.3	207.2	221.8	240.9	260.8
<i>Titres Interbancaires de Paiement</i>	17.2	27.3	32.5	36.2	38.0
<i>Telepayments</i>	0.0	0.1	0.7	1.3	3.7
<i>Card payments</i>	0.1	52.7	89.8	100.1	111.4
<i>ATM withdrawals</i>	23.7	24.9	26.7	28.8	30.8
Cartes Bancaires <sup>2), 4)</sup>	90.7	39.8	-	-	-
<i>ATM withdrawals</i>	0.8	1.1	-	-	-
<i>Card payments</i>	89.9	38.8	-	-	-
Banque de France <sup>5)</sup>	5,616.0	5,308.6	4,242.4	502.0	-
<i>Public Treasury transfers</i>	71.7	73.2	32.5	-	-
<i>Interbank credit transfers</i>	42.6	-	-	-	-
<i>Large-value credit transfers</i>	4,519.4	3,739.9	2,987.5	224.9	-
<i>Telegraphic credit transfers</i>	982.2	1,495.5	1,222.3	277.2	-
SAGITTAIRE <sup>5)</sup>	15,941.1	17,361.8	18,351.4	4,507.3	-
TBF (domestic)	-	-	4,377.3	41,820.0	51,918.2
PNS	-	-	7,257.8	36,162.0	24,041.0
<b>Concentration ratio TBF (domestic) <sup>6)</sup></b>	-	-	-	-	<b>50%</b>

1) The table contains both customer and interbank transactions.

2) Automated clearing houses.

3) Centres Régionaux d'Echanges d'Images-Chèques (truncated cheques).

4) In 1996 the exchange of card payments and ATM withdrawals was transferred to the SIT.

5) This system closed during 1998.

6) Market share of the five largest participants in TBF.



**Table 10**  
**Indicators of the use of various cashless payment instruments: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	millions 1999
Volume of transactions	9,642.3	10,180.5	10,525.3	10,976.1	-
Cheques	4,884.7	4,952.3	4,903.0	4,825.8	-
<i>of which:</i>					
<i>paper-based</i>	4,528.5	4,582.5	4,545.0	4,458.3	-
<i>electronic (via PC or other terminal)</i>	356.2	369.8	358.0	367.5	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit card	1,889.4	2,102.6	2,334.3	2,620.6	2,949.9
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit card	-	-	-	-	-
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	1,662.3	1,781.7	1,857.4	1,951.5	-
<i>of which:</i>					
<i>paper-based</i>	53.8	33.5	15.6	11.2	-
<i>electronic (via PC or other terminal)</i>	1,608.5	1,748.2	1,841.8	1,940.3	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	1,205.9	1,343.9	1,430.6	1,578.2	-
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	-	-	-	-	-
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

**Table I I****Indicators of the use of various cashless payment instruments: value of transactions <sup>1)</sup>**

	EUR billions				
	1995	1996	1997	1998	1999
Value of transactions	29,369.1	45,559.9	51,028.8	88,228.8	-
Cheques	2,119.7	2,227.7	2,255.2	2,298.2	-
<i>of which:</i>					
<i>paper-based</i>	2,090.3	2,197.3	2,225.0	2,267.7	-
<i>electronic (via PC or other terminal)</i>	29.4	30.5	30.2	30.5	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit card	92.0	101.9	111.7	125.0	136.8
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit card	-	-	-	-	-
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	26,744.3	42,763.9	48,137.8	85,232.0	-
<i>of which:</i>					
<i>paper-based</i>	25,016.7	23,691.5	16,276.7	61.0	-
<i>electronic (via PC or other terminal)</i>	1,727.6	19,072.4	31,861.1	85,171.0	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	413.1	466.3	524.1	573.7	-
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	-	-	-	-	-
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

**Table I2****Number of participants in trading, clearing and securities settlement systems***(end of 1999)*

ParisBourse SA	286
Banks	93
<i>of which:</i>	
<i>domestic</i>	51
<i>foreign</i>	42
Brokers/dealers	193
<i>of which:</i>	
<i>domestic</i>	99
<i>foreign</i>	94
Clearnet SA	71
Banks	28
<i>of which:</i>	
<i>domestic</i>	23
<i>foreign</i>	5
Brokers/dealers	43
<i>of which:</i>	
<i>domestic</i>	38
<i>foreign</i>	5
RGV	167
Relit	339

**Table I3****Instructions handled by trading platforms, clearing houses and securities settlement systems***(volume of transactions)*

	1995	1996	1997	1998	millions 1999
Groupe ParisBourse SA					
Volume of transactions	20.3	26.1	37.1	44.8	58.6
Clearnet SA					
Volume of transactions cleared <sup>1)</sup>	20.3	26.1	37.1	44.8	58.7
Euroclear France					
Volume of settlement instructions	-	-	-	-	27.8

1) End of 1998: launch of central guarantee on OTC activity (euro debts).

**Table 14****Instructions handled by trading platforms, clearing houses and securities settlement systems***(market value of transactions)*

	EUR billions				
	1995	1996	1997	1998	1999
<b>Groupe ParisBourse SA</b>					
Value of transactions	161	221	370	513	723
<b>Clearent SA</b>					
Value of transactions cleared <sup>1)</sup>	161	221	370	513	1049
<b>Euroclear France</b>					
Value of settlement instructions	-	-	-	-	38,892

1) End of 1998: launch of central guarantee on OTC activity (euro debts).

**Table 15a****Outstanding securities***(end of year)*

	1995	1996	1997	1998	1999
<b>Groupe ParisBourse SA</b>					
Value of stocks listed (EUR billions)	373	469	620	844	1,499
Value of other securities listed (EUR billions)	630	691	713	760	764
Number of stocks listed	904	897	924	1,097	1,144
Number of other securities listed	2,157	2,024	1,897	1,659	1,533
<b>Euroclear France</b>					
Value of stocks issued (EUR billions)	-	497	638	839	1,421
Value of other securities issued (EUR billions)	-	1,068	1,467	1,663	1,841
Number of stocks issued	-	1,371	1,340	1,405	1,502
Number of other securities issued	-	6,273	16,286	18,256	19,829

**Table 15b****Netting ratio in clearing systems**

	1995	1996	1997	1998	1999
<b>Clearent SA</b>					
Netting ratio for cash over the year	65%	67%	71%	74%	77%
Netting ratio for securities over the year	99.0%	99.2%	99.5%	99.6%	99.7%

**Table 16****Participation in SWIFT by domestic institutions**

	1995	1996	1997	1998	1999
SWIFT users	206	208	238	247	249
<i>of which:</i>					
<i>members</i>	104	101	100	102	65
<i>sub-members</i>	95	100	104	100	98
<i>participants</i>	7	7	34	45	86
Memorandum item:					
Total SWIFT worldwide	5,229	5,632	6,165	6,557	6,797
<i>of which:</i>					
<i>members</i>	2,259	2,874	2,969	3,052	2,214
<i>sub-members</i>	2,259	2,404	2,590	2,720	2,763
<i>participants</i>	277	354	606	785	1,820

**Table 17****SWIFT message flows to/from domestic users**

	1995	1996	1997	1998	1999
Total messages sent	41,025,110	43,779,359	48,756,990	56,257,693	58,762,977
<i>of which:</i>					
<i>category I</i>	10,379,951	11,084,517	12,137,346	13,701,758	16,618,044
<i>category II</i>	13,937,393	14,291,099	15,400,655	15,345,713	12,393,184
<i>sent to/received from</i>					
<i>domestic users</i>	13,405,442	14,020,407	15,992,898	18,931,262	16,804,963
Total messages received	37,811,258	40,775,879	45,940,168	53,393,461	58,640,344
<i>of which:</i>					
<i>category I</i>	10,711,093	11,534,499	12,943,528	14,737,823	18,424,258
<i>category II</i>	13,895,771	14,011,490	14,688,233	14,872,003	12,561,331
Memorandum item:					
Global SWIFT traffic	582,192,512	687,785,294	812,117,556	937,039,995	1,058,836,425

*Definitions:*

- *Sub-members: domestic users sponsored by members abroad;*
- *Participants: users which are not SWIFT shareholders; their message traffic over the network is restricted;*
- *Category I: customer (funds) transfers;*
- *Category II: bank (funds) transfers.*

## Ireland

**Table 1****Basic statistical data**

	1995	1996	1997	1998	1999
Population <sup>1)</sup> (thousands)	3,601	3,626	3,661	3,705	3,745
Gross domestic product (EUR billions)	52.6	57.9	67.0	76.9	87.7
Exchange rate vis-à-vis ECU/euro <sup>2)</sup>	0.8155	0.7935	0.7475	0.7862	0.7876

1) Average for the year.

2) Average for the year until 1998; irrevocable conversion rates were adopted with the introduction of the euro on 1 January 1999.

**Table 2****Settlement media used by non-banks**

(end of year)

	EUR millions				
	1995	1996	1997	1998	1999
Banknotes and coins	2,341.8	2,498.8	2,869.6	3,291.2	3,970.5
Transferable deposits <sup>1)</sup>	4,095.2	4,991.3	6,601.4	8,636.8	12,349.5
Narrow money supply (M1) <sup>2)</sup>	6,436.9	7,490.2	9,469.7	11,927.9	17,359.9
Outstanding value on electronic money schemes	-	-	-	-	-
<i>of which:</i>					
<i>on card-based products</i>	-	-	-	-	-
<i>on network-based products</i>	-	-	-	-	-

1) From 1999 these figures include overnight deposits.

2) Prior to 1999 M1 was calculated for Irish residents only. From 1999 M1 is calculated on a euro area-wide basis.

**Table 3****Settlement media used by deposit-taking institutions**

(end of year)

	EUR millions				
	1995	1996	1997	1998	1999
Required reserves held at central bank	1,125.2	1,241.8	1,217.7	2,793.4	2,073.5
<i>of which can be used for settlement</i>	...	...	1,145.3	2,596.6	1,079.3
Free reserves held at central bank	382.8	66.0	466.0	73.6	411.4
Transferable deposits at other institutions	.	.	.	.	.

**Table 4****Banknotes and coins***(total value, end of year)*

	IEP millions				
	1995	1996	1997	1998	1999
Total banknotes issued	1,926.7	2,106.1	2,416.5	2,815.9	3,562.8
<i>of which:</i>					
IEP 100	4.6	26.7	54.6	79.1	100.1
IEP 50	206.5	229.6	303.7	453.8	892.5
IEP 20	1,401.1	1,524.5	1,711.3	1,910.2	2,153.2
IEP 10	213.6	217.6	230.2	250.7	285.0
IEP 5	86.1	93.1	102.2	107.9	117.9
IEP 1 <sup>1)</sup>	14.1	13.9	13.8	13.6	13.5
Other banknotes <sup>1)</sup>	0.7	0.7	0.6	0.6	0.6
Total coins issued	165.0	179.5	200.9	222.9	255.0
Banknotes and coins held by credit institutions	248.0	319.0	360.0	448.0	691.0
Banknotes and coins in circulation outside credit institutions	1,844.3	1,968.0	2,260.0	2,592.0	3,127.0

1) *In the course of being withdrawn from circulation.***Table 5****Institutional framework***(end of 1999)*

Categories	Number of institutions	Number of branches	Number of accounts (thousands) <sup>1)</sup>	Number of internet-linked accounts (thousands) <sup>4)</sup>	Value of accounts (EUR millions) <sup>1)</sup>
Central bank	1	...	1	...	46.2
Commercial banks	57	964	7,392	19	12,349.47 <sup>3)</sup>
Savings banks <sup>2)</sup>	4	137	773	...	.
Building societies	3	90	650	...	.
Post office	1	1,913	2,100	...	634.9
Total	66	3,104	10,916	19	13,030.6
<i>of which virtual institutions</i>	...	...	...	...	...
Branches of foreign banks	29	.	.	.	.
<i>of which EU-based</i>	26	.	.	.	.

1) *These are current accounts. Payments can increasingly be made through deposit accounts.*2) *Trustee Savings Bank and state-sponsored credit institutions.*3) *Includes savings banks and building societies.*4) *Number of accounts relating to internet services (credit transfers, payment of bills, etc. carried out via the internet).*

**Table 6****Payment card functions and accepting devices***(end of year)*

	1995	1996	1997	1998	1999
<b>Cash function</b>					
Cards with a cash function (thousands)	3,606	2,879	2,697	3,130	2,811
Number of ATMs with a cash dispensing function	918	1,051	1,051	1,229	1,427
<i>open access</i>	.	.	.	.	1,299
<i>limited access</i>	.	.	.	.	128
Volume of transactions (millions) <sup>1)</sup>	63.9	74.8	87.1	104.6	126.0
<i>at ATMs with open access</i>	.	.	.	.	122.0
<i>at ATMs with limited access</i>	.	.	.	.	4.0
Value of transactions (EUR billions) <sup>1)</sup>	4.6	5.7	5.5	7.4	10.2
<i>at ATMs with open access</i>	.	.	.	.	8.9
<i>at ATMs with limited access</i>	.	.	.	.	1.3
Number of ATMs with a giro transfer function	...	...	...	...	...
<i>volume of transactions</i>	...	...	...	...	...
<i>value of transactions</i>	...	...	...	...	...
<b>Debit function</b>					
Cards with a debit function (thousands)	48	123	350	695	578
<i>of which retailer cards</i>	.	.	.	.	.
Number of terminals	.	4,400	5,150	14,784	18,540
Volume of transactions (millions)	.	.	.	6.0	24.0
<i>of which transactions with retailer cards</i>	.	.	.	.	.
Value of transactions (EUR millions)	.	.	.	14.0	1207.5
<i>of which transactions with retailer cards</i>	.	.	.	.	.
<b>Credit function</b>					
Cards with a credit function (thousands)	1,173	865	1,108	1,130	1,139
<i>of which retailer cards</i>	.	.	.	.	.
Number of terminals	.	.	.	.	16,922
Volume of transactions (millions)	.	.	.	.	47
<i>of which transactions with retailer cards</i>	.	.	.	.	.
Value of transactions (EUR millions)	.	.	.	.	3,230
<i>of which transactions with retailer cards</i>	.	.	.	.	.
<b>Electronic money function</b>					
Cards with an e-money function	.	.	.	3,000	3,933
Number of terminals accepting the card	.	.	.	338	406
Number of purchase transactions	.	.	.	.	.
Value of purchase transactions	.	.	.	.	.
Number of loading transactions	.	.	.	.	.
Value of money loaded	.	.	.	.	.
Float	.	.	.	.	.

1) Revised figures for 1998.



**Table 7****Number of payment cards in circulation***(end of year)*

	1995	1996	1997	1998	1999
					thousands
Total number of cards in circulation	1,173	865	1,108	4,130	7,073
<i>of which:</i>					
<i>cards with a combined debit, cash and e-money function</i>	.	.	.	.	.
<i>cards with a credit function</i>	1,173	865	1,108	1,130	1,139
<i>cards with a debit function issued by retailers</i>	.	.	.	.	.
<i>cards with a debit and cash function</i>	.	.	.	.	2,001
<i>cards with an e-money function</i>	.	.	.	3,000	3,933

**Table 8****Payment instructions handled by selected interbank funds transfer systems: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	1999
					thousands
Dublin Bankers' Clearing <sup>2)</sup>	142,754	174,249	190,106	202,413	316,360
<i>cheques</i>	91,912	111,776	121,581	124,392	157,127
<i>direct debits</i>	22,822	31,647	35,216	40,717	49,090
<i>credit transfers – paper</i>	5,818	5,918	6,279	8,471	52,351
<i>credit transfers – electronic</i>	22,202	24,908	27,030	28,833	57,792
Special presentations (large-value cheques)	5.2	3.3	1.3	1.0	1.0
IRIS RTGS <sup>3)</sup>	168	152	343	376	217
<b>Concentration ratio <sup>4)</sup></b>	1995	1996	1997	1998	1999
Dublin Bankers' Clearing <sup>2)</sup>	99.9%	99.3%	99.6%	99.2%	99.3%
<i>cheques</i>	.	.	.	.	99.6%
<i>direct debits</i>	.	.	.	.	98.8%
<i>credit transfers – paper</i>	.	.	.	.	99.3%
<i>credit transfers – electronic</i>	.	.	.	.	99.1%
Special presentations (large-value cheques)	.	.	.	.	100.0%
IRIS RTGS <sup>3)</sup>	.	.	.	.	79.4%

1) The table contains both customer and interbank transactions.

2) The Dublin Bankers' Clearing was replaced by three functional clearing companies in December 1998. These three companies provide clearing facilities for paper debits, paper credits, and electronic debits and credits. The data in this table for 1999, under the heading Dublin Bankers' Clearing, represent the total activity of the three clearing companies.

3) RTGS system: Daily Interbank Settlement (paper-based large-value interbank credit transfers) prior to March 1997.

4) Market share of the five largest participants in each payment system, based on the total volume of transactions.

**Table 9****Payment instructions handled by selected interbank funds transfer systems: value of transactions <sup>1)</sup>**

	EUR billions				
	1995	1996	1997	1998	1999
Dublin Bankers' Clearing <sup>2)</sup>	245.9	200.2	373.7	342.6	817.5
<i>cheques</i>	198.6	138.7	312.2	266.8	621.8
<i>direct debits</i>	6.6	7.1	9.1	10.7	14.1
<i>credit transfers – paper</i>	36.6	49.1	30.7	58.4	172.6
<i>credit transfers – electronic</i>	4.2	5.3	21.6	6.7	9.0
Special presentations (large-value cheques)	10.2	8.5	11.4	0.8	4.7
IRIS RTGS <sup>3)</sup>	772.3	938.2	2,158.6	2,412.5	2,524.7
<b>Concentration ratio <sup>4)</sup></b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
Dublin Bankers' Clearing <sup>2)</sup>	99.3%	98.4%	98.9%	98.7%	97.9%
<i>cheques</i>	.	.	.	.	99.0%
<i>direct debits</i>	.	.	.	.	94.6%
<i>credit transfers – paper</i>	.	.	.	.	99.9%
<i>credit transfers – electronic</i>	.	.	.	.	98.4%
Special presentations (large-value cheques)	.	.	.	.	100.0%
IRIS RTGS <sup>3)</sup>	.	.	.	.	80.0%

1) The table contains both customer and interbank transactions.

2) The Dublin Bankers' Clearing was replaced by three functional clearing companies in December 1998. These three companies provide clearing facilities for paper debits, paper credits and electronic debits and credits. The data in this table for 1999, under the heading Dublin Bankers' Clearing, represent the total activity of the three clearing companies.

3) RTGS system: Daily Interbank Settlement (paper-based large-value interbank credit transfers) prior to March 1997.

4) Market share of the five largest participants in each payment system, based on the total value of transactions.

**Table 10**  
**Indicators of the use of various cashless payment instruments: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	millions 1999
Volume of transactions	143.0	175.0	190.0	202.0	348.2
Cheques	92	112	122	124	157
<i>of which:</i>					
<i>paper-based</i>	92	112	122	124	157
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Payments by debit card <sup>2)</sup>	.	.	.	.	24
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Payments by credit card	.	.	.	.	47
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	25
<i>electronic (via PC or other terminal)</i>	.	.	.	.	22
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Credit transfers <sup>3)</sup>	28	31	33	37	70
<i>of which:</i>					
<i>paper-based</i>	6	6	6	8	12
<i>electronic (via PC or other terminal)</i>	22	25	27	29	58
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Direct debits <sup>3)</sup>	23	32	35	41	50
<i>of which:</i>					
<i>paper-based</i>	23	32	35	41	9
<i>electronic (via PC or other terminal)</i>	.	.	.	.	41
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Card-based electronic money	.	.	.	.	.
Network-based electronic money	.	.	.	.	.

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) Incomplete data.

3) Excludes items processed intra-branch.

**Table I I****Indicators of the use of various cashless payment instruments: value of transactions <sup>1)</sup>**

	EUR millions				
	1995	1996	1997	1998	1999
Value of transactions	245,948	200,238	373,684	342,575	695,034
Cheques	198,587.0	138,655.4	312,228.6	266,772.0	621,790.7
<i>of which:</i>					
<i>paper-based</i>	198,587.0	138,655.4	312,228.6	266,772.0	621,790.7
<i>electronic (via PC or other terminal)</i>	.	.	.	.	...
<i>electronic (via mobile phone)</i>	.	.	.	.	...
Payments by debit card <sup>2)</sup>	.	.	.	.	1,207.5
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	...
Payments by credit card	.	.	.	.	3,230.2
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	1,577.0
<i>electronic (via PC or other terminal)</i>	.	.	.	.	1,653.2
<i>electronic (via mobile phone)</i>	.	.	.	.	...
Credit transfers <sup>3)</sup>	40,758.6	54,471.8	52,313.2	65,137.6	54,563.2
<i>of which:</i>					
<i>paper-based</i>	36,568.5	49,138.9	30,727.7	58,408.0	45,510.0
<i>electronic (via PC or other terminal)</i>	4,190	5,333	21,586	6,730	9,053.2
<i>electronic (via mobile phone)</i>	.	.	.	.	...
Direct debits <sup>3)</sup>	6,602.6	7,110.5	9,142.1	10,665.8	14,242.7
<i>of which:</i>					
<i>paper-based</i>	6,602.6	7,110.5	9,142.1	10,665.8	599.3
<i>electronic (via PC or other terminal)</i>	.	.	.	.	13,643.3
<i>electronic (via mobile phone)</i>	.	.	.	.	...
Card-based electronic money	.	.	.	.	...
Network-based electronic money	.	.	.	.	...

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) Incomplete data.

3) Excludes items processed intra-branch.

**Table 12****Number of participants in trading, clearing and securities settlement systems***(end of 1999)*

CBISSO – Central Bank of Ireland Securities Settlements Office	
Banks	14
<i>of which:</i>	
<i>domestic</i>	10
<i>foreign</i>	4
Brokers/dealers	8
<i>of which:</i>	
<i>domestic</i>	7
<i>foreign</i>	1
Insurance companies	4
Securities settlement systems	
Euroclear – included in bank resident figure	
Cedel – included in bank non-resident figure	
National Treasury Management Agency (NTMA – national debt agency)	1
Central Bank of Ireland	1
Securities houses	8
Total	36

**Table 13****Instructions handled by trading platforms, clearing houses and securities settlement systems***(volume of transactions)*

	1995	1996	1997	1998	1999
<b>CBISSO</b>					
Volume of settlement instructions	41,104	70,383	73,338	46,806	31,343

**Table 14****Instructions handled by trading platforms, clearing houses and securities settlement systems***(market value of transactions)*

	1995	1996	1997	EUR millions	
				1998	1999
<b>CBISSO</b>					
Value of settlement instructions	177,523	494,150	818,754	604,339	332,042

**Table 15a****Outstanding securities***(end of year)*

	1995	1996	1997	1998	1999
<b>CBISSO</b>					
Value of stocks issued (EUR billions)	19,412	20,760	21,474	20,364	23,629
Value of other securities issued (EUR billions)	-	-	-	-	-
Number of stocks issued	-	-	-	-	-
Number of other securities issued	-	-	-	-	-

**Table 16****Participation in SWIFT by domestic institutions**

	1995	1996	1997	1998	1999
SWIFT users	46	51	55	60	64
<i>of which:</i>					
<i>members</i>	13	13	13	13	9
<i>sub-members</i>	21	23	25	27	31
<i>participants</i>	12	15	17	20	24
Memorandum item:					
Total SWIFT worldwide	5,229	5,632	6,165	6,557	6,797
<i>of which:</i>					
<i>members</i>	2,259	2,874	2,969	3,052	2,214
<i>sub-members</i>	2,259	2,404	2,590	2,720	2,763
<i>participants</i>	277	354	606	785	1,820

**Table 17**  
**SWIFT message flows to/from domestic users**

	1995	1996	1997	1998	1999
Total messages sent	2,485,986	2,905,351	3,608,935	4,491,367	5,654,511
<i>of which:</i>					
<i>category I</i>	562,098	656,950	783,846	984,080	1,416,966
<i>category II</i>	735,867	786,581	955,814	1,192,949	1,346,389
<i>sent to/received from</i>					
<i>domestic users</i>	635,647	761,784	936,523	1,106,840	1,260,904
Total messages received	2,679,787	3,270,756	4,392,502	5,575,441	7,120,387
<i>of which:</i>					
<i>category I</i>	766,105	864,594	1,018,241	1,222,146	1,655,627
<i>category II</i>	450,953	535,854	679,023	795,169	952,696
Memorandum item:					
Global SWIFT traffic	582,192,512	687,785,294	812,117,556	937,039,995	1,058,836,425

*Definitions:*

- *Sub-members: domestic users sponsored by members abroad;*
- *Participants: users which are not SWIFT shareholders; their message traffic over the network is restricted;*
- *Category I: customer (funds) transfers;*
- *Category II: bank (funds) transfers.*

## Italy

**Table 1****Basic statistical data**

	1995	1996	1997	1998	1999
Population <sup>1)</sup> (thousands)	57,301	57,397	57,512	57,588	57,630
Gross domestic product (EUR billions)	923	982	1,025	1,068	1,099
Exchange rate vis-à-vis ECU/euro <sup>2)</sup>	2,130.14	1,958.96	1,929.30	1,943.65	1,936.27

1) Average for the year.

2) Average for the year until 1998; irrevocable conversion rates were adopted with the introduction of the euro on 1 January 1999.

**Table 2****Settlement media used by non-banks**

(end of year)

	1995	1996	1997	1998	1999
				EUR billions	
Banknotes and coins	51	52	55	59	66
Transferable deposits	253	263	281	305	366
<i>of which held by:</i>					
<i>households</i>	184	195	210	.	.
<i>corporate sector</i>	48	47	50	.	.
<i>others <sup>1)</sup></i>	21	20	22	.	.
Others <sup>2)</sup>	8	7	7	6	-
Narrow money supply (M1)	312	321	344	370	432
Outstanding value on electronic money schemes (EUR millions) <sup>3)</sup>	-	.	0.7	0.7	0.5
<i>of which:</i>					
<i>on card-based products (EUR millions)</i>	-	.	0.7	0.7	0.5
<i>on network-based products</i>	-	-	-	-	-

1) Insurance companies and public authorities.

2) Banker's drafts, cashier's cheques and current accounts at the Ministry of Treasury.

3) Data refer to the cards in circulation which have been loaded by users.

**Table 3****Settlement media used by deposit-taking institutions**

(end of year)

	1995	1996	1997	1998	1999
				EUR billions	
Required reserves held at central bank <sup>1)</sup>	38	37	43	10	12
<i>of which can be used for settlement</i>	3.8	4.6	10	10	12
Free reserves held at central bank <sup>2)</sup>	0.10	0.13	0.17	0.21	0.11
Transferable deposits at other institutions	33	44	50	55	59

1) Average reserves for the period from 15 December to 14 January, except for 1998 (from 15 to 31 December) and 1999 (from 24 December to 23 January).

2) Up to 1998 figures include non-interest bearing local deposits.



**Table 4****Banknotes and coins***(total value, end of year)*

	1995	1996	1997	1998	ITL billions 1999
Total banknotes issued	103,249	106,106	114,074	122,406	136,804
<i>of which:</i>					
<i>ITL 500,000</i>	-	-	3,919	9,972	16,390
<i>ITL 100,000</i>	74,815	78,264	81,677	83,227	89,846
<i>ITL 50,000</i>	22,177	21,429	21,873	22,469	23,524
<i>ITL 10,000</i>	4,077	4,173	4,299	4,438	4,607
<i>ITL 5,000</i>	938	967	1,016	1,096	1,143
<i>ITL 2,000</i>	292	270	255	231	182
<i>ITL 1,000</i>	950	1,003	1,035	973	1,112
Coins in circulation	1,897	1,986	2,130	2,487	2,525
Banknotes and coins held by credit institutions	6,865	7,979	8,771	9,698	11,908
Banknotes and coins in circulation outside credit institutions	98,281	100,113	107,433	115,200	127,421

**Table 5****Institutional framework***(end of 1999)*

Categories	Number of institutions	Number of branches	Number of accounts (thousands)	Number of internet-linked accounts <sup>1)</sup>	Value of accounts (EUR billions)
Central bank	1	99	-	.	-
Commercial banks	296	20,067	24,668	.	279
Others	581	21,043	.	.	87
<i>of which:</i>					
<i>co-operative and rural banks</i>	580	7,067	6,762	.	.
<i>post office</i>	1	13,976	.	.	.
Total	878	41,209	.	.	366
<i>of which virtual institutions</i>	-	-	-	-	-
Branches of foreign banks	57	89	25	.	1.4
<i>of which EU-based</i>	41	70	18	.	0.9

1) Number of accounts relating to internet services (credit transfers, payment of bills, etc. carried out via the internet).

**Table 6****Payment card functions and accepting devices***(end of year)*

	1995	1996	1997	1998	1999
<b>Cash function</b>					
Cards with a cash function (thousands)	13,824	15,270	17,173	18,693	21,273
Number of ATMs with a cash dispensing function	21,887	24,355	25,546	28,042	30,203
<i>open access</i>	.	.	.	27,275	29,477
<i>limited access</i>	.	.	.	767	726
Volume of transactions (millions)	330	368	412	487	499
<i>at ATMs with open access</i>	.	.	.	.	.
<i>at ATMs with limited access</i>	.	.	.	.	.
Value of transactions (EUR billions)	55	59	67	78	80
<i>at ATMs with open access</i>	.	.	.	.	.
<i>at ATMs with limited access</i>	.	.	.	.	.
Number of ATMs with a giro transfer function	.	.	.	.	.
<i>volume of transactions (millions)</i>	.	.	.	.	.
<i>value of transactions (EUR billions)</i>	.	.	.	.	.
<b>Debit function</b>					
Cards with a debit function (thousands)	13,791	14,906	16,389	17,583	20,256
<i>of which retailer cards</i>	.	.	.	.	.
Number of terminals	153,752	214,705	281,023	345,580	435,176
Volume of transactions (thousands)	51,198	73,967	122,439	171,659	248,057
<i>of which transactions with retailer cards</i>	.	.	.	.	.
Value of transactions (EUR billions)	5	7	11	14	19
<i>of which transactions with retailer cards</i>	.	.	.	.	.
<b>Credit function</b>					
Cards with a credit function (thousands)	6,691	7,643	8,828	10,150	12,350
<i>of which retailer cards</i>	.	.	.	.	.
Number of terminals	.	.	.	.	.
Volume of transactions (thousands)	70,367	95,220	131,257	175,148	218,992
<i>of which transactions with retailer cards</i>	.	.	.	.	.
Value of transactions (EUR billions)	7	9	13	16	20
<i>of which transactions with retailer cards</i>	.	.	.	.	.
<b>Electronic money function <sup>1)</sup></b>					
Cards with an e-money function (thousands)	-	.	62	56	32
Number of terminals accepting the card	-	.	4,406	3,910	3,605
Number of purchase transactions (thousands)	-	.	294	309	376
Value of purchase transactions (EUR millions)	-	.	1.7	1.6	1.0
Number of loading transactions (thousands)	-	.	30	29	31
Value of money loaded (EUR millions)	-	.	1.9	1.6	0.9
Float (EUR millions)	-	.	0.7	0.7	0.5

1) Data refer to the cards in circulation which have been loaded by users.

**Table 7****Number of payment cards in circulation***(end of year)*

	1995	1996	1997	1998	thousands 1999
Total number of cards in circulation <sup>1)</sup>	22,170	24,064	26,957	29,386	33,973
<i>of which:</i>					
<i>cards with a cash function only</i>	33	364	784	1,109	1,017
<i>cards with a combined cash and debit function</i>	13,791	14,906	16,389	17,583	20,256
<i>cards with a credit function</i>	6,691	7,643	8,828	10,150	12,350
<i>cards with an e-money function <sup>2)</sup></i>	-	.	62	56	32
<i>cards with a cheque guarantee function</i>	1,655	1,151	894	488	318

1) A card with multiple functions may appear in several categories. Data, therefore, could be overestimated.

2) Data refer to the cards in circulation which have been loaded by users.

**Table 8****Payment instructions handled by selected interbank funds transfer systems: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	1999
					thousands
<b>BI-COMP</b>					
LOCAL CLEARING	235,665	225,622	217,577	182,660	103,942
Cheques	233,698	223,927	215,827	181,749	103,851
<i>out-of-town cheques</i>	90,259	89,061	91,822	97,774	.
Credit transfers	263	151	104	52	-
Other items <sup>2)</sup>	1,704	1,544	1,646	859	91
ELECTRONIC MEMORANDA	1,810	1,651	1,452	317	-
Interbank deposits	725	776	763	55	-
Foreign operations	208	82	41	2	-
Credit transfers	285	145	53	14	-
Other items <sup>3)</sup>	592	648	595	246	-
INGROSSO (SIPS)	4,462	5,326	6,057	303	-
RETAIL	586,865	664,097	710,609	825,518	959,750
Cheque truncation	283,937	287,635	285,659	336,518	394,881
Bancomat	74,383	91,117	103,529	118,751	132,360
Collection orders	154,061	170,648	189,529	215,987	255,609
Credit transfers	74,484	114,637	129,169	147,967	169,386
Other items <sup>4)</sup>	-	60	2,723	6,295	7,514
<b>BI-REL <sup>5)</sup></b>	<b>1,027</b>	<b>1,129</b>	<b>2,694</b>	<b>10,864</b>	<b>10,989</b>
Large-value and cross-border credit transfers <sup>6)</sup>	-	-	1,566	3,767	5,011
GEC <sup>7)</sup>	-	-	-	4,760	3,528
Interbank credit transfers (BISS)	46	50	82	238	216
MID <sup>8)</sup>	-	-	-	619	469
Payments between banks and the Banca d'Italia or the Ministry of Treasury.	981	1,079	1,046	1,479	1,765
<b>Concentration ratio <sup>9)</sup></b>					%
LOCAL CLEARING	28.7	28.6	28.0	26.9	26.6
ELECTRONIC MEMORANDA	21.9	21.1	19.4	21.9	-
INGROSSO (SIPS)	55.6	53.8	51.4	55.8	-
RETAIL	29.2	29.8	29.8	28.4	27.1
BI-REL	25.7	25.9	37.2	43.1	40.5
Overall concentration ratio	28.0	28.2	28.2	27.4	26.8

1) The table contains both customer and interbank transactions.

2) Payments between the banking system and the Ministry of Treasury, the Banca d'Italia or the postal administration and bills of exchange.

3) In particular, settlement of securities transactions. Since November 1998, the cash balances of securities transactions have been settled in the RTGS system (BI-REL).

4) Mainly transactions through e-money; interests and dividends on the securities deposited at the Monte Titoli; transactions with debit cards at the post office; electronic notification of unpaid cheques.

5) Debits/credits for the settlement of clearing balances are not included.

6) Since June 1997.

7) Replaced INGROSSO, since January 1998.

8) Replaced MEMORANDA Interbank deposits, since January 1998.

9) Market share of the five largest participants in each system, based on the total volume of transactions.

<b>Table 9</b>					
<b>Payment instructions handled by selected interbank funds transfer systems: value of transactions <sup>1)</sup></b>					
	EUR billions				
	1995	1996	1997	1998	1999
<b>BI-COMP</b>					
LOCAL CLEARING	1,846	1,497	1,323	987	710
Cheques	845	851	850	827	689
<i>out-of-town cheques</i>	341	342	358	427	.
Credit transfers	307	131	33	13	-
Other items <sup>2)</sup>	695	514	439	148	21
ELECTRONIC MEMORANDA	9,507	11,930	13,028	4,617	-
Interbank deposits	5,969	7,774	8,594	587	-
Foreign operations	255	169	116	9	-
Credit transfers	532	411	116	45	-
Other items <sup>3)</sup>	2,752	3,576	4,201	3,975	-
INGROSSO (SIPS)	14,139	17,834	21,439	1,293	-
RETAIL	640	817	924	1,124	1,364
Cheque truncation	150	154	155	197	278
Bancomat	11	13	15	17	19
Collection orders	242	269	294	349	417
Credit transfers	237	378	446	536	612
Other items <sup>4)</sup>	-	3	14	25	38
<b>BI-REL <sup>5)</sup></b>	<b>1,414</b>	<b>1,405</b>	<b>2,259</b>	<b>36,630</b>	<b>31,536</b>
Large-value and cross-border credit transfers <sup>6)</sup>	-	-	790	1,727	1,814
GEC <sup>7)</sup>	-	-	-	22,744	17,076
Interbank credit transfers (BISS)	71	72	156	837	1,030
MID <sup>8)</sup>	-	-	-	7,980	7,314
Payments between banks and the Banca d'Italia or the Ministry of Treasury	1,343	1,333	1,313	3,342	4,301
<b>Concentration ratio <sup>9)</sup></b>					<b>%</b>
LOCAL CLEARING	34.7	27.7	26.7	24.2	25.1
ELECTRONIC MEMORANDA	24.2	24.0	23.2	29.2	-
INGROSSO (SIPS)	58.0	57.5	56.9	58.0	-
RETAIL	30.0	28.2	27.9	26.7	26.0
BI-REL	32.4	35.2	33.1	47.5	42.2
Overall concentration ratio	39.7	40.5	41.8	45.2	40.5

1) The table contains both customer and interbank transactions.

2) Payments between the banking system and the Ministry of Treasury, the Banca d'Italia or the postal administration and bills of exchange.

3) In particular, settlement of securities transactions. Since November 1998, the cash balances of securities transactions have been settled in the RTGS system (BI-REL).

4) Mainly transactions through e-money, interests and dividends on the securities deposited at the Monte Titoli, transactions with debit cards at the post office and electronic notification of unpaid cheques.

5) Debits/credits for the settlement of clearing balances are not included.

6) Since June 1997.

7) Replaced INGROSSO, since January 1998.

8) Replaced MEMORANDA Interbank deposits, since January 1998.

9) Market share of the five largest participants in each system, based on the total value of transactions.

**Table 10****Indicators of the use of various cashless payment instruments: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	1999
					millions
Volume of transactions	1,697.9	1,952.9	2,107.5	2,193.6	2,412.6
Cheques	563.6	676.9	656.8	648.7	665.0
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Payments by debit card	51.2	74.0	122.4	171.7	248.1
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Payments by credit card	70.4	95.2	131.3	175.1	219.0
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Credit transfers	921.8	944.0	976.0	971.4	1,003.4
<i>of which:</i>					
<i>paper-based</i>	0.4	0.5	0.5	0.9	0.9
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Direct debits	90.9	162.8	220.7	226.4	276.7
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Card-based electronic money <sup>2)</sup>	-	.	0.3	0.3	0.4
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) Data refer to the cards in circulation which have been loaded by users.

<b>Table I I</b>					
<b>Indicators of the use of various cashless payment instruments <sup>1)</sup></b>					
<i>(value of transactions)</i>					
	EUR billions				
	1995	1996	1997	1998	1999
Value of transactions	29,151	35,695	40,310	44,466	35,110
Cheques	1,131	1,314	1,321	1,276	1,305
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Payments by debit card	5	7	11	14	19
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Payments by credit card	7	9	13	16	20
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Credit transfers	27,947	34,283	38,836	43,016	33,590
<i>of which:</i>					
<i>paper-based</i>	235	310	235	348	439
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Direct debits	60	82	130	144	175
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Card-based electronic money <sup>2)</sup>	-	.	0.002	0.002	0.001
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) Data refer to the cards in circulation which have been loaded by users.

<b>Table I 2</b>	
<b>Number of participants in trading, clearing and securities settlement systems</b>	
<i>(end of 1999)</i>	
<b>Trading platforms</b>	
<b>MTS <sup>1)</sup></b>	<b>380</b>
Banks	179
<i>of which:</i>	
<i>domestic</i>	159
<i>foreign</i>	20
Brokers/dealers	201
<i>of which:</i>	
<i>domestic</i>	181
<i>foreign</i>	20
<b>PCT <sup>2)</sup></b>	<b>394</b>
Banks	180
<i>of which:</i>	
<i>domestic</i>	160
<i>foreign</i>	20
Brokers/dealers	214

<i>of which:</i>	
<i>domestic</i>	194
<i>foreign</i>	20
<b>BORSA ITALIANA <sup>3)</sup></b>	<b>158</b>
Banks	87
<i>of which:</i>	
<i>domestic</i>	82
<i>foreign</i>	5
Brokers/dealers	71
<i>of which:</i>	
<i>domestic</i>	59
<i>foreign</i>	12
<b>Clearing house</b>	
<b>CCG <sup>4)</sup></b>	<b>141</b>
Banks	79
<i>of which:</i>	
<i>domestic</i>	78
<i>foreign</i>	1
Brokers/dealers	62
<i>of which:</i>	
<i>domestic</i>	53
<i>foreign</i>	9
<b>Securities settlement systems</b>	
<b>LDT</b>	<b>284</b>
Banks	173
<i>of which:</i>	
<i>domestic</i>	149
<i>foreign</i>	24
Brokers/dealers	106
<i>of which:</i>	
<i>domestic</i>	101
<i>foreign</i>	5
Others <sup>5)</sup>	5
<b>CAT</b>	<b>435</b>
Banks	306
<i>of which:</i>	
<i>domestic</i>	275
<i>foreign</i>	31
Brokers/dealers	117
<i>of which:</i>	
<i>domestic</i>	112
<i>foreign</i>	5
Others <sup>6)</sup>	12
<b>Monte Titoli</b>	<b>519</b>
Banks	284
<i>of which:</i>	
<i>domestic</i>	263
<i>foreign</i>	21
Brokers/dealers	128
<i>of which:</i>	
<i>domestic</i>	126
<i>foreign</i>	2
Others <sup>7)</sup>	107

1) Secondary market for government securities.

2) Electronic market for repurchase agreements.

3) Italian stock exchange.

4) Clearing and guarantee house.

5) Banca d'Italia, Ministry of Treasury, Monte Titoli, CCG, SIA (Interbank Company for Automation).

6) Banca d'Italia, Ministry of Treasury, Monte Titoli, CCG, CSDs, international financial organisations.

7) CSDs, non-financial securities issuers.



**Table 13**  
**Instructions handled by trading platforms, clearing houses and securities settlement systems**  
*(volume of transactions)*

	1995	1996	1997	1998	1999
<b>Trading platforms</b>	<b>36,005,733</b>	<b>40,359,359</b>	<b>65,564,735</b>	<b>121,754,172</b>	<b>118,869,583</b>
<i>MTS</i> <sup>1)</sup>					
Volume of transactions <sup>2)</sup>	1,125,733	1,457,599	1,568,991	1,050,160	704,351
<i>PCT</i> <sup>3)</sup>					
Volume of transactions <sup>2)</sup>	-	-	.	115,804	219,040
<i>BORSA ITALIANA</i> <sup>4)</sup>					
Volume of transactions <sup>5)</sup>	34,880,000	38,901,760	63,995,744	120,588,208	117,946,192
<b>Clearing house</b>					
<i>CCG</i> <sup>6)</sup>					
Volume of transactions cleared <sup>2)</sup>	4,060,582	6,069,790	11,222,082	10,281,550	9,493,238
<b>Securities settlement systems</b>	<b>17,137,493</b>	<b>24,452,655</b>	<b>31,611,862</b>	<b>41,157,407</b>	<b>39,750,227</b>
<i>LDT</i>					
Volume of settlement instructions <sup>7)</sup>	16,236,625	23,476,342	30,609,421	40,104,473	38,553,348
<i>CAT</i>					
Volume of settlement instructions	646,944	685,730	651,038	485,315	501,427
<i>Monte Titoli</i>					
Volume of settlement instructions	253,924	290,583	351,403	567,619	695,452

1) Secondary market for government securities.

2) Number of contracts.

3) Electronic market for repurchase agreements. The 1998 figure refers to the period 10 February - 31 December.

4) Italian stock exchange.

5) Average daily number of traded shares.

6) Clearing and guarantee house.

7) Bilateral debit balances.

**Table 14****Instructions handled by trading platforms, clearing houses and securities settlement systems***(market value of transactions)*

	EUR billions				
	1995	1996	1997	1998	1999
<b>Trading platforms</b>	<b>3,543</b>	<b>4,620</b>	<b>5,433</b>	<b>5,663</b>	<b>8,716</b>
<i>MTS</i> <sup>1)</sup>					
Value of transactions	3,470	4,539	5,258	3,268	2,801
<i>PCT</i> <sup>2)</sup>					
Value of transactions	-	-	.	1,972	5,407
<i>BORSA ITALIANA</i> <sup>3)</sup>					
Value of transactions <sup>4)</sup>	72	81	174	423	507
<b>Clearing house</b>					
<i>CCG</i> <sup>5)</sup>					
Value of transactions cleared	88	251	617	1,274	1,199
<b>Securities settlement systems</b>	<b>8,784</b>	<b>16,482</b>	<b>22,956</b>	<b>28,650</b>	<b>34,403</b>
<i>LDT</i>					
Value of settlement instructions <sup>6)</sup>	7,816	15,433	21,727	27,469	31,087
<i>CAT</i>					
Value of settlement instructions <sup>7)</sup>	938	997	1,143	1,182	3,317
<i>Monte Titoli</i>					
Value of settlement instructions <sup>7)</sup>	30	52	86	.	.

1) *Secondary market for government securities.*2) *Electronic market for repurchase agreements. The 1998 figure refers to the period 10 February - 31 December.*3) *Italian stock exchange.*4) *Considering only shares.*5) *Clearing and guarantee house.*6) *Bilateral debit balances.*7) *Nominal value.*

**Table 15a****Outstanding securities***(end of year)*

	1995	1996	1997	1998	1999
<b>Trading platforms</b>					
<i>MTS</i> <sup>1)</sup>					
Value of stocks listed (EUR billions)	-	-	-	-	-
Value of other securities listed (EUR billions) <sup>2)</sup>	643	756	838	1,310	1,086
Number of stocks listed	-	-	-	-	-
Number of other securities listed	130	135	135	180	200
<i>BORSA ITALIANA</i> <sup>3)</sup>					
Value of stocks listed (EUR billions)	168	199	310	481	727
Value of other securities listed (EUR billions)	-	-	-	-	-
Number of stocks listed	316	307	301	304	352
Number of other securities listed	-	-	-	-	-
<b>Securities settlement systems</b>					
<i>CAT</i>					
Value of stocks issued (EUR billions)	-	-	-	-	-
Value of other securities issued (EUR billions) <sup>4)</sup>	928	979	994	1,025	1,040
Number of stocks issued	-	-	-	-	-
Number of other securities issued	.	.	.	225	211
<i>Monte Titoli</i>					
Value of stocks issued (EUR billions) <sup>4)</sup>	31	34	39	68	100
Value of other securities issued (EUR billions) <sup>4)</sup>	51	75	109	165	236
Number of stocks issued	.	.	.	294	408
Number of other securities issued	.	.	.	5,573	10,352

1) *Secondary market for government securities.*2) *Market value except for 1999 (nominal value).*3) *Italian stock exchange.*4) *Nominal value.***Table 15b****Netting ratio in clearing systems**

	1995	1996	1997	1998	1999
<i>CCG</i> <sup>1)</sup>					
Netting ratio for cash over the year	.	.	.	.	.
Netting ratio for securities over the year	.	.	.	.	.

1) *Clearing and guarantee house.*

**Table 16****Participation in SWIFT by domestic institutions**

	1995	1996	1997	1998	1999
SWIFT users	219	238	227	238	240
<i>of which:</i>					
<i>members</i>	182	185	181	184	147
<i>sub-members</i>	36	40	44	50	52
<i>participants</i>	1	3	2	4	41
Memorandum item:					
Total SWIFT worldwide	5,229	5,632	6,165	6,557	6,797
<i>of which:</i>					
<i>members</i>	2,259	2,874	2,969	3,052	2,214
<i>sub-members</i>	2,259	2,404	2,590	2,720	2,763
<i>participants</i>	277	354	606	785	1,820

**Table 17****SWIFT message flows to/from domestic users**

	1995	1996	1997	1998	1999
Total messages sent	27,584,947	30,081,128	31,672,855	35,347,305	33,462,912
<i>of which:</i>					
<i>category I</i>	6,360,220	6,903,858	7,968,583	8,556,232	9,734,402
<i>category II</i>	6,512,180	6,659,465	7,091,972	7,369,906	5,344,214
<i>sent to/received from</i>					
<i>domestic users</i>	4,959,227	5,419,805	4,127,570	3,906,821	2,523,560
Total messages received	28,480,765	31,508,461	32,742,840	34,939,777	33,854,013
<i>of which:</i>					
<i>category I</i>	9,502,849	10,487,061	9,980,426	10,758,471	12,158,469
<i>category II</i>	6,239,393	6,736,480	6,881,867	6,904,785	4,038,033
Memorandum item:					
Global SWIFT traffic	603,575,374	687,785,294	812,117,556	937,039,995	1,058,836,425

*Definitions:*

- *Sub-members: domestic users sponsored by members abroad;*
- *Participants: users which are not SWIFT shareholders; their message traffic over the network is restricted;*
- *Category I: customer (funds) transfers;*
- *Category II: bank (funds) transfers.*



## Luxembourg

**Table 1****Basic statistical data**

	1995	1996	1997	1998	1999
Population <sup>1)</sup> (thousands)	412.8	418.3	423.7	429.2	435.7
Gross domestic product (EUR billions)	13.3	14.0	15.5	16.5	18.1
Exchange rate vis-à-vis ECU/euro <sup>2)</sup>	38.5519	39.2986	40.5332	40.6207	40.3399

1) Average for the year.

2) Average for the year until 1998; irrevocable conversion rates were adopted with the introduction of the euro on 1 January 1999.

**Table 2****Settlement media used by non-banks**

(end of year)

	1995	1996	1997	EUR billions	
	1995	1996	1997	1998	1999
Banknotes and coins	0.39	0.41	0.45	0.59	0.55
Transferable deposits	2.2	2.4	2.4	2.6	43.0
Narrow money supply (M1) <sup>1)</sup>	2.5	2.8	2.9	3.2	43.5
Other	-	-	-	-	-
Outstanding value on electronic money schemes	-	-	-	-	0.001
<i>of which:</i>					
<i>on card-based products</i>	-	-	-	-	0.001
<i>on network-based products</i>	-	-	-	-	-

1) Until 1998, the calculation of M1 was based on the national residency criteria; from 1999 onwards, the national contribution to the euro area aggregate is used.

**Table 3****Settlement media used by deposit-taking institutions**

(end of year)

	1995	1996	1997	EUR billions	
	1995	1996	1997	1998	1999
Required reserves held at central bank	-	-	-	-	6.2
Free reserves held at central bank	-	-	-	-	0.02
Transferable deposits at other credit institutions	-	-	-	-	218.6
Broad money aggregate	-	-	-	-	172.7

**Table 4****Banknotes and coins***(total value, end of year)*

	LUF millions				
	1995	1996	1997	1998	1999
Total banknotes issued	4,203.7	5,007.1	4,975.9	4,292.3	4,053.1
<i>of which:</i>					
<i>LUF 5,000</i>	2,749.0	3,298.0	3,497.7	3,065.9	3,070.7
<i>LUF 1,000</i>	1,191.7	1,465.5	1,284.1	1,041.2	821.5
<i>LUF 100</i>	263.0	243.6	194.1	185.2	160.9
Total coins issued	926.7	926.8	926.8	926.6	926.6
Banknotes and coins held by credit institutions	9,501.1	10,874.1	11,369.6	11,337.7	13,661.8
Banknotes and coins in circulation outside credit institutions <sup>1)</sup>	15,900	16,600	18,300	23,800	22,100

1) These data include the Belgian banknotes and coins, which are legal tender in Luxembourg.

**Table 5****Institutional framework***(end of 1999)*

Categories	Number of institutions	Number of branches	Number of accounts (thousands)	Number of internet-linked accounts <sup>1)</sup>	Value of accounts (EUR billions)
Central bank	1	-	-	-	14.2
Commercial banks	208	310	-	-	367.3
Savings banks	0	-	-	-	-
Co-operative and rural banks	2	35	-	-	-
Post Office	1	-	-	-	0.3
Total	212	345	-	-	381.8
<i>of which virtual institutions</i>	-	-	-	-	-
Branches of foreign banks	68	-	-	-	-
<i>of which EU-based</i>	60	-	-	-	-

1) Number of accounts relating to internet services (credit transfers, payment of bills etc. carried out via the internet).

**Table 6****Payment card functions and accepting devices***(end of year)*

	1995	1996	1997	1998	1999
<b>Cash function</b>					
Cards with a cash function (thousands)	460.9	490.6	505.8	529.8	570.7
Number of ATMs with a cash dispensing function	187	223	233	284	310
<i>open access</i>	187	223	233	284	310
<i>limited access</i>	-	-	-	-	-
Volume of transactions (millions)	3.7	4.1	4.4	4.8	5.3
<i>at ATMs with open access</i>	3.7	4.1	4.4	4.8	5.3
<i>at ATMs with limited access</i>	-	-	-	-	-
Value of transactions (EUR millions)	427.3	472.4	504.5	547.2	613.8
<i>at ATMs with open access</i>	427.3	472.4	504.5	547.2	613.8
<i>at ATMs with limited access</i>	-	-	-	-	-
Number of ATMs with a giro transfer function	-	-	-	-	-
<i>volume of transactions</i>	-	-	-	-	-
<i>value of transactions</i>	-	-	-	-	-
<b>Debit function</b>					
Cards with a debit function (thousands)	236.6	246.6	249.1	249.7	269.8
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals	4,017	4,438	4,656	5,072	5,534
Volume of transactions (millions)	5.8	6.4	7.7	8.6	10.1
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (EUR millions)	390.8	433.0	509.4	571.4	661.1
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Credit function</b>					
Cards with a credit function (thousands)	224.3	244.0	256.7	280.1	300.9
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals	3,441	4,263	4,577	5,009	5,423
Volume of transactions (millions)	10.3	10.4	10.5	11.7	12.7
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (EUR millions)	690.5	727.9	785.0	861.9	881.3
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Electronic money function</b>					
Cards with an e-money function (thousands)	-	-	-	-	269.8
Number of terminals accepting the card	-	-	-	-	1,223
Number of purchase transactions (millions)	-	-	-	-	0.26
Value of purchase transactions (EUR millions)	-	-	-	-	1.50
Number of loading transactions (millions)	-	-	-	-	0.06
Value of money loaded (EUR millions)	-	-	-	-	2.52
Float (EUR millions)	-	-	-	-	1.02



**Table 7****Number of payment cards in circulation***(end of year)*

	1995	1996	1997	1998	1999
					thousands
Total number of cards in circulation	460.9	490.6	505.8	529.8	570.7
<i>of which:</i>					
<i>cards with a combined debit, cash and e-money function</i>	236.6	246.6	249.1	249.7	269.8
<i>cards with a credit function</i>	224.3	244.0	256.7	280.1	300.9
<i>cards with a debit function issued by retailers</i>	-	-	-	-	-

**Table 8****Payment instructions handled by selected interbank funds transfer systems: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	1999
					millions
Clearing house	6.5	6.7	7.0	10.5	11.8
Automated clearing house	2.2	3.6	4.3	9.3	11.8
Large-value systems	-	-	-	-	0.2
<b>Concentration ratio <sup>2)</sup></b>	-	-	-	-	-

1) The table contains both customer and interbank transactions.

2) Market share of the five largest payment systems service providers, based on the total volume of transactions.

**Table 9****Payment instructions handled by selected interbank funds transfer systems: value of transactions <sup>1)</sup>**

	1995	1996	1997	1998	1999
					EUR billions
Clearing house	14.8	13.1	12.5	24.9	36.2
Automated clearing house	3.9	2.8	2.5	20.3	36.2
Large-value systems	-	-	-	-	2,961.8
<b>Concentration ratio <sup>2)</sup></b>	-	-	-	-	-

1) The table contains both customer and interbank transactions.

2) Market share of the five largest payment systems service providers, based on the total value of transactions.

**Table 10****Indicators of the use of various cashless payment instruments: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	millions 1999
Volume of transactions	16.1	17.9	19.7	22.0	25.1
Cheques	-	-	0.2	0.1	0.1
<i>of which:</i>					
<i>paper-based</i>	-	-	0.2	0.1	0.1
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit card	5.8	6.4	7.7	8.7	10.1
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	5.8	6.4	7.7	8.7	10.1
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit card	10.3	10.4	10.5	11.6	12.7
<i>of which:</i>					
<i>paper-based</i>	1.0	0.7	0.4	0.3	0.3
<i>electronic (via PC or other terminal)</i>	9.3	9.7	10.1	11.3	12.4
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers <sup>2)</sup>	-	-	-	-	-
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	-	1.1	1.3	1.6	2.1
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	1.1	1.3	1.6	2.1
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	-	-	-	-	0.3
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) No data on intrabank credit transfers are available.

**Table I I**  
**Indicators of the use of various cashless payment instruments: value of transactions <sup>1)</sup>**

	EUR billions				
	1995	1996	1997	1998	1999
Value of transactions	1,081.4	1,288.3	1,439.8	1,601.6	1,772.3
Cheques	-	-	0.02	0.01	0.01
<i>of which:</i>					
<i>paper-based</i>	-	-	0.02	0.01	0.01
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit card	390.8	433.0	509.4	571.4	661.1
<i>of which:</i>					
<i>paper-based</i>	690.6	727.9	785.0	861.9	881.3
<i>electronic (via PC or other terminal)</i>	389.9	433.0	509.4	571.4	661.1
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit card	690.6	727.9	785.0	861.9	881.3
<i>of which:</i>					
<i>paper-based</i>	101.9	80.6	67.0	51.1	36.5
<i>electronic (via PC or other terminal)</i>	588.7	647.3	718.0	810.8	844.7
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers <sup>2)</sup>	-	-	-	-	-
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	-	127.4	145.3	168.3	230.0
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	127.4	145.3	168.3	230.0
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	-	-	-	-	0.001
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) No data on intrabank credit transfers are available.

**Table 12****Number of participants in trading, clearing and securities settlement systems<sup>1)</sup>***(end of 1999)*

Bourse de Luxembourg	
Banks	73
<i>of which:</i>	
<i>domestic</i>	57
<i>foreign</i>	16
Brokers/dealers	33
<i>of which:</i>	
<i>domestic</i>	8
<i>foreign</i>	25
Clearstream Banking (formerly Cedelbank)	-
Banks	-
<i>of which:</i>	
<i>domestic</i>	-
<i>foreign</i>	-
Brokers/dealers	-
<i>of which:</i>	
<i>domestic</i>	-
<i>foreign</i>	-
Others	-

1) No clearing house in Luxembourg.

**Table 13****Instructions handled by trading platforms, clearing houses and securities settlement systems***(volume of transactions)*

	1995	1996	1997	1998	1999
<b>Bourse de Luxembourg</b>					
Volume of trades	-	-	-	100,062	90,738
<b>Clearstream Banking (formerly Cedelbank)</b>					
Volume of settlement instructions	7,068,945	7,428,508	9,249,165	10,079,657	9,642,373

**Table 14****Instructions handled by trading platforms, clearing houses and securities settlement systems***(market value of transactions)*

	1995	1996	1997	1998	1999
	EUR billions				
<b>Bourse de Luxembourg</b>					
Value of trades	0.85	2.14	2.21	2.81	2.50
<b>Clearstream Banking (formerly Cedelbank)</b>					
Value of settlement instructions	6,888	9,881	10,747	13,697	21,335

**Table 15a****Outstanding securities***(end of year)*

	1995	1996	1997	1998	1999
<b>Bourse de Luxembourg</b>					
Value of stocks listed (EUR billions)	-	-	-	455	554
Value of other securities listed (EUR billions)	-	-	-	973	1,471
Number of stocks listed	327	313	317	308	312
Number of other securities listed	11,547	12,557	14,161	15,078	16,739
<b>Clearstream Banking (formerly Cedelbank)</b>					
Value of stocks issued (EUR billions)	-	-	-	-	-
Value of other securities issued (EUR billions)	-	-	-	-	-
Number of stocks issued	-	-	-	-	-
Number of other securities issued	-	-	-	-	-

**Table 15b****Netting ratio in clearing systems**

	1995	1996	1997	1998	1999
Netting ratio for cash over year	-	-	-	-	-
Netting ratio for securities over year	-	-	-	-	-

**Table 16****Participation in SWIFT by domestic institutions**

	1995	1996	1997	1998	1999
SWIFT users	150	156	158	165	170
<i>of which:</i>					
<i>members</i>	29	27	29	29	21
<i>sub-members</i>	121	127	125	130	133
<i>participants</i>	-	2	4	6	16
Memorandum item:					
Total SWIFT worldwide	5,229	5,632	6,165	6,557	6,797
<i>of which:</i>					
<i>members</i>	2,259	2,874	2,969	3,052	2,214
<i>sub-members</i>	2,259	2,404	2,590	2,720	2,763
<i>participants</i>	277	354	606	785	1,820

**Table 17****SWIFT message flows to/from domestic users**

	1995	1996	1997	1998	1999
Total messages sent	12,280,307	13,810,105	16,613,659	20,856,244	24,698,190
<i>of which:</i>					
<i>category I</i>	2,496,990	2,578,108	2,706,042	2,914,482	3,456,692
<i>category II</i>	3,692,809	3,974,317	4,567,451	5,043,127	4,526,480
<i>sent to/received from domestic users</i>	2,158,482	2,408,283	2,903,884	3,852,394	5,753,545
Total messages received	10,784,350	12,881,997	16,280,473	20,743,032	25,881,536
<i>of which:</i>					
<i>category I</i>	1,158,863	1,190,481	1,365,912	1,645,170	2,143,285
<i>category II</i>	1,097,793	1,206,425	1,400,894	1,616,620	1,900,783
Memorandum item:					
Global SWIFT traffic	582,192,512	687,785,294	812,117,556	937,039,995	1,058,836,425

*Definitions:*

- *Sub-members: domestic users sponsored by members abroad;*
- *Participants: users which are not SWIFT shareholders; their message traffic over the network is restricted;*
- *Category I: customer (funds) transfers;*
- *Category II: bank (funds) transfers.*



## Netherlands

**Table 1****Basic statistical data**

	1995	1996	1997	1998	1999
Population <sup>1)</sup> (thousands)	15,460	15,523	15,607	15,703	15,808
Gross domestic product (EUR billions)	302.2	315.1	333.7	354.2	373.9
Exchange rate vis-à-vis ECU/euro <sup>2)</sup>	2.09891	2.13973	2.21081	2.21967	2.20371

1) Average for the year.

2) Average for the year until 1998; irrevocable conversion rates were adopted with the introduction of the euro on 1 January 1999.

**Table 2****Settlement media used by non-banks**

(end of year)

	1995	1996	1997	EUR billions	
	1995	1996	1997	1998	1999
Banknotes and coins	17.3	17.4	17.6	17.1	17.3
Transferable deposits <sup>1)</sup>	61.2	71.0	77.3	99.2	113.8
<i>of which held by:</i>					
<i>households</i>	23.5	26.9	28.8	32.8	36.7
<i>corporate sector</i>	29.6	35.2	38.1	51.8	57.1
<i>other</i>	8.1	8.8	10.4	14.5	20.0
Narrow money supply	78.5	88.4	94.9	116.3	131.1
Outstanding value on electronic money schemes	-	-	-	0.045	0.045
<i>of which:</i>					
<i>on card-based products</i>	-	-	-	0.045	0.045
<i>on network-based products</i>	-	-	-	-	-

1) Data from 1998 onwards include outstanding value on electronic money schemes.

**Table 3****Settlement media used by deposit-taking institutions**

(end of year)

	1995	1996	1997	EUR millions	
	1995	1996	1997	1998	1999
Required reserves held at central bank	...	...	2,774	7,777	7,303
<i>of which can be used for settlement</i>	...	...	2,774	7,777	7,303
Free reserves held at central bank	17	27	9	9	-
Transferable deposits at other institutions <sup>1)</sup>	1,389	1,414	1,081	-	-

1) Data regarding transferable deposits at other institutions are not available after 1997 owing to a change in the reporting procedure to De Nederlandsche Bank.



**Table 4****Banknotes and coins***(total value, end of year)*

	1995	1996	1997	NLG billions	
				1998	1999
Total banknotes issued	38.6	39.0	39.3	38.1	39.0
<i>of which:</i>					
<i>NLG 1,000</i>	14.9	14.4	14.5	13.6	13.7
<i>NLG 250</i>	5.2	5.4	5.3	5.0	4.9
<i>NLG 100</i>	13.8	14.6	14.8	14.8	15.6
<i>NLG 50</i>	1.9	1.7	1.8	1.7	1.8
<i>NLG 25</i>	1.8	2.0	2.0	2.1	2.2
<i>NLG 10</i>	0.8	0.8	0.8	0.8	0.9
<i>NLG 5</i>	0.0	0.0	0.0	0.0	0.0
Total coins issued	2.7	2.7	2.8	2.8	2.8
<i>of which:</i>					
<i>NLG 5.00</i>	0.9	1.0	1.0	1.0	1.0
<i>NLG 2.50</i>	0.5	0.5	0.5	0.5	0.5
<i>NLG 1.00</i>	0.7	0.7	0.7	0.7	0.7
<i>NLG 0.25</i>	0.3	0.3	0.3	0.3	0.3
<i>NLG 0.10</i>	0.2	0.2	0.2	0.2	0.2
<i>NLG 0.05</i>	0.1	0.1	0.1	0.1	0.1
Banknotes and coins held by credit institutions	3.1	3.4	3.4	3.2	3.7
Banknotes and coins in circulation outside credit institutions	38.2	38.3	38.7	37.7	38.2

**Table 5****Institutional framework***(end of 1999)*

Categories	Number of institutions	Number of branches	Number of accounts (millions)	Number of internet-linked accounts <sup>1)</sup>	Value of accounts (EUR billions)
Central bank	1	4	...	...	...
Commercial banks	99	2,215	-	-	-
Savings banks	21	21	-	-	-
Co-operative and rural banks	1	1,795	-	-	-
Postbank	1	2,247	-	-	-
Total	123	6,282	21.1	-	113.8
<i>of which virtual institutions</i>	-	-	-	-	-
Branches of foreign banks	31	...	-	-	-
<i>of which EU-based</i>	21	...	-	-	-

1) Number of accounts relating to internet services (credit transfers, payment of bills, etc. carried out via the internet).

**Table 6****Payment card functions and accepting devices***(end of year)*

	1995	1996	1997	1998	1999
<b>Cash function</b>					
Cards with a cash function (thousands)	19,500	20,400	23,500	24,000	24,200
Number of ATMs with a cash dispensing function	5,862	6,150	6,397	6,568	6,700
<i>open access</i>	-	-	-	6,568	6,700
<i>limited access</i>	5,862	6,150	6,397	-	-
Volume of transactions (millions)	360	400	404	425	530
<i>at ATMs with open access</i>	-	-	-	-	-
<i>at ATMs with limited access</i>	-	-	-	-	-
Value of transactions (EUR billions)	31	34	35	37	39
<i>at ATMs with open access</i>	31	34	35	37	39
<i>at ATMs with limited access</i>	-	-	-	-	-
Number of ATMs with a giro transfer function	-	-	-	-	-
<i>volume of transactions</i>	-	-	-	-	-
<i>value of transactions</i>	-	-	-	-	-
<b>Debit function</b>					
Cards with a debit function (thousands)	14,930	18,460	19,700	19,900	20,100
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals	73,376	96,044	120,417	134,479	145,575
Volume of transactions (millions)	255.9	370.9	485.5	595.0	700.3
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (EUR billions)	11.0	16.0	21.0	25.8	32.0
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Credit function</b>					
Cards with a credit function (thousands)	1,500	1,900	3,800	4,100	4,100
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals	-	-	-	-	-
Volume of transactions (millions)	.	44	48	49	53
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (EUR billions)	-	4	5	4	5
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Electronic money function</b>					
Cards with an e-money function (thousands)	-	1,400	9,500	17,900	20,000
Number of terminals accepting the card	1,008	48,000	105,401	141,916	145,000
Number of purchase transactions	-	-	-	-	-
Value of purchase transactions	-	-	-	-	-
Number of loading transactions	-	-	-	-	-
Value of money loaded	-	-	-	-	-
Float	-	-	-	-	-

**Table 7****Number of payment cards in circulation***(end of year)*

	1995	1996	1997	1998	1999
					thousands
Total number of cards in circulation	19,500	20,400	23,500	24,000	24,200
<i>of which:</i>					
<i>cards with a combined debit, cash and e-money function</i>	-	1,400	9,500	17,900	20,000
<i>cards with a credit function</i>	1,500	1,900	3,800	4,100	4,100
<i>cards with a debit function issued by retailers</i>	-	-	-	-	-

**Table 8****Payment instructions handled by selected interbank funds transfer systems: volume of transactions<sup>1)</sup>**

	1995	1996	1997	1998	1999
					millions
<b>Interpay</b>	<b>1,407.1</b>	<b>1,588.5</b>	<b>1,782.9</b>	<b>2,012.3</b>	<b>2,152.5</b>
Cheques	63.2	50.6	39.9	29.3	16.7
Other	1,343.9	1,537.9	1,743.0	1,983.0	2,135.8
<b>TOP</b>	<b>2.5</b>	<b>2.7</b>	<b>3.2</b>	<b>3.5</b>	<b>3.4</b>
Cheques	...	...	...	...	...
Other	2.5	2.7	3.2	3.5	3.4
<b>Concentration ratio<sup>2)</sup></b>	<b>-</b>	<b>94%</b>	<b>95%</b>	<b>95%</b>	<b>95%</b>

1) The table contains both customer and interbank transactions.

2) Market share of the five largest participants in each payment system, based on the total volume of transactions.

**Table 9****Payment instructions handled by selected interbank funds transfer systems: value of transactions<sup>1)</sup>**

	1995	1996	1997	1998	1999
					EUR billions
<b>Interpay</b>	<b>993.4</b>	<b>1,052.5</b>	<b>1,143.5</b>	<b>1,237.9</b>	<b>1,344.5</b>
Cheques	4.5	3.8	2.9	2.2	1.4
Other	988.9	1,048.7	1,140.6	1,235.7	1,343.1
<b>TOP</b>	<b>8,527.0</b>	<b>10,261.7</b>	<b>12,566.5</b>	<b>15,641.2</b>	<b>15,629.4</b>
Cheques	...	...	...	...	...
Other	8,527.0	10,261.7	12,566.5	15,641.2	15,629.4
<b>Concentration ratio<sup>2)</sup></b>	<b>-</b>	<b>90%</b>	<b>92%</b>	<b>93%</b>	<b>94%</b>

1) The table contains both customer and interbank transactions.

2) Market share of the five largest participants in each payment system, based on the total value of transactions.

**Table 10****Indicators of the use of various cashless payment instruments: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	millions 1999
Volume of transactions	1,900.5	2,120.0	2,296.2	2,454.1	2,633.0
Cheques	109.9	84.3	64.9	46.6	26.7
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	109.9	84.3	64.9	46.6	26.7
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Payments by debit card	255.9	370.9	485.5	595.0	700.3
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	255.9	370.9	485.5	595.0	700.3
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Payments by credit card	-	43.9	48.3	48.9	53.1
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	1,000.8	1,033.1	1,061.4	1,071.7	1,092.2
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	1,000.8	1,033.1	1,061.4	1,071.7	1,092.2
<i>electronic (via mobile phone)</i>	...	...	...	...	-
Direct debits	533.9	587.8	636.1	691.9	760.7
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	533.9	587.8	636.1	691.9	760.7
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Card-based electronic money	-	-	-	-	-
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

**Table I I****Indicators of the use of various cashless payment instruments: value of transactions <sup>1)</sup>**

	EUR billions				
	1995	1996	1997	1998	1999
Value of transactions	1,951	2,027	2,333	2,564	2,733
Cheques	7	6	5	3	2
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	7	6	5	3	2
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Payments by debit card	11	16	21	26	32
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	11	16	21	26	32
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Payments by credit card	-	4	5	4	5
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	1,839	1,899	2,192	2,411	2,559
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	1,839	1,899	2,192	2,411	2,559
<i>electronic (via mobile phone)</i>	...	...	...	...	-
Direct debits	94	102	110	120	135
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	94	102	110	120	135
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Card-based electronic money	-	-	-	-	-
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

**Table 12****Number of participants in trading, clearing and securities settlement systems***(end of 1999)*

Trading platform	AEX-Effectenbeurs	AEX-Optiebeurs
Banks	68	48
<i>of which:</i>		
<i>domestic</i>	36	37
<i>foreign</i>	32	11
Brokers/dealers	72	112
<i>of which:</i>		
<i>domestic</i>	42	109
<i>foreign</i>	30	3
Others	3	66
Total	143	226
Clearing houses	AEX-Effectenclearing	AEX-Optieclearing
Banks	29	12
<i>of which:</i>		
<i>domestic</i>	27	9
<i>foreign</i>	2	3
Brokers/dealers	5	2
<i>of which:</i>		
<i>domestic</i>	4	1
<i>foreign</i>	1	1
Others	1	1
Total	35	15
Securities settlement systems	Necigef	
Banks	55	
<i>of which:</i>		
<i>domestic</i>	49	
<i>foreign</i>	6	
Brokers/dealers	3	
<i>of which:</i>		
<i>domestic</i>	3	
<i>foreign</i>	-	
Others	9	
Total	67	

**Table 13****Instructions handled by trading platforms, clearing houses and securities settlement systems<sup>1)</sup>***(volume of transactions)*

	1995	1996	1997	1998	1999
	thousands				
<b>AEX Effectenclearing</b>					
Volume of transactions	1,502	2,500	3,998	6,095	7,752
<b>AEX Optieclearing</b>					
Volume of transactions cleared <sup>1)</sup>	15,873	26,975	46,166	61,447	46,603
<b>Necigef</b>					
Volume of settlement instructions	906	1,325	1,685	2,061	2,357
<i>of which:</i>					
<i>deliveries against payment</i>	...	286	529	764	982
<i>free transfers</i>	906	1,039	1,156	1,297	1,375

1) Excluding futures.

**Table 14****Instructions handled by trading platforms, clearing houses and securities settlement systems***(market value of transactions)*

	1995	1996	1997	1998	1999
	EUR billions				
<b>AEX Effectenclearing</b>					
Value of transactions	309	446	502	633	749
<b>AEX Optieclearing</b>					
Value of transactions cleared <sup>1)</sup>	8	18	51	74	54
<b>Necigef</b>					
Value of settlement instructions	...	134	258	420	619
<i>of which:</i>					
<i>deliveries against payment</i>	...	134	258	420	619
<i>free transfers</i>	.	.	.	.	.

1) Excluding futures.

**Table 15a****Outstanding securities***(end of year)*

	1995	1996	1997	1998	1999
<b>AEX-Effectenbeurs</b>					
Value of stocks listed (EUR billions)	259	358	506	603	812
Value of other securities listed (EUR billions)	.	.	.	.	.
Number of stocks listed	625	618	651	800	972
Number of other securities listed	.	.	.	.	.
<b>AEX-Optiebeurs</b>					
Value of outstanding contracts (EUR billions)	.	.	.	.	.
Number of options listed	.	.	.	.	.
<b>Necigef</b>					
Nominal values registered (EUR billions)	193	214	228	253	270
Number of securities registered	1,258	1,239	1,298	1,846	2,266

**Table 15b****Netting ratio in clearing systems**

	1995	1996	1997	1998	1999
<b>AEX-Effectenclearing</b>					
Netting ratio for cash over the year	-	-	-	-	-
Netting ratio for securities over the year	-	-	-	-	-
<b>AEX-Optieclearing</b>					
Netting ratio for cash over the year	-	-	-	-	-
Netting ratio for securities over the year	-	-	-	-	-

**Table 16****Participation in SWIFT by domestic institutions**

	1995	1996	1997	1998	1999
SWIFT users	62	65	65	72	79
<i>of which:</i>					
<i>members</i>	28	28	29	28	23
<i>sub-members</i>	32	34	32	36	39
<i>participants</i>	2	3	4	8	17
Memorandum item:					
Total SWIFT worldwide	5,229	5,632	6,165	6,557	6,797
<i>of which:</i>					
<i>members</i>	2,259	2,874	2,969	3,052	2,214
<i>sub-members</i>	2,259	2,404	2,590	2,720	2,763
<i>participants</i>	277	354	606	785	1,820



**Table 17**  
**SWIFT message flows to/from domestic users**

	1995	1996	1997	1998	1999
Total messages sent	16,903,885	18,667,326	21,967,507	26,868,470	36,340,508
<i>of which:</i>					
<i>category I</i>	6,747,310	7,032,141	7,544,714	8,398,068	9,908,891
<i>category II</i>	3,275,847	3,420,058	3,951,510	4,500,328	4,752,652
<i>sent to/received from</i>					
<i>domestic users</i>	1,870,671	2,052,952	2,456,699	3,051,321	7,061,953
Total messages received	16,027,297	17,802,379	20,199,570	23,965,593	32,988,955
<i>of which:</i>					
<i>category I</i>	5,498,322	5,726,242	6,205,747	6,775,293	8,059,671
<i>category II</i>	2,204,721	2,362,906	2,602,689	2,856,930	3,180,250
Memorandum item:					
Global SWIFT traffic	603,575,374	687,785,294	812,117,556	937,039,995	1,058,836,425

*Definitions:*

- *Sub-members: domestic users sponsored by members abroad;*
- *Participants: users which are not SWIFT shareholders; their message traffic over the network is restricted;*
- *Category I: customer (funds) transfers;*
- *Category II: bank (funds) transfers.*

## Austria

**Table 1****Basic statistical data**

	1995	1996	1997	1998	1999
Population <sup>1)</sup> (thousands)	8,047	8,059	8,072	8,079	8,092
Gross domestic product (EUR billions)	172.3	178.0	182.7	190.0	197.1
Exchange rate vis-à-vis ECU/euro <sup>2)</sup>	13.1824	13.4345	13.824	13.85	13.7603

1) Average for the year.

2) Average for the year until 1998; irrevocable conversion rates were adopted with the introduction of the euro on 1 January 1999.

**Table 2****Settlement media used by non-banks**

(end of year)

	1995	1996	1997	EUR billions	
	1995	1996	1997	1998	1999
Banknotes and coins <sup>1)</sup>	10.4	10.7	10.6	10.6	11.2
Transferable deposits <sup>2)</sup>	19.4	20.7	22.2	25.5	30.1
Narrow money supply (M1) <sup>1)</sup>	29.7	31.3	32.9	36.0	41.4
Transferable deposits in foreign currencies	2.0	2.5	2.6	2.8	1.2
Outstanding value on electronic money schemes	...	0.002	0.002	0.003	0.003
<i>of which:</i>					
<i>on card-based products</i>	...	0.002	0.002	0.003	0.003
<i>on network-based products</i>	...	...	...	...	...

1) Without coins in gold and silver.

2) Credit institutions, in local currency only.

**Table 3****Settlement media used by deposit-taking institutions**

(end of year)

	1995	1996	1997	EUR billions	
	1995	1996	1997	1998	1999
Required reserves held at central bank	4.00	4.11	4.19	4.37	3.42
Free reserves held at central bank <sup>1)</sup>	.	.	.	.	.
Transferable deposits at other institutions <sup>2)</sup>	18.40	20.30	21.39	25.53	21.32

1) Average of end-of-month figures.

2) Average of end-of-quarter figures.

**Table 4****Banknotes and coins***(total value, end of year)*

	ATS millions				
	1995	1996	1997	1998	1999
Total banknotes issued (banknotes in circulation)	161,413	169,224	171,125	168,823	184,389
<i>of which belonging to the new series:</i>					
5,000/I	43,878	50,508	54,658	56,805	63,094
1,000/V	...	...	52,883	73,775	83,612
500/IV	...	...	8,335	11,048	11,903
100/VI	13,222	13,464	13,638	13,667	14,454
50/IV	2,241	2,297	2,298	2,321	2,389
20/V	2,044	2,118	2,169	2,234	2,283
<i>of which belonging to the old series:</i>					
1,000/IV	85,650	86,434	30,492	5,932	4,105
1,000/III	622	589	567	543	525
500/III	12,729	12,822	5,123	1,565	1,113
500/II	257	244	234	223	215
100/V	363	352	342	332	324
50/III	163	158	154	151	147
20/IV	243	238	233	228	224
Total coins issued (coins in circulation)	34,660	35,264	35,616	36,139	36,561
<i>of which:</i>					
<i>base metal coins</i>	7,195	7,503	7,720	7,886	8,092
ATS 50	...	50	115	156	174
ATS 20	497	518	513	506	515
ATS 10	2,833	2,949	3,005	3,036	3,109
ATS 5	1,848	1,912	1,963	2,015	2,065
ATS 1	1,452	1,499	1,541	1,584	1,634
ATS 0.50	264	268	271	275	278
ATS 0.10	283	291	295	298	301
ATS 0.05	13	13	13	13	13
ATS 0.02	4	4	4	4	4
ATS 0.01	...	...	...	...	...
<i>gold and silver coins</i>	27,465	27,761	27,895	28,253	28,469
<i>gold coins <sup>1)</sup></i>	8,351	9,363	10,370	11,206	11,823
<i>bimetallic coins</i>	66	67	58	58	57
<i>silver coins with a gold centre ATS 1,000</i>	49	50	42	42	42
<i>silver coins with a gold ring ATS 500</i>	17	17	16	16	16
<i>silver coins</i>	19,048	18,331	17,467	16,989	16,589
ATS 500	10,309	9,888	9,376	9,107	8,884
ATS 200	22	26	26	26	26
ATS 100	5,228	5,032	4,793	4,651	4,533
ATS 50	2,398	2,319	2,234	2,180	2,134
ATS 25	1,091	1,066	1,039	1,026	1,012
Banknotes and coins held by credit institutions	25,869	30,059	32,635	31,163	38,104
Banknotes and coins in circulation outside credit institutions	170,203	174,430	174,106	173,799	182,846

1) *Bullion coins at values of ATS 2,000, 1,000, 500 and 200 and gold coins at values of ATS 1,000 and 500.*

**Table 5****Institutional framework***(end of 1999)*

Categories	Number of institutions	Number of branches	Number of accounts (thousands)	Number of internet-linked accounts <sup>1)</sup>	Value of accounts (EUR billions)
Central bank	1	8	0.6	...	4.80
Credit institutions	950	4,576	6,120.5	.	30.14
Postcheque	1	2,335	.	.	.
Total	952	6,919	6,121.1	.	34.93
<i>of which virtual institutions</i>	.	.	.	.	.
Branches of foreign banks	15	3	.	.	.
<i>of which EU-based</i>	14	3	19.5	.	0.39

1) Number of accounts relating to internet services (credit transfers, payment of bills, etc. carried out via the internet).

**Table 6**  
**Payment card functions and accepting devices**

(end of year)

	1995	1996	1997	1998	1999
<b>Cash function</b>					
Cards with a cash function (thousands)	4,355	4,681	5,286	5,975	6,869
Number of ATMs with a cash dispensing function	3,392	3,864	4,302	4,778	5,340
<i>open access</i>	1,993	2,164	2,337	2,424	2,570
<i>limited access</i>	1,399	1,700	1,965	2,354	2,770
Volume of transactions (millions)	73.7	81.3	87.3	91.5	96.1
<i>at ATMs with open access</i>	68.2	74.2	78.7	81.3	84.1
<i>at ATMs with limited access</i>	5.5	7.1	8.6	10.2	12.0
Value of transactions (EUR billions)	10.11	11.18	11.74	12.57	13.17
<i>at ATMs with open access</i>	9.38	10.25	10.67	11.24	11.50
<i>at ATMs with limited access</i>	0.64	0.81	0.95	1.21	1.54
Number of ATMs with a giro transfer function	.	.	.	.	.
<i>volume of transactions</i>	.	.	.	.	.
<i>value of transactions</i>	.	.	.	.	.
<b>Debit function</b>					
Cards with a debit function (thousands)	3,292	3,566	4,041	4,583	5,915
<i>of which retailer cards</i>	.	.	.	.	.
Number of terminals	3,382	5,095	13,331	19,240	28,763
Volume of transactions (millions)	11.1	15.1	24.0	38.8	58.1
<i>of which transactions with retailer cards</i>	.	.	.	.	.
Value of transactions (EUR billions)	0.52	0.81	1.29	2.00	3.15
<i>of which transactions with retailer cards</i>	.	.	.	.	.
<b>Credit function</b>					
Cards with a credit function (thousands)	1,189	1,275	1,428	1,607	1,673
<i>of which retailer cards</i>	.	.	.	.	.
Number of terminals	.	.	.	.	.
Volume of transactions (millions)	14.6	17.4	20.5	24.4	26.7
<i>of which transactions with retailer cards</i>	.	.	.	.	.
Value of transactions (EUR billions)	1.84	2.24	2.40	2.65	2.95
<i>of which transactions with retailer cards</i>	.	.	.	.	.
<b>Electronic money function</b>					
Cards with an e-money function (thousands)	2,370	2,944	3,121	3,456	4,805
Number of terminals accepting the card	.	3,333	12,756	19,118	29,564
Number of purchase transactions (thousands)	.	87	426	1,161	2,212
Value of purchase transactions (EUR millions)	.	1.27	5.67	9.21	11.69
Number of loading transactions (thousands)	.	48	160	228	262
Value of money loaded (EUR millions)	.	2.18	7.99	11.19	13.59
Float (EUR millions)	.	0.07	2.40	2.54	3.12

**Table 7****Number of payment cards in circulation***(end of year)*

	1995	1996	1997	1998	1999
					thousands
Total number of cards in circulation	5,092	5,440	6,156	6,944	8,760
<i>of which:</i>					
<i>cards with a combined debit, cash and e-money function</i>	3,853	4,113	4,677	5,289	7,037
<i>cards with a credit function</i>	1,189	1,275	1,427	1,606	1,673
<i>cards with a debit function issued by retailers</i>	.	.	.	.	.

**Table 8****Payment instructions handled by selected interbank funds transfer systems: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	1999
					millions
ARTIS <sup>2)</sup>	-	-	0.05	0.11	0.74
<b>Concentration ratio<sup>3)</sup></b>	-	-	-	-	-

1) The table contains both customer and interbank transactions.

2) The ARTIS system was started in July 1997.

3) Market share of the five largest participants in each payment system, based on the total volume of transactions.

**Table 9****Payment instructions handled by selected interbank funds transfer systems: value of transactions <sup>1)</sup>**

	1995	1996	1997	1998	1999
					EUR billions
ARTIS <sup>2)</sup>	-	-	493	1,332	3,416
<b>Concentration ratio<sup>3)</sup></b>	-	-	-	-	-

1) The table contains both customer and interbank transactions.

2) The ARTIS system was started in July 1997.

3) Market share of the five largest participants in each payment system, based on the total value of transactions.

**Table 10****Indicators of the use of various cashless payment instruments: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	millions 1999
Volume of transactions	700.1	727.6	755.7	783.0	805.9
Cheques	32.5	28.0	25.8	22.2	15.9
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Payments by debit card	11.1	15.1	24.0	38.8	58.1
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	11.1	15.1	24.0	38.8	58.1
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Payments by credit card	14.6	17.4	20.5	24.4	26.7
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Credit transfers	432	462	466	480	466
<i>of which:</i>					
<i>paper-based</i>	282	277	266	271	238
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Direct debits	210	205	219	217	237
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Card-based electronic money		0.09	0.43	1.16	2.21
Network-based electronic money	...	...	...	...	...

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

**Table I I****Indicators of the use of various cashless payment instruments: value of transactions <sup>1)</sup>**

	EUR billions				
	1995	1996	1997	1998	1999
Value of transactions	485	884	914	1,189	1,213
Cheques	74	40	34	35	28
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Payments by debit card	0.5	0.8	1.3	2.0	3.2
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	0.5	0.8	1.3	2.0	3.2
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Payments by credit card	1.8	2.2	2.4	2.7	2.9
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Credit transfers	376	804	796	1,014	1,082
<i>of which:</i>					
<i>paper-based</i>	230	427	391	496	332
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Direct debits	33	38	80	135	98
<i>of which:</i>					
<i>paper-based</i>	.	.	.	.	.
<i>electronic (via PC or other terminal)</i>	.	.	.	.	.
<i>electronic (via mobile phone)</i>	.	.	.	.	.
Card-based electronic money		0.001	0.01	0.01	0.01
Network-based electronic money	...	...	...	...	...

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.



**Table 12****Number of participants in trading, clearing and securities settlement systems***(end of 1999)*

<b>Wiener Börse AG – cash trading</b>	<b>437</b>
Banks (members)	58
<i>of which:</i>	
<i>domestic</i>	48
<i>foreign</i>	10
Broker/dealer	379
<i>of which:</i>	
<i>domestic</i>	324
<i>foreign</i>	55
<b>Wiener Börse AG – derivatives trading</b>	<b>136</b>
Banks (members)	17
<i>of which:</i>	
<i>domestic</i>	7
<i>foreign</i>	10
Broker/dealer	119
<i>of which:</i>	
<i>domestic</i>	95
<i>foreign</i>	24
<b>Direct Settlement (DS) system of OeKB (settlement of transactions outside the Wiener Börse)</b>	<b>126</b>
Banks	120
<i>of which:</i>	
<i>domestic</i>	102
<i>foreign</i>	18
Broker/dealer	-
<i>of which:</i>	
<i>domestic</i>	-
<i>foreign</i>	-
Foreign CSDs	6
<b>“Arrangement” system of OeKB (settlement of transactions on the Wiener Börse)</b>	<b>58</b>
Banks	53
<i>of which:</i>	
<i>domestic</i>	50
<i>foreign</i>	3
Broker/dealer	5
<i>of which:</i>	
<i>domestic</i>	5
<i>foreign</i>	...
<b>Derivative market of the Wiener Börse (clearing and settlement of standardised derivative products)</b>	<b>11</b>
Banks	11
<i>of which:</i>	
<i>domestic</i>	6
<i>foreign</i>	5
Broker/dealer	-
<i>of which:</i>	
<i>domestic</i>	-
<i>foreign</i>	-

**Table 13****Instructions handled by trading platforms, clearing houses and securities settlement systems***(volume of transactions)*

	1995	1996	1997	1998	1999
Wiener Börse AG – cash trading					
Volume of transactions	.	.	1,604,810	1,778,783	1,429,456
Wiener Börse AG – derivatives trading					
Volume of transactions	139,929	109,790	110,216	130,199	71,406
Direct Settlement (DS) system of OeKB (settlement of transactions outside the Wiener Börse)					
Volume of settlement instructions	295,808	313,345	276,431	309,997	275,012
“Arrangement” system of OeKB (settlement of transactions on the Wiener Börse)					
Volume of settlement instructions	1,016,669	659,830	1,446,870	1,569,212	1,429,456
Derivative market of the Wiener Börse (clearing and settlement of standardised derivative products) <sup>1)</sup>					
Volume of settlement instructions	139,929	109,790	110,216	130,199	71,406

1) Database: Wiener Börse, Austrian Futures and Options Exchange (ÖTOB) until 1997. ÖTOB was merged with the Wiener Börse in December 1997.

**Table 14****Instructions handled by trading platforms, clearing houses and securities settlement systems***(market value of transactions)*

	1995	1996	1997	EUR millions 1998	1999
Wiener Börse AG – cash trading					
Value of transactions	20,771	17,938	23,603	35,067	22,638
Wiener Börse AG – derivatives trading					
Value of transactions	37,462	54,016	55,334	44,188	19,417
Direct Settlement (DS) system of OeKB (settlement of transactions outside the Wiener Börse) <sup>1)</sup>					
Value of settlement instructions	208,024	471,582	299,811	359,536	335,167
“Arrangement” system of OeKB (settlement of transactions on the Wiener Börse)					
Value of settlement instructions <sup>2)</sup>	20,771	17,938	23,603	35,067	22,934
Derivative market of the Wiener Börse (clearing and settlement of standardised derivative products)					
Value of settlement instructions	37,462	54,016	55,334	44,188	19,417

1) Database: central securities depository; free-of-payment transactions are not included.

2) For 1999, including the unregulated market (Sonstiger Handel).

**Table 15a****Outstanding securities***(end of year)*

	1995	1996	1997	1998	1999
<b>Wiener Börse AG – cash trading</b>					
Value of stocks listed (EUR billions) <sup>1)</sup>	23	26	33	29	32
Value of other securities listed (EUR billions) <sup>2)</sup>	90	93	98	105	112
Number of stocks listed	128	123	118	112	113
Number of other securities listed	1,787	1,656	1,605	1,450	3,385
<b>Direct Settlement (DS) system of OeKB (settlement of transactions outside the Wiener Börse)</b>					
Value of stocks issued (EUR billions) <sup>3)</sup>	.	.	.	.	.
Value of other securities issued (EUR billions) <sup>4)</sup>	89	93	102	110	127
Number of stocks issued	4,998	4,986	5,107	4,965	5,855
Number of other securities issued	.	.	.	.	.
<b>“Arrangement” system of OeKB (settlement of transactions on the Wiener Börse)</b>					
Value of stocks listed (EUR billions)	23	26	33	29	32
Value of other securities listed (EUR billions)	90	93	98	105	112
Number of stocks listed	128	123	118	112	113
Number of other securities listed	1,787	1,656	1,605	1,450	3,385

1) Market capitalisation of domestic stocks listed on the official and semi-official market.

2) Market capitalisation of bonds listed on the official and semi-official market.

3) Only units (Stück) available. 1999: 1,977,140,102 units.

4) Bonds: nominal value.

**Table 15b****Netting ratio in clearing systems**

	1995	1996	1997	1998	1999
Netting ratio for cash over the year	-	-	-	-	-
Netting ratio for securities over the year	-	-	-	-	-

**Table 16****Participation in SWIFT by domestic institutions**

	1995	1996	1997	1998	1999
SWIFT users	75	77	81	83	85
<i>of which:</i>					
<i>members</i>	61	62	62	62	47
<i>sub-members</i>	14	15	16	17	16
<i>participants</i>	-	-	3	4	22
Memorandum item:					
Total SWIFT worldwide	5,229	5,632	6,165	6,557	6,797
<i>of which:</i>					
<i>members</i>	2,259	2,874	2,969	3,052	2,214
<i>sub-members</i>	2,259	2,404	2,590	2,720	2,763
<i>participants</i>	277	354	606	785	1,820

**Table 17****SWIFT message flows to/from domestic users**

	1995	1996	1997	1998	1999
Total messages sent	12,829,110	13,480,754	14,531,271	15,888,958	16,123,133
<i>of which:</i>					
<i>category I</i>	4,974,386	5,163,626	5,221,236	5,838,867	7,371,589
<i>category II</i>	3,273,130	3,304,533	3,593,009	3,762,443	2,762,383
<i>sent to/received from domestic users</i>	-	2,945,226	3,269,698	3,826,572	3,925,717
Total messages received	10,439,996	11,141,807	12,239,259	13,515,128	14,689,810
<i>of which:</i>					
<i>category I</i>	4,027,894	4,195,693	4,420,556	4,850,305	6,131,220
<i>category II</i>	1,906,614	2,039,355	2,192,675	2,447,766	2,000,524
Memorandum item:					
Global SWIFT traffic	603,575,374	687,785,294	812,117,556	937,039,995	1,058,836,425

*Definitions:*

- *Sub-members: domestic users sponsored by members abroad;*
- *Participants: users which are not SWIFT shareholders; their message traffic over the network is restricted;*
- *Category I: customer (funds) transfers;*
- *Category II: bank (funds) transfers.*



## Portugal

**Table 1****Basic statistical data**

	1995	1996	1997	1998	1999
Population <sup>1)</sup> (thousands)	9,917	9,927	9,941	9,969	9,989
Gross domestic product (EUR billions)	81.1	86.7	92.7	99.7	106.3
Exchange rate vis-à-vis ECU/euro <sup>2)</sup>	196.105	195.761	198.589	201.695	200.482

1) Average for the year.

2) Average for the year until 1998; irrevocable conversion rates were adopted with the introduction of the euro on 1 January 1999.

**Table 2****Settlement media used by non-banks**

(end of year)

	EUR billions				
	1995	1996	1997	1998	1999
Banknotes and coins	4.2	4.3	3.8	4.6	5.6
Transferable deposits	16.7	23.9	28.2	32.7	38.3
<i>of which held by:</i>					
<i>households</i>	10.4	13.9	16.0	18.7	22.0
<i>corporate sector</i>	4.9	7.1	9.0	9.8	11.2
<i>other</i>	1.4	2.9	3.2	4.2	5.2
Other	0.3	0.4	0.4	0.6	1.3
Narrow money supply (M1)	21.2	28.6	32.5	37.9	45.2
Deposits in foreign currencies	0.9	1.0	2.3	3.3	4.1
Outstanding value on electronic money schemes	0.002	0.002	0.002	0.002	0.001
<i>of which:</i>					
<i>on card-based products</i>	0.002	0.002	0.002	0.002	0.001
<i>on network-based products</i>	-	-	-	-	-

**Table 3****Settlement media used by deposit-taking institutions**

(end of year)

	EUR billions				
	1995	1996	1997	1998	1999
Required reserves held at central bank <sup>1)</sup>	1.3	1.8	1.8	2.5	2.7
<i>of which can be used for settlement</i>	1.3	1.8	1.8	2.5	2.7
Free reserves held at central bank	0.032	0.006	0.021	0.002	0.009
Transferable deposits at other institutions	0.2	0.1	0.6	1.6	2.3
Memorandum item:					
Broad money aggregate	58.2	62.8	66.8	100.0	109.8

1) Including free reserves held at the central bank.

**Table 4****Banknotes and coins***(total value, end of year)*

	PTE billions				
	1995	1996	1997	1998	1999
Total banknotes issued	894.9	937.0	873.5	1,018.8	1,389.9
<i>of which:</i>					
<i>PTE 10,000</i>	317.0	296.4	223.5	292.7	401.4
<i>PTE 5,000</i>	438.3	490.1	504.1	571.6	789.6
<i>PTE 2,000</i>	68.0	76.7	80.5	80.6	95.2
<i>PTE 1,000</i>	56.8	59.1	49.3	59.1	87.8
<i>PTE 500</i>	14.8	14.7	16.1	14.8	15.9
<i>PTE 100</i>	-	-	-	-	-
Total coins issued	46.2	48.6	52.8	63.1	68.3
<i>of which:</i>					
<i>PTE 200</i>	8.8	8.8	9.8	13.4	14.6
<i>PTE 100</i>	13.3	13.2	13.7	15.9	17.1
<i>PTE 50</i>	5.3	5.3	5.3	5.6	6.2
<i>PTE 20</i>	4.0	4.0	4.0	4.3	4.7
<i>PTE 10</i>	1.3	1.4	1.5	1.7	2.0
<i>PTE 5</i>	1.3	1.3	1.4	1.8	2.0
<i>PTE 2.5</i>	1.2	1.2	1.2	1.2	-
<i>PTE 1</i>	0.4	0.4	0.4	0.4	0.4
<i>PTE 0.5</i>	0.1	0.1	0.1	0.1	-
<i>commemorative</i>	10.5	12.9	15.4	18.7	21.3
Banknotes and coins held by credit institutions	104.0	128.3	161.1	167.1	330.4
Banknotes and coins in circulation outside credit institutions	841.0	857.5	765.2	914.8	1,126.7

**Table 5****Institutional framework***(end of 1999)*

Categories	Number of institutions	Number of branches	Number of accounts (thousands)	Number of internet-linked accounts <sup>1)</sup>	Value of accounts (EUR billions)
Central bank	1	11	-	-	-
Commercial banks	64	4,459	19,006.5	.	38.1
Mutual agricultural credit banks and savings banks	160	555	1,575.7	-	1.4
Post office	1	1,070	57.0	-	0.01
Treasury	1	1	-	-	-
Total	227	6,096	20,639.2	.	39.6
<i>of which virtual institutions</i>	-	-	-	-	-
Branches of foreign banks	20	105	75.7	.	0.57
<i>of which EU-based</i>	17	102	72.6	.	0.56

1) Number of accounts relating to internet services (credit transfers, payment of bills etc. carried out via the internet).

**Table 6****Payment card functions and accepting devices***(end of year)*

	1995	1996	1997	1998	1999
<b>Cash function</b>					
Cards with a cash function (thousands)	6,266	7,024	8,132	9,315	10,824
Number of ATMs with a cash dispensing function	3,674	5,366	6,280	7,081	8,850
<i>open access</i>	3,674	4,422	5,153	5,869	6,831
<i>limited access</i>	-	944	1,127	1,212	2,019
Volume of transactions (millions)	136.8	180.9	216.7	260.3	289.0
<i>at ATMs with open access</i>	136.8	160.7	193.1	229.3	255.5
<i>at ATMs with limited access</i>	-	20.2	23.6	31.0	33.5
Value of transactions (EUR billions)	7.2	10.7	15.0	17.4	20.3
<i>at ATMs with open access</i>	7.2	8.6	12.6	12.5	14.1
<i>at ATMs with limited access</i>	-	2.1	2.4	4.9	6.2
Number of ATMs with a giro transfer function	.	.	.	.	.
<i>volume of transactions</i>	.	.	.	.	.
<i>value of transactions</i>	.	.	.	.	.
<b>Debit function</b>					
Cards with a debit function (thousands)	6,266	7,024	8,132	9,315	10,824
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals	38,178	49,533	59,899	70,549	81,017
Volume of transactions (millions) <sup>1)</sup>	133.8	189.1	235.4	296.9	370.2
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (EUR billions) <sup>1)</sup>	4.1	5.0	6.2	8.4	10.3
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Credit function</b>					
Cards with a credit function (thousands)	1,413	1,574	2,053	2,307	2,574
<i>of which retailer cards</i>	115	137	235	296	364
Number of terminals	38,178	49,533	59,899	70,549	81,017
Volume of transactions (millions) <sup>2)</sup>	35.8	46.5	75.0	106.5	143.0
<i>of which transactions with retailer cards</i>	.	5.8	9.0	12.0	14.6
Value of transactions (EUR billions) <sup>2)</sup>	1.9	2.1	3.0	4.4	5.6
<i>of which transactions with retailer cards</i>	.	0.2	0.3	0.3	0.4
<b>Electronic money function</b>					
Cards with an e-money function (thousands) <sup>3)</sup>	161	299	384	411	3,400
Number of terminals accepting the card	30,760	55,646	63,703	72,429	83,098
Number of purchase transactions (thousands)	1,648	6,235	5,913	5,128	4,958
Value of purchase transactions (EUR millions)	3.0	11.5	10.9	9.5	6.0
Number of loading transactions (thousands)	309	777	683	572	462
Value of money loaded (EUR millions)	4.3	11.6	10.9	9.1	6.1
Float (EUR millions)	1.4	2.0	2.1	1.9	1.2

1) Also including credit transactions.

2) Also including debit transactions.

3) Before 1999 number of cards which had been loaded at least once.



**Table 7****Number of payment cards in circulation***(end of year)*

	1995	1996	1997	1998	1999
					thousands
Total number of cards in circulation	7,113	8,252	9,717	11,139	12,876
<i>of which:</i>					
<i>cards with a credit function</i>	.	791	966	1,117	1,460
<i>cards with a debit function</i>	.	6,379	7,280	8,421	9,665
<i>cards with a combined credit and debit function</i>	.	646	852	894	1,159
<i>cards with a combined debit, cash and e-money function</i>	.	.	.	.	16
<i>cards with an e-money function<sup>1)</sup></i>	161	299	384	411	3,400
<i>cards with a credit function issued by retailers</i>	115	137	235	296	364

1) Before 1999 number of cards which had been loaded at least once.

**Table 8****Payment instructions handled by selected interbank funds transfer systems: volume of transactions<sup>1)</sup>**

	1995	1996	1997	1998	1999
					millions
<b>Gross settlement systems</b>					
SPGT	-	0.4	0.5	0.5	0.6
SLOD	-	0.03	0.03	0.03	0.02
<b>Net settlement systems</b>					
Telecompensação (Teleclearing)	485.4	576.6	668.6	767.6	871.7
<i>cheques</i>	219.9	227.5	234.3	244.2	247.0
<i>other<sup>2)</sup></i>	265.5	-	-	-	-
<i>TEI</i>	.	11.9	13.6	16.8	19.3
<i>Multibanco</i>	.	332.1	414.6	503.5	601.7
<i>EFEITOS (bills of exchange)</i>	.	5.1	6.1	3.1	3.7
Traditional clearing <sup>3)</sup>	11.6	10.4	7.6	3.0	-
<i>cheques</i>	6.6	6.6	5.5	2.3	-
<i>other<sup>4)</sup></i>	5.0	3.8	2.1	0.7	-
<b>Concentration ratio<sup>5)</sup></b>					
Cheques (Telecompensação)	.	.	.	.	54.2%
TEI	.	.	.	.	56.8%
Multibanco	.	.	.	.	.
EFEITOS (bills of exchange)	.	.	.	.	47.0%

1) The table contains both customer and interbank transactions.

2) Mainly electronic transfers.

3) Closed on 30 June 1998.

4) Mainly payment transfers.

5) Market share of the five largest payment systems service providers; based on the total volume of transactions.

**Table 9****Payment instructions handled by selected interbank funds transfer systems: value of transactions<sup>1)</sup>**

	1995	1996	1997	EUR billions	
				1998	1999
<b>Gross settlement systems</b>					
SPGT	-	2,470	3,641	4,540	3,096
SLOD	-	41	41	42	38
<b>Net settlement systems</b>					
Telecompensação (Teleclearing)	432	484	341	373	323
<i>cheques</i>	232	249	271	292	250
<i>other</i> <sup>2)</sup>	200	-	-	-	-
TEI	.	219	51	58	46
Multibanco	.	13	15	19	23
EFEITOS ( <i>bills of exchange</i> )	.	3	4	4	4
Traditional clearing <sup>3)</sup>	770	9	7	3	-
<i>cheques</i>	7	7	6	3	-
<i>other</i> <sup>4)</sup>	763	2	1	0.1	-
<b>Concentration ratio</b> <sup>5)</sup>					
Cheques (Telecompensação)	.	.	.	.	50.0%
TEI	.	.	.	.	45.8%
Multibanco	.	.	.	.	.
EFEITOS ( <i>bills of exchange</i> )	.	.	.	.	56.6%

1) The table contains both customer and interbank transactions.

2) Mainly electronic transfers.

3) Closed on 30 June 1998.

4) Mainly payment transfers.

5) Market share of the five largest payment systems service providers; based on the total value of transactions.

**Table 10**  
**Indicators of the use of various cashless payment instruments: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	millions 1999
Volume of transactions	476.8	580.4	643.8	722.0	836.7
Cheques	236.1	261.9	272.7	285.9	283.5
<i>of which truncated</i>	193.7	201.0	217.9	229.9	238.0
<i>of which:</i>					
<i>paper-based</i>	236.1	261.9	272.7	285.9	283.5
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit and credit card <sup>2)</sup>	140.0	196.8	251.7	315.8	392.0
Payments by debit card <sup>2)</sup>	133.8	189.1	235.4	296.9	370.2
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	133.8	189.1	235.4	296.9	370.2
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit card <sup>2)</sup>	36.9	49.8	78.7	109.8	136.2
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	36.9	49.8	78.7	109.8	136.2
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	40.6	44.4	38.9	45.1	53.0
<i>of which:</i>					
<i>paper-based</i>	3.8	5.8	6.5	8.6	8.3
<i>electronic (via PC or other terminal) <sup>3)</sup></i>	36.8	38.6	32.4	36.5	44.7
<i>electronic (via mobile phone)</i>	-	-	-	-	...
Direct debits	58.5	65.0	67.9	66.1	98.6
<i>of which:</i>					
<i>paper-based</i>	58.5	65.0	67.9	66.1	98.6
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Bills of exchange	.	6.1	6.7	3.9	4.6
<i>of which:</i>					
<i>paper-based</i>	.	6.1	6.7	3.9	4.6
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	1.6	6.2	5.9	5.1	5.0
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) This does not include retailer cards before 1997. Some of the card issuers do not provide data on transactions by type of function.

3) Since February 1996, this includes transfers in the RTGS system, which were previously processed through the netting systems.

**Table I I****Indicators of the use of various cashless payment instruments: value of transactions<sup>1)</sup>**

	EUR billions				
	1995	1996	1997	1998	1999
Value of transactions	463.4	3,160.1	4,144.0	5,210.4	3,712.4
Cheques	260.7	283.2	312.1	339.1	300.7
<i>of which truncated</i>	33.1	36.8	58.2	73.6	90.8
<i>of which:</i>					
<i>paper-based</i>	260.7	283.2	312.1	339.1	300.7
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit and credit card <sup>2)</sup>	4.6	5.6	7.1	9.4	11.5
Payments by debit card <sup>2)</sup>	4.1	5.0	6.2	8.4	10.3
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	4.1	5.0	6.2	8.4	10.3
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit card <sup>2)</sup>	2.0	2.4	3.4	4.7	5.1
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	2.0	2.4	3.4	4.7	5.1
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	178.5	2,842.7	3,793.8	4,830.6	3,366.3
<i>of which:</i>					
<i>paper-based</i>	94.6	88.5	102.3	123.2	103.5
<i>electronic (via PC or other terminal)<sup>3)</sup></i>	83.8	2,754.2	3,691.4	4,707.4	3,262.8
<i>electronic (via mobile phone)</i>	-	-	-	-	...
Direct debits	19.7	22.2	24.7	23.6	25.7
<i>of which:</i>					
<i>paper-based</i>	19.7	22.2	24.7	23.6	25.7
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Bills of exchange	.	6.4	6.4	7.7	8.2
<i>of which:</i>					
<i>paper-based</i>	.	6.4	6.4	7.7	8.2
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	0.003	0.011	0.011	0.010	0.006
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) This does not include retailer cards before 1997. Some of the card issuers do not provide data on transactions by type of function.

3) Since February 1996, this includes transfers in the RTGS system, which were previously processed through the netting systems.

**Table 12****Number of participants in trading, clearing and securities settlement systems***(end of 1999)*

	Trading	Clearing	Settlement
LIST - Lisbon Trading	24		
Banks	-		
<i>of which:</i>			
<i>domestic</i>	-		
<i>foreign</i>	-		
Brokers/dealers	24		
<i>of which:</i>			
<i>domestic</i>	24		
<i>foreign</i>	-		
Other	-		
SEND (Derivatives market)	38	22	
Banks	21	21	
<i>of which:</i>			
<i>domestic</i>	21	21	
<i>foreign</i>	-	-	
Brokers/dealers	17	1	
<i>of which:</i>			
<i>domestic</i>	17	1	
<i>foreign</i>	-	-	
Others	-	-	
INTERBOLSA			64
Banks			38
<i>of which:</i>			
<i>domestic</i>			37
<i>foreign</i>			1
Brokers/dealers			24
<i>of which:</i>			
<i>domestic</i>			24
<i>foreign</i>			-
Others			2
<i>Securities settlement systems</i>			-
<i>Banco de Portugal</i>			1
<i>Public Debt Management Office (IGCP)</i>			1
SITEME			56
Banks			48
<i>of which:</i>			
<i>domestic</i>			40
<i>foreign</i>			8
Brokers/dealers			-
<i>of which:</i>			
<i>domestic</i>			-
<i>foreign</i>			-
Others			8
<i>Securities settlement systems</i>			-
<i>Others</i>			8

**Table I 3****Instructions handled by trading platforms, clearing houses and securities settlement systems***(volume of transactions)*

	1995	1996	1997	1998	1999
LIST - Lisbon Trading					
Volume of trades	262,750	369,646	912,564	2,407,215	2,518,042
SEND (Derivatives market)					
Volume of trades	-	243,938	1,600,412	3,154,288	1,478,171
INTERBOLSA					
Volume of settlement instructions	475,500	717,200	1,787,900	4,773,000	5,174,000
SITEME					
Volume of settlement instructions	6,985	3,369	2,112	1,131	831
<i>of which central bank refinancing</i>	<i>6,732</i>	<i>3,152</i>	<i>1,672</i>	<i>986</i>	<i>650</i>

**Table I 4****Instructions handled by trading platforms, clearing houses and securities settlement systems***(market value of transactions)*

	1995	1996	1997	1998	1999
LIST - Lisbon Trading					
Value of trades (EUR billions)	14	17	30	49	42
SEND (Derivatives market)					
Value of trades (EUR billions)	-	13	64	67	22
INTERBOLSA					
Value of settlement instructions (EUR billions)	40	70	92	161	198
SITEME					
Value of settlement instructions (EUR billions)	100	50	39	24	13
<i>of which central bank refinancing</i>	<i>99</i>	<i>49</i>	<i>36</i>	<i>23</i>	<i>13</i>

**Table 15a****Outstanding securities***(end of year)*

	1995	1996	1997	1998	1999
LIST - Lisbon Trading					
Value of stocks listed (EUR billions)	14	19	37	54	68
Value of other securities listed (EUR billions)	30	34	36	43	48
Number of stocks listed	168	157	147	134	125
Number of other securities listed	164	139	121	118	114
SEND (Derivatives market)					
Value of stocks listed (PTE billions)	-	-	-	-	-
Value of other securities listed (PTE billions)	-	...	...	...	...
Number of stocks listed	-	-	-	-	-
Number of other securities listed	-	3	5	7	9
INTERBOLSA					
Value of stocks issued (EUR billions)	13	14	18	22	25
Value of other securities issued (EUR billions)	32	37	42	49	59
Number of stocks issued	-	395	417	480	531
Number of other securities issued	-	660	585	660	733
SITEME					
Value of stocks issued (EUR billions)	-	-	-	-	-
Value of other securities issued (EUR billions)	16	15	12	9	5
Number of stocks issued	-	-	-	-	-
Number of other securities issued	76	88	80	69	5

**Table 15b****Netting ratio in clearing systems**

	1995	1996	1997	1998	1999
Interbolsa					
Netting ratio for cash over the year	-	-	0.32	0.23	0.19
Netting ratio for securities over the year	0.83	0.80	0.75	0.73	0.87

**Table 16****Participation in SWIFT by domestic institutions**

	1995	1996	1997	1998	1999
SWIFT users	43	44	46	47	51
<i>of which:</i>					
<i>members</i>	29	30	29	28	26
<i>sub-members</i>	14	14	16	16	17
<i>participants</i>	-	-	1	3	8
Memorandum item:					
Total SWIFT worldwide	5,229	5,632	6,165	6,557	6,797
<i>of which:</i>					
<i>members</i>	2,259	2,874	2,969	3,052	2,214
<i>sub-members</i>	2,259	2,404	2,590	2,720	2,763
<i>participants</i>	277	354	606	785	1,820

**Table 17****SWIFT message flows to/from domestic users**

	1995	1996	1997	1998	1999
Total messages sent	4,010,814	4,345,301	4,897,672	5,658,690	5,511,820
<i>of which:</i>					
<i>category I</i>	977,018	1,023,514	1,185,554	1,414,573	1,718,528
<i>category II</i>	978,193	1,011,152	1,055,148	1,079,595	739,986
<i>sent to/received from domestic users</i>	483,748	404,919	436,757	418,400	307,703
Total messages received	3,679,672	3,950,010	4,503,748	4,962,798	4,622,331
<i>of which:</i>					
<i>category I</i>	988,755	1,040,731	1,156,416	1,337,987	1,619,029
<i>category II</i>	637,447	640,528	768,321	824,781	363,905
Memorandum item:					
Global SWIFT traffic	582,192,512	687,785,294	812,117,556	937,039,995	1,058,836,425

*Definitions:*

- *Sub-members: domestic users sponsored by members abroad;*
- *Participants: users which are not SWIFT shareholders; their message traffic over the network is restricted;*
- *Category I: customer (funds) transfers;*
- *Category II: bank (funds) transfers.*



Annex 2 – Portugal

## Finland

**Table 1****Basic statistical data**

	1995	1996	1997	1998	1999
Population <sup>1)</sup> (thousands)	5,108	5,125	5,140	5,153	5,165
Gross domestic product (EUR billions)	95.0	98.5	106.9	116.0	121.4
Exchange rate vis-à-vis ECU/euro <sup>2)</sup>	5.70855	5.82817	5.88064	5.9825	5.94573

1) Average for the year.

2) Average for the year until 1998; irrevocable conversion rates were adopted with the introduction of the euro on 1 January 1999.

**Table 2****Settlement media used by non-banks**

(end of year)

	1995	1996	1997	EUR billions	
	1995	1996	1997	1998	1999
Banknotes and coins <sup>1)</sup>	2.09	2.29	2.44	2.49	2.78
Transferable deposits	27.50	32.16	33.91	35.59	38.33
Narrow money supply (M1)	29.58	34.44	36.35	38.08	41.11
Transferable deposits in foreign currencies	2.30	2.09	2.07	1.83	1.26
Outstanding value on electronic money schemes (EUR millions)	1.67	1.75	0.30	0.50	0.56
<i>of which:</i>					
<i>on card-based products</i>	1.67	1.75	0.30	0.50	0.56
<i>on network-based products</i>	...	...	...	...	...

1) Cash in ATMs is included in this item, because Automatia Ltd, the company that has governed cash dispensing ATMs since 1994, is not a credit institution. Values of cash in ATMs were, in FIM millions, 418 (1995), 788 (1996), 872 (1997), 914 (1998) and 982 (1999).

**Table 3****Settlement media used by deposit-taking institutions**

(end of year)

	1995	1996	1997	EUR billions	
	1995	1996	1997	1998	1999
Required reserves held at central bank	2.64	1.14	1.33	1.18	1.67
Free reserves held at central bank	0.19	0.25	0.47	0.99	3.23
Transferable deposits at other institutions	0.42	0.47	0.52	0.45	0.47

**Table 4****Banknotes and coins***(total value, end of year)*

	FIM millions				
	1995	1996	1997	1998	1999
Total banknotes issued	13,625	14,836	15,689	15,512	17,660
<i>of which:</i>					
<i>FIM 1,000</i>	4,440	5,153	5,580	5,636	6,545
<i>FIM 500</i>	2,505	2,562	2,597	2,542	2,928
<i>FIM 100</i>	5,541	6,008	6,430	6,256	7,082
<i>FIM 50</i>	693	654	616	609	616
<i>FIM 20</i>	396	413	423	428	449
<i>FIM 10</i>	50	45	43	41	40
Total coins issued	1,365	1,439	1,494	1,350	1,431
<i>of which:</i>					
<i>FIM 10</i>	365	392	415	440	476
<i>FIM 5</i>	428	436	440	368	378
<i>FIM 1</i>	390	414	429	323	344
<i>50 penniä</i>	86	92	97	101	107
<i>10 penniä</i>	96	106	113	119	127
Banknotes and coins held by credit institutions	3,210	3,246	3,300	2,886	3,391
Banknotes and coins in circulation outside credit institutions	12,401	13,645	14,517	14,803	16,528
<i>of which cash in ATMs</i>	418	788	872	914	982
Memorandum items:					
Commemorative coins <sup>1)</sup>	281	283	309	188	191
Banknotes and coins which ceased to be legal tender on 1 January 1994	339	333	326	639	637

1) This item is included in "banknotes and coins in circulation" in the balance sheet of Suomen Pankki.

**Table 5****Institutional framework***(end of 1999)*

Categories	Number of institutions	Number of branches	Number of accounts (thousands) <sup>2)</sup>	Number of internet-linked accounts (thousands) <sup>1)</sup>	Value of accounts (EUR billions)
Central bank <sup>2)</sup>	1	4	0.016	-	4.9
Commercial banks	14	458	6,760	1,185	22.0
Savings banks and rural banks	82	370	722	62	4.0
Co-operatives	246	717	3,501	391	9.9
Post Office <sup>3)</sup>	1	470	-	-	-
Total <sup>4)</sup>	344	2,019	10,983	1,638	40.8
<i>of which virtual institutions</i>	-	-	-	-	-
Branches of foreign banks	6	20	521	-	0.57
<i>of which EU-based</i>	6	20	521	-	0.57

1) Number of accounts relating to internet services (credit transfers, payment of bills, etc. carried out via the internet) based on the assumption that one internet service agreement is related only to one bank account.

2) Number of accounts: number of settlement accounts.

3) Post offices are also used as branches of Leonia Bank plc (before June 1998 Postipankki), which is a state-owned commercial bank.

4) In "Value of accounts": the total differs from "Transferable deposits" in Table 2 because the central bank figures are not included in the figures in Table 2. There are also some differences in defining the concept of a "non-bank".

**Table 6****Payment card functions and accepting devices***(end of year)*

	1995	1996	1997	1998	1999
<b>Cash function</b>					
Cards with a cash function (thousands)	4,415	4,768	5,148	5,405	5,505
Number of ATMs with a cash-dispensing function	2,421	2,298	2,285	2,208	2,181
<i>open access</i>	2,421	2,298	2,285	2,208	2,181
<i>limited access</i>	-	-	-	-	-
Volume of transactions (millions)	201	213	223	231	238
<i>at ATMs with open access</i>	201	213	223	231	238
<i>at ATMs with limited access</i>	-	-	-	-	-
Value of transactions (EUR billions)	13	14	15	16	16
<i>at ATMs with open access</i>	13	14	15	16	16
<i>at ATMs with limited access</i>	-	-	-	-	-
Number of ATMs with a giro transfer function	2,153	2,363	2,482	2,458	2,434
<i>volume of transactions</i>	56	68	68	81	86
<i>value of transactions</i>	-	-	-	-	-
<b>Debit function (including cards with a delayed debit function)</b>					
Cards with a debit function (thousands)	2,760	2,918	3,112	3,129	3,343
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals	49,000	51,000	54,000	57,000	60,000
Volume of transactions (millions)	200	215	219	235	264
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (EUR billions)	8	9	9	10	11
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Credit function</b>					
Cards with a credit function (thousands)	2,184	1,933	2,031	2,426	2,968
<i>of which retailer cards</i>	1,749	1,580	1,582	1,849	2,155
Number of terminals	49,000	51,000	54,000	57,000	60,000
Volume of transactions (millions)	44	48	53	62	60
<i>of which transactions with retailer cards</i>	35	37	40	48	49
Value of transactions (EUR billions)	2	2	3	3	3
<i>of which transactions with retailer cards</i>	2	2	2	2	2
<b>Electronic money function <sup>1)</sup></b>					
Cards with an e-money function (thousands)	846	1,175	164	324	454
Number of terminals accepting the card	1,500	5,000	1,344	3,627	5,272
Number of purchase transactions (thousands)	3,425	3,760	77	159	514
Value of purchase transactions (EUR millions)	3	3	0.2	0.3	0.9
Number of loading transactions (thousands)	-	-	-	38	69
Value of money loaded (EUR millions)	-	-	-	0.8	1.4
Float (EUR millions)	-	-	0.3	0.5	0.6

1) Figures from 1997 onwards include only the loadable multipurpose card product Avant II (introduced in March 1997).

**Table 7****Number of payment cards in circulation***(end of year)*

	1995	1996	1997	1998	1999
					thousands
Total number of cards in circulation	7,452	7,876	7,213	7,884	8,555
Total number of payment cards	4,992	5,179	4,276	4,801	5,511
<i>of which :</i>					
<i>cards with a debit and cash function</i>	1,322	1,395	1,481	1,552	1,630
<i>of which with an e-money function</i>	-	-	74	135	162
<i>combined cards (debit + cash + delayed debit or credit)</i>	640	676	730	772	831
<i>of which with an e-money function</i>	-	-	-	10	30
<i>cards with a credit function</i>	435	353	449	577	805
<i>cards issued by retailers</i>	1,749	1,580	1,582	1,849	2,155
<i>cards with an e-money function</i>	846	1,175	34	51	90
Total number of cards with a cash function	2,460	2,697	2,937	3,083	3,044
<i>of which with an e-money function</i>	-	-	56	128	172

**Table 8****Payment instructions handled by selected interbank funds transfer systems: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	1999
					thousands
<b>Interbank Payment System (PMJ)</b>	<b>228,900</b>	<b>248,900</b>	<b>258,000</b>	<b>281,500</b>	<b>306,660</b>
Credit transfers	134,920	147,215	144,693	159,561	167,145
Debit card transfers	91,241	99,363	111,820	121,602	139,183
Cheque transfers	2,739	2,322	1,487	337	332
<b>POPS system <sup>2)</sup></b>	<b>-</b>	<b>246</b>	<b>524</b>	<b>907</b>	<b>1,174</b>
Express transfers	-	48	110	110	146
Cheque transfers	-	198	414	797	1,028
<b>BoF-RTGS <sup>3)</sup></b>	<b>110</b>	<b>99</b>	<b>101</b>	<b>182</b>	<b>449</b>
Credit transfers between banks	69	63	65	147	223
Credit transfers between Suomen Pankki and the banks	41	36	36	35	33
Cross-border TARGET payments sent	-	-	-	-	87
Cross-border TARGET payments received	-	-	-	-	105.80
<b>Concentration ratio <sup>4)</sup></b>					<b>%</b>
Interbank Payment System	99.99	99.99	99.9	99.8	99.7
POPS	-	99.2	96.9	97.4	94.9
BoF-RTGS	-	-	66.9	70.5	85.4

1) The table contains both customer and interbank transactions.

2) Pankkien online-pikasiirrot ja sekkit (Banks' online express transfers and cheques).

3) Bank of Finland RTGS system.

4) Market share of the five largest participants in each payment system, based on the total volume of transactions.

**Table 9****Payment instructions handled by selected interbank funds transfer systems:  
value of transactions <sup>1)</sup>**

	EUR billions				
	1995	1996	1997	1998	1999
<b>Interbank Payment System (PMJ)</b>	<b>406.5</b>	<b>383.7</b>	<b>139.5</b>	<b>231.8</b>	<b>117.1</b>
Credit transfers	243.3	273.7	122.3	211.3	110.7
Debit card transfers	3.5	3.9	4.3	4.9	5.9
Cheque transfers	159.7	106.0	12.9	17.0	0.5
<b>POPS system <sup>2)</sup></b>	<b>-</b>	<b>97.5</b>	<b>291.8</b>	<b>246.7</b>	<b>318.7</b>
Express transfers	-	43.8	191.5	154.1	216.7
Cheque transfers	-	53.7	100.3	92.6	102.1
<b>BoF-RTGS <sup>3)</sup></b>	<b>1,430.9</b>	<b>1,340.4</b>	<b>1,515.9</b>	<b>1,935.5</b>	<b>4,369.2</b>
Credit transfers between banks	1,360.1	1,241.4	1,377.3	1,778.9	1,308.7
Credit transfers between Suomen Pankki and the banks	70.7	99.0	138.6	156.6	53.6
Cross-border TARGET payments sent	-	-	-	-	1,502.9
Cross-border TARGET payments received	-	-	-	-	1,504.0
<b>Concentration ratio <sup>4)</sup></b>					<b>%</b>
Interbank Payment System	96.0	97.0	98.2	97.4	97.0
POPS	-	98.6	97.2	91.4	93.5
BoF-RTGS	-	-	62.0	78.3	80.6

1) The table contains both customer and interbank transactions.

2) Pankkien online-pikasiirrot ja sekit (Banks' online express transfers and cheques).

3) Bank of Finland RTGS system.

4) Market share of the five largest participants in each payment system, based on the total value of transactions.

**Table 10****Indicators of the use of various cashless payment instruments: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	millions 1999
Volume of transactions	721	742	771	826	883
Cheques	4	4	3	2	1
<i>of which</i>					
<i>paper-based</i>	4	4	3	2	1
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit card	200	215	219	235	264
<i>of which:</i>					
<i>paper-based</i>	19	25	20	17	16
<i>electronic (via PC or other terminal (EFTPOS))</i>	181	190	199	218	248
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit card	44	48	53	62	60
<i>of which:</i>					
<i>paper-based</i>	4	5	5	4	4
<i>electronic (via PC or other terminal (EFTPOS))</i>	40	43	48	58	56
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	444	448	470	496	519
<i>of which:</i>					
<i>paper-based</i>	140	132	120	105	96
<i>electronic (via PC or other terminal)</i>	304	316	350	391	423
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	26	24	26	31	39
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	26	24	26	31	39
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	3.4	3.8	...	...	0.5
Network-based electronic money	-	...	...	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

**Table I I****Indicators of the use of various cashless payment instruments: value of transactions <sup>1)</sup>**

	EUR billions				
	1995	1996	1997	1998	1999
Value of transactions	1,592	1,631	1,564	1,642	1,619
Cheques	180	168	123	121	110
<i>of which:</i>					
<i>paper-based</i>	180	168	123	121	110
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit card	8	9	9	10	11
<i>of which:</i>					
<i>paper-based</i>	1	1	1	1	1
<i>electronic (via PC or other terminal (EFTPOS))</i>	7	8	8	9	11
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit card	2	2	3	3	3
<i>of which:</i>					
<i>paper-based</i>	0.2	0.2	0.2	0.2	0.2
<i>electronic (via PC or other terminal (EFTPOS))</i>	2	2	3	3	3
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	1,391	1,441	1,413	1,491	1,476
<i>of which:</i>					
<i>paper-based</i>	438	425	361	316	273
<i>electronic (via PC or other terminal)</i>	952	1,016	1,053	1,175	1,203
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	11	11	15	18	18
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	11	11	15	18	18
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	0.003	0.003	0.44	0.0003	0.001
Network-based electronic money	-	...	...	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.



**Table 12****Number of participants in trading, clearing and securities settlement systems<sup>1)</sup>***(end of 1999)*

Helsinki Securities and Derivatives Exchange, Clearing House Ltd (Helsinki Exchanges)	36
Banks	10
<i>of which:</i>	
<i>domestic</i>	7
<i>foreign</i>	3
Brokers/dealers	26
<i>of which:</i>	
<i>domestic</i>	19
<i>foreign</i>	7
Finnish Central Securities Depository (APK), settlement of shares	25
Banks	9
<i>of which:</i>	
<i>domestic</i>	6
<i>foreign</i>	3
Brokers/dealers	16
<i>of which:</i>	
<i>domestic</i>	7
<i>foreign</i>	9
Finnish Central Securities Depository (APK), settlement of money market instruments	15
Banks	10
<i>of which:</i>	
<i>domestic</i>	10
<i>foreign</i>	-
Brokers/dealers	5
<i>of which:</i>	
<i>domestic</i>	5
<i>foreign</i>	-

1) No independent clearing houses.

**Table 13****Instructions handled by trading platforms, clearing houses and securities settlement systems<sup>1)</sup>***(volume of transactions)*

	1995	1996	1997	1998	1999
					thousands
Helsinki Securities and Derivatives Exchange, Clearing House Ltd (Helsinki Exchanges)					
Volume of transactions	-	378,000	556,800	867,600	1,706,940
Finnish Central Securities Depository (APK), settlement of shares					
Volume of settlement instructions	373	534	784	1,213	2,263
Finnish Central Securities Depository (APK), settlement of money market instruments					
Volume of settlement instructions	41	47	62	72	65
<i>government securities</i>	12	33	42	49	44
<i>CDs</i>	29	13	20	22	20
<i>others</i>	...	...	...	0.4	1
Helsinki Securities and Derivatives Exchange, Clearing House Ltd (Helsinki Exchanges)					
Settlement of derivatives					
Volume of settlement instructions	1,594	4,046	7,475	3,032	3,364

1) No independent clearing houses.

**Table 14****Instructions handled by trading platforms, clearing houses and securities settlement systems <sup>1)</sup>***(market value of transactions)*

	EUR billions				
	1995	1996	1997	1998	1999
Helsinki Securities and Derivatives Exchange, Clearing House Ltd (Helsinki Exchanges)					
Value of transactions	14.0	17.0	31.3	53.3	222.0
Finnish Central Securities Depository (APK), settlement of shares					
Value of settlement instructions	14.0	17.0	31.3	53.3	101.8
Finnish Central Securities Depository (APK), settlement of money market instruments					
Value of settlement instructions	343.0	397.5	705.8	804.5	486.7
<i>government securities</i>	95.9	262.7	512.3	667.3	389.0
<i>CDs</i>	247.1	134.7	193.5	136.5	96.0
<i>others</i>	-	-	-	0.7	1.7
Helsinki Securities and Derivatives Exchange, Clearing House Ltd (Helsinki Exchanges)					
Settlement of derivatives					
Value of settlement instructions	31.3	260.4	393.7	533.0	2,008.0

1) *No independent clearing houses.***Table 15a****Outstanding securities***(end of year)*

	1995	1996	1997	1998	1999
Helsinki Securities and Derivatives Exchange, Clearing House Ltd (Helsinki Exchanges)					
Value of stocks listed (EUR billions)	32	48	65	130	349
Value of other securities listed (EUR billions)	-	-	-	-	-
Number of stocks listed	73	71	80	131	150
Number of other securities listed	387	320	308	285	278
Finnish Central Securities Depository (APK), settlement of shares					
Value of stocks issued (EUR billions)	33	49	68	130	350
Value of other securities issued (EUR billions)	-	-	-	-	-
Number of stocks issued	4	4	4	7	10
Number of other securities issued	-	-	-	-	-
Finnish Central Securities Depository (APK), settlement of money market instruments					
Value of government securities issued (EUR billions)	-	17	27	35	39
Value of CDs issued (EUR billions)	-	14	15	18	20
Value of other securities issued (EUR billions)	-	8	6	3	...
Number of government securities issued	-	-	-	-	100
Number of CDs issued	-	-	-	-	7
Number of other securities issued	-	-	-	-	1,559

**Table 15b****Netting ratio in clearing systems**

	1995	1996	1997	1998	1999
Finnish Central Securities Depository (APK), settlement of money market instruments					
Netting ratio for cash over the year	-	-	0.113	0.139	0.136
Netting ratio for securities over the year	-	-	-	-	-

**Table 16****Participation in SWIFT by domestic institutions**

	1995	1996	1997	1998	1999
SWIFT users	13	14	15	16	17
<i>of which:</i>					
<i>members</i>	9	9	9	9	7
<i>sub-members</i>	4	5	6	6	6
<i>participants</i>	-	-	-	1	4
Memorandum item:					
Total SWIFT worldwide	5,229	5,632	6,165	6,557	6,797
<i>of which:</i>					
<i>members</i>	2,259	2,874	2,969	3,052	2,214
<i>sub-members</i>	2,259	2,404	2,590	2,720	2,763
<i>participants</i>	277	354	606	785	1,820

**Table 17****SWIFT message flows to/from domestic users**

	1995	1996	1997	1998	1999
Total messages sent	4,646,108	5,030,370	5,751,091	6,723,267	7,616,708
<i>of which:</i>					
<i>category I</i>	2,119,344	2,146,159	2,282,875	2,586,846	2,904,906
<i>category II</i>	1,157,502	1,065,054	1,116,193	1,226,368	1,059,012
<i>sent to/received from</i>					
<i>domestic users</i>	-	421,391	390,903	521,669	619,052
Total messages received	3,281,266	3,375,655	3,792,939	4,419,950	4,997,583
<i>of which:</i>					
<i>category I</i>	1,167,447	1,180,787	1,287,983	1,447,029	1,728,075
<i>category II</i>	737,603	686,231	733,604	851,434	551,995
Memorandum item:					
Global SWIFT traffic	603,575,374	687,785,294	812,117,556	937,039,995	1,058,836,425

*Definitions:*

- *Sub-members: domestic users sponsored by members abroad;*
- *Participants: users which are not SWIFT shareholders; their message traffic over the network is restricted;*
- *Category I: customer (funds) transfers;*
- *Category II: bank (funds) transfers.*

## Sweden

**Table 1****Basic statistical data**

	1995	1996	1997	1998	1999
Population <sup>1)</sup> (thousands)	8,834	8,844	8,848	8,852	8,858
Gross domestic product (SEK billions)	1,713.3	1,786.4	1,823.8	1,905.3	1,994.9
Exchange rate vis-à-vis ECU/euro <sup>1)</sup>	9.3319	8.5147	8.6512	8.9159	8.8075

1) Average for the year.

**Table 2****Settlement media used by non-banks**

(end of year)

	1995	1996	1997	1998	1999
				SEK billions	
Banknotes and coins	68.5	72.2	74.4	78.1	87.5
Transferable deposits <sup>1)</sup>	638.0	703.2	698.2	724.3	761.1
Narrow money supply (M1)	-	-	-	-	-
Transferable deposits in foreign currencies	17.2	27.0	35.1	31.4	44.6
Outstanding value on electronic money schemes	-	-	-	-	-
<i>of which:</i>					
<i>on card-based products</i>	-	-	-	-	-
<i>on network-based products</i>	-	-	-	-	-

1) Local currency.

**Table 3****Settlement media used by deposit-taking institutions**

(end of year)

	1995	1996	1997	1998	1999
				SEK billions	
Required reserves held at central bank	-	-	-	-	-
Free reserves held at central bank	1.3	1.5	2.0	1.7	4.5
Transferable deposits at other institutions	54.2	73.4	94.5	113.4	94.2

**Table 4****Banknotes and coins***(total value, end of year)*

	SEK millions				
	1995	1996	1997	1998	1999
Total banknotes issued	73,064	77,134	78,986	82,288	94,237
<i>of which:</i>					
<i>SEK 1,000</i>	37,841	38,636	39,226	40,999	46,808
<i>SEK 500</i>	22,316	25,565	27,157	29,211	34,991
<i>SEK 100</i>	10,649	10,332	9,906	9,431	9,700
<i>SEK 50</i>	185	913	962	955	1,008
<i>SEK 20</i>	1,679	1,309	1,366	1,355	1,417
<i>SEK 10</i>	300	286	277	251	233
<i>SEK 5</i>	94	93	92	86	80
Total coins issued	3,596	3,656	3,809	3,980	4,213
Banknotes and coins held by credit institutions	8,357	8,774	8,681	8,389	11,289
Banknotes and coins in circulation outside credit institutions	68,303	72,016	74,114	77,879	87,161

**Table 5****Institutional framework***(end of 1999)*

Categories	Number of institutions	Number of branch offices	Number of accounts (millions)	Number of internet-linked accounts <sup>1)</sup>	Value of accounts (SEK billions)
Central bank	1	-	-	-	-
Commercial banks	22	3,245	-	-	900.5
Savings banks	84	330	-	-	69.6
Total	107	3,575	-	-	970.1
<i>of which virtual institutions</i>	-	-	-	-	-
Branches of foreign banks	17	17	-	-	35.2
<i>of which EU-based</i>	14	14	-	-	34.6

1) Number of accounts relating to internet services (credit transfers, payment of bills etc. carried out via the internet).

**Table 6****Payment card functions and accepting devices***(end of year)*

	1995	1996	1997	1998	1999
<b>Cash function</b>					
Cards with a cash function (thousands)	6,171	6,317	6,849	6,950	7,357
Number of ATMs with a cash dispensing function	2,359	2,379	2,370	2,485	2,580
<i>open access</i>					
<i>limited access</i>	2,359	2,379	2,370	2,485	2,580
Volume of transactions (millions)	281	297	312	333	310
<i>at ATMs with open access</i>					
<i>at ATMs with limited access</i>	281	297	312	333	310
Value of transactions (SEK billions)	226	239	249	287	257
<i>at ATMs with open access</i>					
<i>at ATMs with limited access</i>	226	239	249	287	257
Number of ATMs with a giro transfer function	-	-	-	-	-
<i>volume of transactions</i>	-	-	-	-	-
<i>value of transactions</i>	-	-	-	-	-
<b>Debit function</b>					
Cards with a debit function (thousands)	3,525	3,731	4,188	5,229	5,364
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals	54,400	61,400	68,800	74,400	81,135
Volume of transactions (millions)	59	88	121	160	197
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (SEK billions)	48	57	77	97	118
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Credit function</b>					
Cards with a credit function (thousands)	1,217	1,931	1,923	1,641	1,717
<i>of which retailer cards</i>	-	-	-	-	-
Number of terminals	54,400	61,400	68,800	74,400	81,135
Volume of transactions (millions)	42	44	48	53	57
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (SEK billions)	38	44	46	52	54
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Electronic money function</b>					
Cards with an e-money function (thousands)	-	-	-	205	540
Number of terminals accepting the card	-	-	-	33,938	43,921
Number of purchase transactions (thousands)	-	-	-	2,317	4,257
Value of purchase transactions (SEK millions)	-	-	-	131	241
Number of loading transactions (thousands)	-	-	-	495	986
Value of money loaded (SEK millions)	-	-	-	154	279
Float (SEK millions)	-	-	-	24	38

**Table 7****Number of payment cards in circulation***(end of year)*

	thousands				
	1995	1996	1997	1998	1999
Total number of cards in circulation					
<i>of which:</i>					
<i>cards with a combined debit, cash and e-money function</i>	9,696	10,048	11,037	12,179	13,261
<i>cards with a credit function</i>	1,217	1,931	1,923	1,641	1,717
<i>cards with a debit function issued by retailers</i>	-	-	-	-	-

**Table 8****Payment instructions handled by selected interbank funds transfer systems: volume of transactions <sup>1)</sup>**

	thousands				
	1995	1996	1997	1998	1999
K-RIX	119	310	326	313	343
E-RIX <sup>2)</sup>	-	-	-	-	47
<b>Concentration ratio <sup>3)</sup></b>	-	-	-	-	-

1) The table contains both customer and interbank transactions.

2) Total volume of domestic and cross-border payments sent via TARGET.

3) Market share of the five largest participants in each payment system, based on the total volume of transactions.

**Table 9****Payment instructions handled by selected interbank funds transfer systems: value of transactions <sup>1)</sup>**

	SEK billions				
	1995	1996	1997	1998	1999
K-RIX	53,591	78,189	82,051	91,701	100,924
E-RIX <sup>2)</sup>	-	-	-	-	12,735
<b>Concentration ratio <sup>3)</sup></b>	-	-	-	-	-

1) The table contains both customer and interbank transactions.

2) Total value of domestic and cross-border payments sent via TARGET.

3) Market share of the five largest participants in each payment system, based on the total value of transactions.

**Table 10****Indicators of the use of various cashless payment instruments: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	millions 1999
Volume of transactions	817	863	912	927	1,060
Cheques	46	40	18	4	4
<i>of which:</i>					
<i>paper-based</i>	46	40	18	4	4
<i>electronic (via PC or other terminal)</i>	...	...	...	...	...
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Payments by debit card	59	88	121	160	197
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	59	88	121	160	197
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Payments by credit card	42	44	48	53	57
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	42	44	48	53	57
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Credit transfers	620	637	660	633	712
<i>of which:</i>					
<i>paper-based</i>	189	196	208	175	171
<i>electronic (via PC or other terminal)</i>	431	441	452	458	541
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Direct debits	50	54	65	74	85
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	50	54	65	74	85
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Card-based electronic money	-	-	-	2.8	5.2
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.



**Table I I**  
**Indicators of the use of various cashless payment instruments: value of transactions <sup>1)</sup>**

	SEK billions				
	1995	1996	1997	1998	1999
Value of transactions	6,631	7,035	7,633	7,900	7,537
Cheques	-	-	-	43	30
<i>of which:</i>					
<i>paper-based</i>	-	-	-	43	30
<i>electronic (via PC or other terminal)</i>	-	-	-	...	...
<i>electronic (via mobile phone)</i>	-	-	-	...	...
Payments by debit card	48	57	77	97	118
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	48	57	77	97	118
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Payments by credit card	38	44	46	52	54
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	38	44	46	52	54
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Credit transfers	6,351	6,732	7,317	7,498	7,108
<i>of which:</i>					
<i>paper-based</i>	1,946	1,656	1,973	1,407	1,388
<i>electronic (via PC or other terminal)</i>	4,405	5,076	5,344	6,091	5,720
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Direct debits	194	202	193	210	227
<i>of which:</i>					
<i>paper-based</i>	...	...	...	...	...
<i>electronic (via PC or other terminal)</i>	194	202	193	210	227
<i>electronic (via mobile phone)</i>	...	...	...	...	...
Card-based electronic money	-	-	-	0.1	0.2
Network-based electronic money	-	-	-	-	-

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

**Table 12****Number of participants in trading, clearing and securities settlement systems***(end of year)*

	1995	1996	1997	1998	1999
<b>CLICK and SAXESS</b>					
Banks	9	10	8	8	8
<i>of which:</i>					
<i>domestic</i>	9	10	8	8	8
<i>foreign</i>	-	-	-	-	-
Brokers/dealers	16	14	14	13	12
<i>of which:</i>					
<i>domestic</i>	16	14	14	13	12
<i>foreign</i>	-	-	-	-	-
Members, banks and brokers, foreign owned	9	9	11	12	12
Members, banks and brokers, remote	7	12	15	20	25
Members, derivatives	36	43	42	40	44
<b>OM Stockholm Exchange Clearing</b>					
Banks					
<i>of which:</i>					
<i>domestic</i>	-	-	-	-	-
<i>foreign</i>	-	-	-	-	-
Brokers/dealers					
<i>of which:</i>					
<i>domestic</i>	-	-	-	-	-
<i>foreign</i>	-	-	-	-	-
VPC AB			55	57	51
Banks			19	19	18
<i>of which:</i>					
<i>domestic</i>			11	11	11
<i>foreign</i>			8	8	7
Brokers/dealers			21	22	22
<i>of which:</i>					
<i>domestic</i>			20	19	19
<i>foreign</i>			1	3	3
Others			15	16	11

**Table I3****Instructions handled by trading platforms, clearing houses and securities settlement systems***(volume of transactions)*

	thousands				
	1995	1996	1997	1998	1999
<b>CLICK and SAXESS</b>					
Volume of transactions – derivatives	31,638	36,615	42,542	47,895	58,040
Volume of transactions – cash	2,628	3,275	4,836	6,427	8,426
<b>OM Stockholm Exchange Clearing</b>					
Volume of transactions cleared	31,600	36,600	42,500	47,800	58,000
<b>VPC AB</b>					
Volume of settlement instructions					
<i>government securities</i>	498	601	594	459	431
<i>equities</i>	2,414	3,077	4,719	5,321	8,483

**Table I4****Instructions handled by trading platforms, clearing houses and securities settlement systems***(market value of transactions)*

	SEK billions				
	1995	1996	1997	1998	1999
<b>SAXESS</b>					
Value of transactions	665	918	1,346	1,830	2,609
<b>OM Stockholm Exchange Clearing</b>					
Value of transactions cleared	-	-	-	-	-
<b>VPC AB</b>					
Value of settlement instructions	41,547	67,937	82,618	97,914	88,376
<i>government securities</i>	40,428	66,432	80,272	94,782	84,227
<i>equities</i>	1,119	1,505	2,346	3,132	4,149

**Table I5a****Outstanding securities***(end of year)*

	1995	1996	1997	1998	1999
<b>SAXESS</b>					
Value of stocks listed (SEK billions)	1,179	1,687	2,164	2,413	3,717
Value of other securities listed (SEK billions)	-	-	-	-	-
Number of stocks listed	223	229	261	276	300
Number of other securities listed	-	-	-	-	-
<b>VPC</b>					
Value of stocks issued (SEK billions)	-	-	-	-	-
Value of other securities issued (SEK billions)	-	-	-	-	-
Number of stocks issued	-	-	-	-	-
Number of other securities issued	-	-	-	-	-

**Table 15b**

Netting ratio in clearing systems	1995	1996	1997	1998	1999
VPC					
Netting ratio for cash over the year	0.05	0.03	0.02	0.02	0.03
Netting ratio for securities over the year	-	0.07	0.06	0.05	0.05

**Table 16****Participation in SWIFT by domestic institutions**

	1995	1996	1997	1998	1999
SWIFT users	20	22	21	29	31
<i>of which:</i>					
<i>members</i>	8	8	7	7	7
<i>sub-members</i>	11	12	12	13	11
<i>participants</i>	1	2	2	9	13
Memorandum item:					
Total SWIFT worldwide	5,229	5,632	6,165	6,557	6,797
<i>of which:</i>					
<i>members</i>	2,259	2,874	2,969	3,052	2,214
<i>sub-members</i>	2,259	2,404	2,590	2,720	2,763
<i>participants</i>	277	354	606	785	1,820

**Table 17****SWIFT message flows to/from domestic users**

	1995	1996	1997	1998	1999
Total messages sent	10,019,610	11,256,498	12,512,774	14,627,952	17,665,867
<i>of which:</i>					
<i>category I</i>	3,816,919	4,349,901	4,890,247	5,389,136	5,889,786
<i>category II</i>	2,223,462	2,400,631	2,576,992	2,866,339	3,168,380
<i>sent to/received from</i>					
<i>domestic users</i>	1,455,832	1,722,933	2,049,871	2,398,305	3,048,117
Total messages received	7,971,173	8,992,702	10,296,368	11,844,938	13,950,316
<i>of which:</i>					
<i>category I</i>	2,833,733	3,167,954	3,649,313	4,122,240	4,636,178
<i>category II</i>	2,104,694	2,357,508	2,635,197	2,942,456	3,656,123
Memorandum item:					
Global SWIFT traffic	582,192,512	687,785,294	812,117,556	937,039,995	1,058,836,425

*Definitions:*

- *Sub-members: domestic users sponsored by members abroad;*
- *Participants: users which are not SWIFT shareholders; their message traffic over the network is restricted;*
- *Category I: customer (funds) transfers;*
- *Category II: bank (funds) transfers.*



## United Kingdom

**Table 1**
**Basic statistical data**

	1995	1996	1997	1998	1999
Population <sup>1)</sup> (thousands)	58,606	58,782	59,021	59,227	59,435
Gross domestic product (GBP billions)	714.0	756.1	805.4	851.7	891.0
Exchange rate vis-à-vis ECU/euro <sup>1)</sup>	0.8288	0.8138	0.6923	0.6764	0.6590

1) Average for the year.

**Table 2**
**Settlement media used by non-banks**

(end of year)

	1995	1996	1997	GBP billions	
	1995	1996	1997	1998	1999
Banknotes and coins	19.9	20.8	22.5	23.3	25.6
Narrow money deposits	417.1	439.5	462.4	491.3	532.9
Narrow money supply (M2)	437.0	460.3	484.9	514.6	558.5
Outstanding value on electronic money schemes <sup>1)</sup>	-	0 <sup>2)</sup>	0 <sup>3)</sup>	0 <sup>6)</sup>	-
<i>of which:</i>					
<i>on card-based products</i>	-	0 <sup>2)</sup>	0 <sup>3)</sup>	0 <sup>4)</sup>	-
<i>on network-based products</i>	-	-	-	0 <sup>5)</sup>	-

1) There is no fully operational electronic money scheme currently in place. Figures are taken from trials being carried out in various parts of the country.

2) Actual figure is GBP 99,900.

3) Actual figure is GBP 194,687.

4) Actual figure is GBP 153,375.

5) Actual figure is GBP 6,000.

6) Actual figure is GBP 159,375.

**Table 3**
**Settlement media used by deposit-taking institutions**

(end of year)

	1995	1996	1997	GBP billions	
	1995	1996	1997	1998	1999
Cash ratio deposit <sup>1)</sup>	1.69	2.40	2.57	1.21	1.29
Free reserves held at central bank	0.11	0.54	0.14	0.39	0.81
Transferable deposits at other credit institutions <sup>2)</sup>	50.1	213.9	240.1	229.8	211.8

1) Reporting banks with average eligible liabilities of GBP 10 million or more were liable to lodge with the Bank of England non-operational, non-interest-bearing deposits of 0.35% of their eligible liabilities until 1 April 1998 and 0.25% until 1 June 1998 (institutions for which Northern Ireland is the main place of business in the United Kingdom were 0.25% throughout this period). On 1 June 1998 a statutory scheme came into effect whereby both banks and building societies with average eligible liabilities of GBP 400 million or more are required to hold non-interest-bearing deposits with the Bank of England of 0.15% of their eligible liabilities in excess of GBP 400 million.

2) Includes some time deposits.

**Table 4****Banknotes and coins***(total value, end of year)*

	GBP millions				
	1995	1996	1997	1998	1999
Total banknotes issued <sup>1)</sup>	19,605	20,904	22,404	23,663	26,662
<i>of which:</i>					
<i>GBP 50</i>	3,205	3,368	3,709	3,992	4,235
<i>GBP 20</i>	9,098	10,021	11,138	12,378	14,469
<i>GBP 10</i>	6,111	6,340	6,426	6,205	6,791
<i>GBP 5</i>	1,135	1,119	1,076	1,088	1,167
<i>GBP 1</i> <sup>2)</sup>	56	56	55	-	-
Notes held by credit institutions <sup>3), 4), 5)</sup>	4,403	5,116	5,170	5,776	6,990
Total coins issued <sup>6)</sup>	1,992	2,094	2,244	2,318	2,496
<i>of which:</i>					
<i>GBP 5</i> <sup>7)</sup>	-	-	-	-	14
<i>GBP 2</i>	<i>n.a.</i>	-	-	133	264
<i>GBP 1</i>	1,033	1,095	1,142	1,111	1,089
<i>GBP 0.50</i>	223	221	291	250	271
<i>GBP 0.20</i>	309	326	337	343	359
<i>GBP 0.10</i>	136	142	146	144	150
<i>GBP 0.05</i>	140	150	161	164	177
<i>GBP 0.02</i>	83	88	92	95	102
<i>GBP 0.01</i>	68	72	75	78	85
Banknotes and coins in circulation outside credit institutions <sup>3)</sup>	18,752	20,843	22,477	23,318	25,580

1) *Bank of England banknotes only.*2) *GBP 1 banknotes "written off" as of March 1998.*3) *Not seasonally adjusted.*4) *Average for the month of December.*5) *Figures include coins.*6) *Estimated as at 31 December.*7) *Millennium commemorative coin.***Table 5****Institutional framework***(end of 1999)*

Categories	Number of institutions	Number of branches	Number of accounts (millions)	Number of internet-linked accounts <sup>1)</sup> (GBP billions)	Value of accounts
Central bank	1	0 <sup>2)</sup>	-	0	422.4 <sup>3)</sup>
Commercial banks	435	12,987 <sup>4)</sup>	115.4 <sup>4)</sup>	1,380,000 <sup>4)</sup>	-
Building societies	69	2,384	22.5	-	110.6 <sup>5)</sup>
Post Office	1	18,775	16.2 <sup>6)</sup>	-	1.3 <sup>5)</sup>
Total	506	34,146 <sup>4)</sup>	154.1 <sup>4)</sup>	-	534.3
<i>of which virtual institutions</i>	-	-	-	-	-
Branches of foreign banks	244	-	-	-	-
<i>of which EU-based</i>	114	-	-	-	-

1) *Number of accounts relating to internet services (credit transfers, payment of bills, etc. carried out via the internet).*2) *Central bank has two outlets for banknote issue and 12 regional agencies for economic intelligence gathering purposes.*3) *The central bank and commercial bank figures are amalgamated.*4) *Estimated figure.*5) *Private sector ordinary share and deposit accounts with UK building societies and shares and deposits below GBP 50,000 from corporate bodies.*6) *Retail issues of subscribed capital, e.g. Perpetual Interest Bearing Shares, are excluded.*7) *National Savings Ordinary Accounts only. NSB facilities are available at post offices on an agency basis.*

**Table 6****Payment card functions and accepting devices***(end of year)*

	1995	1996	1997	1998	1999
<b>Cash function</b>					
Cards with a cash function (thousands)	83,785	88,946	96,825	106,131	111,857
Number of ATMs with a cash dispensing function	20,933	22,121	23,193	24,574	28,279
<i>open access</i>	20,933	22,121	23,193	24,574	28,279
<i>limited access</i>	-	-	-	-	-
Volume of transactions (millions)	1,471	1,599	1,745	1,850	1,968
<i>at ATMs with open access</i>	1,471	1,599	1,745	1,850	1,968
<i>at ATMs with limited access</i>	-	-	-	-	-
Value of transactions (GBP billions)	72	80	90	98	108
<i>at ATMs with open access</i>	72	80	90	98	108
<i>at ATMs with limited access</i>	-	-	-	-	-
Number of ATMs with a giro transfer function	7,536	8,185	8,813	9,338	11,594
<i>volume of transactions</i>	-	-	-	-	-
<i>value of transactions</i>	-	-	-	-	-
<b>Debit function</b>					
Cards with a debit function (thousands)	28,441	32,473	36,646	42,529	46,083
<i>of which retailer cards <sup>3)</sup></i>	-	-	-	-	-
Number of terminals <sup>1)</sup>	505,000	550,000	530,000	610,000	700,000
Volume of transactions (millions) <sup>5)</sup>	1,016	1,290	1,528	1,767	2,100
<i>of which transactions with retailer cards <sup>3)</sup></i>	-	-	-	-	-
Value of transactions (GBP millions) <sup>5)</sup>	29,287	38,314	46,576	55,747	67,012
<i>of which transactions with retailer cards <sup>3)</sup></i>	-	-	-	-	-
<b>Credit function</b>					
Cards with a credit function (thousands) <sup>2)</sup>	30,778	34,139	38,443	41,569	44,871
Retailer cards (thousands) <sup>4)</sup>	12,971	15,370	17,643	18,586	-
Number of terminals <sup>1)</sup>	505,000	550,000	530,000	610,000	700,000
Volume of transactions (millions) <sup>5)</sup>	994	1,125	1,252	1,361	1,490
<i>of which transactions with retailer cards</i>	-	-	-	-	-
Value of transactions (GBP millions) <sup>5)</sup>	49,570	58,548	67,626	75,305	88,083
<i>of which transactions with retailer cards</i>	-	-	-	-	-
<b>Electronic money function</b>					
Cards with an e-money function (millions)	-	0.03	0.11	0.14	0.16
Number of terminals accepting the card	-	1,922	3,537	1,642	1,921
Number of purchase transactions	-	-	-	-	-
Value of purchase transactions (GBP)	-	1,291,985	1,435,362	1,828,261	-
Number of loading transactions (thousands)	-	57	98	185	353
Value of money loaded (GBP millions)	-	1	2	2	3
Float (GBP)	-	99,990	194,687	153,375	-

1) Estimate of total number of POS terminals in the United Kingdom. Most accept both credit and debit cards.

2) This covers bank issued credit cards and charge cards, but excludes retailer cards.

3) Retailers are not able to issue debit cards.

4) This figure does not include cards issued by smaller retailers.

5) These figures include the use of debit/credit cards at ATMs outside the United Kingdom.



**Table 7****Number of payment cards in circulation***(end of year)*

	1995	1996	1997	1998	1999
					thousands
Total number of cards in circulation <sup>1)</sup>	91,830	96,642	104,355	112,277	118,238
<i>of which:</i>					
<i>cards with a combined debit and cash function</i>	27,787	31,804	35,958	41,174	45,381
<i>cards with a combined credit/charge and cash function</i>	29,163	32,440	36,547	41,210	43,272
<i>cards with a stand-alone cheque guarantee function</i>	5,776	5,329	4,947	4,433	4,080 <sup>2)</sup>

1) *Excluding any stand-alone e-money cards and retailer cards.*2) *Including eurocheque cards.***Table 8****Payment instructions handled by selected interbank funds transfer systems: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	1999
					millions
Town Clearing <sup>2), 3)</sup>	...	-	-	-	-
CHAPS	12.6	14.4	16.5	18.0	22.3 <sup>6)</sup>
Cheque and Credit Clearings	2,373	2,342	2,295	2,241	2,158
<i>cheques <sup>4)</sup></i>	2,202	2,167	2,114	2,059	1,981
<i>paper-based credit transfers <sup>4)</sup></i>	171	175	181	182	177
BACS	2,268	2,476	2,683	2,905	3,096
<i>credit transfers <sup>2)</sup></i>	969	1,033	1,099	1,169	1,233
<i>direct debits</i>	1,299	1,443	1,584	1,736	1,863
Total	4,653.6	4,832.4	4,994.5	5,164.0	5,276.3
<b>Concentration ratio <sup>5)</sup></b>	78%	78%	78%	78%	79%

1) *The table contains both customer and interbank transactions.*2) *Excludes inter-branch items.*3) *Town Clearing ceased operation on 24 February 1995.*4) *Includes Northern Ireland (estimated) and Scotland. Excludes inter-branch items.*5) *Market share of the five largest participants, based on the total volume of transactions; figure calculated overall for the four systems.*6) *Includes all payments into and out of the United Kingdom through TARGET.*

**Table 9****Payment instructions handled by selected interbank funds transfer systems: value of transactions <sup>1)</sup>**

	GBP billions				
	1995	1996	1997	1998	1999
Town Clearing <sup>2), 3)</sup>	59	-	-	-	-
CHAPS	26,719	28,881	36,032	41,501	66,814 <sup>6)</sup>
Cheque and Credit Clearings	1,336	1,405	1,456	1,470	1,473
<i>cheques <sup>4)</sup></i>	1,237	1,304	1,355	1,372	1,379
<i>paper-based credit transfers <sup>4)</sup></i>	99	101	101	98	94
BACS	1,054	1,250	1,432	1,602	1,762
<i>credit transfers <sup>2)</sup></i>	742	897	1,025	1,147	1,277
<i>direct debits</i>	312	353	407	455	485
Total	29,168	31,536	38,920	44,573	70,049
<b>Concentration ratio <sup>5)</sup></b>	82%	82%	82%	81%	73%

1) The table contains both customer and interbank transactions.

2) Excludes inter-branch items.

3) Town Clearing ceased operation on 24 February 1995.

4) Includes Northern Ireland (estimated) and Scotland. Excludes inter-branch items.

5) Market share of the five largest participants, based on the total value of transactions; figure calculated overall for the four systems.

6) Includes all payments into and out of the United Kingdom through TARGET.

**Table 10**  
**Indicators of the use of various cashless payment instruments: volume of transactions <sup>1)</sup>**

	1995	1996	1997	1998	millions 1999
Volume of transactions	7,942	8,467	8,895	9,341	9,854
Cheques <sup>2)</sup>	3,284	3,202	3,083	2,986	2,855
<i>of which:</i>					
<i>paper-based</i>	3,284	3,202	3,083	2,986	2,855
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit card	1,004	1,270	1,503	1,736	2,062
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	1,004	1,270	1,503	1,736	2,062
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit and charge card	908	1,025	1,128	1,224	1,344
<i>of which:</i>					
<i>paper-based <sup>3)</sup></i>	183	110	125	99	77
<i>electronic (via PC or other terminal) <sup>3)</sup></i>	725	915	1,003	1,125	1,267
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	1,447	1,527	1,597	1,659	1,730 <sup>6)</sup>
<i>of which:</i>					
<i>paper-based <sup>4)</sup></i>	405	419	419	407	407
<i>electronic (via PC or other terminal) <sup>5)</sup></i>	1,042	1,108	1,178	1,252	1,323 <sup>6)</sup>
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	1,299	1,443	1,584	1,736	1,863
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	1,299	1,443	1,584	1,736	1,863
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	-	-	-	-	-
Network-based electronic money	...	...	...	...	...

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) Including an estimated figure for in-house cheque volumes.

3) Estimated.

4) In-house transactions excluded.

5) For same-day credits only interbank transactions are included.

6) Includes all payments into and out of the United Kingdom through TARGET and domestic CHAPS euro payments.

**Table I I****Indicators of the use of various cashless payment instruments: value of transactions <sup>1)</sup>**

	GBP billions				
	1995	1996	1997	1998	1999
Value of transactions	29,968	32,438	39,834	45,494	70,990
Cheques <sup>2)</sup>	1,844	1,925	1,975	1,989	1,987
<i>of which:</i>					
<i>paper-based</i>	1,844	1,925	1,975	1,989	1,987
<i>electronic (via PC or other terminal)</i>	-	-	-	-	-
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by debit card	28	37	45	54	65
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	28	37	45	54	65
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Payments by credit and charge card	43	50	58	64	76
<i>of which:</i>					
<i>paper-based <sup>9)</sup></i>	8	6	6	7	5
<i>electronic (via PC or other terminal) <sup>9)</sup></i>	35	44	52	57	71
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Credit transfers	27,741	30,073	37,349	42,932	68,377 <sup>5)</sup>
<i>of which:</i>					
<i>paper-based <sup>3)</sup></i>	234	242	234	220	216
<i>electronic (via PC or other terminal) <sup>4)</sup></i>	27,507	29,831	37,115	42,712	68,161 <sup>5)</sup>
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Direct debits	312	353	407	455	485
<i>of which:</i>					
<i>paper-based</i>	-	-	-	-	-
<i>electronic (via PC or other terminal)</i>	312	353	407	455	485
<i>electronic (via mobile phone)</i>	-	-	-	-	-
Card-based electronic money	-	0.001 <sup>6)</sup>	0.001 <sup>7)</sup>	0.002 <sup>8)</sup>	-
Network-based electronic money	...	...	...	...	...

1) This table contains all customer transactions irrespective of whether they are processed intra or interbank.

2) Including an estimated figure for interbank and in-house cheque values.

3) Including an estimated figure for interbank paper credit values. In-house transactions excluded.

4) Including an estimated figure for interbank electronic retail credit values. In-house transactions excluded. For same-day credit only interbank transactions are included.

5) Includes all payments into and out of the United Kingdom through TARGET and domestic CHAPS euro payments.

6) Actual figure is GBP 1,291,985.

7) Actual figure is GBP 1,435,362.

8) Actual figure is GBP 1,828,261.

9) Estimated.

**Table 12****Number of participants in trading, clearing and securities settlement systems***(end of 1999)*

<b>Trading platforms</b>			
	<b>London Stock Exchange</b>	<b>Tradepoint</b>	
Banks	-	42	
<i>of which:</i>			
<i>domestic</i>		39	
<i>foreign</i>		3	
Brokers/dealers	-	54	
<i>of which:</i>			
<i>domestic</i>		41	
<i>foreign</i>		13	
Others	-	32	
<i>of which:</i>			
<i>domestic</i>		29	
<i>foreign</i>		3	
<b>Total</b>	<b>289</b>	<b>128</b>	
<b>Clearing house</b>			
	<b>London Clearing House</b>		
Banks <sup>1)</sup>	58		
<i>of which:</i>			
<i>domestic</i>	6		
<i>foreign</i>	52		
Brokers/dealers <sup>2)</sup>	42		
<i>of which:</i>			
<i>domestic</i>	5		
<i>foreign</i>	37		
Others	10		
<b>Total</b>	<b>110</b>		
<b>Securities settlement systems</b>			
	<b>CREST</b>	<b>CGO</b>	<b>CMO</b>
Banks, brokers/dealers etc.	1,715	-	-
<i>of which:</i>			
<i>domestic</i>	-	-	-
<i>foreign</i>	-	-	-
Others:			
Private clients	21,234		
<b>Total</b>	<b>22,949</b>	<b>378</b>	<b>60</b>

1) *Brokers/dealers are categorised as banks.*2) *Includes US investment banks.*

**Table 13****Instructions handled by trading platforms, clearing houses and securities settlement systems***(volume of transactions)*

	1995	1996	1997	1998	1999
				thousands	
<b>Trading platforms</b>					
<b>London Stock Exchange</b>					
Volume of transactions <sup>1)</sup>					
United Kingdom	9,817	10,962	13,346	16,277	21,077
Other	3,499	4,594	5,449	7,119	7,563
Total	13,316	15,556	18,795	23,396	28,640
<b>Tradepoint</b>					
Volume of transactions <sup>1)</sup>	0.8	2.7	13.2	34.6	34.0
<b>Clearing house</b>					
<b>London Clearing House</b>					
Volume of transactions cleared <sup>2)</sup>					
Securities	-	-	-	189,919	116,138
Commodities	-	-	-	77,276	89,888
Total	198,561	233,811	304,017	267,195	206,026
<b>Securities settlement systems</b>					
<b>CREST <sup>3), 4), 6)</sup></b>					
Volume of settlement instructions	-	1,598	29,005 <sup>5)</sup>	35,801	43,237
<b>CGO <sup>6)</sup></b>					
Volume of settlement instructions	748	960	950	1,114	2,062
<b>CMO <sup>6)</sup></b>					
Volume of settlement instructions	269	268	263	221	334
<b>ESO <sup>6), 7)</sup></b>					
Volume of settlement instructions	14.2	18.5	22.6	-	-

1) Number of bargains settled.

2) Number of contracts.

3) CREST began operations on 15 July 1996.

4) Figures are for the United Kingdom and Ireland. Irish transactions in 1999 account for 1.6% of the volumes.

5) TALISMAN and CREST figures are combined.

6) Volumes include one side of each transaction.

7) ESO was closed on 31 December 1997.

**Table 14**  
**Instructions handled by trading platforms, clearing houses and securities settlement systems**

(market value of transactions)

	GBP billions				
	1995	1996	1997	1998	1999
<b>Trading platforms</b>					
<b>London Stock Exchange</b>					
Value of transactions	646	742	1,013	1,037	1,411
United Kingdom	791	1,039	1,443	2,183	2,420
Other	1,437	1,781	2,456	3,220	3,831
<b>Tradepoint</b>					
Value of transactions	0.1	0.4	2.5	7.5	7.1
<b>Clearing house</b>					
<b>London Clearing House</b>					
Value of trades cleared <sup>1)</sup>	-	-	-	-	50,177
<b>Securities settlement systems</b>					
<b>CREST <sup>2), 3), 4)</sup></b>					
Value of settlement instructions	-	109	3,996	7,367	9,473
<b>CGO <sup>4)</sup></b>					
Value of settlement instructions	16,001	24,288	28,283	32,962	33,146
<b>CMO <sup>4)</sup></b>					
Value of settlement instructions	3,305	3,483	3,842	3,316	2,337
<b>ESO <sup>4), 5)</sup></b>					
Value of settlement instructions	84	90	141	-	-

1) Contract values, securities.

2) CREST began operations on 15 July 1996.

3) Figures are for the United Kingdom and Ireland.

4) Turnover includes one side of each transaction.

5) ESO was closed on 31 December 1997.

**Table 15a****Outstanding securities***(end of year)*

	1995	1996	1997	1998	1999
<b>Trading platforms</b>					
<b>London Stock Exchange</b>					
Value of stocks listed (GBP billions)	3,260	3,405	3,686	4,231	5,425
<i>of which:</i>					
<i>United Kingdom</i>	903	1,017	1,257	1,427	1,834
<i>other</i>	2,357	2,388	2,429	2,804	3,591
Number of stocks listed	2,724	2,958	2,991	2,921	2,791
<i>of which:</i>					
<i>United Kingdom</i>	2,199	2,425	2,465	2,399	2,292
<i>other</i>	525	533	526	522	499
<b>Tradepoint</b>	-	-	-	-	-
<b>Securities settlement systems</b>					
<b>CREST</b>					
Value of stocks issued (GBP billions)	-	455	1,040	1,169	1,320
Number of stocks issued	-	960	3,089	3,496	5,852
<b>CGO</b>					
Value of securities issued (GBP billions)	-	-	-	-	256
Number of securities issued	-	-	-	-	184
<b>CMO</b>					
Value of securities issued (GBP billions)	106	118	124	140	154
Number of securities issued	51,113	54,525	60,084	57,920	63,119

**Table 15b****Netting ratio in clearing systems**

	1995	1996	1997	1998	1999
<b>London Clearing House</b>					
Netting ratio for cash over the year	-	-	-	-	-
Netting ratio for securities over the year	-	-	-	-	-



**Table 16**  
Participation in SWIFT by domestic institutions

	1995	1996	1997	1998	1999
SWIFT users	366	382	408	429	430
<i>of which:</i>					
<i>members</i>	62	66	63	63	53
<i>sub-members</i>	235	236	241	250	243
<i>participants</i>	69	80	104	116	134
Memorandum item:					
Total SWIFT worldwide	5,229	5,632	6,165	6,557	6,797
<i>of which:</i>					
<i>members</i>	2,259	2,874	2,969	3,052	2,214
<i>sub-members</i>	2,259	2,404	2,590	2,720	2,763
<i>participants</i>	277	354	606	785	1,820

**Table 17**  
SWIFT message flows to/from domestic users

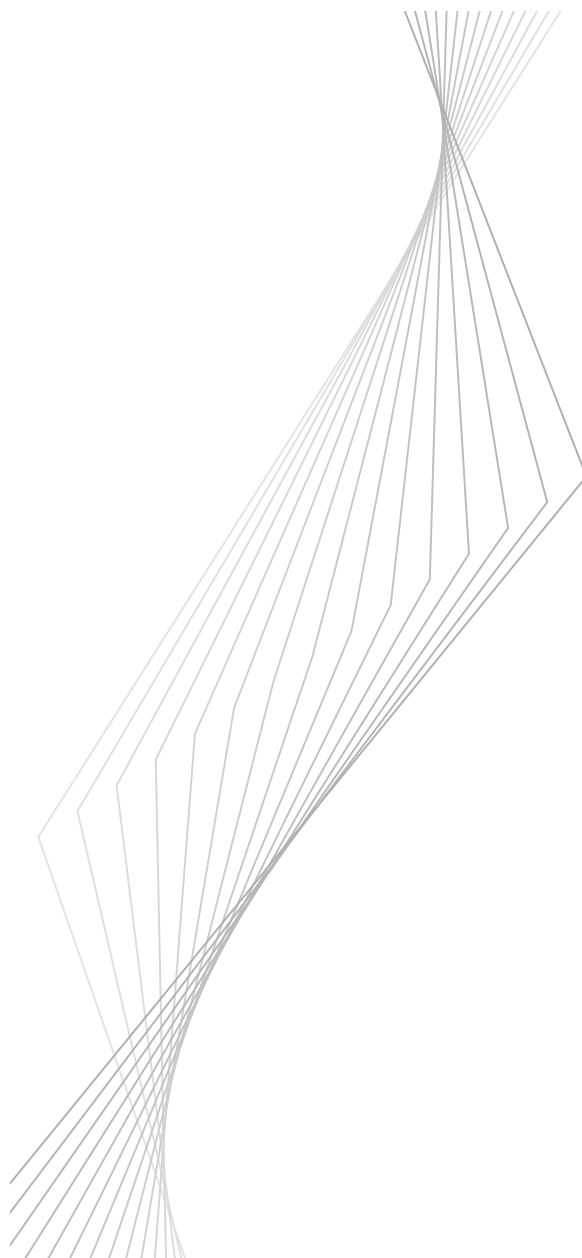
	1995	1996	1997	1998	1999
Total messages sent	71,035,477	82,578,192	100,441,417	116,671,655	138,764,328
<i>of which:</i>					
<i>category I</i>	11,181,501	12,312,467	13,797,623	15,438,669	19,242,575
<i>category II</i>	21,654,710	23,419,297	26,714,116	29,200,240	28,959,082
<i>sent to/received from</i>					
<i>domestic users</i>	16,386,855	19,335,978	23,902,129	28,685,906	39,076,825
Total messages received	66,015,464	79,741,899	101,914,835	124,101,890	157,627,881
<i>of which:</i>					
<i>category I</i>	13,978,532	15,500,253	17,009,249	18,595,169	22,267,913
<i>category II</i>	8,906,827	9,429,168	11,142,323	12,208,457	18,941,986
Memorandum item:					
Global SWIFT traffic	582,192,512	687,785,294	812,117,556	937,039,995	1,058,836,425

*Definitions:*

- *Sub-members: domestic users sponsored by members abroad;*
- *Participants: users which are not SWIFT shareholders; their message traffic over the network is restricted;*
- *Category I: customer (funds) transfers;*
- *Category II: bank (funds) transfers.*



EUROPEAN CENTRAL BANK



## **Annex 3**

# **Methodology for the statistical data**

**June 2001**



## Standard methodology for the statistics of the Blue Book

### Table 1: Basic statistical data

<i>Population and GDP:</i>	Figures are provided by EUROSTAT.
<i>Exchange rate:</i>	Figures are averages for the year. For 1999 the irrevocable conversion rates are used for those Member States which adopted the euro on 1 January 1999.

### Table 2: Settlement media used by non-banks

<i>Banknotes and coins:</i>	In monetary statistics, banknotes and coins represent the value of cash in circulation in the economy. This excludes the value of banknotes and coins kept in vaults at deposit-taking institutions as mentioned in Table 4 (please note that the figures in Table 4 are in national currencies).
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<i>Transferable deposits:</i>	These are deposits which can be used to make cashless payments using one of the instruments mentioned in Tables 10 and 11. They include deposits in foreign currencies unless these are included in M1. In the latter case, they are included under the separate item transferable deposits in foreign currencies.
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<i>M1:</i>	Cash in circulation and sight deposits held by non-banks. This line has not been filled in by countries which no longer calculate this aggregate.
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<i>Others:</i>	Filled in only if M1 includes items other than banknotes and coins and transferable deposits.
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<i>Outstanding value on e-money schemes:</i>	The difference between the value of cash loaded onto electronic purses (a reloadable multi-purpose prepaid card which may be used for small retail or other payments instead of banknotes and coins) or onto electronic wallets (a computer device used in some electronic money systems which can contain an IC card or in which IC cards can be inserted and which may perform more functions than an IC card) and the value spent.
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### Table 3: Settlement media used by deposit-taking institutions

<i>Required reserves held at central bank:</i>	Deposits held at the central bank to fulfil minimum reserve requirements.
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<i>of which can be used for settlement:</i>	If minimum reserves are required to be held as an average over a period of time, the whole required reserves are considered as working balances.
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In some countries only part of the required reserves can be used for payment purposes. This part is mentioned here.

*Free reserves held at central bank:*

Deposits held at the central bank in excess of required reserves held at central bank.

*Transferable deposits at other institutions:*

Deposits held at other institutions (not the national central bank) which can be used to make payments.

**Table 4: Banknotes and coins**  
(end-of-year figures)

*Total banknotes issued:* Value of banknotes which are part of the liabilities of the central bank. Banknotes and coins are broken down by denomination.

*Banknotes and coins held by credit institutions:*

Banknotes and coins in vaults of credit institutions and thus not in circulation.

*Banknotes and coins in circulation outside credit institutions:*

Total banknotes and coins issued less banknotes and coins held by credit institutions (identical to banknotes and coins in Table 2).

**Table 5: Institutional framework**  
(end-of-year figures)

*Columns 1 and 2:* Number of points of entry into the cashless payment system.

*Column 1: Number of institutions:*

Any institution which executes cashless payments is mentioned even if it does not hold deposits for customers (e.g. because the money transferred is brought-in cash, or debited from a sight account held at another institution).

*Column 2: Number of branches:*

All branches of an institution. The head office of the institution is also counted as a branch if it offers payment services.

*Column 3: Number of accounts:*

Number of accounts on which cashless payments (see definitions in Tables 10 and 11) can be made.

The only accounts mentioned here are those which:  
are held by deposit-taking institutions for non-deposit-taking institutions; and  
can be debited directly using one of the instruments mentioned in Tables 10 and 11.

*Column 4: Number of internet-linked accounts:*

Number of accounts relating to internet services (credit transfers, payment of bills, etc. carried out via the internet).

*Column 5: Value of accounts:* Aggregate amount of deposits held on accounts mentioned in Columns 3 and 4. As a rule, the sum of the entries in the last column is identical to transferable deposits in Table 2.

*Branches of foreign banks:* Branches or agencies of foreign banks. Banks which are foreign-owned or are subsidiaries of foreign banks are not included here.

*of which EU-based:* Sub-item to branches of foreign banks, giving the number of branches for which the head-office is located in the EU.

**Table 6: Payment card functions and accepting devices**  
(end-of-year figures)

All items include systems operated by banks and by non-banks.

*Cards with a cash function:* Any card enabling the holder to withdraw cash from a cash dispenser.

*ATMs with a cash dispensing function:*

Electro-mechanical device allowing the authorised user to withdraw cash from its account and in some cases to access a range of other services, such as balance inquiries, transfers of funds and acceptance of deposits. The ATM may be operated online (with real-time reference to an authorisation database) or offline.

*Open access:* The ATM can be accessed by a holder of a card issued by a bank other than the bank which owns the ATM, subject to agreement between the two banks.

*Limited access:* The ATM can only be accessed by a holder of a card issued by the bank which owns the ATM.

*ATMs with a giro transfer function:*

ATMs which allow a cardholder to make credit transfers from its own account to other accounts held at the same institution or at different institutions.

*Card with a debit function:* Card which enables the holder to have its purchases directly charged to funds on its account at a deposit-taking institution (may sometimes be combined with another function, such as that of a cash card or cheque guarantee card).

*Retailer card:* A card issued by non-banking institutions for use at specified retail outlets.

*Card with a credit function:* Card indicating that the holder has been granted a line of credit. It enables it to make purchases and/or draw cash up to a pre-arranged ceiling. The credit granted may be settled in full by the end of a specific

period, or may be settled in part, with the balance taken as extended credit. Interest is charged on the amount of any extended credit and the holder is sometimes charged an annual fee.

*Retailer credit card:* A card issued by non-banking institutions for use at specified retail outlets. The holder of the card is granted a line of credit.

*Card with an e-money function:* A reloadable multi-purpose prepaid card, which can be used at the sites of several service providers for a wide range of purposes and which has the potential to be used on a national or an international scale, but may sometimes be restricted to a certain area.

Only the number of valid cards in circulation should be provided, not the number of cards issued, since this figure would not be very informative if empty or invalid cards were included.

*Float:* Amount of money (cash value) which has been loaded onto the e-money card and has not been used.

**Table 7: Number of payment cards in circulation**  
(end-of-year figures, in thousands)

A card which has several functions is counted on each relevant line (e.g. a eurocheque card which can be used to withdraw cash, to make payments and to guarantee cheques is counted under each of these three items). For this reason, the figures should not be added together.

Travel and entertainment cards need to be mentioned in the relevant category.

Delayed debit cards should be mentioned in the debit category.

**Tables 8 and 9: Payment instructions handled by selected IFTSs**

*IFTS:* Interbank funds transfer systems in which most (or all) direct participants are credit institutions and which are used primarily to process cashless payments.

*Funds Transfer Systems (FTS):* A formal arrangement, based on private contract or statute law with multiple membership, common rules and standardised arrangements for the transmission and settlement of money obligations arising between the members.

As a rule, all IFTSs are mentioned here, both those managed by the central bank and those managed by private operators.

Figures are provided system by system, with categories of various payment instruments (such as cheques, direct debits, credit transfers, postal drafts, ATMs and POSs, etc.) as sub-items.

*Concentration ratio:* Market share of the five largest participants in each payment system.

### **Tables 10 and 11: Indicators of use of various cashless payment instruments**

The objective of these tables is to estimate the volume and the value of cashless payment instruments used in the country concerned. Figures concerning only a sample of banks or customers should not be given, but should be extrapolated to provide figures covering the whole volume and value of cashless payment instruments used in the country.

“Payment” is defined in the Blue Book as the “the payer’s transfer of a monetary claim on a party acceptable to the payee”. This definition excludes any funds transfer in which the originator and the beneficiary are the same institution or individual. Therefore, any instrument which is used by bank customers to get cash should not be counted (e.g. cheques used to obtain cash, or ATM withdrawals – although these operations might be included in Tables 8 and 9, which have a different focus). Theoretically, transfers from and to accounts held under the same name – either within the same institution (e.g. from a cheque account to a savings account) or between two institutions – are also excluded.

Strictly speaking, “cashless” means without the involvement of cash. Such a narrow definition would exclude money (postal) orders which involve cash at one or both ends of the transaction as well as a large proportion of traveller’s cheques, which are often paid in cash. It is not realistic to use such a narrow definition because it is very doubtful whether available statistics would permit a breakdown of the number of money orders or traveller’s cheques according to the way they are paid for or settled. Therefore, all payment instruments which involve cashless interbank settlement are included in the statistics.

The distinction between paper-based and electronic payment instruments is based on the way the customer submits the payment instrument to the bank.

Cross-border cashless payments are counted in the country of the originator.

According to the above principles, the following guidelines are followed:

- No distinction is made between payments in foreign and domestic currencies.
- No distinction is made between interbank items (bank A to bank B), inter-branch items (from one bank A branch to another bank A branch), or intra-branch items (from one bank A customer to another bank A customer at the same branch); all are included in the statistics.
- Transfers to and from the account-holding institution and its customers (e.g. interest or fee payments) are included.
- Commercial bills are included if funds transfers can be made on the basis of these without using another medium.
- Funds transfers used to settle payment card balances are included (payment between the issuer and the user).
- Traveller’s cheques, eurocheques and banker’s drafts are included under cheques.
- Money orders are included under credit transfers (if the volume is significant they could constitute a sub-item).



**Table 12: Number of participants in trading platforms, clearing houses and securities settlement systems**

*Trading platform:* An infrastructure or mechanism aimed at facilitating securities transactions between those who wish to buy and sell. A trading platform could be a legal entity recognised as an exchange or an integrated part of a stock exchange.

*Clearing houses:* A department of an exchange or a separate legal entity which provides a range of services related to the clearing and settlement of transactions and payments and to the management of risks associated with the resulting contracts. In many cases, the clearing house acts as the central counterparty.

*Securities settlement systems:* Transfer systems which settle transfer instructions for both securities and funds. As a rule, all SSSs are mentioned here, not only those managed by the central bank, but also those managed by private operators.

Figures are provided separately for each trading platform, clearing house and securities settlement system, with categories of various participants (such as banks, stockbrokers, etc.) as sub-items.

**Tables 13 and 14: Instructions handled by trading platforms, clearing houses and securities settlement systems (volume and value of transactions)**

Figures are provided separately for each trading platform, clearing house and securities settlement system, with categories of various securities (such as government securities, bonds, shares, certificates of deposits (CDs), futures, options, etc.) as sub-items. Should some of the sub-items not be available or not exist, the corresponding row is marked with a hyphen “-”.

Transfer instructions comprise all transfer instructions entered into the trading platform, clearing house or securities settlement system (including deliveries free of payment). As regards options, all the contracts are included.

As far as CDs are concerned, transactions should be considered regardless of their issuers (banks, central bank, mortgage institutions).

Each transaction is counted once (not twice for sale and purchase).

**Table 15a: Outstanding securities**

Volume and value of securities which have been issued; volume and value of securities which have been registered.

**Table 15b: Netting ratio in clearing systems**

The figure showing the size of the netted transactions in relation to the size of the traded transactions before the netting takes place. The ratio refers to the value of the transactions.

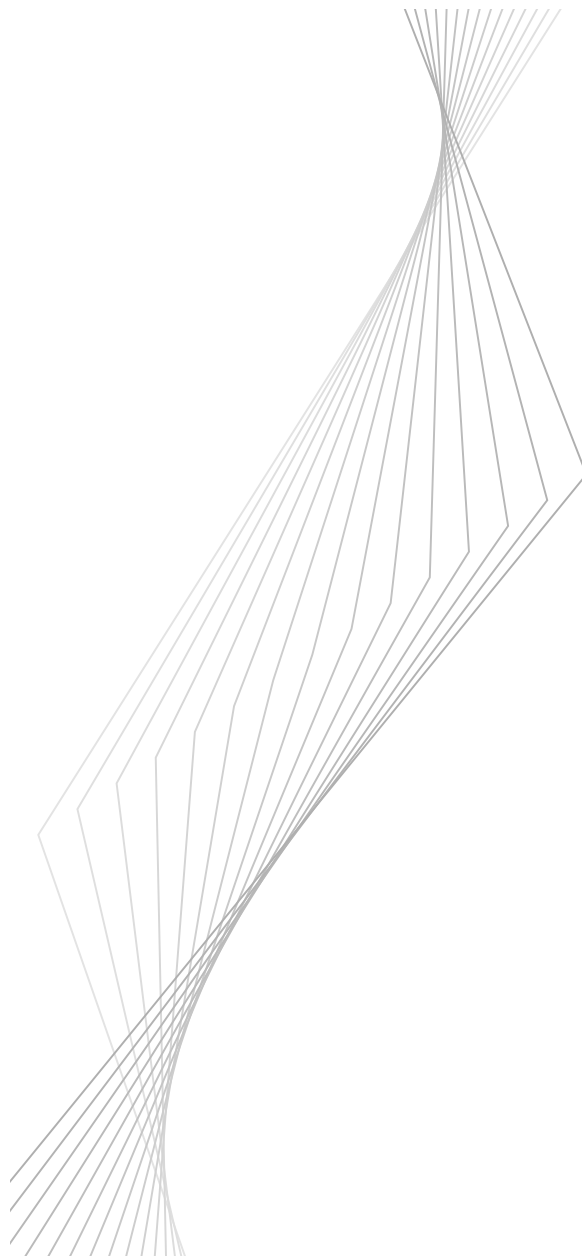
**Tables 16 and 17: SWIFT tables**

These figures are provided by SWIFT.





EUROPEAN CENTRAL BANK



**Annex 4**

**Glossary**

**June 2001**



## Glossary

<b>Term</b>	<b>Definition</b>
<b>Acceptance for settlement:</b>	the stage in the processing of a payment at which it has passed all risk management and other tests and can be settled under the system's rules and procedures.
<b>Access:</b>	the right of or opportunity for an institution to use the services of a particular payment or securities settlement system to settle payments/transactions on its own account or for customers. See also <i>participant/member of an IFTS</i> , <i>direct participant in an IFTS</i> , <i>indirect participant/member</i> .
<b>Acquirer:</b>	the entity or entities which hold deposit accounts for card acceptors (retailers) and to which the card acceptor transmits the data relating to the transaction. The acquirer is responsible for the collection of transaction information and settlement with the acceptors.
<b>Acquiring technical operator:</b>	the party providing the technical facilities for each acquiring entity to accept the data relating to each transaction.
<b>Advisory netting:</b>	see <i>position netting</i> .
<b>Ancillary system:</b>	a system in which payments or securities are exchanged and/or cleared while the ensuing monetary obligations are settled in another system, typically an RTGS system.
<b>Assured payment system (APS):</b>	an arrangement in an exchange-for-value system under which completion of the timely settlement of a payment instruction is supported by an irrevocable and unconditional commitment from a third party (typically a bank, syndicate of banks or clearing house). See also <i>exchange-for-value settlement system</i> .
<b>Asymmetric cryptography:</b>	a set of cryptographic techniques in which two different keys (private and public keys) are used for encrypting and decrypting data. The private key is kept secret by its holder while the public key is made available to communicating entities. Also called <i>public key cryptography</i> .
<b>Authentication:</b>	the methods used to verify the origin of a message or to verify the identity of a participant connected to a system and to confirm that a message has not been modified or replaced in transit.
<b>Automated clearing house (ACH):</b>	an electronic clearing system in which payment orders are exchanged among financial institutions, primarily by using magnetic media or via telecommunication networks, and handled by a data-processing centre. See also <i>clearing/clearance</i> .
<b>Automated teller machine (ATM):</b>	an electromechanical device which permits authorised users, typically using machine-readable plastic cards, to withdraw cash from their

accounts and/or access other services, such as making balance enquiries, transferring funds or making deposits. ATMs may be operated either online with real-time access to an authorisation database or offline.

- Availability:** criterion for evaluating a system on the basis of its backup facilities and the possibility of switching over to them.
- Balance-based system:** an electronic money system in which the electronic funds are stored on a device as a numeric ledger, with transactions performed as debits or credits to a balance.
- Bank draft:** a term which generally refers to a draft drawn by a bank on itself. The draft is purchased by the payer and sent to the payee, who presents it to his bank for payment. That bank presents it to the payer's bank for reimbursement. See *draft*.
- Bank identifier code (BIC):** a universal means of identifying financial institutions in order to facilitate the automated processing of telecommunication messages in financial environments.
- Batch processing:** the transmission or processing of a group of payment orders and/or securities transfer instructions in batches at discrete intervals of time.
- Beneficial ownership/ interest:** the entitlement to receive some or all of the benefits of ownership of a security or other financial instrument (e.g. income, voting rights, power to transfer). Beneficial ownership is usually distinguished from "legal ownership" of a security or financial instrument. See *legal ownership*.
- Bilateral credit limit:** see *credit limit*.
- Bilateral exposure:** one party's exposure to another party. See *credit risk/exposure*.
- Bilateral net settlement system:** a settlement system in which participants' bilateral net settlement positions are settled between each bilateral combination of participants. See also *net credit (or net debit) position*.
- Bilateral netting:** an arrangement between two parties to net their bilateral obligations. The obligations covered by the arrangement may arise from financial contracts, transfers, or both. See also *netting, multilateral netting, net settlement*.
- Bill of exchange:** a written order from one party (the drawer) to another (the drawee) to pay a specified sum on demand or on a specified date to the drawer or to a third party specified by the drawer. Widely used to finance trade and, when discounted with a financial institution, to obtain credit. See also *draft*.
- Book-entry system:** an accounting system which permits the transfer of claims without the physical movement of paper documents or certificates (e.g. electronic transfer of securities). See also *debt book-entry system, share book-entry system, dematerialisation, immobilisation*.

<b>Bridge:</b>	the name commonly used for the link between Euroclear Bank and Clearstream Luxembourg. See <i>link between securities settlement systems</i> .
<b>Broker:</b>	a firm which communicates bid and ask levels to potential principals and otherwise arranges transactions as agent for a fee, without acting as a party in the transactions.
<b>Broker-dealer:</b>	a person or firm sometimes acting as broker and sometimes as principal intermediary in securities transactions. See <i>broker</i> .
<b>Bulk funds transfer system:</b>	see <i>retail funds transfer system</i> .
<b>Business continuity:</b>	a payment system or securities settlement system arrangement which aims to ensure that it meets agreed service levels even if one or more components of the system fail or if it is affected by another abnormal event. This includes both preventative measures and arrangements to deal with these events.
<b>Capital risk:</b>	see <i>principal risk</i> .
<b>Caps:</b>	quantitative limits on the funds transfer activity of individual participants in a system; limits may be set by each individual participant or may be imposed by the body managing the system. Limits can be placed on the net debit position or net credit position of participants in the system.
<b>Card:</b>	see <i>cash card, cheque guarantee card, chip card, credit card, debit card, delayed debit card, prepaid card, retailer card, travel and entertainment card</i> .
<b>Card-based products:</b>	electronic money products which provide the customer with a portable, specialised computer device, typically an IC card containing a microprocessor chip. See also <i>IC (integrated circuit) card</i> .
<b>Case law:</b>	precedents established in previously decided court cases which may influence future interpretations of law or the disposition of future court cases.
<b>Cash card:</b>	card for use only in ATMs or cash dispensers. (Other cards often have a cash function which permits the holder to withdraw cash.)
<b>Cash correspondents:</b>	banks (or similar institutions) used by the SSS to make or receive payments.
<b>Cash dispenser:</b>	an electromechanical device which permits consumers, typically using machine-readable plastic cards, to withdraw banknotes (currency) and, in some cases, coins. See also <i>automated teller machine</i> .
<b>Cashier's cheque:</b>	see <i>bank draft</i> .



<b>Central bank bills:</b>	short-term securities issued by the central bank which could be marketable or tradable.
<b>Central bank credit (liquidity) facility:</b>	a standing credit facility which can be drawn upon by certain designated account holders (e.g. banks) at a central bank. The facility can be used automatically at the initiative of the account holder. The loans typically take the form of either advances or overdrafts on an account holder's current account which may be secured by a pledge of securities or by repurchase agreements. See <i>daylight credit (or daylight overdraft, daylight exposure, intraday credit), marginal lending facility</i> .
<b>Central counterparty:</b>	an entity which interposes itself as the buyer to every seller and as seller to every buyer of a specified set of contracts.
<b>Central securities depository (CSD):</b>	an entity which holds and administers securities and enables securities transactions to be processed by book entry. Securities can be held in a physical but immobilised or dematerialised form (i.e. so that they exist only as electronic records). In addition to the safekeeping and administration of securities, a CSD may incorporate clearing and settlement functions.
<b>Certification authority:</b>	an entity entrusted with creating and assigning public key certificates.
<b>Chaining:</b>	a method used in certain transfer systems (mostly for securities) for processing instructions. It involves the manipulation of the sequence in which transfer instructions are processed in order to increase the number or value of transfers which may be settled with available funds and/or securities balances (or available credit or securities lending lines).
<b>Charge card:</b>	see <i>travel and entertainment card</i> .
<b>Cheque:</b>	a written order from one party (the drawer) to another (the drawee; normally a bank) requiring the drawee to pay a specified sum on demand to the drawer or to a third party specified by the drawer. Cheques may be used for settling debts and withdrawing money from banks. See also <i>bill of exchange</i> .
<b>Cheque guarantee card:</b>	a card issued as part of a cheque guarantee system. This function may be combined with other functions in the same card, e.g. those of a cash card or debit card. See also <i>cheque guarantee system</i> .
<b>Cheque guarantee system:</b>	a system to guarantee cheques, typically up to a specified amount, which have been validated by the retailer either on the basis of a card issued to the cheque writer or through a central database accessible to retailers. Validated cheques are guaranteed by the issuer of the guarantee card, the drawee bank or the system operator.
<b>Chip card:</b>	also known as an IC (integrated circuit) card. A card containing one or more computer chips or integrated circuits for identification, data storage or special-purpose processing used to validate personal

identification numbers (PINs), authorise purchases, verify account balances and store personal records. In some cases, the memory in the card is updated every time the card is used (e.g. an account balance is updated).

- Clearing/clearance:** the process of transmitting, reconciling and, in some cases, confirming payment orders or security transfer instructions prior to settlement, possibly including the netting of instructions and the establishment of final positions for settlement. Sometimes the terms are used (imprecisely) to include settlement.
- Clearing and settling institution:** an institution which transmits information and funds through a payment system network. It may operate as an agent or a principal.
- Clearing house:** a department of an exchange or a separate legal entity which provides a range of services related to the clearing and settlement of transactions and payments, and the management of risks associated with the resulting contracts. In many cases, the clearing house acts as central counterparty. See *central counterparty, clearing/clearance*.
- Clearing system:** a set of procedures whereby financial institutions present and exchange data and/or documents relating to funds or securities transfers to other financial institutions. The procedures often also include a mechanism for the calculation of participants' bilateral and/or multilateral net positions with a view to facilitating the settlement of their obligations on a net or net net basis. See also *netting*.
- Closed network:** telecommunications network used for a specific purpose, such as a payment system, and to which access is restricted.
- Close-out netting:** a special form of netting which occurs following some predefined events such as default. Close-out netting is intended to reduce exposures on open contracts if one party falls foul of certain conditions specified by the contract (e.g. becomes subject to insolvency procedures) before the settlement date. (This is also referred to as default netting, open contract netting or replacement contract netting).
- Collateral:** assets pledged as a guarantee for the repayment of the short-term liquidity loans which credit institutions receive from the central banks, as well as the assets sold to central banks by credit institutions as part of repurchase operations.
- Collateral pool:** pool account on which a pooling system's participant holds securities pledged in favour of the central bank in charge of the system when obtaining credit (for intraday, overnight or monetary policy operations). See *collateral pooling system*.
- Collateral pooling system:** a central bank system for managing collateral in which the counterparties open a pool account in which they deposit assets to

	serve as collateral in their transactions with the central bank. In a pooling system, by contrast with an earmarking system, the underlying assets are not earmarked for individual transactions. See <i>collateral pool</i> .
<b>Computer-based terminal (CBT):</b>	a network interface device, provided and operated by the user, consisting of both hardware and software.
<b>Confidentiality:</b>	the quality of being protected against unauthorised disclosure.
<b>Confirmation:</b>	a particular connotation of this widely used term is the process whereby a market participant notifies its counterparties or customers of the details of a trade and, typically, allows them time to affirm or question the trade.
<b>Correspondent banking:</b>	an arrangement under which one bank provides payment services and other services to another bank. Payments through correspondents are often executed through reciprocal accounts (nostro and loro accounts), to which standing credit lines may be attached. Correspondent banking services are primarily provided across international boundaries, but are also found as agency relationships in some domestic contexts. A loro account is the term used by a correspondent to describe an account held on behalf of a foreign bank; the foreign bank would regard this account as its nostro account.
<b>Correspondent central banking model (CCBM):</b>	a model established by the European System of Central Banks (ESCB) with the aim of enabling counterparties to transfer eligible assets as collateral in a cross-border context. In the CCBM, NCBs act as custodians for one another. This means that each NCB has a securities account in its securities administration for each of the other NCBs (and for the European Central Bank (ECB)).
<b>Counterparty:</b>	the opposite party in a financial transaction (e.g. the other party in any transaction with the central bank).
<b>Credit caps:</b>	see <i>caps</i> .
<b>Credit card:</b>	a card indicating that the holder has been granted a line of credit. It enables the holder to make purchases and/or withdraw cash up to a prearranged ceiling; the credit granted can be settled in full by the end of a specified period or can be settled in part, with the balance taken as extended credit. Interest is charged on the amount of any extended credit and the holder is sometimes charged an annual fee.
<b>Credit card company:</b>	a company which owns the trademark of a particular credit card, and may also provide a number of marketing, processing or other services to its members using the card services.
<b>Credit institution:</b>	a credit institution is an institution covered by the definition contained in Article 1 (1) of the European Parliament and Council Directive 2000/12/EC of 20 March 2000 relating to the taking up and pursuit of the business of credit institutions, i.e. "an undertaking whose business

is to receive deposits or other repayable funds from the public and to grant credit for its own account”.

- Credit limit:** the limit on the credit exposure which a payment system participant incurs vis-à-vis another participant (bilateral credit limit) or vis-à-vis all other participants (multilateral credit limit) as a result of receiving payments which have not yet been settled.
- Credit risk/exposure:** the risk that a counterparty will not settle an obligation in full, either when due or at any time thereafter. In exchange-for-value systems, the credit risk is generally defined to include replacement cost risk and principal risk.
- Credit transfer:** a payment order or sometimes a sequence of payment orders made for the purpose of placing funds at the disposal of the beneficiary. Both the payment instructions and the funds described therein move from the bank of the payer/originator to the bank of the beneficiary, possibly via several other banks as intermediaries and/or more than one credit transfer system.
- Credit transfer system:** a funds transfer system through which payment orders move from (the bank of) the originator of the transfer message or payer to (the bank of) the receiver of the message or beneficiary.
- Cross-border netting scheme:** an arrangement to net positions or obligations between or among parties in more than one country or jurisdiction. See also *netting*.
- Cross-border settlement:** a settlement which takes place in a country other than the country or countries in which one or both of the parties to the trade are located.
- Cross-system settlement:** a settlement of a trade which is effected through a link between two separate securities transfer systems.
- Cryptography:** the application of mathematical methods to develop techniques and algorithms which can be applied to data in order to ensure goals such as confidentiality, data integrity and/or authentication.
- Current exposure:** the loss that would be incurred today on a contract or set of contracts if a counterparty failed to perform on its obligations. Also known as replacement cost, current exposure is what it would cost to replace a given contract if the counterparty defaulted today.
- Custodian:** an entity, often a bank, which safekeeps and administers securities and other financial assets on behalf of others and which may also provide various other services, including clearance and settlement, cash management, foreign exchange and securities lending.
- Custody:** the safekeeping and administration of securities and financial instruments on behalf of others.

<b>Custody risk:</b>	the risk of loss of securities held in custody occasioned by the insolvency, negligence or fraudulent action of the entity safekeeping the securities.
<b>Customer-to-customer transfer:</b>	see <i>transferability</i> .
<b>Daily processing:</b>	the complete cycle of processing tasks which needs to be completed in a typical business day, from start-of-day procedures to end-of-day procedures, including the backing-up of data.
<b>Daily settlement:</b>	the completion of settlement on the day of value of all payments accepted for settlement.
<b>Day of value:</b>	the day on which a payment is due to be credited to the receiving participant in the payment system. The day of value for the receiving participant's customer (i.e. the day on which the receiving participant credits the customer in its books) may or may not be the same day, depending on specific arrangements or local practice.
<b>Daylight credit (or daylight overdraft, daylight exposure, intraday credit):</b>	credit extended for a period of less than one business day. Daylight credit may be extended by central banks to even out mismatches in payment settlements. In a credit transfer system with end-of-day final settlement, daylight credit is, in effect, extended by a receiving institution if it accepts and acts on a payment order even though it will not receive final funds until the end of the business day.
<b>Dealer:</b>	a firm that enters into transactions as a counterparty on both sides of the market in one or more products. OTC derivatives dealers are primarily large international financial institutions – mostly commercial banks, but also some securities firms and insurance companies – as well as a few affiliates of what are primarily non-financial firms.
<b>Debit caps:</b>	see <i>caps</i> .
<b>Debit card:</b>	a card enabling the holder to have his purchases directly charged to funds on his account at a deposit-taking institution. (This may sometimes be combined with another function, e.g. that of a cash card or cheque guarantee card.)
<b>Debit transfer system:</b>	a funds transfer system in which debit collection orders made or authorised by the payer move from (the bank of) the payee to (the bank of) the payer and result in a charge (debit) to the account of the payer; for example, cheque-based systems are typical debit transfer systems. Also called debit collection system.
<b>Debt book-entry system:</b>	a computerised system for the issue and registration of debt securities in book-entry form. See also <i>book-entry system</i> , <i>share book-entry system</i> .
<b>Default:</b>	the failure to complete a funds or securities transfer according to its terms for reasons which are not technical or temporary, usually as a result of bankruptcy. Default is usually distinguished from a “failed transaction”.

<b>Defaulter pays:</b>	a loss-sharing arrangement whereby each participant is required to collateralise any exposures which it creates for other participants. As a result, losses from a party's default are borne by the defaulting party.
<b>Deferred net settlement system:</b>	a system which effects the settlement of obligations or transfers between or among parties on a net basis at some later time.
<b>Delayed debit card:</b>	a card issued by banks indicating that the holder may charge his account up to an authorised limit. It allows holders to make purchases but does not offer extended credit, the full amount of the debt incurred having to be settled at the end of a specified period. The holder is usually charged an annual fee.
<b>Delivery:</b>	final transfer of a security or financial instrument.
<b>Delivery versus payment system (or delivery against payment; DVP):</b>	a mechanism in an exchange-for-value settlement system which ensures that the final transfer of one asset occurs if, and only if, the final transfer of another asset (or other assets) occurs. Assets could include securities or other financial instruments.
<b>Dematerialisation:</b>	the elimination of physical certificates or documents of title which represent ownership of securities so that securities exist only as accounting records.
<b>Depository:</b>	an agent with the primary role of recording securities either physically or electronically and keeping records of the ownership of these securities.
<b>Deposit facility:</b>	a standing facility of the Eurosystem which counterparties may use to make overnight deposits at an NCB and which are remunerated at a pre-specified interest rate.
<b>Derivative:</b>	a financial contract, the value of which depends on the value of one or more underlying reference assets, rates or indices. For analytical purposes, all derivatives contracts can be divided into basic building-blocks of forward contracts, options or combinations thereof.
<b>Data encryption standard (DES):</b>	a symmetric cryptographic algorithm (ANSI standard) which is widely used, in particular in the financial industry. Triple-DES consists of operating three times the algorithm on a set of data (encrypting-decrypting-encrypting) using a double-length DES key.
<b>Digital signature:</b>	a string of data, generated by a cryptographic method, which is attached to a message in order to ensure its authenticity and protect the recipient against repudiation by the sender.
<b>Direct debit:</b>	a pre-authorised debit on the payer's bank account initiated by the payee.

<b>Direct participant in an IFTS:</b>	a participant in an Interbank Funds Transfer System (IFTS) which is responsible to the settlement agent (or to all other direct participants) for the settlement of its own payments, those of its customers, and those of the indirect participants on whose behalf it is settling.
<b>Discharge:</b>	the release from a legal obligation imposed by contract or law.
<b>Disclosure:</b>	see <i>public disclosure</i> .
<b>Distributing institution:</b>	an institution which distributes (as an agent) or sells (as the issuer or an underwriter) electronic money to its customers.
<b>Domestic settlement:</b>	a settlement which takes place in the country in which both parties to the trade are located.
<b>Domestic trade:</b>	a trade between parties located in the same country.
<b>Draft:</b>	a written order from one party (the drawer) to another (the drawee) to pay a party identified on the order (payee) or the bearer a specified sum, either on demand (sight draft) or on a specified date (time draft). See <i>cheque, bank draft, bill of exchange</i> .
<b>DVP schemes as defined by the GI0:</b>	three schemes can be distinguished: in Model 1, transfer instructions for both securities and funds are settled on a trade-by-trade basis, with final transfer of the securities from the seller to the buyer (delivery) occurring at the same time as final transfer of the funds from the buyer to the seller (payment); in Model 2, securities transfer instructions are settled on a gross basis with final transfer of securities from the seller to the buyer (delivery) occurring throughout the processing cycle, but funds transfer instructions are settled on a net basis, with final transfer of funds from the buyer to the seller (payment) occurring at the end of the processing cycle; and in Model 3, transfer instructions for both securities and funds are settled on a net basis, with final transfers of both securities and funds occurring at the end of the processing cycle.
<b>EEA (European Economic Area) countries:</b>	the EU Member States plus Iceland, Liechtenstein and Norway.
<b>EFTPOS:</b>	see <i>point of sale</i> .
<b>Electronic data interchange (EDI):</b>	the electronic exchange between commercial entities (in some cases also public administrations), in a standard format, of data relating to a number of message categories, such as orders, invoices, customs documents, remittance advices and payments. EDI messages are sent through public data transmission networks or banking system channels. Any movement of funds initiated by EDI is reflected in payment instructions flowing through the banking system. EDIFACT, a

United Nations body, has established standards for electronic data interchange.

<b>Electronic money (e-money):</b>	an electronic store of monetary value on a technical device that may be widely used for making payments to undertakings other than the issuer without necessarily involving bank accounts in the transaction, but acting as a prepaid bearer instrument (see also <i>multi-purpose prepaid card</i> ).
<b>Electronic purse:</b>	a reloadable multi-purpose prepaid card which may be used for small retail or other payments instead of banknotes and coins. See <i>multi-purpose prepaid card</i> .
<b>Electronic wallet:</b>	a computer device used in some electronic money systems which can contain an IC card or in which IC cards can be inserted and which may perform more functions than an IC card. See IC ( <i>integrated circuit card</i> ).
<b>Encryption:</b>	the use of cryptographic algorithms to encode clear text data (plaintext) into ciphertext in order to prevent unauthorised observation.
<b>End-of-day gross settlement systems:</b>	funds transfer systems in which payment orders are received one by one by the settlement agent during the business day, but in which the final settlement takes place at the end of the day on an individual or aggregate gross basis. This definition also applies to gross settlement systems in which payments are settled in real time but remain revocable until the end of the day.
<b>Exchange-for-value settlement system:</b>	a system which involves the exchange of assets, such as money, foreign exchange, securities or other financial instruments, in order to discharge settlement obligations. These systems may use one or more funds transfer systems in order to satisfy the payment obligations which are generated. The links between the exchange of assets and the payment system(s) may be manual or electronic. See <i>delivery versus payment system (or delivery against payment; DVP)</i> .
<b>Face-to-face payment:</b>	a payment carried out by the exchange of instruments between the payer and the payee in the same physical location.
<b>Failed transaction:</b>	a securities transaction which does not settle on the contractual settlement date.
<b>Final (finality):</b>	irrevocable and unconditional.
<b>Final settlement:</b>	settlement which is irrevocable and unconditional.
<b>Final transfer:</b>	an irrevocable and unconditional transfer which effects a discharge of the obligation to make the transfer. The terms “delivery” and “payment” are each defined as a final transfer. See <i>provisional transfer</i> .



<b>Financial application (FIN):</b>	the SWIFT II application within which all SWIFT II user-to-user messages are input and output. Certain user-to-SWIFT and SWIFT-to-user messages may also be sent and received within FIN.
<b>Financial risk:</b>	term covering a range of risks incurred in financial transactions – both liquidity and credit risks. See also <i>liquidity risk</i> , <i>credit risk/exposure</i> .
<b>Firewall:</b>	a hardware and/or software-based system that is used as an interface between the internet and a computer system to monitor and filter incoming and outgoing communications.
<b>Foreign exchange settlement risk:</b>	the risk that one party to a foreign exchange transaction will pay the currency it sold but not receive the currency it bought. This is also called cross-currency settlement risk or principal risk. It is also referred to as Herstatt risk, although this is an inappropriate term given the differing circumstances in which this risk has materialised.
<b>Free-of-payment (FOP) delivery:</b>	delivery of securities with no corresponding payment of funds.
<b>Funds transfer system (FTS):</b>	a formal arrangement, based on private contract or statute law, with multiple membership, common rules and standardised arrangements, for the transmission and settlement of money obligations arising between the members. See <i>Interbank Funds Transfer System (IFTS)</i> .
<b>Fungibility:</b>	a concept that characterises the method of holding securities by a CSD or other financial intermediary in which each of a number of issues of physical or dematerialised securities is held in a separate fungible pool. No owner has the right to any particular physical or dematerialised security in a particular pool, but has a right to such an amount of physical or dematerialised securities as shown in its account with a CSD or other financial intermediary.
<b>Giro system:</b>	see <i>credit transfer system</i> .
<b>Global custodian:</b>	a custodian which provides its customers with custody services in respect of securities traded and settled not only in the country in which the custodian is located but also in numerous other countries throughout the world.
<b>Gridlock:</b>	a situation which can arise in a funds or securities transfer system in which the failure of some transfer instructions to be executed (because the necessary funds or securities balances are unavailable) prevents a substantial number of other instructions from other participants from being executed. See also <i>failed transaction</i> , <i>queuing</i> , <i>systemic risk</i> .
<b>Gross settlement system:</b>	a transfer system in which the settlement of funds or securities transfer instructions occurs individually (on an instruction-by-instruction basis).

<b>Haircut:</b>	the difference between the market value of a security and its collateral value. Haircuts are taken by a lender of funds in order to protect the lender, should the need arise to liquidate the collateral, from losses owing to declines in the market value of the security. See <i>margin</i> .
<b>Herstatt risk:</b>	see <i>principal risk</i> .
<b>Home banking:</b>	banking services which a retail customer of a financial institution can access using a telephone, television set, terminal or personal computer as a telecommunication link to the institution's computer centre.
<b>Hybrid system:</b>	a payment system which combines characteristics of RTGS systems and netting systems.
<b>IC (integrated circuit) card:</b>	a plastic card in which one or more integrated circuits are embedded. Also called <i>chip card</i> .
<b>Immobilisation:</b>	placement of certificated securities and financial instruments in a central securities depository to facilitate book-entry transfers.
<b>Indirect participant/member:</b>	refers to a type of participant in a funds or securities transfer system in which there is a tiering arrangement. Indirect participants are distinguished from direct participants by their inability to perform some of the system activities (e.g. inputting of transfer orders, settlement) performed by direct participants. Indirect participants thus require the services of direct participants to perform those activities on their behalf. In an EU context, the term refers more specifically to participants in a transfer system which are responsible only to their direct participants for settling the payments input into the system. See <i>direct participant/member</i> , <i>settling participant/member</i> , <i>tiering arrangement</i> .
<b>Initial margin:</b>	a risk control measure applied in reverse transactions implying that the collateral required for a transaction is equal to the credit extended to the counterparty plus the value of the initial margin. More generally, cash or collateral which is deposited with the clearing house in order to ensure performance on obligations. (Also known as <i>performance bond</i> or <i>original margin</i> .)
<b>Integrity:</b>	the quality of being protected against accidental or fraudulent alteration or the quality of indicating whether or not alteration has occurred.
<b>Interbank Funds Transfer System (IFTS):</b>	a funds transfer system in which most (or all) direct participants are financial institutions, particularly banks and other credit institutions.
<b>Interchange fee:</b>	a transaction fee set by the network organisation and paid by the card-issuing institution to the acquiring institution for the cost of deploying and maintaining ATMs and EFTPOS terminals.

<b>Interlinking:</b>	within the TARGET system, Interlinking provides common procedures and an infrastructure which allow payment orders to move from one domestic RTGS system to another.
<b>International central securities depository (ICSD):</b>	a securities settlement system which clears and settles international securities or cross-border transactions in domestic securities. At present, there are two ICSDs located in EU countries, Clearstream Luxembourg and Euroclear Bank.
<b>Internet:</b>	a worldwide open communication infrastructure consisting of interconnected computer networks which allows access to remote information and the exchange of information between computers.
<b>Interoperability:</b>	a situation in which payment instruments belonging to a given scheme may be used in other countries and in systems installed by other schemes. Interoperability requires technical compatibility between systems, but can only take effect where commercial agreements have been concluded between the schemes concerned.
<b>Intraday credit:</b>	see <i>daylight credit (or daylight overdraft, daylight exposure, intraday credit)</i> .
<b>Intraday liquidity:</b>	funds which can be accessed during the business day, usually to enable financial institutions to make payments in real time. See also <i>intraday credit</i> .
<b>Irrevocable and unconditional transfer:</b>	a transfer which cannot be revoked by the transferor and is unconditional (and therefore final).
<b>Issuer:</b>	the entity which is obligated on a security or other financial instrument. For example, a corporation or government with authority to issue and sell securities; or a bank which issues a letter of credit. The term is sometimes used to refer to a financial institution which issues credit or debit cards. In a stored value or similar prepaid electronic money system, the issuer is the entity which receives payment in exchange for value distributed in the system and which is obligated to pay or redeem transactions or balances presented to it.
<b>Key:</b>	a unique series of digits used in combination with a cryptographic algorithm.
<b>Large-value funds transfer system:</b>	a funds transfer system through which large-value and high-priority funds transfers are made between participants in the system for their own account or on behalf of their customers. Although, as a rule, no minimum value is set for the payments they carry, the average size of payments passed through such systems is usually relatively large. Large-value funds transfer systems are sometimes known as wholesale funds transfer systems.
<b>Large-value payments:</b>	payments, generally of very large amounts, which are mainly exchanged between banks or between participants in the financial markets and usually require urgent and timely settlement.

<b>Legal ownership:</b>	recognition in law as the owner of a security or financial instrument.
<b>Legal risk:</b>	the risk of loss because of the unexpected application of a law or regulation or because a contract cannot be enforced.
<b>Letter of credit (L/C):</b>	a promise by a bank or other issuer to a third party to make payment on behalf of a customer in accordance with specified conditions. Frequently used in international trade to make funds available in a foreign location.
<b>Limit:</b>	see <i>credit limit</i> .
<b>Limited-purpose prepaid card:</b>	a prepaid card which can be used for a limited number of well-defined purposes. Its use is often restricted to a number of well-identified points of sale within a well-identified location (e.g. a building, corporation or university). In the case of single-purpose prepaid cards, the card issuer and the service provider may be identical (e.g. cards used in public telephones). See <i>prepaid card</i> .
<b>Link between securities settlement systems:</b>	a link consists of all the procedures and arrangements which exist between two SSSs for the transfer of securities between the two SSSs concerned through a book-entry process.
<b>Liquidity risk:</b>	the risk that a counterparty (or participant in a settlement system) will not settle an obligation for full value when due. Liquidity risk does not imply that a counterparty or participant is insolvent, since it may be able to settle the required debit obligations at some unspecified time thereafter.
<b>Long position:</b>	a condition that the buyer or holder of securities owns more securities than it contracts to deliver.
<b>Loss-sharing agreement:</b>	an agreement among participants in a clearing or settlement system regarding the allocation of any losses arising from the default of a participant in the system or of the system itself.
<b>Loss-sharing pools:</b>	cash, securities or possibly other assets that are provided by the participants in advance and are held by the system to ensure that commitments arising from loss-sharing agreements can be met.
<b>MAC:</b>	Message Authentication Code: a hash algorithm parameterised with a key to generate a number which is attached to the message and used to authenticate it and guarantee the integrity of the data transmitted.
<b>Magnetic ink character recognition (MICR):</b>	a technique, using special MICR machine-readable characters, whereby documents (i.e. cheques, credit transfers, direct debits) are read by machines for electronic processing. See <i>optical character recognition (OCR)</i> .
<b>Margin:</b>	a term generally referring to the collateral used to secure an obligation, either realised or potential. In securities markets, it is the

collateral deposited by a customer in order to secure a loan from a broker for the purchase of shares. In organisations with a central counterparty, the deposit of collateral to guarantee performance on an obligation or cover potential market movements on unsettled transactions is also sometimes referred to as margin.

<b>Marginal lending facility:</b>	a standing facility of the Eurosystem which counterparties may use to receive overnight credit from an NCB against a pre-specified interest rate.
<b>Market risk:</b>	the risk of losses in on and off-balance-sheet positions arising from movements in market prices.
<b>Marking to market:</b>	the practice of revaluing securities and financial instruments using current market prices. In some cases, unsettled contracts to purchase or sell securities are marked to market and the party with an as yet unrealised loss on the contract is required to transfer funds or securities equal to the value of the loss to the other party.
<b>Matching:</b>	the process used for comparing the trade or settlement details provided by parties in order to ensure that they agree on the terms of the transaction. Also called comparison checking.
<b>Minimum standards of the Lamfalussy report (Lamfalussy standards):</b>	the six minimum standards for the design and operation of cross-border and multicurrency netting schemes or systems. (i) Netting systems should have a well-founded legal basis under all relevant jurisdictions. (ii) Netting scheme participants should have a clear understanding of the impact of the particular scheme on each of the financial risks affected by the netting process. (iii) Multilateral netting systems should have clearly defined procedures for the management of credit risks and liquidity risks which specify the respective responsibilities of the netting provider and the participants. These procedures should also ensure that all parties have both the incentives and the capabilities to manage and contain each of the risks they bear and that limits are placed on the maximum level of credit exposure which can be produced by each participant. (iv) Multilateral netting systems should, as a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single net debit position. (v) Multilateral netting systems should have objective and publicly disclosed criteria for admission which permit fair and open access. (vi) All netting schemes should ensure the operational reliability of technical systems and the availability of backup facilities capable of completing daily processing requirements.
<b>Money order:</b>	an instrument used to remit money to the named payee, often used by persons who do not have a current account with a financial institution, to pay bills or to transfer money to another person or to a company. There are three parties to a money order: the remitter (payer), the payee and the drawee. Drawees are usually financial institutions or post offices. Payees can either cash their money orders or present them to their bank for collection.

<b>Multifunction cards:</b>	a card which, in addition to a stored value card function, may include other payment facilities such as a debit or credit card function and/or non-payment facilities.
<b>Multilateral credit limit:</b>	see <i>credit limit</i> .
<b>Multilateral net settlement position:</b>	the sum of the value of all the transfers a participant in a net settlement system has received during a certain period of time less the value of the transfers made by the participant to all other participants. If the sum is positive, the participant is in a multilateral net credit position; if the sum is negative, the participant is in a multilateral net debit position.
<b>Multilateral net settlement system:</b>	a settlement system in which each settling participant settles (typically by means of a single payment or receipt) the multilateral net settlement position which results from the transfers made and received by it, for its own account and on behalf of its customers or non-settling participants for which it is acting. See <i>multilateral netting</i> , <i>multilateral net settlement position</i> , <i>direct participant in an IFTS</i> .
<b>Multilateral netting:</b>	an arrangement among three or more parties to net their obligations. The obligations covered by the arrangement may arise from financial contracts, transfers or both. The multilateral netting of payment obligations normally takes place in the context of a multilateral net settlement system. Such netting is conducted through a central counterparty. The multilateral net position is also the bilateral net position between each participant and the central counterparty. See <i>bilateral netting</i> , <i>multilateral net settlement position</i> , <i>multilateral net settlement system</i> .
<b>Multi-purpose prepaid card:</b>	a prepaid card which can be used at the outlets of several service providers for a wide range of purposes and which has the potential to be used on a national or international level, but which may sometimes be limited to a certain area. A reloadable multi-purpose prepaid card is also known as an <i>electronic purse</i> . See <i>electronic money (e-money)</i> .
<b>Multi-purpose prepaid card scheme:</b>	a scheme in which at least three parties are involved: the issuer, the cardholder and the acceptor of the card. (Where one acceptor currently exists, it must be possible for other legally distinct acceptors to join the scheme.)
<b>Net credit (or net debit) position:</b>	a participant's net credit or net debit position in a netting system is the sum of the value of all the transfers it has received up to a particular point in time less the value of all transfers it has sent. If the difference is positive, the participant is in a net credit position; if the difference is negative, the participant is in a net debit position. The net credit or net debit position at settlement time is called the net settlement position. These net positions may be calculated on a bilateral or multilateral basis.

<b>Net debit cap:</b>	see <i>caps, net credit (or net debit) position</i> .
<b>Net settlement:</b>	the settlement of a number of obligations or transfers between or among parties on a net basis. See <i>netting</i> .
<b>Net settlement system:</b>	a funds transfer or securities settlement system whose settlement operations are completed on a bilateral or multilateral net basis.
<b>Netting:</b>	an agreed offsetting of positions or obligations by trading partners or participants. The netting reduces a large number of individual positions or obligations to a smaller number of obligations or positions. Netting may take several forms which have varying degrees of legal enforceability in the event of the default of one of the parties. See also <i>bilateral netting, multilateral netting, position netting, novation, substitution (of party)</i> .
<b>Netting by novation:</b>	netting by novation agreements provide for individual forward-value contractual commitments (e.g. foreign exchange contracts) to be discharged at the time of their confirmation and replaced by new obligations forming part of a single agreement. Amounts due under a discharged contract will be added to running balances due between the parties in each currency at each future value date.
<b>Network money:</b>	electronic money which is transferred via telecommunications networks such as the internet.
<b>Nominee:</b>	a person or entity named by another to act on its behalf. A nominee is commonly used in a securities transaction to obtain registration and legal ownership of a security.
<b>Non-repudiability:</b>	the ability to prevent denial or repudiation by the sender or receiver of a payment message.
<b>Novation:</b>	satisfaction and discharge of existing contractual obligations by means of their replacement by new obligations (whose effect, for example, is to replace gross with net payment obligations). The parties to the new obligations may be the same as to the existing obligations or, in the context of some clearing house arrangements, there may additionally be substitution of parties. See <i>substitution (of party)</i> .
<b>Obligation:</b>	a duty imposed by contract or law. It is also used to describe a security, such as a bond or promissory note (containing the issuer's undertaking to pay the owner), or another financial instrument.
<b>Offline:</b>	in the context of payment and settlement systems, the term may refer to the transmission of transfer instructions by users through such means as spoken, written or faxed instructions, which must subsequently be input into a transfer processing system. The term may also refer to the storage of data by the transfer processing system on media such as magnetic tape or disk such that the user may not have direct and immediate access to the data. See <i>online</i> .

<b>Offsetting:</b>	see <i>netting</i> .
<b>Online (e-money):</b>	in electronic money systems this term indicates that a direct connection is made to a centralised computer system for authorisation or validation before a transaction is executed.
<b>Online (payment and settlement systems):</b>	in the context of payment and settlement systems, this term may refer to the transmission of transfer instructions by users, through such electronic means as computer-to-computer interfaces or electronic terminals, which are entered into a transfer processing system by automated means. The term may also refer to the storage of data by a transfer processing system on a computer database such that the user has direct access to the data (frequently in real time) through input/output devices such as terminals.
<b>Open network:</b>	telecommunications network to which access is not restricted.
<b>Open offer netting:</b>	describes a contractual means by which a third party, such as a clearing house, becomes party to a transaction agreed by two separate entities. The third party extends an “open offer” to those entities, with the effect that if they agree the terms of a transaction which satisfies certain pre-agreed conditions, the third party automatically and immediately becomes interposed in that transaction. Two separate, equal and opposite contractual obligations are created; one between the clearing house and one entity, and one between the clearing house and the other entity. If all pre-agreed conditions are met, at no stage does a direct contractual obligation exist between the two entities.
<b>Operating system:</b>	that part of the software of a computer system (or chip) which is closely connected to the hardware on which it runs and performs basic input/output operations, computations, memory management, etc.
<b>Operational risk:</b>	the risk of human error or a breakdown of some component of the hardware, software or communications systems which is crucial to settlement.
<b>Operational safe custody accounts:</b>	securities accounts run by the central bank in which credit institutions can place securities which are eligible as collateral for central bank operations. The securities held on these accounts are finally deposited with the CSD under the name of the NCB, so that the transfer into a safe custody account results in a transfer between the bank's and the NCB's account with the CSD. The securities deposited with the NCB are generally pledged to the NCB as collateral for (interest-bearing) overnight and (interest-free) intraday credits. They can also be used for open market transactions (repos) based on general authorisation given to the NCB to acquire securities.
<b>Optical character recognition (OCR):</b>	a technique, using special machine-readable characters, whereby documents (e.g. cheques, credit transfers, direct debits) are read by machines for electronic processing. See <i>magnetic ink character recognition (MICR)</i> .



<b>Optimisation routine:</b>	routine processes in a payment system to determine the order in which payments are accepted for settlement. Optimisation routines are used to improve system liquidity and increase settlement efficiency. See also <i>queuing, scheduling</i> .
<b>Overnight money (day-to-day money):</b>	a loan with a maturity of one business day.
<b>Oversight of payment systems:</b>	a central bank task, principally intended to promote the smooth functioning of payment systems. The objectives of oversight are to protect the financial system from possible “domino effects” which may occur when one or more participants in the payment system incur credit or liquidity problems and to foster the efficiency and soundness of payment systems. Payment systems oversight is aimed at a given system (e.g. a funds transfer system) rather than at individual participants. It also covers payment instruments.
<b>Oversight of securities settlement systems:</b>	a task, principally intended to promote the smooth functioning of securities settlement systems and to protect the financial system from possible “domino effects” which may occur when one or more participants in the securities settlement system incur credit or liquidity problems. The oversight of securities settlement systems is aimed at a given system (e.g. a securities transfer system) rather than at individual participants. It is performed by the competent financial authority/authorities and/or the central bank in accordance with the local legal framework.
<b>Paperless credit transfers:</b>	credit transfers which do not involve the exchange of paper documents between banks. Other credit transfers are referred to as paper-based.
<b>Participant/member of an IFTS:</b>	a party which participates in a transfer system. This generic term refers to an institution which is identified by a transfer system (e.g. by a bank identification number) and is allowed to send payment orders directly to the system or which is directly bound by the rules governing the transfer system. See <i>direct participant in an IFTS, indirect participant/member</i> .
<b>Payment:</b>	the payer’s transfer of a monetary claim on a party acceptable to the payee. Typically, claims take the form of banknotes or deposit balances held at a financial institution or at a central bank.
<b>Payment instrument:</b>	any instrument enabling the holder/user to transfer funds.
<b>Payment lag:</b>	the time lag between the initiation of the payment order and its final settlement.
<b>Payment message/instruction/order:</b>	an order or message to transfer funds (in the form of a monetary claim on a party) to the account of the beneficiary. The order may relate either to a credit transfer or to a debit transfer. See also <i>credit transfer, debit transfer system, payment</i> .

<b>Payment netting:</b>	settling payments due on the same date and in the same currency on a net basis.
<b>Payment system:</b>	a payment system consists of a set of instruments, banking procedures and, typically, interbank funds transfer systems which facilitate the circulation of money.
<b>Payment versus payment (PVP):</b>	a mechanism in a foreign exchange settlement system which ensures that a final transfer of one currency occurs if, and only if, a final transfer of the other currency or currencies takes place.
<b>Personal identification number (PIN):</b>	a numeric code which the cardholder may need to quote for verification of identity. In electronic transactions, it is seen as the equivalent of a signature.
<b>Pledge:</b>	a delivery of property to secure the performance of an obligation owed by one party (the debtor/pledgor) to another (the secured party). A pledge creates a security interest (lien) in the property so delivered.
<b>Point of sale (POS):</b>	this term refers to the use of payment cards at a retail location (point of sale). The payment information is captured either on paper vouchers or by electronic terminals, which, in some cases, are designed to also transmit the information. Where this is so, the arrangement may be referred to as “electronic funds transfer at point of sale” (EFTPOS).
<b>Pooling system:</b>	see <i>collateral pool, collateral pooling system</i> .
<b>Position netting:</b>	a netting of instructions in respect of obligations between two or more parties which neither satisfies nor discharges those original individual obligations. Also referred to as <i>payment netting</i> , in the case of payment instructions, or <i>advisory netting</i> .
<b>Prefunding:</b>	the requirement that funds be available in accounts at the settlement institution before institutions use these accounts to meet their settlement obligations.
<b>Prepaid card:</b>	a card on which value is stored, and for which the holder has paid the issuer in advance. See also <i>limited-purpose prepaid card, multi-purpose prepaid card, stored value card</i> and <i>electronic purse</i> .
<b>Prepaid card holder:</b>	the customer associated with the prepaid cardholder’s identification on the card or, in the case of anonymous card products not related to any account, the customer owning the card.
<b>Principal risk:</b>	the risk that a party will lose the full value involved in a transaction (credit risk). In the settlement process, this term is typically associated with exchange-for-value transactions when there is a lag between the final settlement of the various legs of a transaction (i.e. the absence of

delivery versus payment). The principal risk which arises from the settlement of foreign exchange transactions (foreign exchange settlement risk) is sometimes called cross-currency settlement risk or *Herstatt risk*. See *credit risk/exposure*.

<b>Provider:</b>	an operator which establishes the hardware and software conditions for the conduct of transactions with electronic money, without necessarily being the issuer of the electronic money units.
<b>Provisional transfer:</b>	a conditional transfer in which one or more parties retain the right by law or agreement to rescind the transfer.
<b>Public disclosure:</b>	making information accessible to the public, for example by posting it on an internet website.
<b>Public key cryptography:</b>	see <i>asymmetric cryptography</i> .
<b>Queuing:</b>	an arrangement whereby transfer orders are held pending by the originator/deliverer or by the system until sufficient cover is available in the originator's/deliverer's clearing account or under the limits set against the payer; in some cases, cover may include unused credit lines or available collateral. See also <i>caps</i> .
<b>Real time:</b>	the processing of instructions at the time they are received rather than at some later time.
<b>Real-time gross settlement (RTGS):</b>	the continuous (real-time) settlement of funds or securities transfers individually on an order-by-order basis (without netting).
<b>Real-time gross settlement (RTGS) system:</b>	a settlement system in which processing and settlement take place on an order-by-order basis (without netting) in real time (continuously).
<b>Real-time risk management:</b>	a process which allows the risk associated with payments between payment system participants to be managed immediately and continuously.
<b>Real-time transmission, processing or settlement:</b>	the transmission, processing or settlement of a funds or securities transfer instruction at the time it is initiated.
<b>Receiver finality:</b>	analytical rather than operational or legal term used to describe the point at which an unconditional obligation arises on the part of the receiving participant in a transfer system to make final funds available to its beneficiary customer on the value date. See <i>final settlement</i> .
<b>Registration:</b>	the listing of ownership of securities in the records of the issuer or its transfer agent/registrar.

<b>Remote access to an SSS:</b>	the facility for an SSS in one country (“home country”) to become a direct participant in an SSS established in another country (“host country”) and, for that purpose, to have a securities account in its own name with the SSS in the host country. See <i>securities settlement system (SSS)</i> .
<b>Remote access to an IFTS:</b>	the facility for a credit institution established in one country (“home country”) to become a direct participant in an interbank funds transfer system (IFTS) established in another country (“host country”) and, for that purpose, to have a settlement account in its own name with the central bank in the host country, if necessary, without having established a branch in the host country.
<b>Remote participant:</b>	a participant in a system which has neither its head office nor any of its branches located in the country where the system is based.
<b>Remote payment:</b>	payment carried out through the sending of payment orders or payment instruments (e.g. by post). Contrast with <i>face-to-face payment</i> .
<b>Replacement cost risk:</b>	the risk that a counterparty to an outstanding transaction for completion at a future date will fail to perform on the settlement date. This failure may leave the solvent party with an unhedged or open market position or deny the solvent party unrealised gains on the position. The resulting exposure is the cost of replacing, at current market prices, the original transaction. Also called <i>market risk</i> , <i>price risk</i> . See also <i>credit risk/exposure</i> .
<b>Repo:</b>	see <i>repurchase agreement</i> .
<b>Repudiation:</b>	the denial by one of the parties to a transaction of participation in all or part of that transaction or of the content of the communication.
<b>Repurchase agreement:</b>	an arrangement whereby an asset is sold while the seller simultaneously obtains the right and obligation to repurchase it at a specific price on a future date or on demand. Such an arrangement is similar to collateralised borrowing, with the exception that ownership of the securities is not retained by the seller.
<b>Reserve requirement:</b>	the requirement for institutions to hold minimum reserves with the central bank. In the minimum reserve framework of the Eurosystem, the reserve requirement of a credit institution is calculated by multiplying the reserve ratio for each category of items in the reserve base with the amount of those items in the institution’s balance sheet. In addition, institutions are allowed to deduct a lump-sum allowance from their reserve requirement.
<b>Respondent:</b>	see <i>correspondent banking</i> .
<b>Retail funds transfer system:</b>	a funds transfer system which handles a large volume of payments of relatively low value in such forms as cheques, credit transfers, direct debits, and ATM and EFTPOS transactions.

<b>Retail payments:</b>	this term describes all payments which are not included in the definition of large-value payments. Retail payments are mainly consumer payments of relatively low value and urgency.
<b>Retail transactions:</b>	transactions of small amounts mainly initiated by individuals. See <i>retail payments</i> .
<b>Retailer card:</b>	a card issued by non-banking institutions, to be used in specified stores. The holder of the card has usually been granted a line of credit.
<b>Reverse repo:</b>	a contract with a counterparty to buy and subsequently resell securities at a specified date and price; the mirror image of a repo.
<b>Reverse transaction:</b>	an operation whereby an NCB buys or sells assets under a repurchase agreement or conducts credit operations against collateral.
<b>Risk management test:</b>	a test carried out on payments submitted to a payment system in order to establish whether processing a particular payment would cause the system or its participants greater risk than permitted under the rules of the system.
<b>Same-day funds:</b>	money balances which the recipient has a right to transfer or withdraw from an account on the day of receipt.
<b>Scheduling:</b>	a technique to manage payment queues by determining the order in which payments are accepted for settlement. See also <i>queuing, optimisation routine</i> .
<b>Securities settlement system (SSS):</b>	a system which permits the holding and transfer of securities, either free of payment (FOP) (for example in the case of a pledge) or against payment (DVP). It comprises all the institutional arrangements required for the clearing and settlement of securities trades and the safekeeping of securities. Settlement of securities occurs on securities deposit accounts held with the CSD, ICSD or institution in charge of operating the system. The final custodian is normally a CSD.
<b>Seigniorage:</b>	in a historical context the term “seigniorage” was used to refer to the share, fee or tax which the seignior, or sovereign, took to cover the expenses of coinage and for profit. With the introduction of paper money, larger profits could be made because banknotes cost much less to produce than their face value. When central banks became monopoly suppliers of banknotes, seigniorage came to be reflected in the profits made by them and ultimately their major or only shareholder, the government. Seigniorage can be estimated by multiplying banknotes and coin outstanding (non-interest-bearing central bank liabilities) by the long-term rate of interest on government securities (a proxy for the return on central bank assets).
<b>Sender finality:</b>	analytical rather than operational or legal term used to describe the point at which an unconditional obligation arises on the part of the

initiating participant in a funds transfer system to make final payment to the receiving participant on the value date. See *final settlement*.

- Settlement:** an act which discharges obligations in respect of funds or securities transfers between two or more parties. A settlement may be final or provisional. See *gross settlement system, net settlement system, net settlement, final settlement*.
- Settlement agent:** an institution which manages the settlement process (e.g. the determination of settlement positions, monitoring the exchange of payments, etc.) for transfer systems or other arrangements which require settlement. See *final settlement, settlement, settlement institution, multilateral net settlement system*.
- Settlement asset:** an asset used for the discharge of settlement obligations as specified by the rules, regulations, or customary practice of a payment system.
- Settlement finality:** see *final settlement*.
- Settlement institution:** the institution through which books transfers between participants take place in order to achieve settlement within a settlement system. See *settlement agent, multilateral net settlement system, bilateral net settlement system*.
- Settlement lag:** in an exchange-for-value process, the time-lag between entering into a trade/bargain and its discharge by the final exchange of a financial asset for payment. See *payment lag*.
- Settlement obligation:** an amount due from one financial institution to other financial institutions as a result of the clearing of payments. See also *net credit (or net debit) position*.
- Settlement risk:** general term used to designate the risk that settlement in a transfer system will not take place as expected. This risk may comprise both credit and liquidity risks.
- Settlement system:** a system used to facilitate the settlement of transfers of funds or financial instruments.
- Share book-entry system:** a computerised system for the issue and registration of equity securities in book-entry form. See also *book-entry system, debt book-entry system*.
- Single-purpose prepaid card:** a stored value card for which the card issuer and merchant (card acceptor) are identical, thus representing a prepayment for specific goods and services delivered by the issuer. See *prepaid card*.
- Smart card:** an integrated circuit card with a microprocessor capable of performing calculations.

<b>Software-based electronic money products:</b>	electronic money products which employ specialised software on a personal computer and which can typically be used to transfer a value in electronic form via telecommunications networks such as the internet.
<b>Stakeholder:</b>	in a payment system, stakeholders are those parties whose interests are affected by the operation of the system.
<b>Standing facility:</b>	a central bank facility available to counterparties on their own initiative. The Eurosystem offers two overnight standing facilities, the marginal lending facility and the deposit facility.
<b>Standing order:</b>	an instruction from a customer to its bank to make a regular payment of a fixed amount to a named recipient.
<b>Stored value card:</b>	a prepaid card in which the record of funds can be increased as well as decreased. Also called an <i>electronic purse</i> .
<b>Straight-through processing:</b>	the automated end-to-end processing of trades/payment transfers including the automated completion of confirmation, generation, clearing and settlement of instructions.
<b>Substitution (of party):</b>	the substitution of one party for another in respect of an obligation. In a netting and settlement context the term typically refers to the process of amending a contract between two parties so that a third party is interposed as counterparty to each of the two parties and the original contract between the two parties is satisfied and discharged. See <i>novation</i> .
<b>Substitution (of securities):</b>	recalling the securities lent from a borrower and replacing them with other securities of equivalent market value during the life of the lending.
<b>Supervision of financial institutions:</b>	the assessment and enforcement of compliance by financial institutions with laws, regulations or other rules intended to ensure that they operate in a safe and sound manner and that they hold capital and reserves sufficient to support the risks which arise in connection with the conduct of their business.
<b>Surcharge fee:</b>	a transaction fee set by an ATM owner and paid directly by the cardholder to the ATM owner for the cost of deploying and maintaining the ATM.
<b>Survivors pay:</b>	a loss-sharing arrangement which, in the event of a participant's inability to settle, requires losses to be borne by the surviving participants in accordance with a predetermined formula.
<b>Swap:</b>	an agreement on the exchange of payments between two parties at some point(s) in the future in accordance with a specified formula.
<b>SWIFT:</b>	the Society for Worldwide Interbank Financial Telecommunication (S.W.I.F.T. s.c.r.l.): a co-operative organisation created and owned by banks which operates a network to facilitate the exchange of payment

and other financial messages between financial institutions (including broker-dealers and securities companies) throughout the world. A SWIFT payment message is an instruction to transfer funds; the exchange of funds (settlement) subsequently takes place via a payment system or through correspondent banking relationships.

- Switch fee:** a transaction fee set by the network organisation and paid by the card-issuing institution to the organisation for the cost of routing transaction information.
- Symmetric cryptography:** a set of cryptographic techniques in which devices share the same secret key in combination with algorithms. For encryption, the same key is used for encrypting and decrypting, and the decrypting algorithm is the reverse function of the encrypting algorithm.
- Systemic disruption:** an event or events whose impact has the potential to threaten the stability of the financial system through transmission from one financial institution to another, including through the payment system. See also *systemic risk*.
- Systemic risk:** the risk that the failure of one participant in a transfer system, or in financial markets generally, to meet its required obligations will cause other participants or financial institutions to be unable to meet their obligations (including settlement obligations in a transfer system) when due. Such a failure may cause significant liquidity or credit problems and, as a result, might threaten the stability of financial markets.
- Systemically important payment system:** a payment system is systemically important where, if the system were insufficiently protected against risk, disruption within it could trigger or transmit further disruptions amongst participants or systemic disruptions in the financial area more widely.
- TCP/IP:** Transmission Control Protocol/Internet Protocol: a set of commonly used communications and addressing protocols; TCP/IP is the de facto set of communications standards of the internet.
- Telematics:** the combined use of data-processing and data-transmission techniques.
- Teller's cheque:** see *bank draft*.
- Tiering arrangement:** an arrangement which may exist in a funds or securities transfer system whereby participants in one category require the services of participants in another category to exchange and/or settle their transactions. See *direct participant in an IFTS, indirect participant/member*.
- Tier one asset:** a marketable asset fulfilling certain uniform euro area wide eligibility criteria specified by the ECB. Among these criteria are the requirements that it must be denominated in euro, be issued (or



	guaranteed) by entities located in EEA countries and be located in an NCB or a CSD within the euro area.
<b>Tier two asset:</b>	a marketable or non-marketable asset for which specific eligibility criteria are established by the NCBs, subject to ECB approval.
<b>Time-stamp:</b>	a value inserted in a message to indicate the time at which the message was created.
<b>Trade date:</b>	the date on which a trade/bargain is executed.
<b>Trade netting:</b>	a legally enforceable consolidation and offsetting of individual trades into net amounts of securities and money due between trading partners or among members of a clearing system. A netting of trades which is not legally enforceable is a <i>position netting</i> .
<b>Trade-for-trade (gross) settlement:</b>	the settlement of individual transactions between parties. See <i>gross settlement system</i> .
<b>Transfer:</b>	operationally, the sending (or movement) of funds or securities or of rights relating to funds or securities from one party to another party by (i) conveyance of physical instruments/money; (ii) accounting entries on the books of a financial intermediary; or (iii) accounting entries processed through a funds and/or securities transfer system. The act of transfer affects the legal rights of the transferor, the transferee and possibly third parties with regard to the money, security or other financial instrument being transferred.
<b>Transfer system:</b>	a generic term covering interbank funds transfer systems and exchange-for-value systems.
<b>Transferability:</b>	in electronic money systems, the degree to which an electronic balance can be transferred between devices without interaction with a central entity.
<b>Travel and entertainment card:</b>	a card issued by non-banks indicating that the holder has been granted a line of credit. It enables it to make purchases but does not offer extended credit, the full amount of the debt incurred having to be settled at the end of a specified period. The holder is usually charged an annual fee. Also called charge card.
<b>Truncation:</b>	a procedure in which the physical movement of paper payment instruments (e.g. paid cheques or credit transfers) within a bank, between banks or between a bank and its customer is curtailed or eliminated, being replaced, in whole or in part, by electronic records of their content for further processing and transmission.
<b>Ultimate settlement:</b>	a term sometimes used to denote final settlement in central bank money.

<b>Unwinding (or settlement unwind):</b>	a procedure followed in certain clearing and settlement systems in which transfers of securities or funds are settled on a net basis, at the end of the processing cycle, with all transfers being provisional until all participants have discharged their settlement obligations. If a participant fails to settle, some or all of the provisional transfers involving that participant are deleted from the system and the settlement obligations from the remaining transfers are then recalculated. Such a procedure has the effect of transferring liquidity pressures and possible losses arising from the failure to settle to other participants, and may, in an extreme case, result in significant and unpredictable systemic risks. Also called settlement unwind.
<b>User:</b>	payment system users comprise both participants and their payment service customers. See also <i>direct participant in an IFTS</i> , <i>indirect participant/member</i> , <i>participant/member of an IFTS</i> .
<b>User fee:</b>	a transaction fee set by the card issuer and paid by the cardholder to the issuing institution for card payments or ATM cash withdrawals; other user fees, sometimes called foreign fees, are paid by the cardholder to the issuing institution for the use of ATMs not owned by the issuing institution.
<b>Variation margin (or marked-to-market payments):</b>	delivery or receipt of collateral (securities and/or cash) adjusting the initial margin which covers a market participant's position. This adjustment is often carried out daily and allows any additional potential losses (or gains) on the market participant's position which are implied by current market conditions to be offset.
<b>White list:</b>	in a card-based system, a database containing the list of all authorised card numbers.
<b>Wholesale funds transfer system:</b>	see large-value funds transfer system.
<b>Zero-hour rule:</b>	a provision in the insolvency laws of some countries whereby any transaction of a closed institution which takes place after midnight on the date on which the institution was ordered to be closed may be retroactively rendered ineffective.



