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Study on the organisation of doctoral programmes in EU neighbouring countries

Practices, developments and regional trends

Final synthesis



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1. Objectives and methodology

1.1 Objectives of the study

The “EU neighbourhood” is of growing political relevance for the European Union (EU). The Western Balkans are readying themselves to become part of the EU, and since 2004, Southern Mediterranean countries, Eastern European countries and Caucasus have been “targeted” by the European Neighbourhood Policy (ENP).

The Lisbon Treaty committed the EU to the “development of a special relationship with neighbouring countries aiming to establish an area of prosperity and good neighbourliness, founded on the values of the European Union and characterised by close and peaceful relations based on cooperation”¹.

EU higher education and research cooperation programmes such as TEMPUS, Erasmus Mundus and Marie Curie Actions have already been targeted at neighbourhood countries for many years. Doctoral programmes are increasingly being included as action to promote EU cooperation, in line with the objective of increasing the synergies between the European Higher Education Area (EHEA) and the European Research Area (ERA) in the Bologna process².

In this context, this study proposes to map the organisation of doctoral programmes in 23 EU neighbouring countries (see Exhibit 1). More precisely, the study analyses the main practices, developments and regional trends observed in recent years. The result will shed some more light on how the EU and its neighbouring countries can further cooperate at doctoral level.

Exhibit 1 List of the 23 EU neighbouring countries covered

Region	Countries
Western Balkan countries	Albania, Bosnia and Herzegovina, Croatia, the Former Yugoslav Republic of Macedonia (FYROM), Montenegro, Serbia, Kosovo under UNSC Resolution 1244/99
Eastern European countries	Belarus, the Russian Federation, Ukraine, Moldova
Caucasus	Armenia, Azerbaijan, Georgia
Southern Mediterranean countries	Algeria, Morocco, Tunisia, Lebanon, Egypt, Israel, Jordan, the Occupied Palestinian Territory (oPt), Syria

NB: Only countries in bold participate in the European Neighbourhood Policy.

1.2 Methodology and analytical framework

The study was first conducted by collecting data for 23 EU neighbouring countries through “Country desk reviews” and phone interviews. Field visits were undertaken in six selected countries (the Russian Federation, Ukraine, Morocco, Egypt, Serbia and Croatia) during spring 2010. This document summarises the main findings of the investigation.

Doctoral studies are analysed from a system perspective (see Exhibit 2): **i) the overall organisation** of studies; **ii) the different actors** at the Policy making level, the Operational and programming level and the Performing level³; **iii) inputs** to the

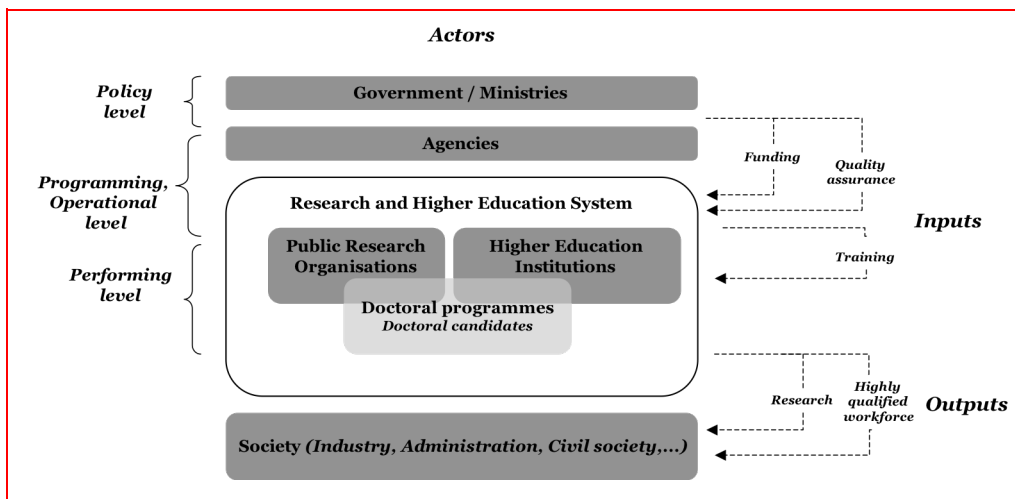
¹ art. 8 TEU

² 2003 Berlin Conference Communiqué

³ a) The “policy making level” refers to elaboration and implementation of national policy, definition of main national priorities and allocation of resources over these goals; b) the “operational and programming level” refers to the translation and implementation of national priority setting into scientific priorities and

system (funding of doctoral studies, quality assurance) and **outputs** (research and the provision of a highly qualified workforce for the benefit of the society as a whole).

Exhibit 2 Schematic representation of a doctoral study system



The synthesis is organised so as to investigate the main features of the doctoral system: Section 2 provides a panorama of the 23 countries from a socio-economic and higher education perspective; Section 3 presents the main organisational features of doctoral studies; Section 4 describes the spectrum of actors involved at the policy making, and programming and operational and finally performing levels for each country; Section 5 presents both doctoral system inputs (funding, quality assurance) and outputs in the form of the provision of research and highly qualified workforce for the society in question; Section 7 provides perspectives on the internationalisation of doctoral studies in EU neighbouring countries.

The final section (Section 8) sums up the main challenges and barriers to the further development of doctoral studies in the regions analysed.

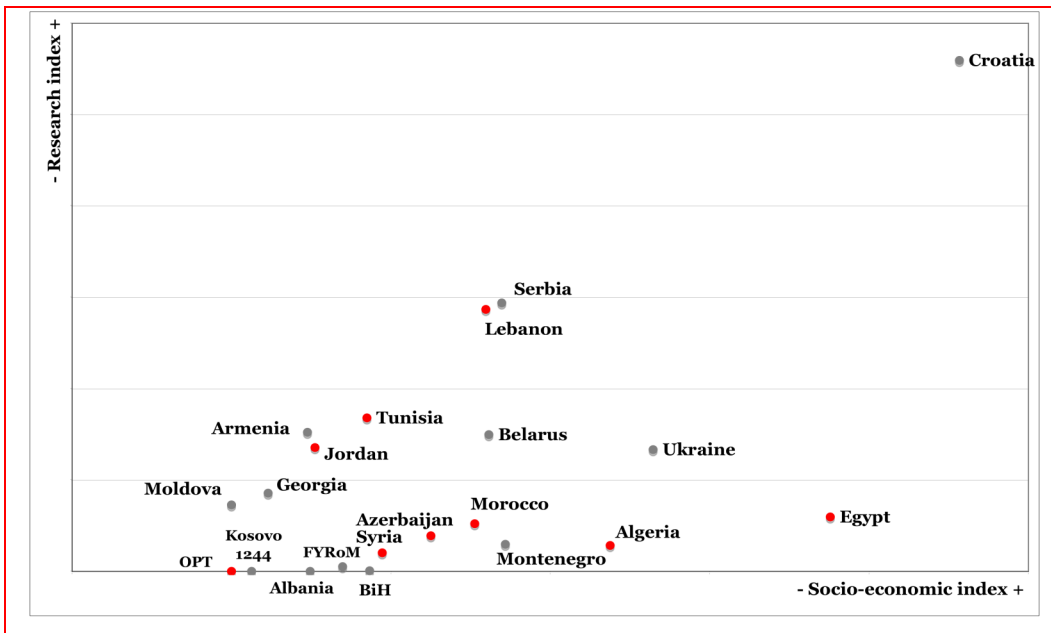
The volume and level of detail of information presented vary between the countries covered by the study. Individual national briefs provides with specific country data.

2. Socio-economic background of EU neighbouring countries

The EU neighbourhood is characterised by the existence of a highly diverse mosaic of countries varying in size and dynamics (see Exhibit 3). The following paragraphs briefly present an overview of the socio-economic contexts within which higher education is organised in these regions.

research programmes as well as the allocation of resources to research performers; c) the “performing level” refers to the production, distribution and exploitation of knowledge.

Exhibit 3 Relative weight of EU neighbouring countries in terms of research and socio-economic indicators



Source: World Bank, UNESCO IUS

NB: *Research index*: a combination of Research and Development (R&D) expenses as % of Gross Domestic Product (GDP) and number of scientific and technical journal articles per million inhabitants – Technopolis calculation; *Socio-economic index*: a combination of the population and GDP per capita data – Technopolis calculation

NB: Population growth rate (positive in red and negative in grey)

NB: Israel and the Russian Federation are not represented in the above exhibit. Israel's science index is 47.9 compared to a 3.8 average and the Russian Federation socio-economic index is 11.1 compared to an average 2.6. (see table in Appendix D for details)

2.1 General socio-economic data

In 2008, the total population of the 23 EU neighbouring countries was 440.5m inhabitants, compared to the 497.7m inhabitants of the EU27. As would be expected, there are considerable differences between countries both in terms of demographics and national revenue.

An important factor is that a handful of countries in the four regions covered (Western Balkans, Eastern European countries, Southern Mediterranean countries and Caucasus) represent a concentrated majority of the total population of all EU neighbouring countries.

The Russian Federation, together with Ukraine, accounts for more than 40% of the total population; the three Maghreb countries, together with Syria and Egypt, a further 40%. The remaining 16 countries are much smaller in population terms, and in most cases have populations of under 10m inhabitants (see Appendix B).

European Union neighbouring countries also show marked and notable differences in population dynamics, especially over the last decade (1998-2008). Two opposite trends emerge from the demographic analysis of neighbouring countries. On the one hand there is a set of Western Balkans and Caucasus countries where population growth either stagnated or decreased during this period (3% for the Russian Federation and Serbia and up to -11% and -14% for Georgia and Moldova respectively). These countries represent approximately half of those included in this study. On the other hand, the population of Southern Mediterranean countries has greatly expanded. Population growth rates over the last 10 years usually stand between 11% and 31%, as in the case of Syria (see Appendix B , Exhibit 18). Demographic trends are

an important factor to keep in mind when explaining the current and future changes and pressures on the educational sector and higher education systems.

Unsurprisingly, EU neighbouring countries lag behind Western countries in terms of Gross Domestic Product (GDP) per capita. In 2008, while GDP per capita reached an average of €29,000 in Western countries (EU and United States) Southern Mediterranean countries averaged at €4,651 (but €2,614 without Israel) the Western Balkans at €4,574, Eastern European countries⁴ at €4,043, and Caucasus at €2,771 (see data per country in Exhibit 19). The levels of national wealth and income are also a key determinant in the development of doctoral studies. For example, countries facing serious financial difficulties tend to favour developing primary or secondary education.

In each region, it is possible to identify one or two dynamic countries: Israel and Lebanon for the Mediterranean countries, Croatia for the Western Balkans and the Russian Federation for the Eastern European countries and the Caucasus. In spite of their leading position, these countries still have GDP per capita figures which are two to three times lower than in Western countries (see Appendix B , Exhibit 19).

2.2 Higher education landscape

2.2.1 General data on tertiary education

In 2008, the 23 EU neighbouring countries had 19,091,623 people enrolled⁵ in tertiary education⁶, that is to say a figure comparable to the EU27 (19,040,142). The gross enrolment ratio⁷ for the tertiary level in the EU neighbouring countries displays a significant regional specificity with Eastern European countries showing ratios above 70, much higher than France or the UK (53 and 57 respectively) and comparable to the United States (83). For the rest of the EU neighbouring countries the ratio is below 50.

It is worth highlighting the fact that growth rates in enrolments at tertiary level in EU neighbouring countries since 1999 exceed those in Western countries (Germany, the UK and France averaged only a 10% increase between 1999 and 2008 whilst increase are above 50% in 11 of the EU neighbouring countries). EU27 growth rates as a whole show a 52% increase since 1999.

Notable growth peaks are in Southern Mediterranean countries such as Algeria (98%) Tunisia (123%) and Occupied Palestinian Territory (173%). The noticeable exception in the Southern Mediterranean region is Egypt where tertiary enrolment only grew by 2% over the 1999-2008 period. The Western Balkans, Eastern European countries and Caucasus also record high growth rates (60% average) although to a lesser extent (see Appendix F , Exhibit 23). The pressure on tertiary education can also impact on the organisation of doctoral programmes by increasing mechanically the demand for third cycle studies (see Section 4.3).

⁴ Russian Federation, Ukraine, Belarus and Moldova

⁵ Enrolment is understood as the total number of students in the system (stock)

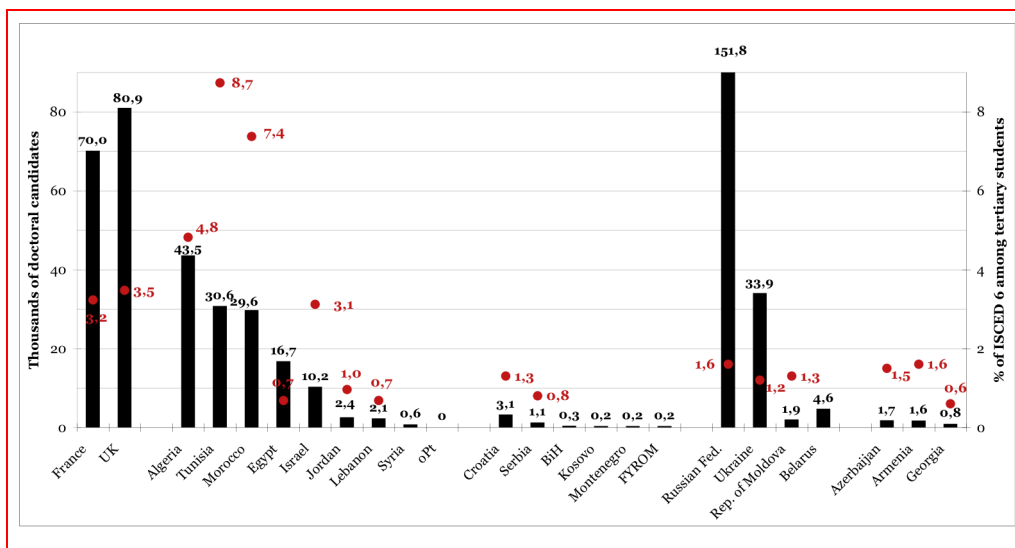
⁶ Tertiary education: ISCED 5 and 6

⁷ Definition: Total enrolment in a specific level of education, regardless of age, expressed as a percentage of the eligible official school-age population corresponding to the same level of education in a given school year. (UNESCO Institute for Statistics, 2009, Education indicators, Technical guidelines.)

2.2.2 Data on doctoral candidates

In 2008, the 23 EU neighbouring countries had 335,993 candidates enrolled at the doctoral level (ISCED 6)⁸ compared to 499,400 in the EU27 and 460,805 in the United States. Among these, Eastern European countries accounted for 57% of enrolments (with the Russian Federation accounting for 45% of all neighbouring countries); and the Southern Mediterranean region accounted for 40%. Each of the countries of the Western Balkans and Caucasus represented 1% or less of the total ISCED 6 enrolments. There are also no significant data on completion or graduation ratios in these countries. This type of data is not being produced by the main international organisations at the ISCED 6 level, nor is it being produced by national statistical services (for most countries studied). This data can usually only be found at university level or at the sub-level of the faculties. Universities are not always well integrated, therefore faculties may tend not to share all information with the university level. This makes it difficult and costly to carry out a bottom-up compilation of data.

Exhibit 4 ISCED 6 total enrolment (thousand of candidates) and ISCED 6 as % of total tertiary education (2008)



Source: World Bank, UNESCO, IUS data centre and calculation from national briefs (BiH, Kosovo under UNSC Resolution 1244/99 and FYROM)

Notes: * 1999, ** 2007, *** 2009

NB: Data unavailable for Albania

In EU neighbouring countries, doctoral candidates usually only make up about 1% to 1.5% of all tertiary enrolments. This is lower than the rates in the UK or France (3.5%). However, Israel and the three Maghreb countries have much higher rates than the rest of the EU neighbouring countries (up to 8.7% for Tunisia).

With regard to the participation of women in doctoral education, the Western Balkans and Eastern Europe have a much higher proportion of women than Western countries

⁸ ISCED 6: Advanced Research Qualifications refer to tertiary programmes that lead directly to the award of an advanced research qualification, e.g., PhD. The theoretical duration of these programmes is three years full-time in most countries (for a cumulative total of at least seven years full-time at the tertiary level) although the actual enrolment time is typically longer. The programmes are devoted to advanced study and original research.

and the EU27 (53.8% and 52.3% respectively compared to 46.5% for the UK and France and 48.0% for the EU27 as a whole).

In Southern Mediterranean countries the regional average is 44% of women involved in doctoral programmes. This hides significant differences between the countries, however: Israel and Tunisia have more than 50% women compared to the rest of the Southern Mediterranean countries where the average is 39%. Similarly in Caucasus the figures are 36.9% for Armenia and up to 59.9% for Georgia.

3. Organisation of doctoral programmes

This section looks at the main reforms of doctoral programmes (3.1) and at regional organisational trends with particular regard to the structuring of doctoral studies (3.2).

3.1 Organisational reforms of doctoral programmes

Most of the EU neighbouring countries have been very active in reforming their entire higher education system over the last five to ten years. The overhaul of doctoral programmes happened more recently, taking place over the last year or two. Doctoral programmes are therefore undergoing a period of transition and are often characterised by the simultaneous existence of two parallel organisational models. This is the case, for example, in Serbia, Algeria and Tunisia where the first classes of doctoral candidates have not yet graduated under the new model, making it impossible to judge the degree of effectiveness of the reforms undertaken.

Nine countries out of 23 have established a legal framework for doctoral programmes at the national level (Syria, Morocco, Tunisia, Algeria, Russian Federation, Belarus, Serbia, Bosnia and Herzegovina and Albania). These generally serve as an overview framework for the organisation of doctoral programmes, while more detailed rulebooks and guidelines are developed at the universities or faculties level. The guidelines usually define the minimum requirements for doctoral programmes in terms of resources as well as duration, type of supervision and specific programme curricula. The guidelines can also define the standards for accreditation.

It is worth mentioning that common national guidelines are a novelty in most countries, and have been adopted only in the last five years (for instance, Syria adopted such a document in 2006). In other countries, there are no rules set at national level and guidelines are established at the HEI sub-level instead. Some HEI have adopted very detailed sets of rules and regulations as observed for instance in Israel (most universities) and in Croatia (the University of Zagreb).

One major driver behind doctoral programmes reforms and improvement is the commitment to the Bologna process. Indeed, of the 23 countries under review, 12 have signed the Bologna Declaration and are full members of the process. Western Balkans countries signed in 2003 (but Kosovo under UNSC Resolution 1244/99) and Eastern European but Belarus and Caucasus countries signed in 2005 (see list in Appendix A). Three additional countries (Algeria, Morocco and Tunisia) have committed to the Bologna process even though they have not formally joined since they are not eligible.

In fact, the Bologna process does not include any detailed guidelines regarding the organisation of doctoral programmes, focusing mostly on the first two cycles of higher education instead (Bachelor and Masters). The only set of principles applicable to the doctoral level within the Bologna process was defined in a Bologna seminar in

Salzburg and presented to the Bergen conference in 2005⁹ (see Appendix F , the Salzburg principles).

Interviewees in Western Balkans countries and Maghreb countries explicitly and continuously refer to the Bologna process when describing their doctoral programmes reforms (even though the latter are not formally Bologna signatory countries). Interviewees often even referred to their new programmes as “Bologna compliant” programmes.

This trend led to more structured programmes, with a specified number of courses and exams. Also noticeable is the use of ECTS¹⁰ at doctoral level. In the Western Balkans countries, the post-reform doctoral level is only completed after carrying out 180 ECTS. In the Former Yugoslav Republic of Macedonia (FYROM) or in Kosovo under UNSC Resolution 1244/99, for instance, doctoral programmes are broken down precisely by type of activity (e.g. compulsory courses and seminars – 60 ECTS, pilot research work and submission of the thesis proposal – 30 ECTS, etc.)

3.2 Regional trends in the organisation of doctoral programmes

Two main organisational types were identified: the one-step system that is commonly found in Western countries; and the two-step system inherited from the Soviet era (see Exhibit 5). Here we describe the evolution of doctoral programmes within the two organisational types which are marked by a reshaping and streamlining of practices over the last five years.

Exhibit 5 Typology of organisation of doctoral programmes

One-step system		
<p>Doctoral programmes</p> <ul style="list-style-type: none"> • Serbia, FYROM, Croatia, Bosnia and Herzegovina, Kosovo under UNSC Resolution 1244/99 Montenegro • Georgia • Occupied Palestinian Territory, Lebanon 	<p>Doctoral schools</p> <ul style="list-style-type: none"> • Morocco, Tunisia, Algeria and Lebanon 	<p>No specifically dedicated organisation</p> <ul style="list-style-type: none"> • Syria, Israel, Algeria, Egypt, Jordan • Albania
Two-step system		
<ul style="list-style-type: none"> • Russian Federation, Ukraine, Belarus, Azerbaijan 		

NB: Some countries do not have just one uniform doctoral programme organisation type, and may accordingly be categorised under more than one heading.

3.2.1 One-step system doctoral programmes

The one step-system doctoral programmes are found in 19 out of the 23 countries reviewed.

In these countries, there is an observable general trend towards a reduction in the length of doctoral programmes, at least within the legal frameworks of neighbouring countries. This reduction was triggered by the adoption of standards benchmarked in Western countries (Europe) and the Salzburg principles. Under the reforms currently being implemented, doctoral programmes will have a legal duration of three years (in most of the countries reviewed). In most countries, a two-year extension is usually possible, although formal requests have to be submitted to university bodies (scientific council, dean, etc.).

⁹ http://www.ehea.info/Uploads/Declarations/Bergen_Communique1.pdf

¹⁰ European Credit Transfer and Accumulation System

The study points to significant differences between the legal and the real duration of doctoral programmes, especially under the reformed systems. The reported actual time taken to finish doctoral programmes is generally between five and six years. In many of the countries reviewed, however, it is too early to know if average duration has decreased as a result of the recent implementation of the reform process. This decrease in length is often criticised by faculty staff who questions the quality of research carried out by doctoral candidates within the new time constraints. There is even more criticism where a reduction in the duration of doctoral programmes has been accompanied by an increase in the amount of mandatory coursework. It is true that, in these cases, the time available for pure hands-on research has been drastically reduced.

Admission of candidates and thesis defence tend to be fairly homogeneous from one country to another. On the contrary, the reform of doctoral programmes led to the establishment of mainly two different organisational models inspired from western countries.

- Admission

For all the countries reviewed, entrance into third cycle studies requires the completion of the second cycle of higher education (Masters degree or equivalent). In addition, candidates are also generally required to be in possession of a good academic record. With the exception of Moldova, Jordan and Armenia, written examinations are not part of the selection process. In half of the countries reviewed, language tests such as the TOEFL (Test of English as a Foreign Language) are now required.

There is a trend towards more formalised procedures following recurring complaints regarding the opacity of recruitment procedures. This concern was often expressed during the investigation.

In most countries, doctoral candidates do not need to have a formalised project thesis. In Western Balkans countries, the subject is chosen at the end of the first year.

- “Thesis defence”

The process for the “defence of a thesis” is fairly homogeneous among the countries under review, even though there are specific requirements pertaining to each country.

The first step is usually to obtain authorisation for the submission of the thesis, and its defence. When this authorisation is granted, a scientific council within the faculty or the doctoral school appoints a jury. The supervisor is often included as a member of the jury and may have the right to vote. Juries are composed of a minimum of 3, and a maximum of 15 members (Armenia). All jury members must have the status of professor, and external professors (who have no connection to the candidate) are also usually included. Foreigners are also welcomed but it is difficult to measure the frequency of their involvement. In half of the countries reviewed, candidates must publish articles before being authorised to defend their thesis.

The diploma awarded upon completion of doctoral programmes is generally referred to as the Doctor of Philosophy diploma, often abbreviated to PhD. Some countries also have additional diplomas such as the Doctor of Science (DSc) in Egypt, which is given to a selected number of doctoral graduates after at least 5 years of work. The official titles of doctoral diplomas may differ slightly from one country to another but actors commonly use the PhD abbreviation¹¹.

- Organisational models

- Structured doctoral programmes: most of the Western Balkans countries (Serbia, FYROM, Croatia, Bosnia and Herzegovina, Montenegro, Kosovo)

¹¹ In Maghreb countries, the doctoral diploma is most often referred to as the “doctorat”.

under UNSC Resolution 1244/99 (University of Prishtina)) the Occupied Palestinian Territory (oPt) and Georgia have structured programmes. Structured programmes are organised in such a way that part of the time is dedicated to coursework and the rest to research. The programme is planned in advance.

- Doctoral schools: Doctoral programmes in Morocco, Tunisia, Algeria and Lebanon (the Lebanese University, which represents more than half of the total student population, has three doctoral schools) are organised along the lines of those in France. These doctoral schools' main functions are to resource doctoral programmes and coordinate the actors involved in the organisation of programmes. For the time being, they see their purpose as administrative (yearly registration, exams preparation) rather than academic (development of specific transversal curricula, soft skills, etc.) Their underlying purpose is of being innovative by developing transversal and generic skills transfer through seminars and dedicated events¹².

The TEMPUS programme has played a major role in the development of more structured programmes and doctoral schools (see K.2, Exhibit 37). Out of 28 TEMPUS III and IV projects related to the third cycle in the neighbouring countries, 21 are linked to the development of new PhD programmes in specific fields, three concern the general implementation of the three cycle system and four are specifically for the establishment of doctoral schools. In Southern Mediterranean countries, in particular, TEMPUS actions contributed to the development of doctoral schools by supporting the exchange of best practice, as is the case of the *Université Pierre et Marie Curie* which was one of the first to establish the doctoral school model of organisation in France. Another important TEMPUS project targeted Lebanon and supported the reorganisation of doctoral programmes in doctoral schools in the Lebanese University, the only public university in Lebanon, with more than half of the national student population. It is worth noting that some of the last TEMPUS projects were carried out at regional level whereas the previous generation of projects were only country-oriented.

3.2.2 Eastern European countries' two-step system

The Russian Federation, Ukraine, Belarus, Azerbaijan and Armenia have the two-step third cycle system of *Aspirantura* and *Doktorantura* programmes. These lead to the award of the titles of *Kandidat Nauk* (the Candidate of Sciences, the first level, duration equivalent to PhD) and *Doktor Nauk* or the Doctor of Sciences. The two steps of postgraduate study usually have a legal duration of three years for *Aspirantura* (with a real average duration of four to five years) and up to 15 years for the *Doktorantura*.

- Admission

Unlike one-step doctoral programmes, admission to *Aspirantura* programmes is regulated by a written entrance examination. These vary but include the scientific field of research, a foreign language and philosophy.

- “Thesis defence”

In Eastern European countries, candidates' dissertations are approved by dissertation councils/committees. In Russia, dissertation councils are organised by the Higher

¹² Definition : Doctoral school is an organisational structure that includes only doctoral students. It may be organised around a particular discipline, research theme or a cross-disciplinary research area and/or it is focused on creating a research group/network and is project-driven. In EUA 2007 report *Doctoral programmes in Europe's universities : Achievement and challenges*.

Attestation Commission (VAK). In Ukraine, dissertation committees are organised within HEI but only a few HEI have their own (mainly in Kiev) with the result that candidates have to travel to other HEI for their thesis defence. Dissertation committees or councils are composed of about 20 to 25 individual holders of a Doctor of Science and Candidate of Science degree. In both Russia and Ukraine candidates (at the Candidate of Science level) must have published 3-4 articles.

4. Actors involved in the organisation of doctoral programmes

This section looks at three of the actors involved in doctoral programmes: national policy makers; Higher Education Institutes; and doctoral candidates.

4.1 National policy makers

The degree of centralisation of power at policy and operational levels represents the main distinctive feature in respect to the public authorities in charge of doctoral programmes in the EU neighbouring countries. Two distinct groups of countries can be distinguished.

The first group (derived from the Soviet model) includes Eastern European countries in which the Higher/Supreme Attestation/Certification Commission (VAK) has extended powers of control and supervises the implementation of legislation, as well as the licensing and accreditation of institutions and programmes. The VAK also awards doctoral diplomas. These systems are fairly centralised. This model is found in countries such as Belarus, the Russian Federation and Ukraine. In Moldova, the National Commission for Accreditation and Attestation (CNAA) is deeply involved in the doctoral programme since it i) provides 6-year accreditation to HEI involved in research, ii) it provides accreditation to doctoral supervisors and iii) it delivers the doctoral diploma.

The second group of countries has a much less centralised system in the sense that different bodies endorse complementary functions. Usually, the ministry for higher education and its associated services have prime responsibility for doctoral education policy. An array of bodies (services, departments or agencies) which are more or less independent of the given ministry play a specific role in the organisation of doctoral programmes (mostly accreditation procedures and evaluation). In this model, responsibilities are spread out across more “actors”, and universities or faculties usually award diplomas. Each country with this type of system will have its own set of specificities.

In all countries (with the exception of Moldova) the ministry responsible for the overall policy and coordination of doctoral programmes is the ministry in charge of education or higher education. These ministries usually have responsibilities for both higher education and scientific research (except for Serbia which has a separate ministry which is also *de facto* involved in doctoral programmes). In Moldova, doctoral programmes are not part of the higher education system, but are still seen as post-university studies. The Ministry of Education is therefore not responsible for doctoral programmes at national level. Doctoral programmes are the responsibility of the Academy of Sciences of Moldova (ASM) – as in the Soviet system.

4.2 Higher Education Institutions and Research organisations

4.2.1 Doctoral programmes' host institutions

In most EU neighbouring countries, doctoral programmes are solely hosted by Higher Education Institutions (HEI), and more specifically universities. The rest of the HEI,

(for instance the higher institutes for technological studies in Tunisia, colleges of professional career studies and colleges of academic studies in Serbia, or the Academic colleges in Israel) can only offer first or second cycle degrees.

It is only in the Russian Federation, Ukraine, Belarus, Armenia and Moldova that Research Organisations are able to create, organise and run doctoral programmes in parallel with universities. In the other countries, Research Institutes can be partners (i.e. doctoral candidates can pursue their research in laboratories) but are not entitled to award doctoral degrees or to run doctoral programmes.

The vast majority of HEI offering doctoral programmes are public universities, mainly because private universities are usually more recent foundations and have fewer resources available for research. Even though private universities are not formally prevented from organising doctoral programmes, the requirements in terms of resources, research infrastructure, quality and quantity of mentors are so high that, in practical terms, private HEI cannot be accredited. In several countries, private universities are currently lobbying their governments to reduce the requirements for hosting doctoral programmes and obtain the relevant accreditation. This is the case, for instance, in Serbia. In Montenegro, a private university has recently been accredited so that it can offer doctoral programmes.

Exhibit 6 Institutions hosting doctoral programmes

Doctoral programmes exclusively hosted and managed by public universities	Doctoral programmes only hosted and managed by public and private universities	Doctoral programmes only hosted and managed by public and private universities and <u>Research Organisations</u>
<ul style="list-style-type: none"> • Croatia, Serbia, Albania, Bosnia and Herzegovina, FYROM, Kosovo under UNSC Resolution 1244/99 • Egypt, Israel, Morocco, Tunisia, Algeria, Occupied Palestinian Territory 	<ul style="list-style-type: none"> • Lebanon, Jordan • Montenegro • Georgia, Azerbaijan 	<ul style="list-style-type: none"> • Ukraine, the Russian Federation, Belarus, Armenia, Moldova

Examples of countries where private universities are involved in doctoral programmes are Lebanon, Montenegro, Armenia, Jordan and Georgia, but even in these countries, public HEI host the bulk of doctoral candidates. Lebanon is the only exception to this general picture since all universities there, except for the Lebanese University, are private.

In most cases, Higher Education Institutes (or Research organisations in some countries) enjoy a high degree of autonomy in the design of doctoral programmes. They must be licensed by their respective governments in order to be eligible to set up doctoral programmes. New doctoral programmes have to be systematically accredited before they start up.

The only exception to this rule is Israel, where no accreditation of new doctoral programmes is required. Israeli universities, which obtain accreditation upon their creation (renewed every six years), are free to launch the programmes they wish.

Usually, the creation of doctoral programmes follows a bottom-up process, with HEI themselves deciding what types of programmes they wish to initiate. It is only in a very limited number of cases that the decision to open a doctoral programme is taken by the government in order to meet specific social or economic needs.

4.2.2 Links with the business sector

Doctoral programmes have loose connections with the business sector in all EU neighbouring countries. Even though 17 countries reported some links with the private

sector, they were always qualified as scarce and poor. Business support consists more of financing research than direct participation in the organisation of doctoral programmes (membership of thesis committee, co-mentorship, etc.). In Ukraine, 43% of research projects' budgets are funded by the private sector, but involvement is usually limited to the realisation of single projects answering a specific need, as opposed to long-term strategic partnerships.

Egypt provides examples of joint research projects carried out by university departments in collaboration with private sector actors. The University of Cairo carries out clinical trials for the private sector on a regular basis, for which it receives funding covering the necessary salaries and equipment. This type of cooperation is much more frequent in hard sciences than in social sciences or humanities, as in other countries. The University of Alexandria has also established a steering committee aimed at developing ties with the private sector and improving its knowledge of labour market trends. This committee includes several representatives from the business and industrial sectors. This represents a simple mechanism that allows the demands of potential doctoral employers to be heard so that educational programmes can be adapted accordingly.

The study also reveals an interesting situation in Israel, where the private sector is clearly kept apart from the organisation of doctoral programmes. This situation is, however, balanced by the existence of technology and research transfer companies attached to universities thus enabling research outputs to be used by the industrial sector.

4.3 Doctoral candidates

The status of doctoral candidates is similar in all the countries under review with regard to status and rights. If candidates occupy teaching positions at the same time as pursuing their studies, they have a combined status as *both students and professionals* (this is the case for teaching assistants, for instance).

Teaching is generally not a mandatory part of a doctoral programme. It is difficult to get a clear picture, however, as there are insufficient data on the number of doctoral candidates occupying teaching positions. Teaching positions are nonetheless sought out by candidates because they provide a secure source of income and in some cases, a tuition waiver. The downside is that teaching duties take up a considerable amount of doctoral candidates' time, leaving them with little time to conduct their research work.

In some of the newly reformed systems, a teaching hour limit per week has been established to allow candidates to get on with their research. However, this is not yet harmonised across countries.

Otherwise, doctoral candidates are *always recognised as students*, similar to those enrolled in other cycles of higher education. Although it is impossible to estimate the exact numbers, a large proportion of doctoral candidates probably occupy teaching positions.

As a result, doctoral candidates' rights are equal to regular student rights. In some cases, such as Serbia, doctoral candidates may have no rights at all if they exceed the age limit where they benefit from general student status.

The issue of creating specific rights for doctoral candidates did not elicit any particular response from interviewees in the investigation. It generally seemed to be a non-issue, in fact. This lack of interest must, however, be seen in the wider context of the more severe budget constraints and less developed welfare systems of the EU neighbouring countries, if compared to the EU.

It is worth noting that several of the countries under review reported having facilities for maternity or military service leave. There are also some examples of doctoral candidates participating in university senates, though usually without the right to vote.

5. Doctoral programmes inputs: training, funding and quality assurance

5.1 Doctoral programmes content (training and research)

The content of and the distribution of time allocated to the two main activities carried out by doctoral candidates (research and training) follow regional patterns. Three main groups emerge from the investigation (see Exhibit 7):

- In half of the Southern Mediterranean countries, such as Syria, Israel, Egypt and Algeria, there are no mandatory supplementary training activities within the doctoral programme, at least for the time being. As a result, doctoral candidates spend all their time on research.
- In a second category, in the rest of the Mediterranean countries, in Eastern Europe and Caucasus, the majority of time is allocated to research (80-90%) while a marginal amount of time is given over to coursework.
- The last category comprises the Western Balkans and Central European countries and Jordan where the training component of doctoral programmes can account for up to a third of the time (or credits) of doctoral programmes.

Exhibit 7 Distribution of time between research and training

<p>100% research</p> <ul style="list-style-type: none"> • Syria, Israel, Egypt, Algeria 	<p>80-90% of time for research 10-20% in training</p> <ul style="list-style-type: none"> • Tunisia, Morocco, Lebanon, the Occupied Palestinian Territory, • Ukraine, the Russian Federation, • Armenia, Montenegro
<p>Up to 30% of the time in training</p> <ul style="list-style-type: none"> • Serbia, Croatia, Kosovo under UNSC Resolution 1244/99, Bosnia and Herzegovina, FYROM, Albania • Moldova, Georgia, Azerbaijan • Jordan 	

In general terms, **hands-on research** represents the core activity of all doctoral programmes. In all the countries observed, hands-on research is mainly pursued within the host university. In some case, particularly when there is a need for a specific type of equipment, candidates may carry out research in an integrated Research Institute, but this is a marginal factor other than in the Russian Federation, Ukraine, Belarus and Armenia, where it is part of the Soviet legacy. Note that in some countries, Research Institutes are integrated within universities. An example is Serbia, which has integrated Research Institutes and co-mentorship even though the diploma is granted by the university. In social sciences and humanities, research is usually carried out either in university libraries or from home.

There are only very limited examples of research projects carried out within private sector laboratories, reflecting the generally weak links between academia and the business sector.

In many countries, as in the Western Balkans, research subjects are defined at the end of the first year of doctoral study. Doctoral candidates do not necessarily have to define a research subject before that point.

In recent years both the **training and mandatory coursework** elements of doctoral programmes have gained in significance. Countries reforming their higher education systems have increased the amount of time allocated to training, and

reduced the overall studies timeframe. Courses are mostly aimed at developing scientific skills rather than soft/generic skills. The principle is that doctoral candidates can usually select courses relevant to their thesis topic, as observed in Serbia and Croatia. This can include courses in several disciplines, i.e. offered by faculties other than the one hosting the candidate.

In reality, however, because “integration” within universities is often at a low level, it remains difficult to offer multidisciplinary training to doctoral candidates. A couple of interviewees stressed ironically the fact that it is easier to establish a convention with a foreign university than another faculty within the same university.

Another problem is the shortage of suitable teaching staff. No one mentioned approaching individuals from the business sector to become course providers.

In the Russian Federation and Ukraine, 20% of the three-year *Aspirantura* studies have to be spent on courses on the philosophy of science, foreign languages (mainly English) and the scientific speciality. In all cases, courses are evaluated through written examination. The examinations must normally be taken before starting work on drafting the thesis.

5.2 Funding

Funding was found to be the most critical issue in the organisation of doctoral programmes in EU neighbouring countries. One must distinguish between i) the funding of doctoral programmes (training, professors and mentors), ii) the funding of doctoral candidates (stipends or grants) and iii) the funding of research itself (through bloc grant to the university or through competitive calls from research agencies (see section 6.1).

5.2.1 Funding of doctoral programmes

Generally speaking, doctoral programmes are poorly funded, which impacts primarily on the quality of supervision, but also increases the length of studies and affects the quality of the research conducted. It is difficult to establish any clear regional trends with regard to funding (see Exhibit 8). Three groups of countries emerge from the analysis.

Exhibit 8 Funding of doctoral programmes

Mainly funded by the state	Mix of tuition fees and governmental funding	Mainly funded by the candidates through tuition fees
<ul style="list-style-type: none"> • Algeria, Morocco, Tunisia, Israel • Russian Federation, Ukraine <ul style="list-style-type: none"> • Kosovo under UNSC Resolution 1244/99, Albania 	<ul style="list-style-type: none"> • Egypt, Lebanon, Syria • Azerbaijan, Georgia, Armenia • Moldova 	<ul style="list-style-type: none"> • Jordan, oPt • Croatia, BiH, Serbia, FYROM, Montenegro

NB: Data unavailable for Belarus

In the first category of countries, doctoral programmes are mainly funded through state budgets. The countries within this category have very different profiles, however, with the three Maghreb countries (Algeria, Morocco and Tunisia) and the Russian Federation all sharing the specific feature of offering tuition-free doctoral programmes.

A very different picture can be seen in Israel where doctoral programmes are a policy priority. Funding is channelled by an independent Planning and Budgeting Committee (VATAT). One of the main criteria for distributing the public budget to universities is the number of doctoral candidates they host. In spite of the existence of high tuition

fees, candidates may benefit from tuition waivers, especially in the field of exact science and technology.

For the second category of countries, doctoral programmes are funded by a mix of tuition fees, government funding (extremely limited) and on occasions funding from donors (mostly in private universities). Tuition fees are often under €500 per year and candidates can benefit from tuition waivers and living allowances or grants (usually they can apply for teaching positions in the host institution). The combination of the low state budget and tuition fees is not enough to fund an efficient doctoral system and competitive research.

In the third category, the funding issue is very sensitive since doctoral programmes are quasi-exclusively financed from the fees of the doctoral candidates themselves. This is the case for many Western Balkans countries. Tuition fees are usually high (more than €1,000 per year) and candidates have to pay for their research themselves. Government grants are usually available to excellent candidates, but in such limited numbers that it has low impact on the overall doctoral system.

Exhibit 9 Average annual tuition fees

No tuition fees	Below or €500/ year	More than €1,000/ year	Large disparities between (€500 up to €10,000)
<ul style="list-style-type: none"> • Algeria, Morocco, Tunisia • Russian Federation 	<ul style="list-style-type: none"> • Armenia, Moldova • Syria, Egypt, Lebanon* 	<ul style="list-style-type: none"> • Israel**, Jordan, oPt • Croatia, BiH, Azerbaijan*** 	<ul style="list-style-type: none"> • Ukraine • Serbia • Georgia

Source: Country briefs

Notes: * Only valid for the Lebanese University ** No fees at all in certain universities, *** Azerbaijan tuition fees introduced starting 2010

NB: No information available for Kosovo under UNSC Resolution 1244/99, Albania, Montenegro, Belarus, FYROM

5.2.2 Funding of doctoral candidates

The funding of doctoral candidates themselves is a key issue in the neighbouring countries as elsewhere (see Salzburg principles, Appendix F) since it impacts on the motivation and availability of candidates to pursue the programmes.

As a general rule, the most efficient way to secure funding is to stand for a teaching position. However, not all doctoral candidates benefit from teaching positions. In most countries, regular doctoral candidates without teaching position will not receive any grant or stipend that guarantee a living. When they do, the amount cannot guarantee a living (except for Israel).

Two main sources of funding may exist: i) very limited number of excellence grants allocated according to excellence criteria (good marks, etc.) and funded by the government, ii) through a research project to which the doctoral candidate is embedded to and receives a salary.

In Eastern European countries, where the state funds doctoral programmes, HEI have a number of subsidised positions for doctoral candidates. Usually, doctoral candidates benefiting from those positions get also tuition waivers. In Southern Mediterranean countries, the Algerian Government has recently created doctoral scholarships which are given to all doctoral candidates during the first four years of their doctoral programmes. These scholarships allow doctoral candidates to receive a monthly allowance equal to the national minimum wage. Also the Moroccan Government provides about 70% of doctoral candidates with a monthly stipend of approximately €110 per month (based on a ranking from the host institution).

Exhibit 10 Funding of doctoral candidates

No national funding mechanisms	Limited number of excellence grants or grants through research projects	Funding mechanism
<ul style="list-style-type: none"> • Georgia • Kosovo under UNSC Resolution 1244/99 • Syria, Egypt 	<ul style="list-style-type: none"> • Croatia, Serbia, BiH, FYROM, Montenegro, Albania* • Moldova 	<ul style="list-style-type: none"> • Israel, Algeria, Morocco, Lebanon** • Russian Federation, Ukraine, Belarus, • Armenia, Azerbaijan

Source: Country briefs

NB: Funding is understood as grant or stipend for doctoral candidates. It does not include salary for teaching position

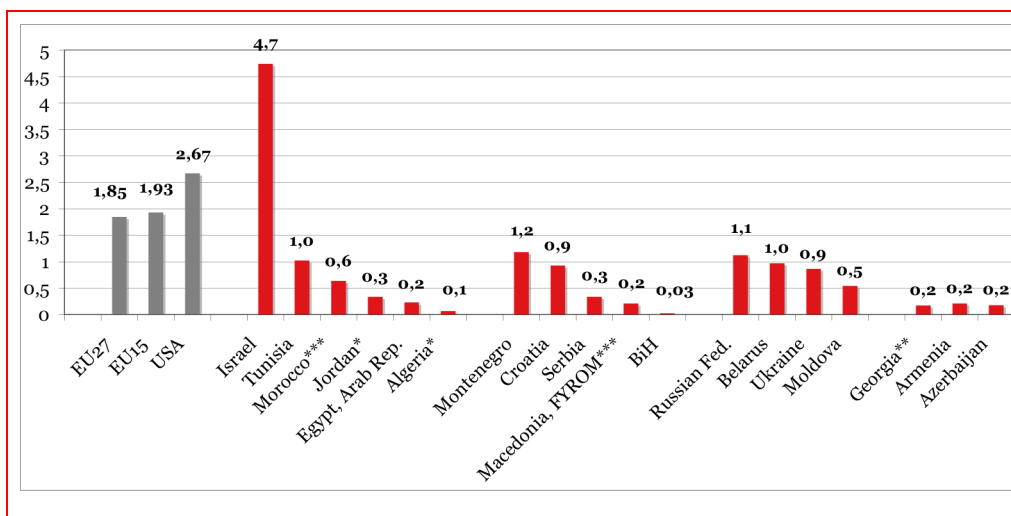
NB : no information available for the Occupied Palestinian Territory

Note : * the Albanian government finances grants from an Excellence fund to send doctoral candidates abroad, ** in Lebanon, funding mechanisms depends on HEI and are not set at the national level

5.2.3 Funding of higher education and research

The main indicator for assessing research investment is the R&D expenditure as a percentage of GDP, which in EU neighbouring countries is far below EU27 and American standards (around 2% of GDP, see Exhibit 11). Two groups of countries can be identified: the seven countries for which R&D expenditures are close to 1% of GDP (Russian Federation, Tunisia, Belarus, Ukraine, Croatia, Montenegro and Morocco); and the other countries where contributions to research are much lower and closer to 0.2% of GDP (see Exhibit 11).

Exhibit 11 Research and development expenditures (% of GDP – 2007)



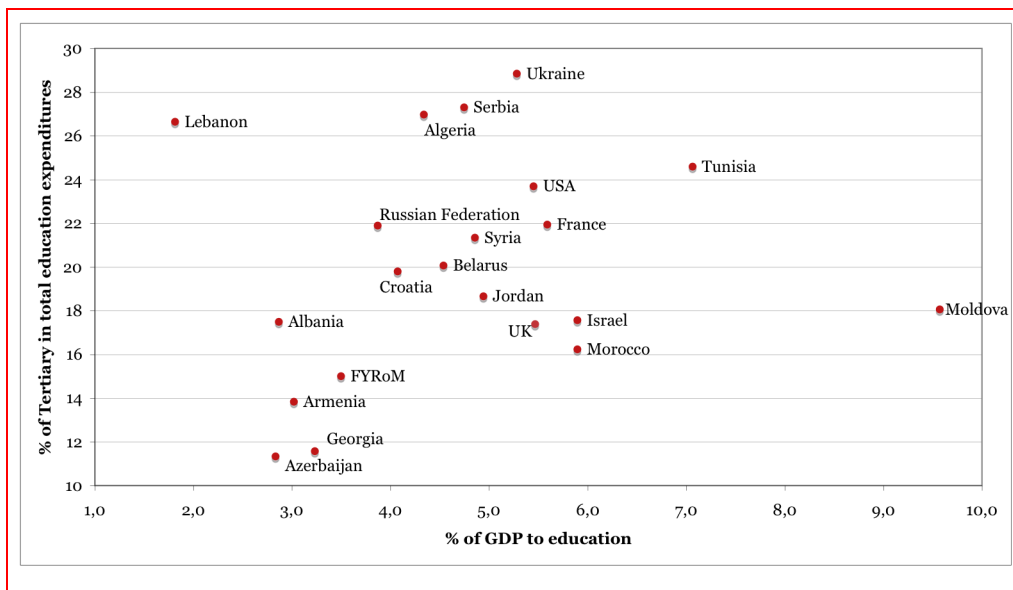
Source: World Bank and Eurostat

Notes: * 2002, ** 2005, *** 2006

NB: Data missing for: Kosovo under UNSC Resolution 1244/99, Lebanon, oPt, Syria and Albania

The percentage of expenditures devoted to doctoral programmes is not available. However, the percentage of expenditures devoted to tertiary education gives an interesting picture that does not follow regional patterns.

Exhibit 12 % of tertiary education (ISCED 5 and 6) in total education expenditures and % of GDP to education



Source: UNESCO IUS

NB: years for data are not homogeneous and span from 1999 to 2010 because of gaps in data collection

NB: data for Kosovo under UNSC Resolution 1244/99 unavailable

Most countries under scrutiny (but Israel, Morocco, Tunisia and Moldova) seem to spend less on general education as percentage of their GDP than western countries such as the USA, France of the UK. Then, three groups emerge: the first group devotes between 11 and 17% of total education expenditure to tertiary education (Western Balkans and Caucasus); the second group devotes between 19 and 22% of total education expenditure to tertiary education (Eastern European countries and Southern Mediterranean countries) and the third groups which clearly stresses on tertiary education with higher level of spending (Eastern European countries and Maghreb).

With low levels of GDP dedicated to overall education and low levels of expenditure devoted to tertiary education, the first group of countries appears to have less room for manoeuvre if they would like to change the policy focus.

5.3 Quality assurance in doctoral programmes

The investigation examined the factors that jeopardize the quality of doctoral programmes (sub-section 5.3.1) and the mechanisms in place to supervise doctoral work (5.3.2) and to enforce quality assurance (5.3.3).

5.3.1 Main obstacles to quality doctoral programmes

The current context - that is to say the growth of students enrolment figures, diversification of higher education providers (private HEI), governments advocating a development through the knowledge society, the development of cross-border studies leading to an increased competition among students and institutions, the development

of information and communication technologies - puts pressure on the higher education system and calls for enhanced quality assurance¹³ support measures.

However even in a given country, the quality of doctoral diplomas can vary greatly from one institution to another. The quality of doctoral programmes is determined by two main factors:

- the **lack of financial and human resources** that make up the system:
 - the lack of funding for doctoral programmes, impacts on access to advanced scientific equipment and documentation, that reduces the ambition and scope of the research and may lead to poor quality research;
 - the lack of human resources leading to doctoral work being inadequately supervised;
- **academic fraud and corruption**, a sensitive issue that jeopardizes the quality of higher education and doctoral education. In particular:
 - most of the 23 countries face serious corruption problems that affect the functioning of the public sector in general. An illustration, corroborated by scientific and policy papers, is the very low rank of EU neighbouring countries in the Corruption Perception Index¹⁴. The situation is critical particularly in Eastern European countries and Caucasus that are at the very bottom of the ranking (see Appendix I , Exhibit 28);
 - among the phenomena observed during investigation and through literature review, are the bought diplomas in Eastern European countries “Dissertation for sale”¹⁵, false diplomas or the lack of transparency in selection procedures for doctoral positions;

The impacts of fraud and corruption practices are twofold: it affects the international recognition of diplomas (e.g. Eastern European *Aspirantura* programmes and *Kandidat Nauk* title) and also puts into question the value of diplomas abroad.

5.3.2 Doctoral programme supervision

Doctoral supervision is a key element in the quality of the diploma and is a matter of concern in all of the countries under review. In EU neighbouring countries, mentorship faces serious demographic problems:

- Mentors are part of an ageing population. A large proportion are within sight of their retirement years. The age of mentors is also said to be a barrier to the adoption of new processes, and new work habits.
- In many countries there is a gap between young researchers and older ones with entire generations (often the 35-40 year olds) having fled their countries as a result of armed conflict (notably in the Western Balkans and Lebanon) or for economic reasons.

In practice, mentors usually have to accept too many candidates, and cannot guarantee supervision quality. No precise figures are available about the real workload

¹³ Hallack P. Poisson M. 2007, *Academic Fraud, Accreditation and Quality Assurance*, Higher Education in the World 2007, *Accreditation For Quality Assurance: What Is At Stake?* 2nd Edition, Global University Network for Innovation (GUNI)

¹⁴ The Corruption Perceptions Index (CPI) ranks countries according to the perception of corruption in the public sector. The CPI is an aggregate indicator that combines different sources of information about corruption, making it possible to compare countries.
http://www.transparency.org/policy_research/surveys_indices/cpi/2010/in_detail

¹⁵ Osipian A., 2008, *Corruption in Russia's Doctoral Education*, Vanderbilt University

created for mentors by their responsibilities for supervising doctoral candidates. However, they identify the main problem, in discussion, as combining their teaching workload with their duties as supervisors.

Furthermore, supervision duties are usually poorly paid, if paid at all. There are some exceptions to this, such as the Russian Federation and Ukraine, where mentors are paid for 50 hours per year per candidate supervised. One good example was found at the Jordanian University of Yarmouk, where supervisors are paid the equivalent of €230 for each semester per doctoral candidate supervised. In the latter case, remuneration may only be received for a maximum of four semesters and, where there is a supervisor and a co-supervisor, remuneration is divided equally between them.

Investigation in half of the countries reviewed shows that doctoral candidates work under a traditional single mentor scheme (see Exhibit 13). The candidate has one professor he can refer to. This traditional scheme can bring difficulties (accessing the supervisor during the doctoral programme, conflicts, etc.). In the rest of countries, there seems to be a tendency to favour co or multiple mentorship with one leading mentor and co-mentors, either professors from the same or other HEI or outside academia. Usually, co-mentors still belong to academia.

Exhibit 13 Supervision scheme

Traditional single-mentor scheme	Co-mentorships
Tunisia, Morocco, Jordan, Egypt, Syria	FYROM, Croatia, Albania
Ukraine, Armenia, Moldova	Lebanon, the Occupied Palestinian Territory, Algeria, Israel
Serbia Bosnia and Herzegovina, Kosovo under UNSC Resolution 1244/99, Montenegro,	Russian Federation, Georgia

An additional problem is the lack of formalisation of the supervision process. In countries where new doctoral programme reform legislation has been introduced, the requirements for mentorship tend to be more developed and precise. In six countries, university regulations or national regulations set a limit on the number of candidates to be supervised by a single mentor. In these cases, the average number of doctoral candidates allowed to be supervised by a single mentor is four.

In all countries, being in possession of a doctoral degree is a *sine qua non* condition for supervising. However, additional requirements vary from one country or even faculty to another. Requirements can also include a minimum number of publications (for instance in Serbia). In countries where there is widespread use of thesis or doctoral charters, the relationship between doctoral candidates and supervisors seems to be more formalised and regulated. However, in most cases, it is too early to judge the impact of the introduction of such mechanisms.

5.3.3 Quality assurance bodies

Quality assurance in higher education is a growing concern for most EU neighbouring countries, as reflected in the growing number of new quality assurance and evaluation agencies and framework laws put into place over the last five years (see Exhibit 14). However, this development focuses more on the two first cycles of higher education than on the doctoral level yet.

For the doctoral level, there is still a lack of a quality assurance culture with non-existent or very recently formalised processes of evaluation.

Exhibit 14 National quality assurance bodies

<p>Independent quality assurance agency</p> <ul style="list-style-type: none"> • Albania*, BiH*, Croatia*, Serbia*, FYROM, Kosovo under UNSC Resolution 1244/99 <ul style="list-style-type: none"> • Russian Federation, Ukraine • Israel 	<p>Quality assurance department/services within the responsible ministry</p> <ul style="list-style-type: none"> • Algeria, Morocco, Tunisia • Montenegro, Moldova, Azerbaijan, Georgia
<p>No dedicated agency or other mechanism</p> <ul style="list-style-type: none"> • Lebanon, Syria • Moldova 	

Note: * Agencies within the European Association for Quality Assurance in Higher Education (ENQA)

The European programme TEMPUS is active in supporting the development of a quality culture. For instance, one of the objectives of the TEMPUS IV structural measures project “Fostering and developing the quality culture at the University of Prishtina” is to set up evaluation standards for doctoral research by means of knowledge transfer from EU27 universities¹⁶.

6. Doctoral programmes' outputs: research and workforce

Doctoral programmes are normally expected: i) to generate knowledge and knowledge applications from research activity (publication, patents,...); ii) to create a highly qualified workforce. This section addresses the relative performance of EU neighbouring countries in both regards.

6.1 Research output

A low level of resources specifically for research necessarily impacts on the research outputs.

Research outputs can be quantitatively measured as the number of scientific publications per million inhabitants. Each region has one more dynamic country whose figures are far above its regional counterparts. However, while Croatia and the Russian Federation display higher numbers of publications (respectively 214 and 100 per million inhabitants) they still remain three to six times below those of Western countries (694 for the United States and 497 for France). The regional averages are much lower (30.8 for Mediterranean countries¹⁷, 164.3 for Western Balkans, 54.8 for Eastern European countries and 35.0 for Caucasus).

6.2 Provision of a highly qualified workforce

The final objective of a doctoral system is to meet society's needs for a highly qualified workforce. Recently graduated doctors usually have several options: i) start post-doctoral work; ii) engage in research in the public or private sector; or iii) leave research. Unfortunately, doctoral candidates' careers after graduation are poorly

¹⁶ World University Service Austria, the University of Salzburg (Austria) the University of Wuppertal (Germany) the University College Cork (Ireland) and the Ministry for Education, Science and Technology

¹⁷ Note that Israel is the exception amongst the EU neighbouring countries and is more easily categorised in the context of EU countries. As a result, the type and level of organisation of doctoral studies in Israel is not comparable to the other countries under review.

monitored. This study's investigations could not be sufficiently backed by sound statistical data even though the interviews provide a few pointers.

In order to understand doctors' careers, consideration has to be given to the proportion of part-time versus full-time candidates. As would be anticipated, their motivations and expectations of the doctoral degree tend to be different. It was reported that part-time candidates in particular undertake doctoral programmes for professional advancement purposes (increase in salary, higher position) rather than to provide new and innovative knowledge.

It seems that a significant proportion of doctoral candidates in EU neighbouring countries already occupy professional positions (as opposed to student jobs) before starting their doctoral degrees, and in addition to their studies. In Egypt, for instance, it was reported that 95% of Egypt's doctoral candidates already occupied positions in the labour market when they started out on their doctoral programmes.

Despite the differences between the doctoral programmes systems under review, all have one thing more or less in common: higher education remains the main source of employment for doctoral graduates. Most graduates obtain a position within their host university upon completion of the doctoral programme. This situation is not likely to change as universities are understaffed and face a growing demand for higher education, as observed in Syria, Algeria, Morocco and Tunisia. Another example is Serbia, where it was reported that doctoral graduates have access to opportunities in the newly created private universities.

The number of researchers is, however, two to three times lower in EU neighbouring countries than in Western countries: 2,881 R&D researchers per million people in the UK as compared to an average of 924 in the Western Balkans, 995 in the Southern Mediterranean countries and 1,381 in Eastern European countries¹⁸. Note that the Russian Federation taken separately has a comparable number of researchers per million inhabitants (3,305).

This employment situation illustrates some of the most significant realities of doctoral programmes in the reviewed countries:

- Doctoral candidates do not necessarily take doctoral programmes in order to pursue a research career. In many cases, they are seen as a way of climbing administrative and hierarchical ladders;
- Candidates can be deterred from a research career by lack of funding and an inadequate infrastructure for research;
- In most countries under review, there is a shortage of professors, with many needing to be replaced in forthcoming years. As a result, doctoral graduates are generally easily absorbed by HEI;
- Doctoral programmes are not always designed to cope with the needs of the business sector. There are significant gaps between doctoral programmes and the demands of the labour market outside of academia. In certain countries this is because the business sector is mainly composed of very small or family businesses which are unable to “absorb” doctoral competences.

The one exception is Israel where obtaining a position in academia is difficult and highly competitive. Recent graduates are usually obliged to leave their host universities and find post-doc positions in other universities or abroad before being able to submit an application for a position. As a result, doctoral graduates are primarily employed by the business sector or in public administration.

¹⁸ Figures are calculated from World Bank data (Cf. Exhibit 20). The average figure for Southern Mediterranean countries does not take into account Israel.

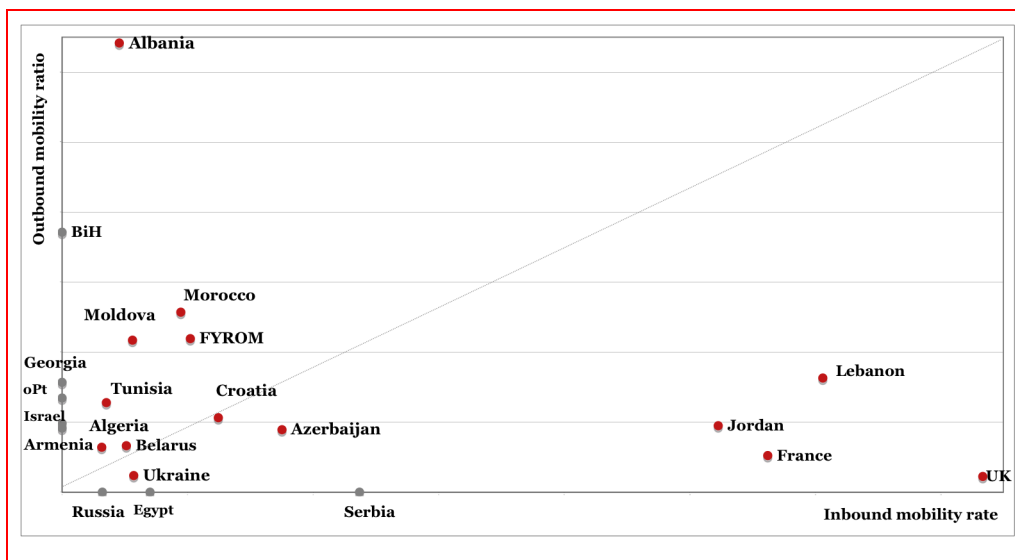
In general, the unemployment rate for doctors was reported as negligible. It is worth noting that tracking systems for doctoral graduates are rare and exist primarily in Eastern European countries.

7. Internationalisation of doctoral programmes

Data gathered for international collaboration reflect first and foremost the scarcity of information available to measure the mobility of doctoral candidates from and to the EU neighbouring countries.

Available data for the tertiary level suggest that there are brain drain issues in certain countries (see Exhibit 15). Once again, however, the picture is not homogeneous. Three profiles emerge from international data: i) a cluster of relatively closed countries with low proportions of foreign tertiary students both coming into the country and leaving it (Belarus, Ukraine, Algeria) ii) countries that tend to have a relatively high proportion of tertiary students leaving the country compared to those coming in (Albania, Bosnia and Herzegovina and Morocco) and iii) countries hosting a high proportion of foreigners (Lebanon and Jordan, for example).

Exhibit 15 Relative openness of EU neighbouring countries (tertiary level) (2008)



Source: UNESCO IUS

NB: Data unavailable for Kosovo under UNSC Resolution 1244/99, Montenegro and Syria

NB: Incomplete data (grey points)

7.1 Foreigners as doctoral candidates

There are no harmonised data available on foreign doctoral candidates.

However, it does clearly appear from these investigations and the few data available that the number of foreign doctoral candidates coming to study in the countries under review is extremely low. Foreigners at the doctoral level per year range from a dozen candidates in some countries (10-15 in Armenia, 30 in Moldova, for instance) to a couple of hundred in others (150 in Albania, 120 in Croatia). Egypt on the other hand is said to attract a large number of candidates from the wider region, but no data are available at national level to quantify the phenomenon.

The inbound mobility rate for the total tertiary level¹⁹ used as a proxy suggests a low openness for EU neighbouring countries. Most countries will have rates close to the 1.7% average rate (see Appendix I , Exhibit 29), which is far below France or UK figures (respectively 11% and 14%). The two exceptions are Lebanon and Jordan which are comparable to France. In those two countries, the number of foreign students in tertiary education has doubled the last decade²⁰ thanks to the good regional reputation of some universities that for instance deliver courses in English and hire foreign professors.

The origins of foreign candidates are usually associated with traditional areas of influence: sub-Saharan African countries for Morocco; the Arabic world for Lebanon or Egypt. In Serbia and Croatia, foreigners mostly come from other countries within the Former Yugoslavia. This type of movement is facilitated by the recognition of diplomas through bilateral agreements in a given area (e.g. Russia, Belarus and Ukraine).

The requirements for the few foreign doctoral candidates are usually reported to be the same as for national candidates, as are the fees. It was however reported that fees for foreigners may amount three to 10 times the fees for nationals.

7.2 National candidates going abroad

Paradoxically, two distinct but contradictory trends emerge in the EU neighbouring countries with regards internationalisation of the doctoral candidates trajectories. At the same time, decision-makers:

- *encourage candidates to go abroad* in order to access more advanced scientific infrastructures or cutting edge technologies, state of the art knowledge and internationally renowned professors. There is vigorous demand for the intensification of mobility schemes such as Erasmus Mundus in EU neighbouring countries.

National support measures to foster mobility are usually scarce and much constrained by the overall higher education and R&D budget. Often it will be correlated to the general migration policy. For instance in Belarus and the Russian Federation, there are only very limited incentives to go abroad. Georgia does not have any support mechanism at all. At the opposite end of the scale, the governments of Albania or Tunisia provide grants to obtain doctoral diplomas abroad, in the latter case because of a shortage of teaching staff.

- *but seek not to accentuate the existing brain drain phenomenon.* The outbound mobility ratio²¹ for the tertiary level as a whole shows that EU neighbouring countries have a significantly higher proportion of their tertiary students studying abroad than, for instance, France or the UK. No specific regional trend is observable but some countries experience huge outbound rates, such as Albania (25.7%) Bosnia and Herzegovina (14.9%) and Morocco (10.3%) (see Appendix I).

In 2007, EU27 hosted a total of 237,136 tertiary students from the EU neighbouring countries, a third of them from the three countries of Maghreb, the Russian Federation and Ukraine. Albania made up another 20% of the foreign tertiary students from EU neighbouring countries (see Appendix I , Exhibit 30).

¹⁹ The inbound mobility rate measures the number of students from abroad studying in a given country, as a percentage of the total tertiary enrolments in that country.

²⁰ The sum of internationally mobile students in tertiary education was 12,155 in 2000 and 26,637 in 2008 in Jordan and 14,008 in 2000 and 22,674 in 2007 in Lebanon, UNESCO IUS.

²¹ The outbound mobility ratio is the number of students from a given country studying abroad divided by the total higher education enrolments in that country.

The most popular destinations of tertiary students from EU neighbouring countries are first France, followed by the Russian Federation, Germany, the United States and the UK. Please note that the figures are strongly constrained by the availability of data (no information for most countries, see Appendix I , Exhibit 31).

Unfortunately, data are not available for the numbers of doctoral candidates leaving the EU neighbouring countries, nor on the types of doctoral programmes carried out abroad (whole duration of the studies vs a couple of semesters, etc.).

7.3 Participation in EU mobility programmes

EU mobility, structural and research programmes have targeted EU neighbouring countries for a long time (mainly up to the Master level for mobility programmes). The scope of EU action has however widened with the opening of Erasmus Mundus for doctoral candidates and the development of Marie Curie Actions.

- Today, the *Erasmus Mundus* mobility programme is broken down into three Actions, and EU neighbouring countries normally participate in Action 2, the development of academic partnerships and mobility. Action 2 of the EU Erasmus Mundus programme (former External Cooperation Window) is open to third cycle students and provides scholarships to enhance mobility between the EU and targeted Third countries. Groups of countries form networks such as the JOSYLEEN²² network between Jordan, Lebanon, Syria and the EU or the JOINEUSEE²³ network between Western Balkan countries and the EU. Scholarships are granted on a short to long-term basis. Unfortunately, it is too soon to assess the impact of such programmes on the overall organisation of doctoral programmes (See Appendix K.3).

The participation of EU neighbouring countries in Erasmus Mundus Action 1 “developing joint programmes of outstanding quality at Masters and Doctoral level” is limited to three out of the 23 Erasmus Mundus Joint doctorates selected in 2010²⁴ (two Russian, one Egyptian, one Tunisian and one Israeli HEI).

- Between 2004 and 2009, the *TEMPUS programme* carried out 28 projects in the EU neighbouring countries linked to the development and organisation of doctoral programmes through Joint projects²⁵ or Structural Measures²⁶. Seventeen countries of the EU neighbouring countries benefited from national or regional projects (See K.2).
- Doctoral candidates in EU neighbouring countries also have the opportunity to participate in *Marie Curie Actions*. These actions, which were formerly within the remit of the European Commission Directorate General for Education and Culture, are open to third countries. Sixty institutions in total participated in the training of postgraduates from EU neighbouring countries in the 6th Framework Programme for Research (FP6) including those from Israel on 40 occasions, from

²² <http://www.josyleen.eu/>

²³ <http://www.joineusee.eu/>

²⁴ <http://erasmusmundus-edeem.univ-paris1.fr/>; <http://www.riverscience.eu/>; <http://www.riverscience.eu/>

²⁵ Joint Projects are based on multilateral partnerships between higher education institutions in the EU and the partner countries. These projects develop, modernise and disseminate new curricula, teaching methods or materials, boost a quality assurance culture, and modernise the management and governance of higher education institutions.

²⁶ Structural Measures contribute to the development and reform of higher education institutions and systems in partner countries, to enhance their quality and relevance, and increase their convergence with EU developments.

Russia on 12, Croatia 7 and Ukraine 1. With regard to the early stage researchers (ESRs) themselves, out of 323 participants originating from 21 countries, 35% came from Russia, 13% from Ukraine and 12% from Serbia (plus Montenegro). The trend seems to be confirmed in FP7 participation, where Israel and Russia are also the most active participating neighbouring institutions (See Appendix K.1).

Most EU neighbouring countries seek to develop deepened and more intensive cooperation at all levels of higher education and research through those existing programmes. They also express the wish to participate in excellence programmes such as FP7 research programmes. This stems mainly from the desire to benefit from the potential positive impacts (access to infrastructures, state of the art knowledge,...) that such programmes could have on their own systems.

8. Conclusion

8.1 Perspective from the European Union

Since the end of the 1990's, the European Union and its member states have increasingly paid attention to the doctoral degree, in line with the Lisbon objectives of a knowledge economy and the building of the European Research Area.

The Bologna process included doctoral education in 2003 as third cycle. In 2005, 10 recommendations were developed (See Salzburg principles appendix F.1) and adopted as key principles for the development of the third cycle within the Bologna process. 2005 was also the year of publication of the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers²⁷ the objective of which is to make research an attractive career. In EU neighbouring countries, HEIs in Croatia, Serbia, Israel and the Russian Federation also adopted the Charter.

The organisational picture of doctoral programmes within the European Union is diverse and, as in the EU neighbouring countries, different organisational models co-exist²⁸. Since 2005, an array of organisational changes was implemented in the doctoral programmes in line with those Salzburg principles, as it happened in EU neighbouring countries.

The latest institutional developments are the establishment of a Council for Doctoral Education²⁹ European University Association in 2008 and the developments of the Salzburg principles through the 2010 Salzburg II initiative (See appendix F.2). This 2010 set of recommendations convey three key messages:

- “First of all, doctoral education has a particular place in the European Research Area and the European Higher Education Area. It rests on the practice of research, which makes it fundamentally different from the first and second cycles.
- Secondly, doctoral candidates must be allowed independence and flexibility to grow and develop. Doctoral education is highly individual and by definition original. The path of progress of the individual is unique, in terms of the research project as well as in terms of the individual professional development.
- Lastly, doctoral education must be developed by autonomous and accountable institutions taking responsibility to cultivate the research mindset. Institutions

²⁷ <http://ec.europa.eu/euraxess/index.cfm/rights/index>

²⁸ EUA (2007) Doctoral Programmes in Europe's universities: achievements and challenges

²⁹ <http://www.eua.be/cde/about-euacde.aspx>

need flexible regulation to create special structures and instruments and continue advancing European doctoral education”³⁰.

The European Union member states and the 23 neighbouring countries are definitely linked in the processes of improvement of doctoral programmes in the respective countries.

8.2 The challenges ahead for EU neighbouring countries

EU neighbouring countries present a dynamic landscape with regard to the organisation of doctoral programmes. Most of these countries are currently reforming their systems with the intention of better matching EU country organisation and they display high levels of commitment and motivation towards this end. However, there are still challenges to be overcome for the future development of doctoral programmes in these countries. Challenges appear at three levels: i) at the level of the overall society, ii) at the policy level, and iii) at the level of doctoral programmes organisation itself.

8.2.1 Societal challenges

Certain trends can clearly hinder the sound development of doctoral programmes, and they were apparent in various ways in this study. The most critical trend is the **demographic challenge**. On the one hand, and in particular in some countries (notably in Mediterranean countries) the combination of a demographic explosion with improved access to higher education could put pressure on the development of a doctoral programmes system that is not yet fully in place. On the other hand, the **ageing population** of professors, the absence of a full generation of researchers in the 35-40 age bracket to replace them and the effects of the **brain drain** have led to a serious human resources shortage in higher education and research. The increased demand for highly qualified teaching staff in higher education is particularly noticeable in countries such as Serbia, Croatia, Israel, Algeria, Egypt and Jordan.

8.2.2 Research and higher education policy challenges

Additional efforts still need to be made by policy makers involved in the development and enhancement research and higher education policy.

- **The lack of funding** directly impacts on the quality of research equipment and research infrastructure to finally affect the quality of the research produced. Funding is insufficient for:
 - **doctoral candidates** : limited number of grants and reduced amount of scholarships force candidates to take up work simply in order to subsidise their studies. They only devote part of their time to research;
 - **doctoral candidates' research** which leads to reduced ambitions and scope of the research conducted and put at stake the very definition of a doctoral programme (original research);
 - **funding for doctoral programmes**: limited human resources dedicated to supervision, administration, relevant teaching, etc.

The current level of spending in research as a whole is insufficient and hinders the sound development of doctoral programmes.

³⁰ EUA (2010) Salzburg II Recommendations, European universities' achievements Since 2005 in implementing the Salzburg Principles

- **Reach critical mass:** in line with the scarce resources available and the nature of scientific work (exchanging and sharing ideas to build new ones), the challenge is to develop doctoral programmes through gathering existing resources, infrastructures and knowledge from different actors that are not necessarily involved enough in doctoral research. Research organisations, public and private HEI should rather team up than compete.
- **Quality assurance:** A particular challenge relates to the development and enforcement of quality assurance mechanisms. Many of the countries in this study have taken considerable steps to develop quality assurance mechanisms, but still have a long way to go when it comes to implementing them. Even more importantly, there is a lot of work still to be done in initiating existing teaching staff and HEI authorities into a culture of quality assurance and evaluation. The poor quality of some of the research conducted, the corruption and forgery practices affect the value of diplomas. This phenomenon affects the international recognition of curricula as well as society as a whole.

The **supervision** resources and practices must also evolve to cope with the demographic problem linked to the ageing population of mentors.

Finally, authorities in charge of the organisation of doctoral programmes must also be made aware of the need to develop **monitoring systems** enabling the collection of **statistical data** about the detailed characteristics of the doctoral candidate population. This would significantly contribute to the development of policy frameworks able to respond to existing needs and realities.

- **Relationships with Industry:** the employability and access to labour market (apart from academic careers) remain an exception rather than a rule. There are huge gaps between the labour market and national economic need and the types of doctoral programmes being developed. As a result, labour market and economic actors do not take any interest in the development of doctoral programmes, and doctoral programmes are not contributing to the development of labour market actors.

8.2.3 Doctoral programme challenges

The organisation of doctoral programmes can no longer be considered as a challenge in itself since most of the countries reviewed have already put into place significant measures to reform their systems. The difficulty relates more to the implementation of the new rules and regulations, and to the monitoring and evaluation of the new systems once they have been set up. In general, the latest reforms pressured doctoral candidates through:

- A twofold reduction of the length of PhD studies (in theory and practice);
- A growing imbalance between research and training in doctoral programmes (serious concern in some countries where the number of teaching and training hours is too high to produce good research)

In this regard, one of the challenges is to **avoid over-regulation** of doctoral programmes. The uptake of the Salzburg principles as a baseline for the doctoral reforms has led to highly structured programmes (mostly in the Western Balkans). However, doctoral education, defined as the advancement of knowledge through original research, remains a specific activity, which cannot be quantified. The use of ECTS (which is supposed to define learning outcomes) to describe doctoral programmes, for instance, consistently raises a level of concern in academia, where over-regulation is feared.

Appendix

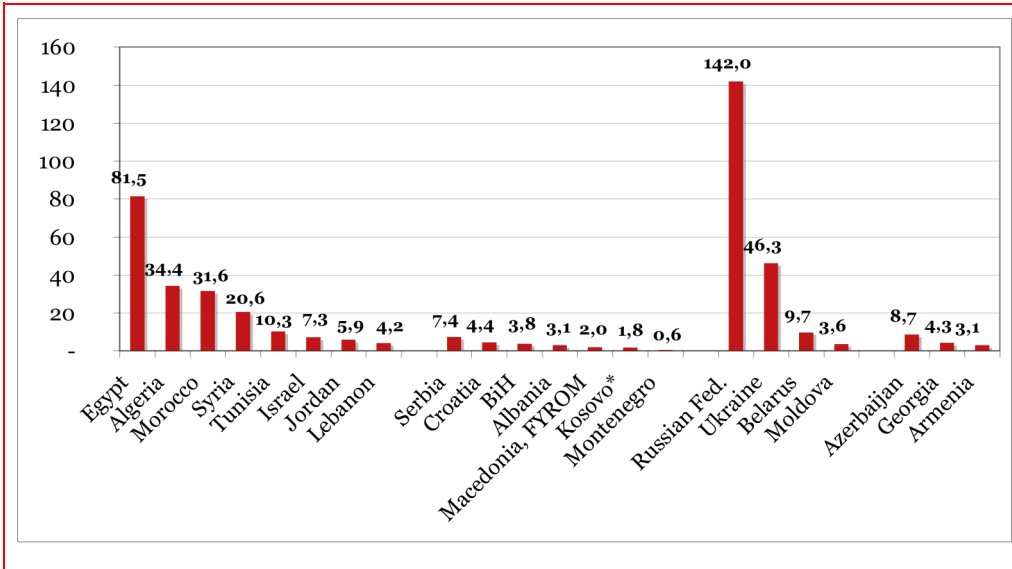
Appendix A Interviewees in the EU neighbouring countries

Exhibit 16 Nature of interviewees in the 23 countries

Location	Type of interviewee	Site/number of interviews required	Potential interviewees
EU neighbouring countries	Type 1	HEI/universities	Deans/vice-rectors for academic studies
			Deans/vice-rectors for doctoral programmes
			Deans/vice-rectors for research and international relations
	Type 2	Ministries and education and research advisory councils	Ministries of higher education research
			Councils for higher education/research
	Type 3	EC programmes relay on site	Staff from national TEMPUS offices
			Staff working on Erasmus Mundus
			Staff from EC delegations
			Marie Curie contact points
	Type 4	Others	Representatives of the Bologna Follow-up Group
			ENIC-NARIC office
			Other donor organisations/nationally representative officers in education and research

Appendix B EU neighbouring countries socio-economic data

Exhibit 17 EU neighbouring countries total population (2008)



Source: World Bank

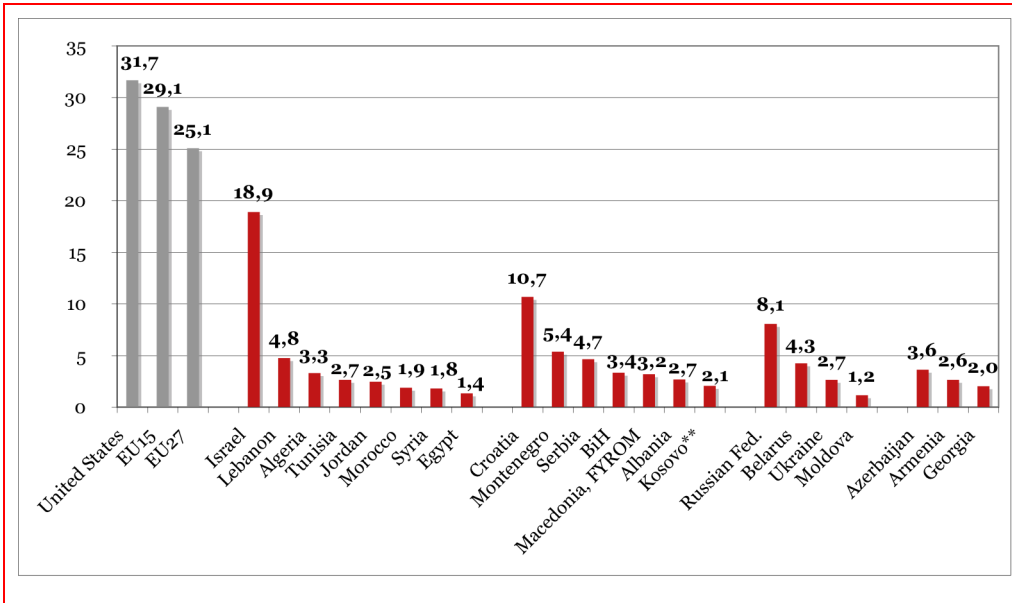
Note: * Kosovo under UNSC Resolution 1244/99

Exhibit 18 EU neighbouring countries total population and growth rate (2008 and 1998-2008)

Country	Total population 2008	Growth rate 1998-2008
Egypt	81,527,172	21%
Algeria	34,373,426	16%
Morocco	31,605,616	12%
Syria	20,581,289	31%
Tunisia	10,327,800	11%
Israel	7,308,800	22%
Jordan	5,906,042	28%
Lebanon	4,193,758	14%
oPt	3,937,309	41%
Serbia	7,350,221	-3%
Croatia	4,434,000	-1%
BiH	3,773,100	8%
Albania	3,143,291	2%
FYROM	2,041,342	2%
Kosovo under UNSC Resolution 1244/99	1,795,000	-9%
Montenegro	622,344	-5%
Russian Fed.	141,950,000	-3%
Ukraine	46,258,200	-8%
Belarus	9,680,850	-4%
Moldova	3,633,369	-14%
Azerbaijan	8,680,100	10%
Georgia	4,307,011	-11%
Armenia	3,077,087	-1%

Source: World Bank and Technopolis calculation

Exhibit 19 GDP per capita (thousands of € at 2008 rate of exchange*) (2008)

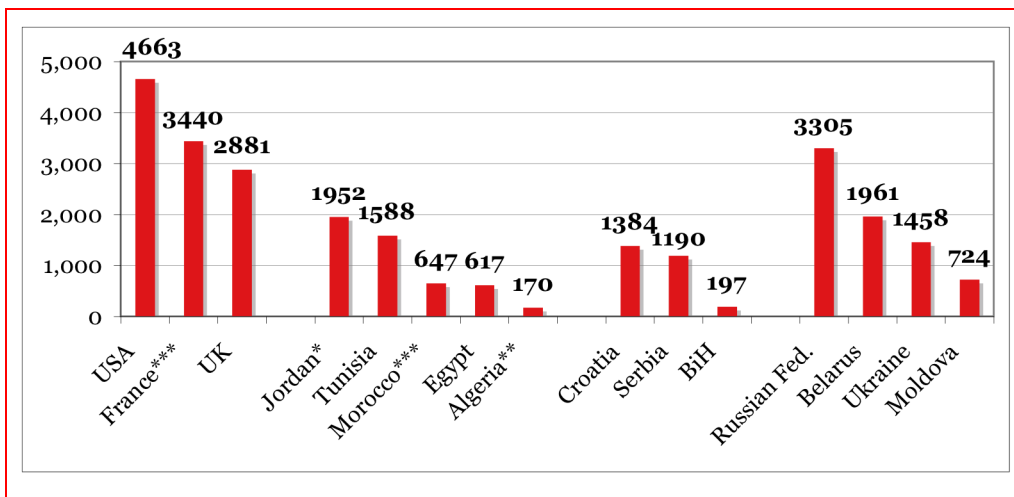


Source: World Bank national accounts data, and OECD National Accounts data files and Eurostat

Note: * Exchange rate \$/€ = 0.683747455; **Kosovo under UNSC Resolution 1244/99

Appendix C EU neighbouring countries research data

Exhibit 20 R&D researchers per million people (2007)



Source: World Bank

Notes: * 1998, ** 2005, *** 2006

Notes: Data are unavailable for Lebanon, Kosovo under UNSC Resolution 1244/99, Serbia, Occupied Palestinian Territory, Syrian Arab Republic, FYROM, Montenegro, Georgia, Armenia and Azerbaijan

Exhibit 21 Number of scientific and technical journal articles per million inhabitants (2005)

Region	Country	Articles per million inhabitants
Mediterranean countries	Israel	910.4
	Lebanon	57.3
	Tunisia	56.9
	Jordan	50.8
	Egypt	21.5
	Morocco	14.5
	Algeria	10.7
	Syrian Arab Republic	4.0
Western Balkans	Croatia	214.5
	Serbia	114.1
Eastern European countries	Russian Federation	100.7
	Belarus	50.1
	Ukraine	44.7
	Moldova	23.7
Caucasus	Armenia	58.7
	Georgia	32.5
	Azerbaijan	13.8
Western countries	United States	694.7
	United Kingdom	756.7
	Germany	535.3
	France	497.9

Source: World Bank

Note: Data unavailable for Albania, Montenegro, Kosovo under UNSC Resolution 1244/99, FYROM

Appendix D Research and socio-economic index table

Table 1 Relative weight of EU neighbouring countries in terms of research and socio-economic indicators

Region	Country	Socio-economic index	Research index
Mediterranean countries	Egypt	4,76	1,19
	Algeria	3,38	0,57
	Morocco	2,53	1,05
	Tunisia	1,85	3,36
	Israel	9,82	47,89
	Jordan	1,52	2,71
	Lebanon	2,60	5,73
	The occupied Palestinian Territory	0,20	0,00
	Syrian Arab Republic	1,95	0,40
	Western Balkans	Serbia	2,70
Croatia		5,57	11,19
Bosnia and Herzegovina		1,87	0,01
Former Yugoslav Republic of Macedonia		1,70	0,10
Kosovo under UNSC Resolution 1244/99		1,13	0,00
Albania		1,49	0,00
Montenegro		2,72	0,59
Eastern European countries	Russian Federation	11,14	5,60
	Ukraine	3,65	2,67
	Belarus	2,61	2,99
	Republic of Moldova	0,76	1,46
Caucasus	Azerbaijan	2,25	0,78
	Georgia	1,23	1,71
	Armenia	1,48	3,04

Source: World Bank, UNESCO IUS and Technopolis calculation

Appendix E Bologna process signatories and non-signatory countries

Exhibit 22 Bologna process signatories and non-signatory countries

Regions	Bologna signatories	Non-signatories
Western Balkans	<ul style="list-style-type: none"> • Croatia (2001) • Former Yugoslav Republic of Macedonia (2003) • Albania (2003) • Bosnia and Herzegovina (2003) • Serbia (2003) • Montenegro (2003/2007) 	<ul style="list-style-type: none"> • Kosovo under UNSC Resolution 1244/99
Eastern European countries and Caucasus	<ul style="list-style-type: none"> • the Russian Federation (2003) • Ukraine (2005) • Moldova (2005) • Armenia (2005) • Azerbaijan (2005) • Georgia (2005) 	Belarus
Mediterranean countries		<ul style="list-style-type: none"> • Algeria • Morocco • Tunisia • Lebanon • Egypt • Israel • Jordan • the Occupied Palestinian Territory • Syria

Appendix F The Salzburg principles

F.1. The Salzburg principles

- **The core component of doctoral training is the advancement of knowledge through original research.** At the same time it is recognised that doctoral training must increasingly meet the needs of an employment market that is wider than academia.
- **Embedding in institutional strategies and policies:** universities as institutions need to assume responsibility for ensuring that the doctoral programmes and research training they offer are designed to meet new challenges and include appropriate professional career development opportunities.
- **The importance of diversity:** the rich diversity of doctoral programmes in Europe - including joint doctorates - is a strength which has to be underpinned by quality and sound practice.
- **Doctoral candidates as early stage researchers:** should be recognised as professionals – with commensurate rights - who make a key contribution to the creation of new knowledge.
- **The crucial role of supervision and assessment:** in respect of individual doctoral candidates, arrangements for supervision and assessment should be based on a transparent contractual framework of shared responsibilities between doctoral candidates, supervisors and the institution (and where appropriate including other partners).
- **Achieving critical mass:** doctoral programmes should seek to achieve critical mass and should draw on different types of innovative practice being introduced in universities across Europe, bearing in mind that different solutions may be appropriate to different contexts and in particular across larger and smaller European countries. These range from graduate schools in major universities to international, national and regional collaboration between universities.
- **Duration:** doctoral programmes should operate within an appropriate time duration (three to four years full-time as a rule).
- **The promotion of innovative structures:** to meet the challenge of interdisciplinary training and the development of transferable skills.
- **Increasing mobility:** doctoral programmes should seek to offer geographical as well as interdisciplinary and inter-sectoral mobility and international collaboration within an integrated framework of cooperation between universities and other partners
- **Ensuring appropriate funding:** the development of quality doctoral programmes and the successful completion by doctoral candidates requires appropriate and sustainable funding

Source: Conclusions and recommendations of the Bologna seminar on “Doctoral Programmes for the European Knowledge Society”, Salzburg, 3-5 February 2005, Bologna process website

F.2. Salzburg II principles

1. Research as the basis and the difference

The goal of doctoral education is to cultivate the research mindset, to nurture flexibility of thought, creativity and intellectual autonomy through an original, concrete research project. It is the practice of research that creates this mindset.

2. Clues for the success

2.1. Critical mass and critical diversity

Doctoral education is dependent on the research environment. Institutions must develop a critical mass and diversity of research in order to offer high quality doctoral education.

2.2. Recruitment, admission and status

Structured programmes should develop recruitment strategies that correspond to their particular mission and profile.

2.3. Supervision

As stressed in the fifth Salzburg Principle, supervision plays a crucial role. Supervision must be a collective effort with clearly defined and written responsibilities of the main supervisor, supervisory team, doctoral candidate, doctoral school, research group and the institution, leaving room for the individual development of the doctoral candidate.

2.4. Outcomes

The main outcome of doctoral education are the early stage researchers and their contribution to society through knowledge, competences and skills learnt by undertaking research, as well as awareness and openness towards other disciplines.

2.5. Career development

Career support for doctoral candidates must take into account individual goals and motivations and acknowledge the wide range of careers for doctorate holders.

2.6. Credits

Applying the credit system developed for cohorts of students in the first and second cycles is not a necessary precondition for establishing successful doctoral programmes.

2.7. Quality and accountability

It is necessary to develop specific systems for quality assurance in doctoral education based on the diverse institutional missions and, crucially, linked to the institutional research strategy.

2.8. Internationalisation

Internationalisation strategies should be a tool in increasing the quality in doctoral education and in developing institutional research capacity.

3.1. Funding

The tenth and final Salzburg Principle underlines the importance of sustainable funding. Universities as well as doctoral candidates are still underfunded. High quality doctoral education requires adequate, sustainable and doctorate specific funding opportunities.

3.2. Autonomy

Institutions need autonomy to be able to establish, and be accountable for, diverse structures with different research strategies and strengths.

3.3. Legal framework

The national and European legal frameworks must give institutions the possibility to engage in innovative doctoral programmes and take the necessary institutional responsibilities.

3.4. Intersectoral collaboration

All stakeholders should engage in measures to facilitate cooperation between providers of doctoral education and the non-academic sectors to the mutual benefit of all partners. It is essential to create awareness about the qualities of doctorate holders as well as to build trust between universities and other sectors.

Source: EUA (2010) Salzburg II Recommendations, European universities' achievements Since 2005 in implementing the Salzburg Principles

Appendix G Enrolment at tertiary level

Exhibit 23 Total tertiary enrolment (public and private, full and part time)

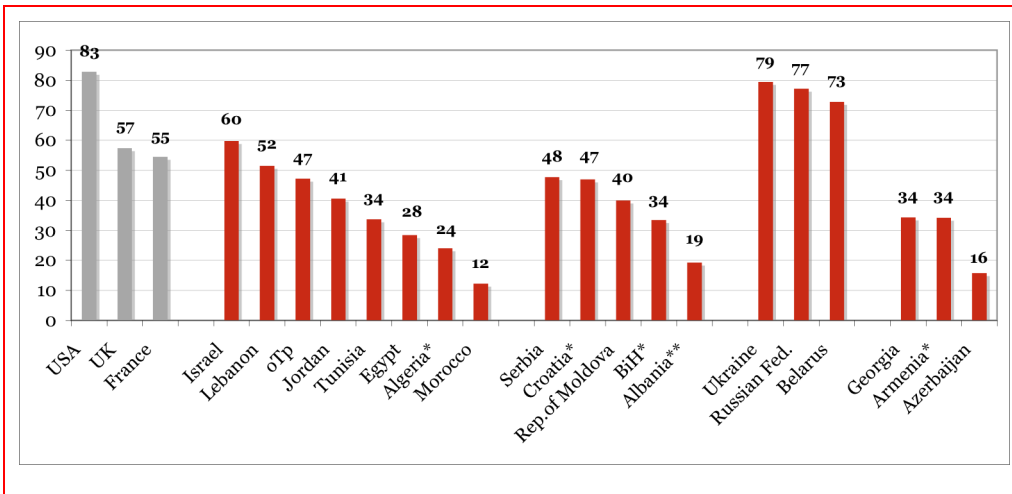
Region	Country		Year	Growth rate	Period of reference	
Mediterranean countries	Egypt	2,488,434	2008	2%	1999	2008
	Algeria	901,562	2007	98%	1999	2007
	Morocco	401,093	2008	47%	1999	2008
	Tunisia	350,828	2008	123%	1999	2008
	Israel	325,246	2008	32%	1999	2008
	Jordan	254,752	2008	79%	2000	2008
	Lebanon	199,656	2009	77%	1999	2009
	Occupied Palestinian Territories	180,905	2008	173%	1999	2008
Western Balkans	Syria	n/a		n/a		
	Serbia	237,598	2008	0%	2007	2008
	Croatia	139,996	2008	46%	1999	2008
	Bosnia and Herzegovina	99,414	2007	n/a		
	Former Yugoslav Republic of Macedonia	65,504	2008	86%	1999	2008
	Albania	53,014	2004	38%	1999	2004
Eastern European countries	Montenegro	n/a		n/a		
	Russian Federation	9,446,408	2008	17%	2003	2008
	Ukraine	2,847,713	2008	64%	1999	2008
	Belarus	576,679	2008	49%	1999	2008
Caucasus	Republic of Moldova	143,601	2008	43%	1999	2008
	Azerbaijan	141,896	2009	67%	1999	2009
	Georgia	129,926	2008	0%	1999	2008
Western countries and region	Armenia	107,398	2007	77%	1999	2007
	European Union (27 countries)	19,040,142	2008	52%	1999	2008
	United States	18,248,124	2008	33%	1999	2008
	United Kingdom	2,329,494	2008	12%	1999	2008
	Germany (including ex-GDR from 1991)	2,245,138	2008	8%	1999	2008
France	2,164,538	2008	8%	1999	2008	

Source: UNESCO IUS and Eurostat

NB : Data unavaible for Kosovo under UNSC Resolution 1244/99

NB : enrolment is understood as the total number of student in the system (stock)

Exhibit 24 Gross enrolment ratio, ISCED 5 and 6 (2008)



Source: UNESCO, IUS data centre

NB: Data unavailable for Kosovo under UNSC Resolution 1244/99, Syria and Montenegro

Note: * data for 2007, ** data for 2004

Appendix H Enrolment at ISCED 6 level

Exhibit 25 Total enrolment at ISCED 6 level (2008)

	Country	Total enrolment at ISCED 6 level	Year
Mediterranean countries	Algeria	43,458	2007
	Tunisia	30,634	2008
	Morocco	29,580	2008
	Egypt	16,675	1999
	Israel	10,156	2008
	Jordan	2,261	2008/2009
	Lebanon	1,366	2009
	Syria	586	2006/2007 (national report)
	oPt	3	2008
Western Balkans	Croatia	3,052	2008
	Serbia	1,064	2009
	BiH	282	2009
	Kosovo under UNSC Resolution 1244/99	202	2008
	Montenegro	167	2009
	FYROM	159	2008
Eastern European countries	Russian Federation	151,828	2008
	Ukraine	33,915	2008
	Rep. of Moldova	1,880	2008
	Belarus	4,642	2008
Caucasus	Armenia	1,568	2007
	Azerbaijan	1,729	2009
	Georgia	786	2008
Western countries	France	70,030	2008
	United Kingdom	80,906	2008
	EU27	499,400	2008
	United States	460,805	2008

Source: UNESCO IUS, Eurostat and investigations data collection from the national briefs (Kosovo under UNSC Resolution 1244/99 and BiH)

Exhibit 26 Total enrolment at ISCED 6 level - growth rate

Region	Country	Growth rate	Period of reference	
Mediterranean countries	Jordan	515%	2002	2008
	Tunisia	187%	1999	2008
	Lebanon	141%	1999	2009
	Morocco	97%	1999	2008
	Israel	61%	1999	2008
	Algeria	44%	2004	2007
Western Balkans	Croatia	564%	2003	2007
	Serbia	13%	2007	2008
Eastern European countries	Russian Federation	49%	1999	2008
	Republic of Moldova	48%	1999	2008
	Ukraine	47%	1999	2008
	Belarus	2%	1999	2008
	Georgia	-57%	1999	2008
Caucasus	Armenia	68%	1999	2008
	Azerbaijan	36%	1999	2009
Western countries and region	France	-27%	1999	2008
	United Kingdom	-1%	1999	2008
	EU27	28%	1999	2008
	United States	57%	1999	2008

Source: UNESCO IUS and Technopolis calculation

NB: Data unavailable for Syria, BiH, Montenegro, FYROM, Kosovo under UNSC Resolution 1244/99, Georgia

Exhibit 27 Percentage of female candidates enrolled, ISCED 6 (2008)

Region	Country	% of female in ISCED 6	Year
Mediterranean countries	Tunisia	55.2	2005
	Israel	52.7	2008
	Algeria	45.5	2007
	Lebanon	42.8	2009
	Morocco	37.6	2008
	Jordan	30.2	2008
	Western Balkans	Former Yugoslav Republic of Macedonia	53.5
Serbia		52.1	2008
Croatia		50.8	2008
Eastern European countries	Ukraine	56.8	2008
	Belarus	55.1	2008
	Moldova	54.6	2008
	Russian Federation	42.9	2008
Caucasus	Georgia	59.9	2008
	Azerbaijan	40.3	2009
	Armenia	36.9	2007
Western countries and regions	France	46.5	2008
	United Kingdom	46.4	2008
	European Union (27 countries)	48.4	2008
	United States	50.1	2008

Source: UNESCO IUS and Eurostat

NB: Data unavailable for oPt, Albania, Syria, Egypt, BiH, Montenegro, Kosovo under UNSC Resolution 1244/99

Appendix I Data on corruption

Exhibit 28 Corruption Perception Index

Region	Country Rank	Country / Territory	CPI 2010 Score
Mediterranean country	30	Israel	6.1
	50	Jordan	4.7
	59	Tunisia	4.3
	85	Morocco	3.4
	98	Egypt	3.1
	105	Algeria	2.9
	127	Syria	2.5
	127	Lebanon	2.5
Western Balkans	62	Croatia	4.1
	62	Former Yugoslav Republic of Macedonia	4.1
	68	Georgia	3.8
	69	Montenegro	3.7
	78	Serbia	3.5
	87	Albania	3.3
	91	Bosnia and Herzegovina	3.2
Caucasus	110	Kosovo under UNSC Resolution 1244/99	2.8
	68	Georgia	3.8
	123	Armenia	2.6
Eastern European countries	134	Azerbaijan	2.4
	105	Moldova	2.9
	127	Belarus	2.5
	134	Ukraine	2.4
Western countries	154	Russian federation	2.1
	1	Denmark	9.3
	20	United Kingdom	7.6
	22	United States	7.1

Source: Transparency International, Corruption Perception Index 2010-12-07

NB: Data missing for the Occupied Palestinian Territory

NB : Denmark is ranked as the most transparent and least corrupted country

Appendix J Data on internationalisation

Exhibit 29 Inbound mobility rate*, total tertiary (2008)

Region	Country	Inbound mobility rate	Year
Mediterranean country	Lebanon	12.1	2007
	Jordan	10.4	2008
	Morocco	1.9	2008
	Egypt	1.4	2007
	Tunisia	0.7	2008
	Algeria	0.6	2007
	Occupied Palestinian Territory	n/a	-
	Syrian Arab Republic	n/a	-
	Israel	n/a	-
Western Balkans	Serbia	4.7	2008
	Croatia	2.5	2007
	Former Yugoslav Republic of Macedonia	2.0	2008
	Albania	0.9	2004
	Montenegro	n/a	-
	Bosnia and Herzegovina	n/a	-
	Kosovo under UNSC Resolution 1244/99	n/a	-
Eastern European countries	Ukraine	1.1	2008
	Republic of Moldova	1.1	2008
	Belarus	1.0	2008
	Russian Federation	0.6	2007
Caucasus	Azerbaijan	3.5	2009
	Armenia	n/a	-
	Georgia	n/a	-
	United Kingdom	14.7	2008
	France	11.2	2008
	United States	3.4	2008

Source: UNESCO IUS

Note: * the inbound mobility rate represents the number of students from abroad studying in a given country, as a percentage of the total tertiary enrolment in that country

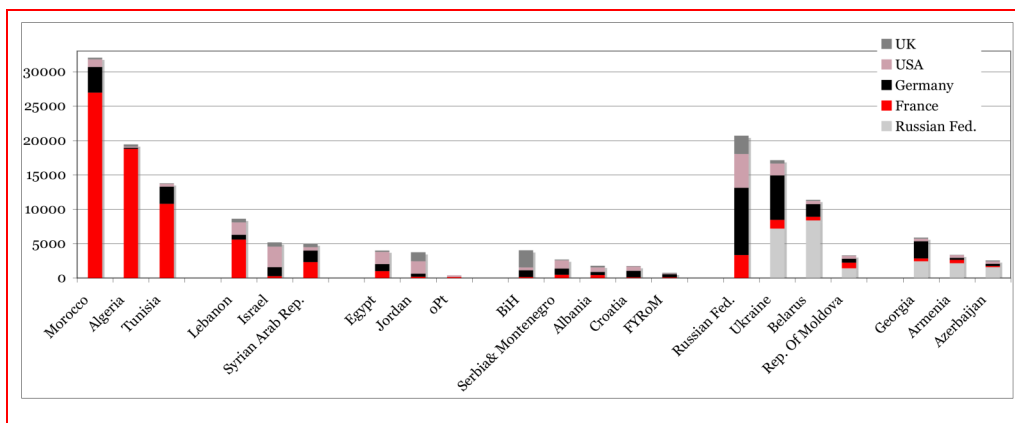
Exhibit 30 Foreign students in EU27 tertiary education (ISCED 5 and 6) by country of citizenship (2007)

European Union Country (EU27)	Foreign students in tertiary education
Morocco	46,258
Russian Federation	29,590
Algeria	21,809
Ukraine	20,336
Albania	18,965
Tunisia	14,993
Serbia and Montenegro	9,617
Moldova	9,158
Croatia	9,126
Lebanon	8,895
BiH	7,258
Syria	6,477
Belarus	6,384
Israel	6,328
FYROM	6,205
Georgia	4,341
Egypt	4,242
Jordan	3,719
Armenia	1,606
Azerbaijan	1,072
OtP	757

Source: Eurostat

NB: Data unavailable for Kosovo under UNSC Resolution 1244/99

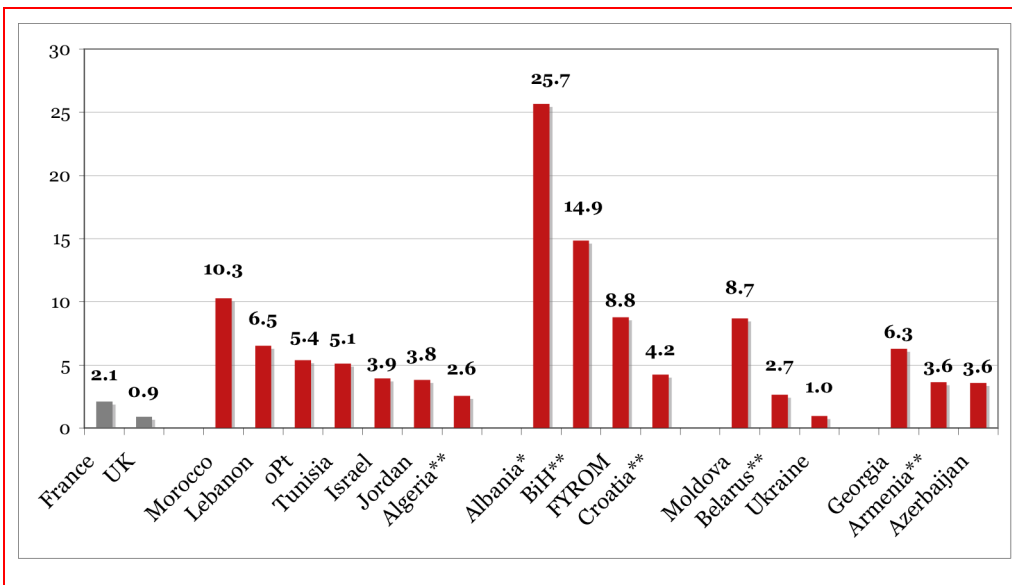
Exhibit 31 International flows of mobile students at the tertiary level from EU neighbouring countries going to five selected countries (ISCED 5 and 6) (2008)



Source: UNESCO IUS

NB: all data for 2008 but Russian Federation (2007)

Exhibit 32 Outbound mobility ratio (%) at tertiary level (2008)



Source: UNESCO IUS

Notes: * 2004, ** 2007

Note: *** the outbound mobility ratio is the number of students from a given country studying abroad divided by the total higher education enrolment in that country

NB: Data unavailable for Syria, Montenegro, Russian Federation, Serbia and Kosovo under UNSC Resolution 1244/99

Appendix K Data on participation in EU programmes

K.1. Participation in Marie Curie Actions

K.1.1. FP6 participation of neighbouring countries in the training of postgraduates

Exhibit 33 Participation of early stage researchers (ESRs) by country of origin

Regions	Country	Number of ESRs
Mediterranean countries	Israel	31
	Algeria	7
	Tunisia	7
	Egypt	7
	Lebanon	6
	Morocco	6
	Jordan	4
	Occupied Palestinian Territory	1
Western Balkans	Croatia	26
	Serbia	21
	Serbia and Montenegro	19
	Albania	5
	Bosnia and Herzegovina	4
	Former Yugoslav Republic of Macedonia	2
Eastern European countries	Russian Federation	112
	Ukraine	42
	Belarus	13
	Republic of Moldova	2
Caucasus	Armenia	6
	Azerbaijan	1
	Georgia	1
	Total	323

Exhibit 34 Participation of institutions

Participant country	Number of participations
Israel	40
Russian Federation	12
Croatia	7
Ukraine	1
Total	60

K.1.2. FP7 participation of neighbouring countries in the training of postgraduates (2007-2009, statistics as available in February 2010)

Exhibit 35 Participants in IAPP and participants in ITN as full network participants (recruit and train ESRs and “early ERs”)

Participant country	Number of participating institutions
Israel	22
Russia	5
Ukraine	2
Lebanon	1
Morocco	1
Serbia	1
Croatia	1
Total	33

NB: For definitions and an explanation of all the acronyms, see list below Exhibit 34.

Exhibit 36 Participants in ITN as associated partners (offer secondments and/or workshops to ESRs and ‘early ERs’)

Participant country	Number of participants	Type of participant (institutions)
Israel	3	Public body
Israel	2	SME
Albania	1	Higher education
Armenia	1	Higher education
Croatia	1	Higher education
Morocco	1	Commercial enterprise
Moldova	1	Higher education
Russia	1	Higher education
Total	11	

ITN: Initial Training Networks

IAPP: Industry-Academia Partnerships and Pathways

ESR: Early stage researcher (less than 4 years of experience and no PhD at the time of recruitment)

“early ER”: Experienced researcher (PhD and less than 5 years of research experience at the time of recruitment, or between 4 and 5 years of research experience at the time of recruitment)

SME : Small Medium Enterprise

K.2. Participation in TEMPUS programmes (28 projects) in the field of doctorate programmes

Exhibit 37 TEMPUS III and IV projects targeting EU neighbouring countries (2004-2009)

TEMPUS programme	Year	Project title	Targeted countries	Project objective
III	2004	Use of ICT in the training of doctoral candidates in Belarus	Belarus	The project builds on previous programmes (video conference system and website).
III	2004	Organisation of training in Science & technologies and Health	Lebanon	The aim is to reorganise higher education in order to set up a Masters and a Doctoral School in the field of science and technology and health at the Lebanese University.
III	2005	New Bologna Oriented Doctoral Study Programme in BA	Bosnia and Herzegovina	The development of a new third cycle programme - doctoral programmes in the field of food technology and food safety in BA in accordance with the Bologna process

III	2005	Restructuring the Study of Manufacturing Engineering in Bosnia and Herzegovina	Bosnia and Herzegovina	To restructure and strategically adapt the syllabi and curricula in Manufacturing Engineering, in harmony with modern developments in techniques and technology for BSc, MSc & PhD degrees.
III	2005	Advanced Ship Design for Pollution Prevention	Croatia	The primary specific objective is to provide support for the development and implementation of a set of optional courses on Advanced Ship Design for Pollution Prevention (ASDEPP) within Naval Architecture Studies in the Faculty of Mechanical Engineering and Naval Architecture (FAMENA) at the University of Zagreb and in the Faculty of Engineering (FE) at the University of Rijeka.
III	2005	Development of Masters and PhD Programmes in Economics and Business in Kosovo	Kosovo	1. Restructure and upgrade the Masters and PhD programmes in Prishtina 2. Establish a new MBA programme in Peja 3. Develop the human and material capacity of the two institutions to prepare and implement the new programmes Developing and revising curricula, adapting teaching materials and methodologies, retraining staff members for a Masters/PhD course in Ecological and Resource Saving Engineering; the creation of a new academic-methodological centre on resource-saving processes and a laboratory for distance learning.
III	2005	Ecological and Resource Saving Engineering	Russian Federation	1. To update the "Computer Systems and Networks" MSc programme (4 courses) by August 2009; 2. To develop the "Computer Systems and Networks" PhD programme (2 courses) by August 2009; 3. To establish the Critical Computing Training-Resource Centre at the Department of KhAI by August 2009.
III	2005	MSc and PhD Studies in Aerospace Critical Computing	Ukraine	1. To update the "Computer Systems and Networks" MSc programme (4 courses) by August 2009; 2. To develop the "Computer Systems and Networks" PhD programme (2 courses) by August 2009; 3. To establish the Critical Computing Training-Resource Centre at the Department of KhAI by August 2009.
III	2005	Capacity Building in the Social Sciences in Palestine	oPt	The objective is to develop Palestinian curricula in social science methodology at the graduate level, so as to meet Bologna standards for PhD students and programmes.
III	2005	Best practices exchange in the implementation of Bachelor, Masters-Doctorate systems	Tunisia	The objective is to support Tunisian universities to implement Bachelor, Masters-Doctorate systems by 2006 - Establishing a third cycle doctoral programme at the University of Sarajevo, School of Economics and Business according to the Bologna process and Bergen Conference Declaration - Developing doctoral curriculum and courses based on European standards - Creating an international network for research and teaching - Creating a national network for the dissemination of knowledge
III	2006	Third Cycle Doctoral Programme in Economics and Business	Bosnia and Herzegovina	The objective is to support Tunisian universities to implement Bachelor, Masters-Doctorate systems by 2006 - Establishing a third cycle doctoral programme at the University of Sarajevo, School of Economics and Business according to the Bologna process and Bergen Conference Declaration - Developing doctoral curriculum and courses based on European standards - Creating an international network for research and teaching - Creating a national network for the dissemination of knowledge
III	2006	Joint Advanced Doctoral Degree in Energy Systems	FYROM, Serbia, Bosnia and Herzegovina	To prepare joint doctoral studies in advanced energy systems which are environmentally friendly (based on renewable energy sources) cost effective and sustainable. The study area has been identified as of the highest interest for the power industry, students and the entire population in CARDS countries and as a logical continuation of joint and well prepared postgraduate studies in Cost Effective and Environmentally Friendly Energy Systems (CEFES) through JEP-18126-2003 CD.

III	2006	Establishing interdisciplinary curricula and a centre for postgraduate studies and research in Cognitive Sciences in Croatia	Croatia	<p>The project objectives are: -To study and benchmark best European practice in organising interdisciplinary study and research programmes in the Cognitive Sciences</p> <ul style="list-style-type: none"> - To establish the Interdisciplinary Centre of Cognitive Sciences as an open university department with an international orientation - To develop a new Masters and Doctoral programme to be carried out by the Centre of Cognitive Sciences in line with European standards - To test and improve the curricula in the national and international environments, to implement and pilot interdisciplinary research projects in the centre
III	2006	Training in doctoral research	Moldova	<p>The objective is an exchange of information on the modalities of doctoral training in the EU and in Moldova and focus on the role of doctoral schools. Scenarios on the possible adaptation of doctoral studies in Moldova will be developed.</p>
III	2006	Developing Doctoral Studies (as third cycle) in Social Sciences in FYROM according to the Bologna agreement	FYROM	<p>To develop a System of Doctoral Studies in Social Sciences in FYROM, as a third cycle in higher education, in accordance with the Bologna agreement and with national higher education legislation.</p> <p>The objectives are: 1. Promotion in Serbia of the current European doctoral programmes landscape; 2. Establishing and implementing pilot doctoral programmes based on innovative European recommendations; 3. Introduction of improved and new teaching methods: the acquisition and exchange of knowledge in specific fields of teachers' and students' interests; 4. Establishing a suitable environment for linking the EHEA and ERA.</p>
III	2006	Doctoral School towards European Knowledge Society	Serbia	<p>The objectives are to develop PhD education at three universities in the Baikal region through: supervisor training; the development and introduction of a new PhD curriculum; the creation of a network of supervisors in the Baikal region universities.</p> <p>To develop and implement, over a period of two years, a module on scientific communication and research methodology to upgrade the research and scientific communication skills of Masters and PhD students at three Ukrainian Agricultural Universities (the National Agricultural University of Ukraine, Kiev, the Agrarian University, Lviv and the State Agrarian University, Mykolayiv).</p>
III	2006	Baikal Region Quality Development in PhD Education	Russian Federation	<p>To develop and implement, over a period of two years, a module on scientific communication and research methodology to upgrade the research and scientific communication skills of Masters and PhD students at three Ukrainian Agricultural Universities (the National Agricultural University of Ukraine, Kiev, the Agrarian University, Lviv and the State Agrarian University, Mykolayiv).</p>
III	2006	Implementation of basic and advanced scientific methodologies in agricultural Masters & PhD curricula	Ukraine	<p>- To train ministry officials, university administrators, academic advisers and doctoral candidates in preparation for the implementation of the EHEA (European Higher Education Area) third cycle principles in Ukraine</p> <ul style="list-style-type: none"> - To promote To Ukrainian academics and practitioners the recommendations of the Bologna Follow-up Group and the European University Association (EUA) for the organisation of third cycle education.
III	2006	Training for the Implementation of the European Higher Education Area Third Cycle in Ukraine	Ukraine	<p>- To train ministry officials, university administrators, academic advisers and doctoral candidates in preparation for the implementation of the EHEA (European Higher Education Area) third cycle principles in Ukraine</p> <ul style="list-style-type: none"> - To promote To Ukrainian academics and practitioners the recommendations of the Bologna Follow-up Group and the European University Association (EUA) for the organisation of third cycle education.
III	2006	New Medical Curriculum at Syrian Universities	Syria	<p>To develop and implement a new curriculum for basic and clinical immunology at undergraduate,</p>

				postgraduate and MD/PhD level.
III	2006	Organisation of Science and Technology Training at Masters and Doctoral level at the Alep University	Syria	The project objective is to reorganise scientific training at the Alep University by setting up a Masters cycle and a Doctoral School in Science Engineering (EDSI). The 4 activities are: analysing existing Magister and Higher Education Diplomas, organising a Masters degree, formalising a supervision diploma (Diplôme d'Habilitation à la Direction de Doctorants (HDD)) and the establishment of a doctoral school. Preparatory to the 2010 transition from the Bologna process to the European Higher Education Area(as in the London Communiqué). Universities from Western Balkan countries and their EU partners have already successfully collaborated under TEMPUS IIbis and TEMPUS III on various aspects of the reform of higher education (the first two cycles, curricula improvement, quality assurance, university management and strategic planning) and are to jointly develop structured doctoral studies in mathematical sciences in a way that overcomes fragmentation and fosters the reciprocal development of human resources in accordance with EHEA-ERA goals.
IV	2008	SEE Doctoral Studies in Mathematical Sciences	Serbia, FYROM, Montenegro, Albania, Bosnia and Herzegovina	
IV	2008	Creation of a third cycle of doctoral studies in metrology	FYROM, Kosovo, Croatia	To create new regulations and procedures for PhD studies and new curricula for the third cycle of studies-doctoral studies in the field of metrology, based on the new legislative for higher education in FYROM, Croatia and Kosovo and the Bologna Declaration.
IV	2008	Support for Doctoral Studies Reforms in Maghreb	Tunisia, Algeria, Morocco	The general objective is, over 3 years, to provide a methodology for the enhancement of doctoral studies support structures. Nine universities are involved: 2 Algerian universities, 2 Moroccan universities, 2 Tunisian universities and 3 from the EU (UPMC, UB, ULB)
IV	2008	"i-Créa Formation" (Innovation, Créativité en Réseau: Action et formation)	Tunisia, Algeria, Morocco	The "i-Créa Formation" project set up training for innovation at the Masters, doctoral and lifelong learning level.
IV	2009	Development of a qualification framework in meteorology (QUALIMET)	Russian Federation	QUALIMET aims to continue the reform of the system of higher education and qualifications in the area of hydrometeorology in the Russian Federation to better meet the high and ever changing demand for meteorological science professionals and to comply with best international practice.
IV	2009	Vernetzte und gestufte Aus- und Weiterbildung in Bildungsmanagement	Russian Federation, Ukraine, Belarus	
IV	2009	National Safeware Engineering Network of Centres of Innovative Academia-Industry Handshaking	Ukraine	The key goal of the project is to produce a new generation of engineering and research staff capable of developing engineering safeware for Ukrainian enterprises and institutions involved in various critical domains and partner country regions. Critical Domains = nuclear power plants; the oil and gas industry and communications; aerospace; air traffic; maritime; power industry; e-health and medical systems; railway and automotive

				transport
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K.3. Erasmus Mundus participation

Exhibit 38 Participation in Erasmus Mundus External Cooperation Window 2007-2009

Region	Country	Number of participations (from institutions)	Number of participating institutions
Mediterranean countries	Egypt	17	12
	Jordan	15	5
	Algeria	9	6
	Israel	9	5
	oPt	9	7
	Tunisia	9	5
	Morocco	9	5
	Lebanon	6	2
Western Balkans	Syria	6	2
	Serbia	10	4
	FYROM	7	4
	Bosnia and Herzegovina	4	2
	Albania	5	3
	Kosovo under UNSC Resolution 1244/99	3	1
	Montenegro	3	1
Eastern European countries	Croatia	2	1
	Russian Federation	68	34
	Ukraine	18	6
	Belarus	10	2
Caucasus	Moldova	6	2
	Armenia	15	5
	Azerbaijan	15	3
	Georgia	9	3

Source: Erasmus Mundus – External Cooperation Window – Compendium 2007-2009

Appendix L Acronyms

BiH	Bosnia and Herzegovina
ECTS	European Credit Transfer and Accumulation System
ENQA	European Association for Quality Assurance in Higher Education
ER	Experienced researcher
ESR	Early stage researcher
FYROM	Former Yugoslav Republic of Macedonia
HEI	Higher Education Institution
IAPP	Industry-Academia Partnerships and Pathways
ISCED	International Standard Classification of Education
ITN	Initial Training Networks
OECD	Organisation for Economic Co-operation and Development
oPt	Occupied Palestinian Territory
SME	Small or medium sized enterprises
TEMPUS	Trans-European Mobility Scheme for University Studies
UK	United Kingdom
VAK	Higher Attestation Commission (Russia)
VATAT	Planning and Budgeting Committee (Israel)

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