EMCOSU
Emerging Modes of Cooperation between Private Sector Organisations and Universities

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Emerging Modes of Cooperation between Private Enterprises and Universities – Insights of European Enterprises and Employers Organisations

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1 Introduction

1.1 Background

Current major European policy concerns related to establishing the European Higher Education Area are closely related to supporting graduates' career success, international mobility, cooperation among higher education institutions and among universities and business. The report focuses on the last mentioned dimension. It looks at how three general questions in the area of university-business cooperation – i) which are the most relevant modes of cooperation between universities and business; ii) what are the determinants of cooperation modes and their future developmental needs; and iii) which are the key developmental drivers and barriers to cooperation on the side of universities and business? – are linked to the issue of graduates' transition from education to the labour market. In the context of the general interdisciplinary conceptualisation of knowledge creation processes and the shift from a linear to an interactive knowledge cycle (Nonaka and Takeuchi, 1995; Boisot, 2002; Lundvall, 2001), these questions relate to the functions of professional groups (e.g. Abbott, 1988), the overall goal of interaction between the academic sphere, business and society (e.g. Etzkowitz & Leydesdorff, 2000) and the transition of graduates from education to the labour market (e.g. Allen, Pavlin and Van der Velden, 2011).

Already the HEGESCO project (Pavlin et al., 2009) indicates that most modes of cooperation between business and universities are perceived to be in the service of supporting graduates' careers, although some have shorter rather than longer term perspectives – as certain determinants of the development of competencies fall within the direct jurisdiction of higher education, while others go beyond the borders of higher education institutions. The need to further explore and improve knowledge in the interrelated areas of graduates' careers and cooperation between universities and business is clear. According to the HEGESCO project's findings, employers have very little knowledge of what to expect from graduates, and higher education institutions have a similar low level of knowledge concerning employers' needs. This problem is particularly relevant in the private sector which often has, compared to state-regulated professional education and certification, more blurred links with education.

With the area of the 'knowledge-based society' characterised by increasing globalisation processes, the value of services and intangibles, networking organisations and digital technologies, university-business cooperation has been described using distinct concepts such as "national innovation systems" (Nelson, 1993), a "new mode of knowledge production" (Gibbons et al., 1994), "entrepreneurial university" (Clark, 1998) and "the triple helix model" (Etzkowitz & Leydesdorff, 2000; Etzkowitz, 2008).

These concepts have gradually been reflecting the call for the 'third mission' of universities – from teaching and research towards community engagement – via technology transfer, trans-disciplinarity, regional development and living laboratories (e.g. Trencher et al., 2013: 4). The so-called Wilson's review (Wilson, 2012), in the case of the UK, explains well which actions

drive university-business and foster students' careers. Examples include setting enterprises by graduates, the enhancement of study relevant work experience through apprenticeship and qualifications, the recognition of informal learning and recognition, lifelong learning activities, implementation of an innovation voucher scheme, support for graduates' career services and alumni etc. Moreover, this review indicates that cooperation between universities and industry is supposed to cause paradigmatic shifts (Wilson, 2012: 23-24) like, for example: "from future-oriented research in advanced technologies, to in-house up skilling of employees", "from university science park developments, to support for entrepreneurial research students finding their way in the business world", "from improving business skills amongst undergraduates, to enabling small companies to recognise the value of employing a first graduate", "from supporting spin-out companies from research teams, to helping government agencies attract major employers to invest…".

Related to this, the Organisation for Economic Cooperation and Development and the European Commission (OECD & EC, 2012) have also recently promoted guidelines for how universities can become more "entrepreneurial". The areas they identify relate to leadership and governance, organisational capacities with a strong stress on acquiring new financial sources and cooperation with business, the promotion of entrepreneurial principles and innovation through the curriculum, promoting start-ups, internationalisation and the development of measurement principles. These "recommendations" are accompanied by the latest economic necessity to "do more with less" (OECD, 2010). In this context, several authors question this convergence from the traditional towards an entrepreneurial university and do not regard it as a positive development (e.g. Hackett, 2005), particularly due to the proletarisation, deprofessionalisation and hybridisation of academic roles (Henkel, 2009; Kogan, 2009) as well as the decline of the traditional social function of higher education to give equal opportunities and citizenship (Zgaga, 2009). Moreover, intensified collaboration between industry and the academic sphere is leading to the segmentation and trivialisation of disciplinary areas (Becher, 1989), modified or even polarised relations between research and teaching (Elton, 1986) and the precarisation of academic institutions (Musselin, 2009).

Few studies have tried to explain the principles of university-business cooperation in relation to disciplinary differences. Existing literature (e.g. Kolb, 1981; Neumann, 2009) differentiates between hard-pure (e.g. natural sciences and mathematics), soft-pure (the humanities and the social sciences), hard-applied (e.g. medicine) or soft-applied (e.g. social work) categories and explain what this implies for the vocational focus and professionalisation scope of graduates' careers. Moreover, Pavlin and Svetlik (2008) described the principles of how these different disciplines interact with the world of work, particularly when it comes to the creation of study programmes, (re)accreditation of study programmes and implementation of practicums. The variety of disciplinary areas importantly determines what applied potential for the world of work a particular higher education institution offers due to the capabilities of its academics and students which are determined by (Teichler, 2011: 403):

"

- a professionally geared composition of knowledge within a study programme (e.g. mechanical engineering) versus an academically determined composition of knowledge of a study programme (e.g. philosophy);
- an academic versus applied emphasis of teaching and learning, i.e. an emphasis on understanding the logic of the knowledge system versus and emphasis on the transfer of knowledge to practical problem-solving;
- academic orientation versus orientation towards practice, i.e. pursuit of knowledge for its own sake versus learning to understand the tensions between theory and practice during the course of study;
- preparing students to be able to become scholars versus preparing students to understand and utilize the results of academic work in their subsequent professional work outside academia;
- prime emphasis on the understanding and the ability to handle conventional wisdom versus prime emphasis on sceptical and critical views as well as on coping with indeterminate work tasks and innovation;
- emphasis on conveying foundation of knowledge relevant for professional practice versus preparing students directly to master all the relevant knowledge;
- emphasis on general knowledge and competences versus emphasis on specific academic or professional knowledge and competences, and
- disciplinary versus interdisciplinary approaches."

These particularities significantly determine the prevailing orientation of academics towards industry cooperation. Lam (2010), for example, developed a typology that describes the traditional academic who believes the academic sector and industry should be separate, the traditional hybrid and the entrepreneurial hybrid who believe some form of cooperation should exist and the entrepreneurial type who believes in the fundamental importance of science and business collaboration. Lam further explored to what extent different factors – increasing funding and other research resources, application & exploitation of research results, creation of opportunities for knowledge exchange/transfer, building personal and professional networks, enhancing the visibility of research and an increase in personal income – motivate particular academic types for cooperation with business. These elements also hold important implications for the development of curricula, interdisciplinary development, the integration of learning with research, the organisation of problem-based learning and student practices (Palmer et al., 2010). On this basis various actors have developed frameworks on university-business cooperation.

Although several projects have started to develop indicators that measure cooperation such as number of patents, spin-offs and contract value of contracts with external stakeholders (e.g. SIAMPI from 7FP), "…there is still no comparative information as to which universities are among the world's major providers of science-based information and services to the business sector in general, and research-active industry in particular" (Tijssen et al., 2009). It is thus no surprise that there is a wide diversity of university-business cooperation modes that in recent times have been extracted from the best case studies. A report of the Technopolis organisation (2011), for example, presents a review of 15 countries that identified best practices of

university-business cooperation, including practice-oriented teaching methods, problem-based learning in interaction with industry, decentralised management in cooperation with SMEs, autonomous management of business cooperation at the university level, compulsory placements with industry, common laboratories etc. Davey et al. (2011a) also conducted a similar survey on 30 European case studies related to entrepreneurial training, international MBA programmes, state-of-the-art R&D with industry, adult education, start-ups, accelerating apprenticeships, empowering science-society linkages or generating living laboratories.

The search for drivers and barriers is another area that has recently been attracting significant attention. While the set of drivers (e.g. better employability of graduates, curriculum improvements, spin-offs and financial measurements) can be classified according to a particular beneficiary (e.g. higher education institutions, academics, students, the community etc.), the set of barriers has traditionally been classified as restrictions imposed by a company, problems related to the appropriation of results, communication problems, duration of the research and cultural differences (Mora-Valentin & Ortiz-de-Urbina-Criado, 2009: 396). Based on the results of an Imperial College survey, Wilson (2012: 28) conceptualised major barriers to business university cooperation in the UK and to different degrees the results can be generalised across European countries. In the report, he stressed: "i) the needs of the business do not align with the mission and strategy of the university, ii) time scale and capacity mismatch (a university has already committed its resources and does not have the available capacity to meet the timescale that the business needs, iii) capability mismatch (a university does not have the skill set or the facilities to meet the needs of the business), iv) the cycle of bureaucracy (where external funding is required, the bidding cycle does not meet the timescale the business needs), v) financial constraints (a university is unable to provide the service required for the price the company is willing to pay), vi) sustainability: the investment required by the university to provide the service does not have an acceptable payback period, vii) mismatch in expectations and objectives (expectations of outcomes from collaboration are not mutually recognised), viii) agreement on the future of the intellectual property that may be generated".

Some other reports have in recent years presented a general picture of university-business cooperation in Europe. For example, with a large-scale survey among over 4,000 enterprises Davey et al. (2011b) explored how eight EC pillars of business-university collaboration (research and development, mobility of academics, mobility of students, commercialisation of R&D results, curriculum development and delivery, lifelong learning, entrepreneurship and governance) are practiced by academics and what determines these cooperation aspects. The authors found there is a high statistical correlation among these types and measurable modes are perceived to be more important than more tacit ones. The study also found the strong effect of influencing factors that were classified as action processes (mechanisms that support university-business cooperation, strategies, structures and approaches, activities and framework conditions), motives, drivers and barriers. Interestingly, the results show that academics believe their institutes, students and employers benefit from cooperation much more than they do. They see the funding system and bureaucracy within higher education

institutions as the main barriers to cooperation. This is the reason, according to the report, that almost every second academic is not involved in any way in cooperation with industry.

1.2 Structure of the report

The main part of the report focuses on the detailed analyses of the university-business cooperation from the perspective of employers (chapters 2-6). Firstly, the report provides analyses of the most frequent means of cooperation with higher educational institutions, following by identification of drivers and motives which lead to this cooperation as well as the barriers of this cooperation the companies are facing with.

The report also provides the quantitative analyses of the outcomes and impact of the university-business cooperation and companies' perceptions on universities and cooperation with them as well as qualitative analyses of the companies' own experiences of university-business cooperation. Regarding the issues of the employability the report provides an insight into the acquired competences of the graduates from employers' perspective and the recruitment mechanisms they use to hire new employees. The quantitative and qualitative analyses of university-business cooperation from the perspective of the employers in the first place provide policy implications.

Chapter 7 includes analyses on university-business cooperation among employers on the EU level. Besides EMCOSU countries the analyses also include responses of employers from several other countries and regions that were involved in the large scale survey. Among the countries the survey was focused to Croatia, Czech Republic, Slovakia and Italy with additional regions comprising several countries: continental, ex-YU countries, Scandinavia and Russia.

Chapter 8 comprises additional analyses among employers' associations in EMCOSU countries and on EU level (few countries outside of the project consortium) from which the majority of them are chambers of commerce and industry. Chapter 9 includes analyses of survey responses among experts of specific economic sectors. It focuses on three major sectors, namely industry, services and ICT. The employers' associations representatives provided responses on their institutional cooperation with universities, but specific sector experts provided their views on the university-business cooperation of companies from their sector of expertise.

All analyses provide results that can bring a great contribution to university-business cooperation in EMCOSU countries, but also on a broader EU level. The conclusions and policy implications are available in Chapter 10.

1.3 Methodology

General approach

After review of existing literature and previous survey steps several interviews with experts in the area of higher education and university business cooperation experts were implemented. On this basis further elaboration of the approach has been conducted including i) description of particularities of the key purpose of the survey, ii) sampling and road map completions, iii) guidelines for survey implementation and iv) finalisation of the questionnaire.

The initial goals of the survey, reflected in the current version of the questionnaire, are related to the following three questions:

> *a) Which are the most relevant modes of cooperation between universities and enterprises and why?*
> *b) What are current characteristics of cooperation modes and their future developmental needs?; and*
> *c) Which are key developmental drivers and motives on cooperation on the side of universities and enterprises?*

These questions provide the basis for exploring hierarchical relations among different modes of cooperation between universities and business (UBC). However, after review of existing material and work conducted, we found that UBC modes are very deeply interrelated and compared in the past research. This opens the need to support existing mainstream research in this area by surveying what key factors triggers UBC – why some works and others not. Moreover, it is also important to learn what enterprises expect from universities. On this basis it is possible to identify different relation between drivers and barriers on cooperation and cooperation modes.

The EMCOSU consortium agreed that general and tentative goals of UBC should be studied in addition to existing ones, because this is the better way to seek for improvement possibilities. This is particularly the case in SMEs. Therefore an important issue in the questionnaire is related to distinguishing between experiences with university collaboration versus expectations from universities. It is mandatory to encounter in the survey hard elements of UBC such as are contracts, patents, licences and publications which are sediments of other cooperation forms.

It is important to stress employers' associations were studied separately from enterprises: they should be explored in the way what expectations they have from public disclosure on university research including funding, what they would like to have in the future, and how they are involved into translation process between cooperation process.

These considerations called for i) minor adaptation of the questionnaire for enterprises in the way to drop some sections and add new one, and ii) development of two new questionnaires – experts, chambers and R&D centres – that have in common only some sections.

Thus, within the framework of the project there were two surveys implemented – among employers and among employers' organisations and associations – what results also into two main parts of the large scale survey report. The main emphasis is given to employers' perceptions to university-business cooperation (on a level of countries from project consortium and on broader EU level), and a smaller part also to employers' associations' views.

Sampling

EMCOSU partners first provided information of relevant data bases with enterprises in relation to UBC as described in the report *Elaboration of Key Economic Strategies and Economic Sectors*, earlier in the project. The selection of enterprises sought for two main types: i) relevant existing 'best practices' UBC »cases« as well as ii) cases where cooperation is »surprisingly by experts« not taking place for different reasons. This concept, in the view of experts, requires several layers of interviewees, as originally indicated already in the last template. Based on this, and on earlier information of EMCOSU members, the development of non-representative approach were provided in each country.

Table 1.1: ***Typology of survey units and approaches***

Code	Requested new information	Nr of Cases
A	Professional associations that can explain particular national or institutional UBC case.	approx. 15
B	Enterprises that collaborate in the cases above or collaborate in other UBC forms[1]. The selection shall explain relation with WP3 national report;	approx. 45
C	Enterprises that is »surprisingly« not involved in UBC. The selection shall explain relation with WP3 national report.	approx. 25
	Total	100

Other requirements and recommendations for sections C and D were related to encounter proportions between industry and services. Since points of comparison will be introduced in the final report, it is mandatory the enterprises are selected from similar sectors (at least from NACE second digit level), what enables broad cross sector comparison. Other break variables are size of enterprise, technology level and geographical scope of operation. These issues can be described latter in the survey. Main part of the questionnaire is based on closed questions (see Attachment), with open question at the end. Each partner also surveyed ten case studies with more in-depth approach. In this way the survey of enterprises in the EMCOSU project explores both – successful cooperation but also cases where university-business cooperation does not exist: only in this way it is possible to learn what enterprises expect from universities.

[1] It is expected at least half of cases should be included in UBC cases above.

The decision on the final selection of interviewees within enterprises depends on feasibility aspects, however partners should be aware that human resources managers are in general better in contacts on UBC mobility, while managers are better contacts on research.

Learning why some factors trigger UBC can be learned by different approached studying personal factors, economic needs and expectations as well as identifying policy support on the country regional levels. Completion of the final questionnaire proposal is in line with U-B cooperation network at Munster University. In this way it is possible to integrate some sections to be the same as in the UBC survey among Universities, what enables creation of common data base and enables direct comparison between universities and enterprises.

Each project partner ran the survey in three phases, starting in November 2013 and finishing in June 2014. Prior to the survey project partners prepared road maps of companies and employers' associations according to the pre-agreed typology. Project partners contacted the selected companies mostly with a motivation letter and attached questionnaire over e-mails. The potential respondents were approached also via phone with a request to participate in the large scale survey, and, if needed, also in person. Those who did not respond the request to participate in the survey were also sent a reminder. The next two phases of the implementation of the survey were running in a similar way. Project partners reported they have gained a response rate from 10 % to 20 % of all companies included in the road maps.

The survey implementation on the EU level (countries outside the project consortium) was running in a slightly different way and was implemented by the two universities included in the EMCOSU project. To approach representatives of companies and employers' associations from different countries, there was a need to translate the questionnaires into several national languages. Project partners later used their own contacts mostly within higher education institutions and other research networks from different EU countries with a request to pass motivation letters and questionnaires to relevant representatives of companies and associations. However, some companies were approached by the two project partners responsible for the implementation of the survey on the EU level directly. Since there was (in most cases) no direct approach, expectedly also the response rate was lower and it gained around 5 per cent.

Survey among enterprises

The empirical analyses in the report are done on the basis of data obtained through a large scale survey among employers in the five EMCOSU countries, namely Bulgaria, Hungary, Poland, Slovenia and Spain. The selection of the companies to be included in the survey followed the agreed criteria on the sector distribution, size of the company and existence of the university-business cooperation (UBC).

The total number of companies included in the large scale survey was 396 and the number of participating companies throughout the countries range from 70 in Poland to 98 in Bulgaria. However, the large scale survey included also companies from countries outside the project consortium, employers' associations and responses of specific sector experts which are further analysed.

Table 1.2*: Number of responding companies per country*

Country	Bulgaria	Hungary	Poland	Slovenia	Spain	Total
Number of respondents	98	74	70	80	74	396

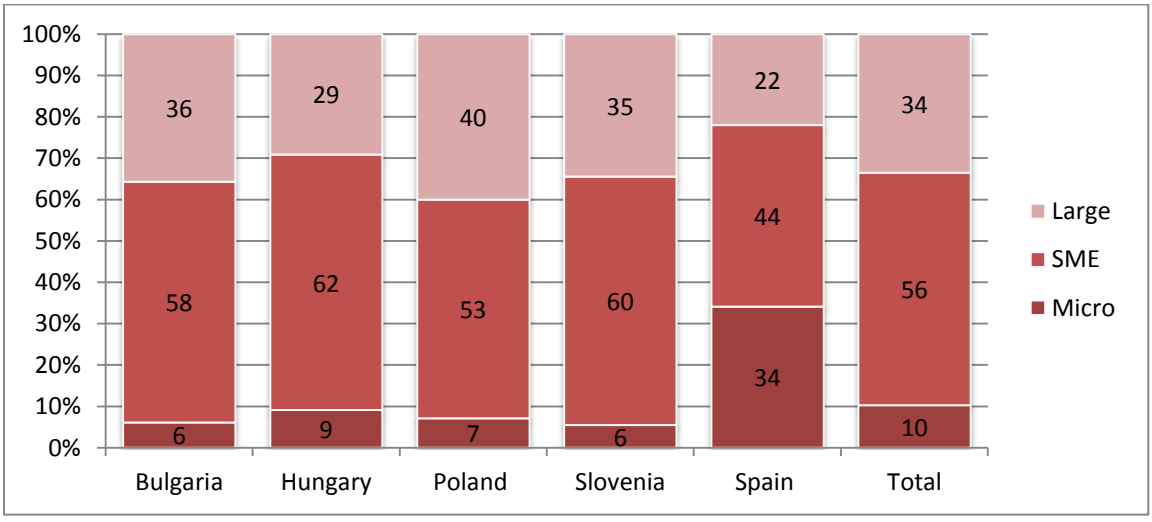
The questionnaire of the large scale survey was mostly targeted to representatives of the companies who have an insight into their own university-business cooperation or are actively involved in that kind of cooperation. The majority of the respondents are managers (for example CEOs, directors, executive directors, general managers), around one third of the respondents are human resources experts, following by specialist managers, for example head of departments.

The vast majority of the responding companies are private profit organisations. In all EMCOSU countries this number overreached three quarters of the included companies, from 77 per cents in Poland to 95 per cents in Spain, and the total average is 88 per cent of companies with private profit structure.

The sample includes also public companies and organisations and private non-profit organisations, however their number is comparing to private profit organisations quite low – the lowest in Spain and the highest in Poland. In total there are seven per cent public companies and organisations and three per cent private non-profit organisations.

The numbers of the employees in the responding companies are categorized in the three main categories – if there are ten or less employees the company is recognized as micro, companies with more than 10 and up to 250 employees are marked as small and medium enterprises (SME), and companies with more than 250 employees are considered as large.

Figure 1.1*: Distribution of companies by their size per country (in per cent)*



The majority of the companies in all countries included in the sample are small and medium enterprises, following by large companies and then micro. In total there are over one half of SMEs, over one third of large companies and ten per cent of micro companies. The

distribution of companies throughout the EMCOSU countries do not vary significantly: only in Spain the percentage of micro companies is higher than the one of large companies and also the percentage of the SMEs is the lowest comparing to the other countries involved. Poland has the highest percentage of large companies.

The respondents were asked to provide the number of the employees in their own unit of the company in a case the company has more than one dislocated units. In total there are more than one half SMEs, however comparing to the overall size of the company (see above) there are more micro companies, with 18 per cent, and less large companies, one quarter comparing to one third.

The number of micro companies/units on their own location in Spain reaches one half and is the only country where the proportion of micro companies/units is above the proportion of SMEs. However, the percentages of micro companies/units are higher in all EMCOSU countries and the proportion of large companies/units rather lower.

The companies included in the large scale survey cover economic sectors that have been identified in the first phase of the EMCOSU project as the sectors with the highest developmental potential. These sectors were recognized as important within the elaboration of key national economic strategies. Considering the identification of these sectors one can say that on the general level the most important sectors in the EMCOSU countries which also have the biggest developmental potential are information and communication technologies, agriculture and food industry, logistics and transport, electrical energy and electrical industry (including renewable energy), and technology (including biotechnology, new materials, medicine and pharmacy).

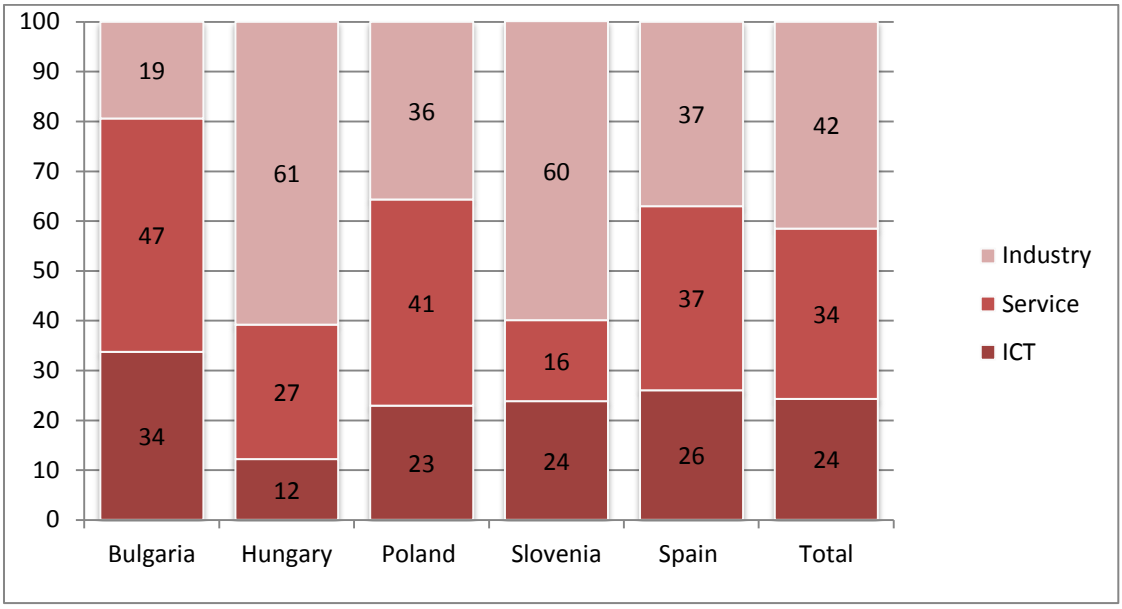
On the national levels the most important sectors by countries identified in the national economic strategies are the following:

- *Bulgaria* – information and communication technologies, energy, agriculture, tourism and heritage;
- *Hungary* – medical and health sciences, information and communication technologies, economics, legal sciences;
- *Poland* - information and communication technologies, pharmacy, energy, transport and storage;
- *Slovenia* - information and communication technologies, life sciences (including biotechnology, medicine, pharmacy, food processing), advanced materials and nanotechnology, electrical and electronics industry;
- *Spain* – automotive industry, renewable energy, technology sector, consulting services.

The economic sectors of the companies that have been selected for the participation in the large scale survey have been in line with the identified key sectors and are categorised in the three broad categories of economic sectors: industry, service and information and communication technologies. The large scale survey was targeted to reach 40 per cent of the companies from the industry, 40 per cent from the services and 20 per cent of the companies

from the ICT sector, however the national particularities of the key sectors have also not been omitted.

Figure 1.2: ***Distribution of companies by economic sector per country (in per cent)***



In total the proportion of responding companies from the industry sectors reaches the highest level, which is 42 per cent, followed by companies in service sector with 34 per cent and ICT companies with 24 per cent. The highest proportions of the companies from industry sector are in Hungary and in Slovenia, and consequently, the lowest proportions of companies from the service sector are to be found in those two countries. Bulgaria has the lowest proportion of companies from the industry sector and the highest from the service sector. Regarding the ICT sector the proportion among the countries is similar; however the lowest is in Hungary and the highest in Bulgaria.

To sum – the following empirical analyses are based on the data obtained through a large scale survey among almost 400 companies in five EU countries. The large majority of the companies are private profit organisations and most of them can be identified as small and medium enterprises. The companies are categorized into three broad economic sectors: industry, service and ICT and were selected upon the elaboration of the key economic sectors with the highest developmental potential.

Additional to the analyses among companies' representatives in five EMCOSU countries, one chapter of the report includes also an analyses of 89 responses of companies' representatives from countries and regions outside the project consortium, namely from Croatia, Czech Republic and Slovakia, Italy, Ex-YU countries, Scandinavia, Continental region, Russia. The details of the survey on EU level are presented in chapter 7 of this report.

As mentioned earlier the analyses include also the responses of representatives of employers' associations and specific sector experts. In Bulgaria, Poland, Slovenia and few non-EMCOSU countries the project partners implemented a survey among employers' associations, but in

Hungary, Spain and also few non-EMCOSU countries the project partners implemented a part of the large scale survey among experts of specific sectors.

Table 1.3*: Number of responding employers' association representative or specific sector experts per country*

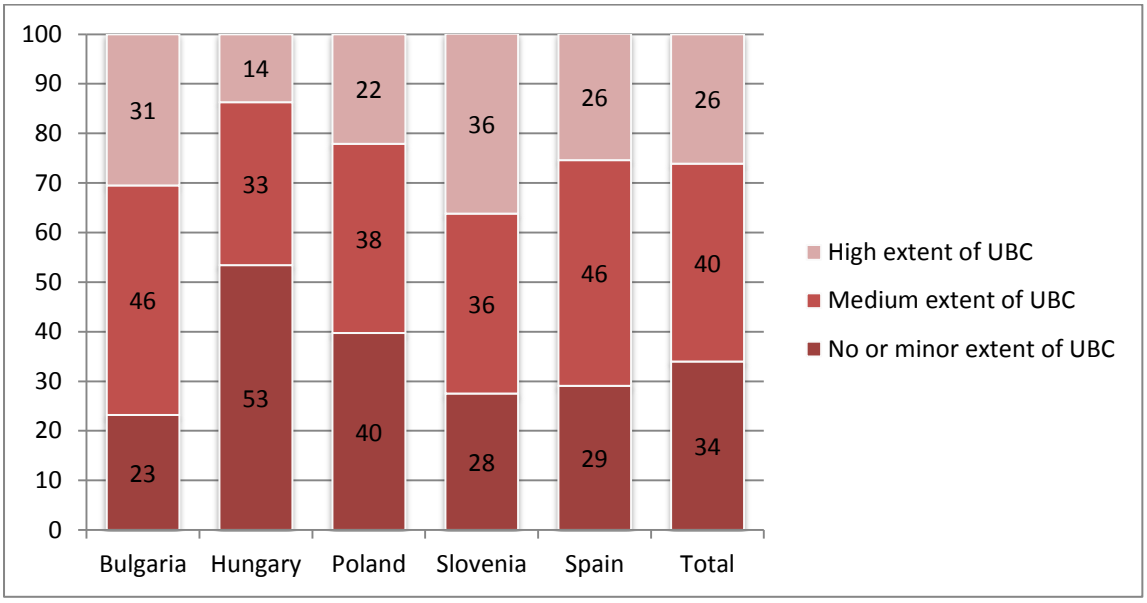
	Bulgaria	Hungary	Poland	Slovenia	Spain	Non-EMCOSU	Total
Associations	14		30	19		6	69
Specific Sector		26			25	18	69

In total, the analyses presented in this report include 485 responses of representatives of companies, 69 responses od representatives of employers' associations and 69 responses of experts of specific economic sectors what reaches 623 responses on views of university-business cooperation in the larger EU area.

2 Modes and Activities of University-Business Cooperation

In order to follow the EMCOSU project's main objectives the sampling plan of the large scale survey envisaged the inclusion of the companies which have already developed modes of cooperation with higher education institutions. However, the selection included also the companies without UBC in order to identify the major barriers, challenges and motives of possible future cooperation[2].

Figure 2.1: ***Distribution of companies with university-business cooperation per country (in per cent)***



In total there is around one third of companies with no or minor extent of university-business cooperation with the highest percentage in Hungary where over half of the approached companies does not have developed university-business cooperation. Consequently those two countries reach the lowest percentage of companies with high extent of university-business cooperation. Meanwhile in Slovenia there are more than one third of companies with high extent of cooperation. The majority of companies reported that the extent of their cooperation with universities reaches medium level.

In the total average of all EMCOSU countries the most common activity of the university-business cooperation are the following:

[2] The distribution of the companies into the categories related to the extent of the university-business cooperation was prepared on a basis of the responses of the companies to the question to what extent they cooperate with higher education institutions regarding the activities listed in a questionnaire. Five variables each with a value from 1 (not at all) to 7 (to a very high extent) were computed into one common variable and the newly computed values later divided into three parts: a) no or minor extent of university-business cooperation; b) medium extent of university-business cooperation; c) high extent of university-business cooperation. Point a) includes computed values from 5 to 11, what means that the equal distribution of the company's responses would include values 1 and 2. Point b) includes computed values from 12-19 and point c) includes computed values from 20 to 35.

- Mobility of students [1]
- Research and development [2]
- Curriculum development [3]
- Adult learning* [4]
- Mobility of academics [5]

*Comment: Considering the total average of all EMCOSU countries the most common activity of UBC is adult learning. However, this percentage is high above the average only in Bulgaria, therefore this activity is not considered as the most common in total.

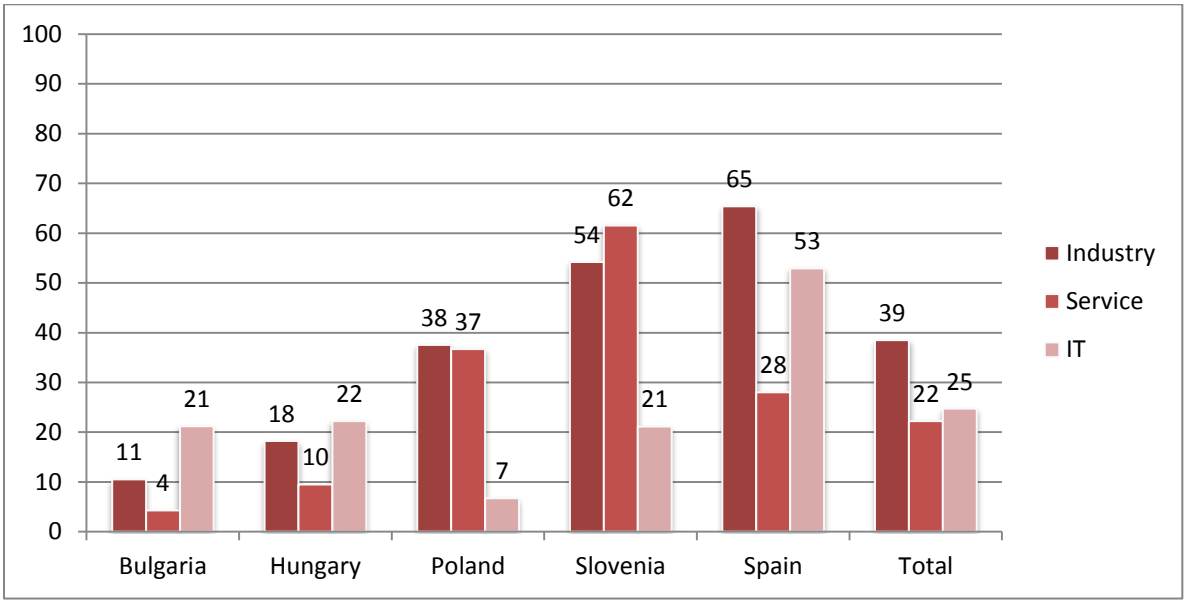
Table 2.1: ***Comparison ranks of UBC activities among employers, academics and HEI representatives***

UBC activities	Employers	Academics	HEI representatives
Mobility of students	1	2	2
R&D	2	1	1
Curriculum development	3	4	4
Adult learning, lifelong learning	4	3	3
Mobility of academics	5	5	5

Sources: EMCOSU analyses, Davey et al. (2011b, 45-46)

The highest percentage of companies with cooperation in research and development can be found in Slovenia and in Spain and the lowest in Bulgaria. Cooperation in research and development is on average the highest in the industry sector, however the sectors of service and IT gain approximately the same percentage. A representative of a Slovenian company from the industry sector reported that the output of the cooperation with a faculty of mechanical engineering resulted into the "*improvement of the current manufacturing technologies of the company*". Comparing to other two sectors in Poland and Slovenia the research and development cooperation is quite low in IT sector, and in Spain in the sector of services. Slovenia is also the only country where the highest percentage of this cooperation is in services sector and Bulgaria the only country where the highest percentage of cooperation is in IT.

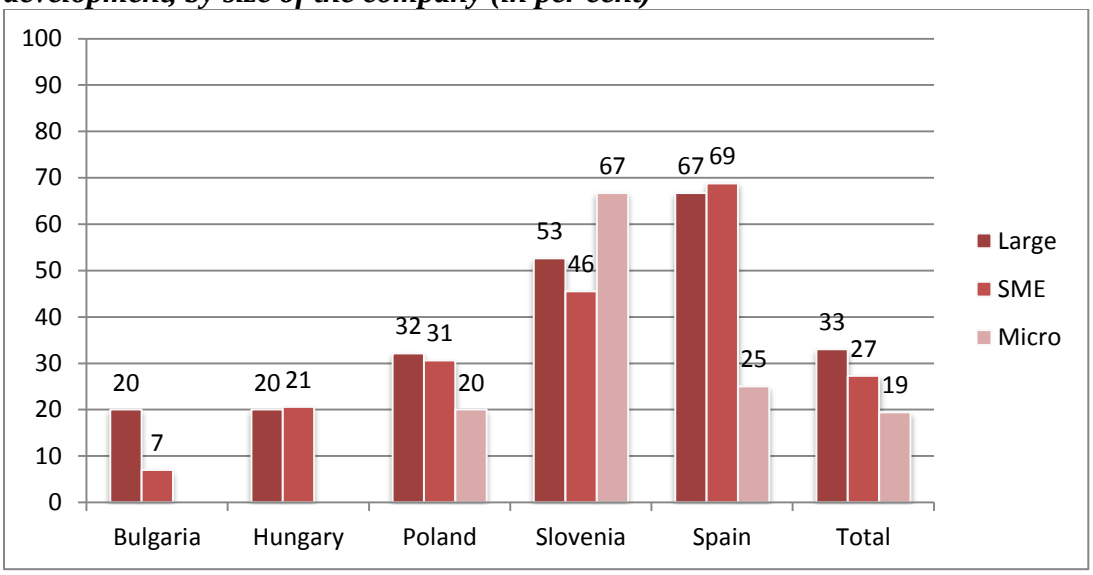
Figure 2.2*: Companies with high extent of cooperation with universities in research and development, by sectors (in per cent)*



Question B1: To what extent does your organisation cooperate with HE institutions regarding the following activities? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="To a very high extent".

In general there are not many differences in cooperation in research and development regarding the size of the company, however there are more differences within the countries. In Slovenia two thirds of micro companies reported on high extent of cooperation with universities what is more than large and SME companies. On the other side in Spain micro companies are least engaged in R&D activities of university-business cooperation. The lack of engagement of micro companies into the R&D can be notices also in Bulgaria and Hungary.

Figure 2.3*: Companies with high extent of cooperation with universities in research and development, by size of the company (in per cent)*

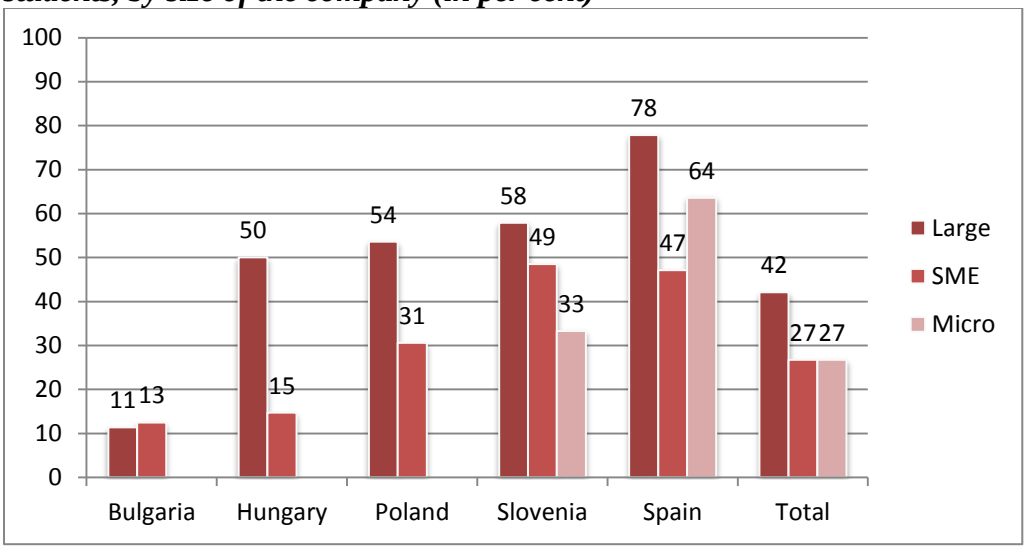


Question B1: To what extent does your organisation cooperate with HE institutions regarding the following activities? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="To a very high extent".

In mobility of students there are no larger differences among the economic sectors, with an exception of Hungary where over a half of companies from IT sector reported on high extent of mobility. However there are more differences regarding the size of the company where the mobility of students is more extensive in large companies. This is even more obvious in Spain, Poland and Hungary but in Spain also two thirds of micro companies reported on their activities in mobility of students, whereas this percentage is significantly lower in other countries, therefore we can say that micro companies are in general less included in the mobility activities of students comparing to SME and large companies.

The reason why there is more cooperation within large and SME companies can be found in their larger support of human resources departments and their stuff, higher resources aimed to research and development and the traineeships of the current/future staff etc. The outcomes of the mobility of students into company's activities as described by a representative of a Polish company (PL_Case study_8) can be beneficial to both, a company and a student – the student has a chance to acquire valuable new knowledge, which in turn can be used for strategic development of the company.

Figure 2.4*: Companies with high extent of cooperation with universities in mobility of students, by size of the company (in per cent)*



Question B1: To what extent does your organisation cooperate with HE institutions regarding the following activities? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="To a very high extent".

Similar results were shown also within research among academics who reported that: *»Both academics and HEIs place a certain emphasis on cooperation related to research and the commercialisation of research which provide opportunities for direct income-earning as well as student mobility, which directly benefits to students. Less developed cooperation can be found in more academic cooperation types (i.e. lifelong learning and curriculum development), whilst other less measurable cooperation types that provide a more indirect benefit and little ability to promote (governance and mobility of academics), are the least developed types of university-business cooperation«* (Source: Science-to-Business Marketing Research Centre, 2012).

Companies were also asked to report how often they engage in the activities of university-business cooperation listed in the questionnaire. The list below provides the activities from most often to the least often:

- Participation of business people in study, teaching and research activities [1]
- Cooperation with HEI's career offices [2]
- Cooperation with institutes focused on UBC [3]
- Cooperation with incubators for the development of new businesses [4]
- Participation in the activities of alumni networks [5]
- Participation of business people on HEI boards [6]
- Participation of academics on company boards [7]

Table 2.2: ***Comparison ranks of extent of UBC activities among employers and HEI representatives***

UBC activities	Employers	HEI representatives
Participation of business people in study, teaching and research activities	1	4
Cooperation with HEI's career offices	2	1
Cooperation with institutes focused on UBC	3	5
Cooperation with incubators for the development of new businesses	4	6
Participation in the activities of alumni networks	5	2
Participation of business people on HEI boards	6	3
Participation of academics on company boards	7	7

Sources: EMCOSU analyses, Davey et al. (2011b, 81)

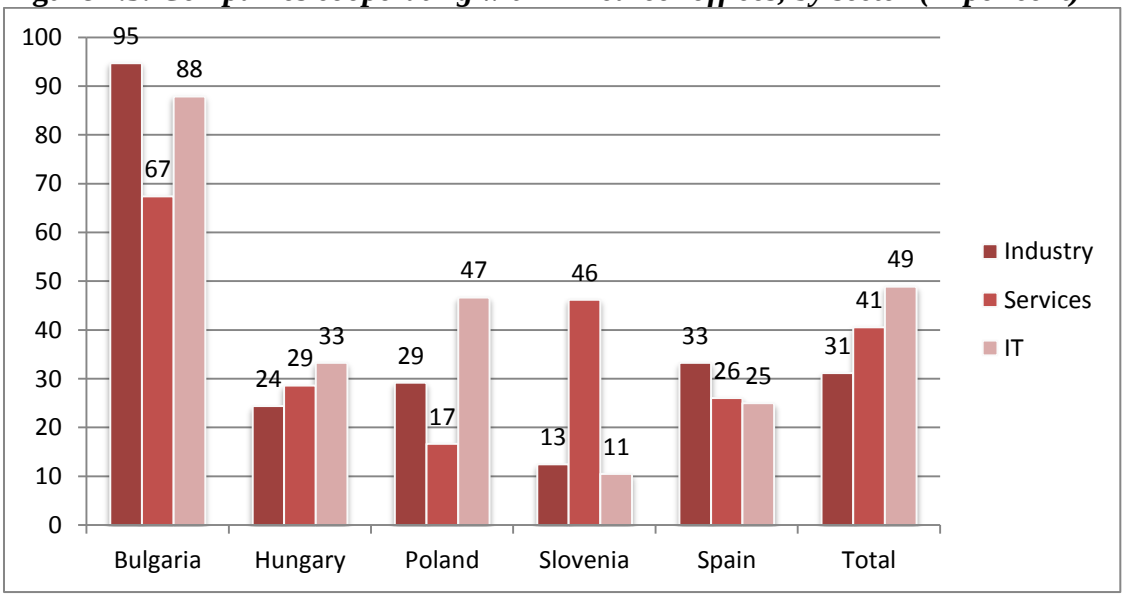
In total they most often engage in the study, teaching and research activities, followed by cooperation with career offices. We can assume that company representatives are often invited to participate in educational processes as invited lecturers and researchers. The case from Bulgaria (a company from the sector of food production) (BG_Case study_4) shows an example of a company-delivered course: "*Throughout the years our company has worked with different universities on various projects but the most significant is the academic course delivered by our employees named 'Skills for negotiations' which was a part of the Master's program in Business at the university. The course comprised five lectures delivered by our specialists in sales, purchase, finance, human resources, quality, new products development and others.«* However, regarding the responses from the representatives of companies, company-based courses are still very rare, but it is more common to be invited as guest lecturers.

Regarding the cooperation with career offices the companies are often participating on career offices' job fairs and related employment event etc. The representative of a marketing company from Bulgaria emphasised that the goal of the company's presentation at the career office event is to *present new marketing concepts to students and to motivate them to pursue careers in online marketing. Very often the most inspired students contact us after such events. We are glad to offer them internships if they are interested"* (BG_Case study_9).

Companies are least often engaged in higher education boards and also academics are least often engaged on company boards. Even though the inclusion of academics on company boards is least often, a representative from Poland reported on the benefits of participation of academics in a private sector: "*This facilitates contacts at the individual level with researchers at universities and allows presenting an offer to the university in a way attractive for it. With researchers in the management structures dialogue with universities is easier. Employment of university staff allows the company to have indirectly impact on the development of the university, including e.g. investment in rigging laboratory chemicals. This symbiosis allows the university to effectively spend resources to equip and educate graduates ready to enter the labour market in the region. Also the problem of inadequate communication between the university and the company has been eliminated"* (PL_Case study_9). Also the results of DEHEMS project show that employers would like to participate in higher education on more formal bases, for example by creation of a robust mechanism for adapting study programmes to their needs what can be best achieved by being involved in all aspects of curriculum development (Melink, Pavlin; 2012).

The figure below shows that in general the companies from IT sector are most often engaged in the cooperation with career offices, around half of them, however only in Slovenia they are engaged to a quite lower extent – around one company out of ten. If we compare the engagement among the countries, one can see that Bulgarian companies from all sector reach over 60 per cent, as in the other countries the percentages of often engagement in the cooperation with career offices is below 50 per cent in all sectors. Regarding the size of the companies large companies are those which are more often engaged into the cooperation with the career offices comparing to small and medium enterprises and micro companies. As it has been already pointed out in the paragraphs above, large companies have usually larger and stronger support from their departments (HR, R&D) to get involved with the universities and on the other side they usually carry higher social awareness and responsibility for the local/regional/national development. The future development of university-business cooperation should provide more incentives for the inclusion of micro companies and SMEs into higher education activities, especially if taken into the account that two thirds of the companies belong to a category of micro and small and medium companies.

Figure 2.5*: Companies cooperating with HE career offices, by sector (in per cent)*



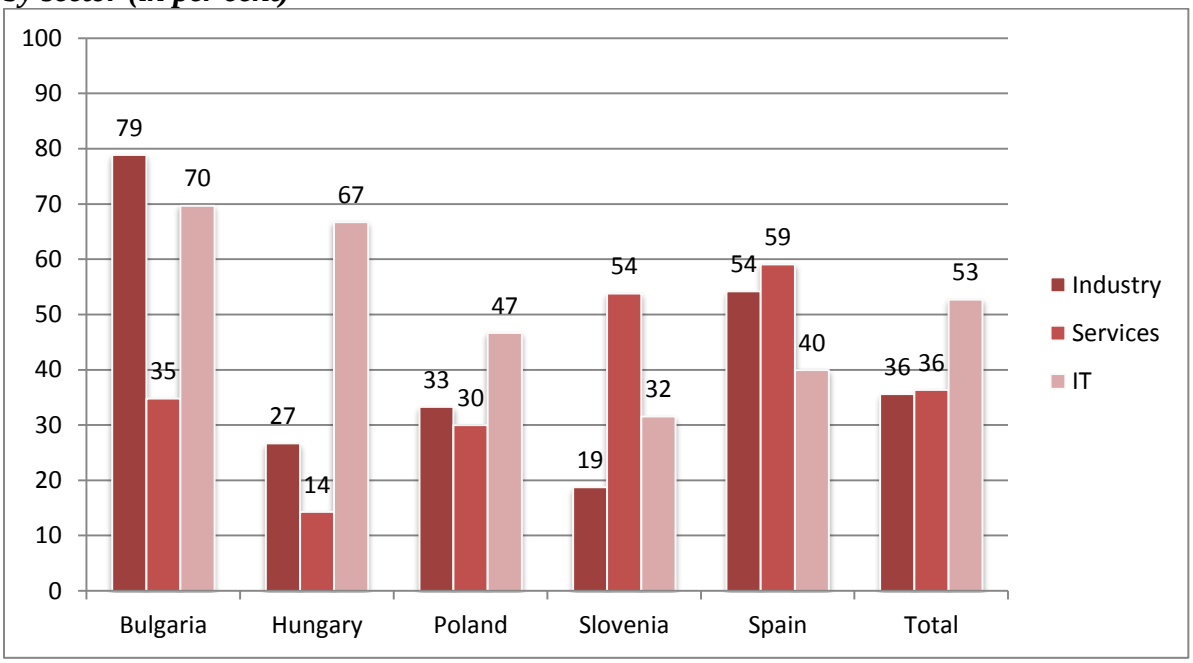
Question B5: How often does your organisation engage in the following activities in relation to HE institutions? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="Very often".

One of the most often activity of cooperation between companies and the universities is also the participation of business people in higher education's study, teaching and research activities what it should not be surprising since also research and development is one of the mode of cooperation between the two stakeholders that is used to a high extent.

From the point of view of different economic sectors the business people from IT sector are most often involved in the teaching and research activities of the universities (more than a half), with industry and service sectors sharing the same but lower percentage (around one third). Regarding the size of the companies the differences among large, SME and micro companies are in general also not so big.

It is interesting to note that there are more differences among the countries. The participation of business people from the industry sector in the universities' activities is most frequent in Bulgaria, in Slovenia and in Spain this percentage is the highest in the sector of services, and in Hungary and Poland in the sector of IT. There are also obvious differences among countries regarding the size of the companies. On one side around two thirds of the micro companies from Bulgaria, Hungary and Spain reported they often participate in the universities' teaching and research activities, while on the other side this percentage is significantly lower in Poland and Slovenia.

Figure 2.6*: Participation of business people in HE study, teaching and research activities, by sector (in per cent)*



Question B5: How often does your organisation engage in the following activities in relation to HE institutions? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="Very often".

In a nutshell, companies are most often and to a larger extent included in research and development and teaching activities at the universities in almost all EMCOSU countries. Throughout the cooperation with the universities they are also looking for the opportunities to approach the students as their potential future employees in a form of mobilisation of students into their environment and their presentation to students on career events.

In total picture there are no major differences among companies of different sizes or of different economic sectors, but are these differences more obviously shown within each of the EMCOSU country and also in comparison of one country to another. However, we can still point out that larger companies are usually more involved into the cooperation with higher education institutions, assumable due to a larger support they have within their own company, especially regarding the broader activities of human resources departments and larger staff needs. Taking into the account that national economies consist of a high share of micro and small-medium companies the future emphasis of the university-business cooperation should also target to them.

The next chapter of this report focuses on the drivers and barriers of the cooperation between universities and companies.

3 Drivers and Barriers of University-Business Cooperation

The representatives of the companies were also asked to provide information on the factors that facilitate their cooperation with higher education institutions and the barriers to university-business cooperation. The general list of drivers of university-business cooperation is the following, with the most common driver on the top:

- Existence of mutual trust and commitment [1]
- Existence of shared motives [2]
- Prior relationship with HEI [3]
- Interest of HEI in accessing practical knowledge [4]
- Close geographical distance of HEI [5]
- Access to HEI's R&D facilities [6]
- Financial resources for working with HEI [7]
- Flexibility of HEI [8]

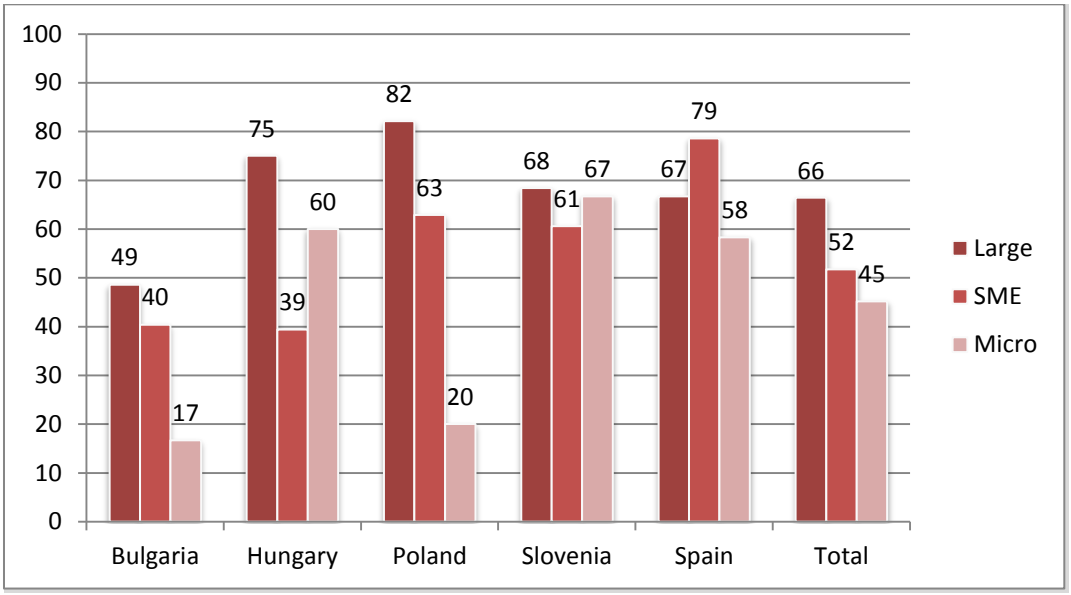
Table 3.1: ***Comparison ranks of drivers of UBC among employers, academics and HEI representatives***

Drivers of UBC	Employers	Academics and HEI representatives
Existence of mutual trust and commitment	1	1
Existence of shared motives	2	2
Prior relationship with HEI	3	3
Interest of HEI in accessing practical knowledge	4	4 (Interest of business in accessing scientific knowledge)
Close geographical distance of HEI	5	6
Access to HEI's R&D facilities	6	8 (Access to business-sector research and development facilities)
Financial resources for working with HEI	7	5
Flexibility of HEI	8	7

Sources: EMCOSU analyses, Davey et al. (2011b, 67)

However, there are few differences among EMCOSU countries. In Hungary the prevailing factor is interest of higher education institutions in accessing practical knowledge and in Bulgaria the existence of shared motives. Besides those two facilitating factors the companies reported quite to a large extent that the driver for their cooperation with universities is also prior relationships with them. The least often factors that were reported as facilitating factors of university-business cooperation are of a financial nature and the flexibility of higher education institutions, however one cannot say whether they are meant also as barriers. It is interesting to note that the results of a research among academics on the most important drivers for university-business cooperation are the same. They rated the existence of mutual trust, mutual commitment and shared goals as essential drivers of cooperation (Davey and others edt. 2011).

Figure 3.1*: Existence of mutual trust and commitment as facilitating factor of cooperation between company and HE institutions, by size of the company (in per cent)*



Question B6: How much do the following statements facilitate your organisation's cooperation with HE institutions? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="To a very high extent".

In general the existence of mutual trust as a driver for university-business cooperation is higher in large companies, followed by SMEs and micro companies. This can be explained by the fact that as seen from the results above large companies are also more willing to cooperate with higher education institutions and their cooperation is often already long-lasting what allows that the trust and commitment between the two stakeholders is built.

Not surprisingly the mutual trust and commitment is the factor that promotes the cooperation with universities to a high extent among those companies which already have high extent of university-business cooperation, followed by companies with medium extent of cooperation and minor or non-extent. Regarding the economic sector of companies' activities there are no major differences among them.

The companies were also requested to identify the main barriers they are facing with when it comes to the cooperation with the higher education institutions. The barriers listed from the most relevant to the least are the following:

- Bureaucracy within or external to the higher education institutions [1]
- Different time horizons between higher education institutions and business [2]
- Different motivations and values between higher education institutions and business [3]
- Difficulty in finding the appropriate persons within higher education institutions [4]
- Different modes of communication and language between higher education institutions and business [5]
- Limited ability of knowledge transfer [6]
- Higher education institutions want to publish confidential results [7]

- The current financial crisis [8]

Table 3.2: ***Comparison ranks of barriers to UBC among employers, academics and HEI representatives***

Barriers to UBC	Employers	Academics and HEI representatives
Bureaucracy within or external to the higher education institutions	1	4
Different time horizons	2	1
Different motivations and values	3	3
Difficulty in finding the appropriate persons within HEI	4	7
Different modes of communication and language	5	6
Limited ability of knowledge transfer	6	5
HEI want to publish confidential results	7	8
Current financial crisis	8	2

Sources: EMCOSU analyses, Davey et al. (2011b, 69)

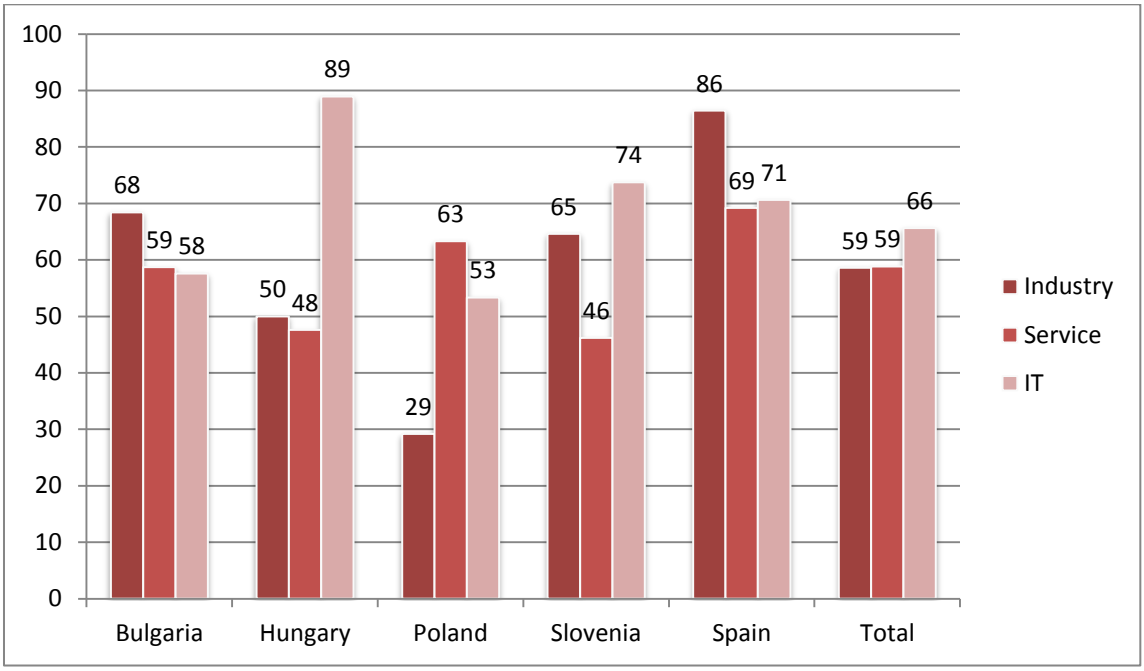
The bureaucracy is the main barrier of the cooperation in three EMCOSU countries, namely Hungary, Slovenia and Spain. As reported from a Spanish representative of a company "*the main barrier the company is facing in its relationship with the university is limited to administrative level. The bureaucracy of the university is important and sometimes too much time is needed to comply with the formalities required which in some cases can slow or even stop the collaboration*". (SP_Case study_2). Similarly it was reported from a Hungarian representative: "*The barrier from the University side is that they need to document everything, there is a lot of administration, despite the fact that an enterprise is only curious about the solution*". (HU_Case study_9) As the representative reported the bureaucracy is time demanding what the rapidly changing labour market cannot afford.

But there are not only employers who see the bureaucratic obstacles as relevant in university-business cooperation. As reported in The State of European UBC report *"the vas majority of academics of all levels of university-business cooperation experience agree that funding barriers and bureaucracy within the HEI are the most relevant barriers. Further, they believe that the main responsibility for funding university-business cooperation rests with the HEI, thus seeing the main barriers to university-business cooperation within the HEI"* (Davey and others; 2011).

In Bulgaria the main barrier is difficulty in finding the appropriate persons within HE institutions and in Poland different motivations and values between higher education institutions and business or as one of the interviewees reported: "*Obstacle to mutual cooperation are divergent methods of communication and language barrier between the two sectors. A different time perspective and different motivations parties are undoubtedly perceived as obstacle to conducting cross-sector cooperation ". (*PL_Case study_2). Few respondents from Poland also additionally mentioned the universities are not willing to cooperate with business.

Throughout different sectors there are no major differences regarding marking bureaucracy as a relevant barrier to university-business cooperation, with industry and services sectors even with equal percentages. However there are larger differences within particular country. In Hungary almost 90 per cent of companies from the IT sector reported the bureaucracy within or external to the HE institutions means a barrier to cooperation with them, comparing to around 50 per cents of responses from industry and service, and in Spain this percentage is the highest in the industry sector but in Polish industry sector is the lowest.

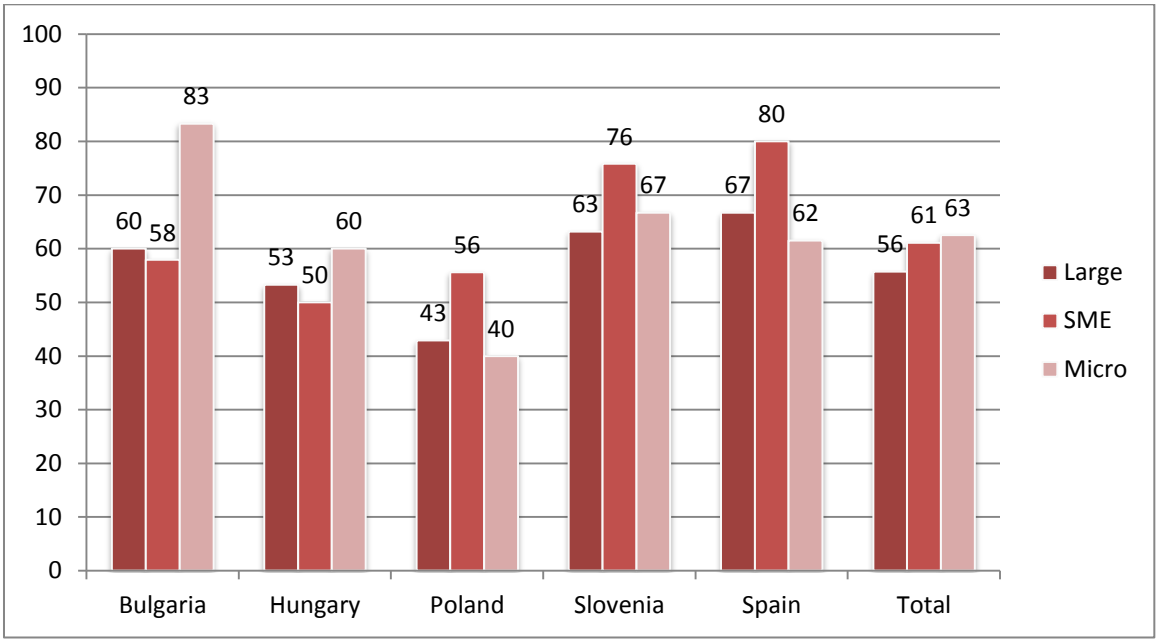
Figure 3.2*: Bureaucracy within or external to the HE institutions as a barrier to cooperation with HE institutions, by sector (in per cent)*



Question B7: How relevant are the following barriers to HE institutions-business cooperation? Responses 5 to 7 on a scale of answers from 1=”Not at all” to 7=”To a very high extent”.

Regarding the size of the companies there are also no major differences within different sizes. However, expectedly this percentage is the highest among micro companies and is getting lower towards large companies. As was already explained in the chapter 4 of this report, it is more likely that the large companies have more support in the implementation of cooperation with universities, therefore it is also easier to overcome the barriers. However, in Slovenia, Spain and Poland it was reported that these barriers are more relevant for small and medium enterprises.

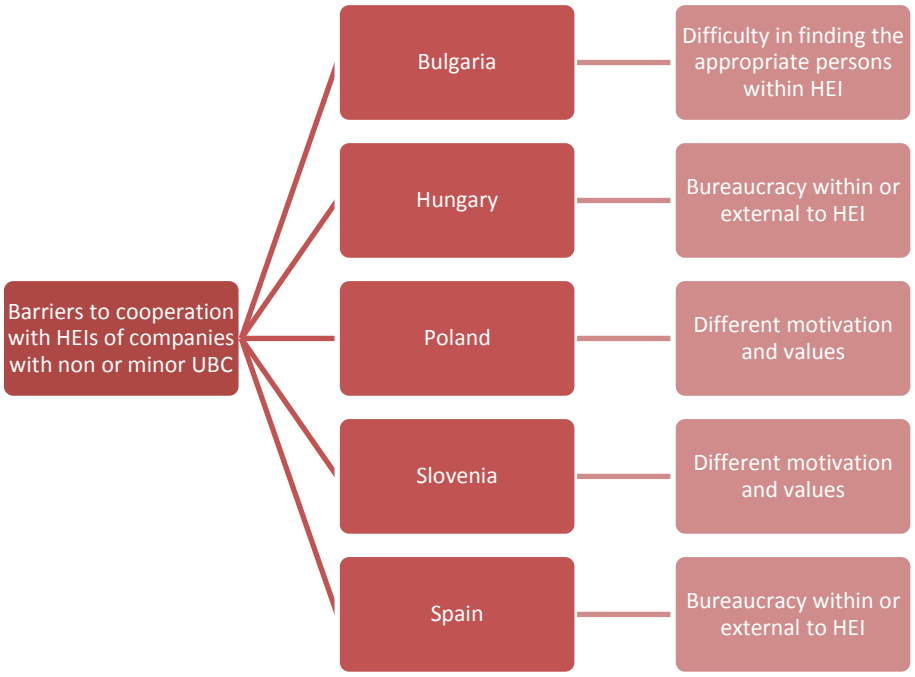
Figure 3.3*: Bureaucracy within or external to the HE institutions as a barrier to cooperation with HE institutions, by size of the company (in per cent)*



Question B7: How relevant are the following barriers to HE institutions-business cooperation? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="To a very high extent".

This report also discovers which are the most relevant barriers to cooperation with universities among companies with no or minor extent of cooperation with them as they might signal the reasons for no-cooperation. The bureaucracy presents the biggest barrier in three EMCOSU countries, Hungary, Slovenia and with a high percentage also in Spain. In Poland the companies who don't have or have minor cooperation with universities find the biggest barrier in different motivations and values and in Bulgaria in finding the appropriate persons within HEI. The barrier relevant to cooperation with universities with the lowest percentage is in total the confidentiality of published results of higher education institutions; therefore we assume that it is also the least "problematic".

Figure 3.4*: Main barriers to cooperation with HE institutions of companies with none or minor cooperation with HE institutions*



In general one can say that the companies decide for cooperation with higher education institutions mostly based on the previous experiences they had with them which also led to the establishment of mutual trust and commitment which is the main driver of the university-business cooperation regarding the responses of the company's representatives included in the EMCOSU research along with sharing the same motives and interests.

However, when it comes to the possible or actual cooperation between companies and universities, there are also barriers reducing or even eliminating the cooperation. The main barrier that was identified by the representatives of companies is the bureaucracy within or external to higher education institutions what usually does not allow the flexibility of the cooperation that is required in the private sector. Thus, one of the main challenges of the higher education systems and also other stakeholders, most notably policy makers, will be to adapt, reduce and/or eliminate bureaucratic obstacles to the establishment and implementation of university-business education.

Among the barriers to this cooperation we can include also different motivation and values or as one representative of a Spanish company explained: "*The activity of research groups at universities and technology centres are far from the needs of businesses. For the companies the most important is the generation of patents for commercial exploitation, but the priority for universities is to publish the results of research. There is little market orientation in the research activity of the universities. The work of researchers is measured by the number of publications they do, not by its practical outcome*". Since sharing motives, interests and values is one of the main drivers that facilitates university-business cooperation but at the same time also one of the main barriers to it there should be made several considerations

whether the universities and their academic and research staff should become more market oriented, what takes into the account also the reorganisation of habiliation processes of the academics.

4 Outcomes and Impacts of University-Business Cooperation

The EMCOSU project also explores the impact of the university-business cooperation from the perspective of the employers. Below there are improvements listed from the most important downwards:

- The skills of students relevant to the labour market careers [1]
- The innovative capacities of the enterprise [2]
- The knowledge of academics [3]
- The practical skills of professionals from organisations [4]
- Regional development and social cohesion [5]
- The performance of business [6]

Table 0.1: ***Comparison ranks of UBC benefits among employers, academics and HEI representatives***

Benefits of UBC	Employers	Academics	HEI representatives
The skills of students relevant to the LM careers	1	1	1
The innovative capacities of the enterprise	2		
The knowledge of academics	3	3	
The practical skills of professionals from organisations	4		
Regional development and social cohesion	5		2
The performance of business	6	2	

Sources: EMCOSU analyses, Davey et al. (2011b, 65-66)

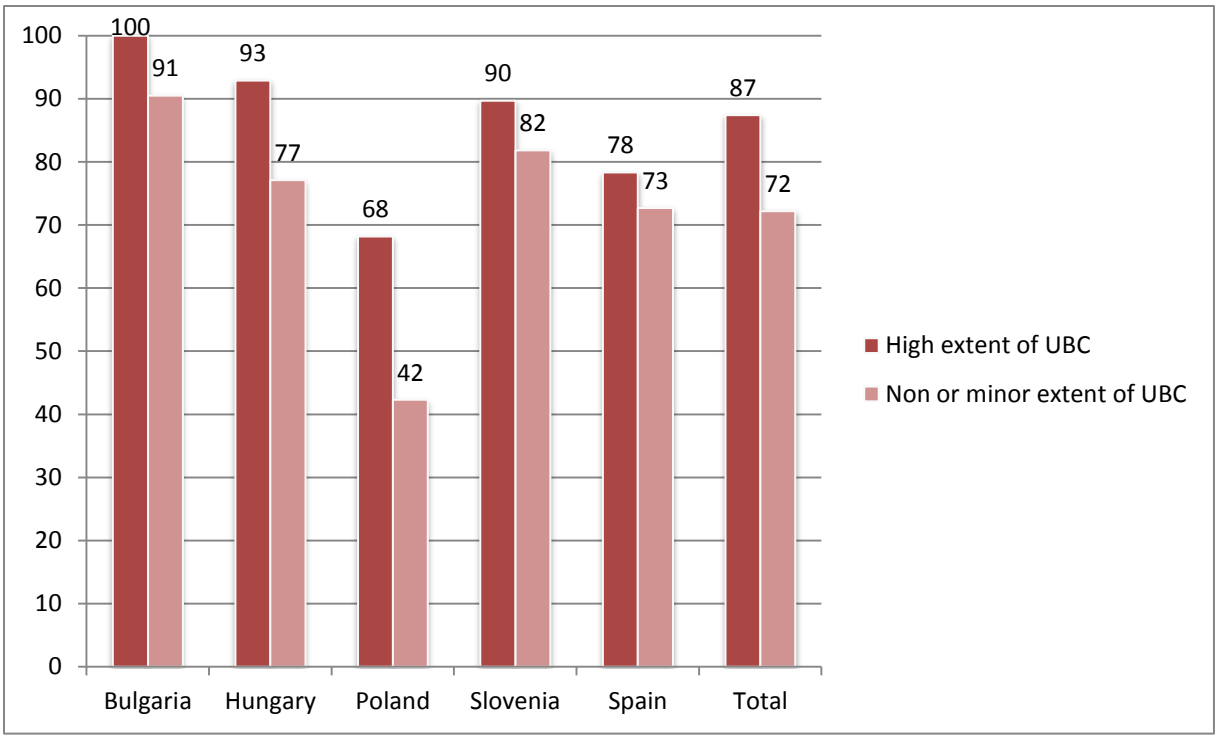
In general the representatives of companies recognize the benefits of university-business cooperation as the values of responses to the question on improvements deriving from university-business cooperation were quite high for all the variables listed above. However, most of the employers agree that the in first place university-business improves the skills of students relevant to the labour market careers. Beside the benefits for students the companies consider university-business cooperation also as an opportunity of improving the innovative capacities of the enterprise; however they see lower impact on the improvement of the performance of business. On the other hand, as reported in report on the State of European university-business cooperation, »*academics do not recognise the benefits of university-business cooperation for themselves or their research and especially not in respect of their standing within the HEI or their chances of promotion*« (Davey and others, 2011).

There are no major changes in the responses regarding sector division or the division of the companies by their size where in total more than three quarters of respondents reported that university-business cooperation improves students' skills relevant for their labour market careers. However, in Hungary the percentages are lower in services sector and among small and medium companies. There is also an exception of the IT sector in Slovenia and in Spain with smaller percentages of respondents comparing to other two sectors. These percentages

are significantly lower in Poland comparing to other EMCOSU countries in both, economic sector and size of the companies.

The figure below shows shares of respondents from companies with high extent of cooperation and from companies with none or minor extent reporting that university-business cooperation improves the skills of students. In all EMCOSU countries the percentages among companies with high extent of cooperation are higher comparing to companies with none or minor extent of university-business cooperation. These percentages are again lower in Poland.

Figure 4.1: ***Improvement of the skills of students relevant to the labour market careers through university-business cooperation, by the extent of UBC (in per cent)***

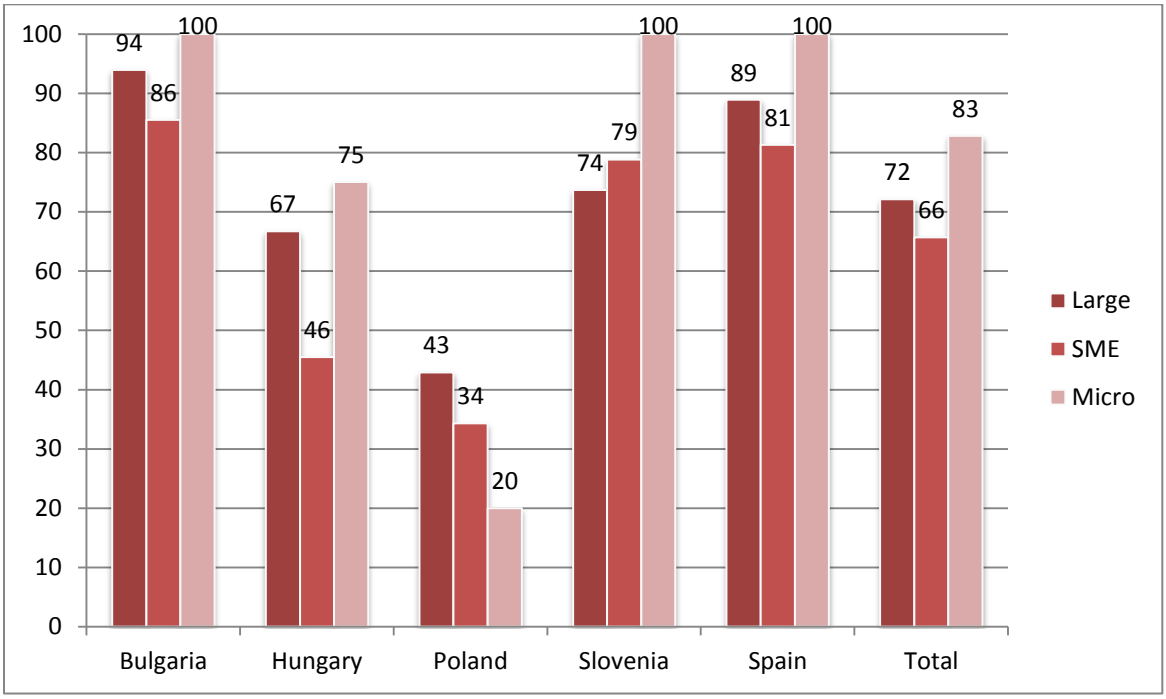


Question B9: Please indicate to what extent you agree with the following statements: HEI-business cooperation importantly improves…? Responses 5 to 7 on a scale of answers from 1=”Not at all” to 7=”To a very high extent”.

According to the respondents the university-business cooperation also boosts the innovative capacities of the companies. The majority of respondents who reported that this cooperation improves innovative capacities to a high or very high extent are coming from Slovenian and Spanish services sector and Bulgarian industry and IT sector. Comparing to other EMCOSU countries Hungary and Poland hold lower percentages what means that employers from those two countries see a potential of innovation deriving from university-business cooperation to a smaller extent.

Regarding the size of the companies in all EMCOSU countries with an exception of Poland the highest percentages of companies that reported the university-business cooperation improves their innovative capacities are ranged as micro companies. We can explain this by the fact that they have less staff support in research and development and therefore rely more on the innovation processes through the cooperation with universities.

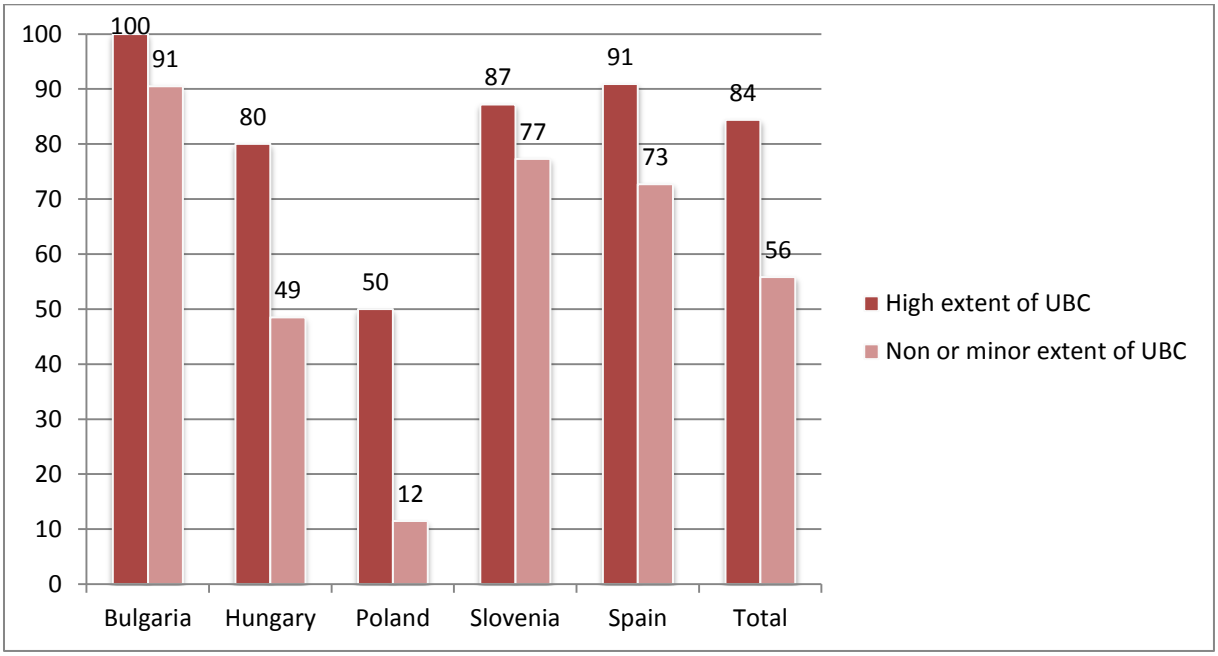
Figure 4.2*: Improvement of the innovative capacities of the company through university-business cooperation, by size of the company (in per cent)*



Question B9: Please indicate to what extent you agree with the following statements: HEI-business cooperation importantly improves…? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="To a very high extent".

The companies with high extent of university-business cooperation reported to a relatively high extent that this cooperation improves their innovative capacities what is most probably deriving from their own experiences. On the other side there are only good half of the companies with none or minor extent of university-business cooperation that would recognize the benefit of fostering innovation processes in the company through the inclusion of the universities. However, there are big differences among the none or minor cooperation companies throughout the countries – with only 12 per cent of companies from Poland to 90 per cent of companies in Bulgaria.

Figure 4.3*: Improvement of the innovative capacities of the company through university-business cooperation, by the extent of cooperation (in per cent)*



Question B9: Please indicate to what extent you agree with the following statements: HEI-business cooperation importantly improves…? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="To a very high extent".

Most of the variables that were available to the employers to evaluate the benefits of university-business cooperation received high rates and one can say that in general the employers recognize the benefits of cooperation with universities. The cooperation should be mostly beneficial for students as it allows them to gain the practical skills that are needed on the labour market and it also shows them an insight into the employers' needs. But at the same time it provides the skills to the companies' future employees, therefore the cooperation is not just one-sided or as a Polish company representative pointed out: "*This form of cooperation has a direct tangible benefits to both the company and the student. What is important for the company is that students have the chance to acquire valuable new knowledge, which in turn can be used for strategic development of the company"* (PL_Case study_8). The two-sided benefit of university-business cooperation was also stressed by a Spanish respondent: *The main UBC benefits that the company has obtained are related to student mobility. The company offers internships to students and recent graduates. At the end of the traineeships, the students are usually integrated into the business. This is a beneficial policy for the company because the costs associated with recruitment are minimized. First, the training provided to the students is essential for the performance of his/her job when he/she was hired. In addition, risks are minimized because the company hires a person who has already had a background in the business, for a time long enough to know if he or she fits for work.*" Thus, we can conclude that university-business cooperation not only that it provides good knowledge to the students before entering the labour market but usually these students and their internships are also a good investment for the company itself.

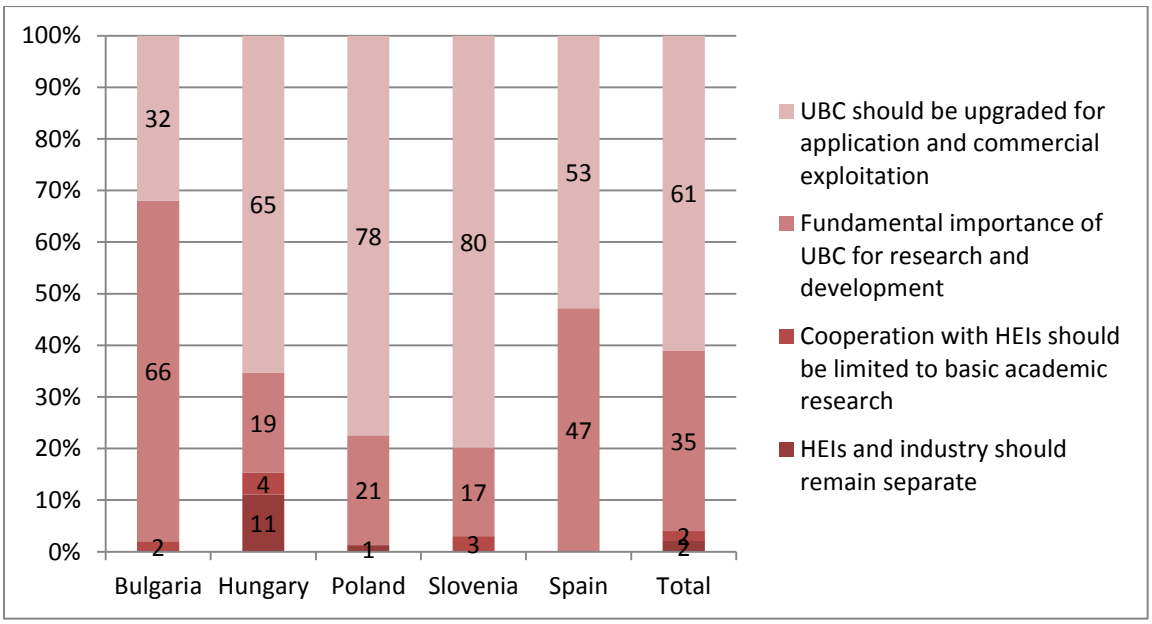
According to the reported responses the university-business cooperation also improves the innovative capacities of the companies, where we suppose that the innovative processes are

run mostly through the research and development. The future development on this field could thus also include the presentation of good practices to companies with weak cooperation with universities and their benefits.

5 Companies' Perceptions on Universities and University-Business Cooperation

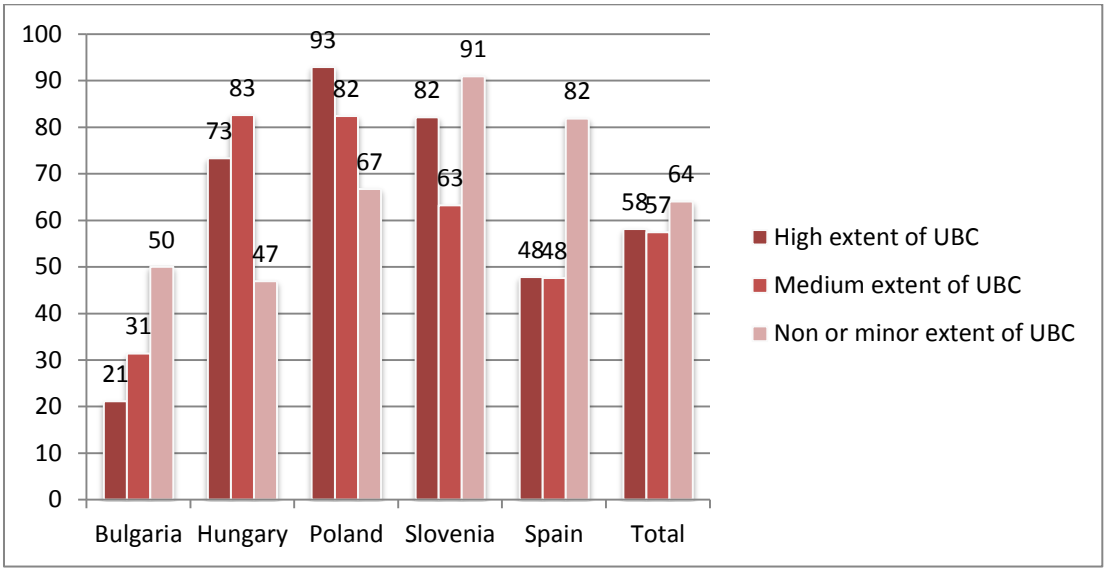
The employers were also asked to report their opinion on the future developmental needs in order to increase the university-business cooperation. The majority of the companies believe that university-business cooperation should be upgraded for application and commercial exploitation, approximately one out of three companies believes in fundamental importance of university-business cooperation for research and development and just minor shares of companies believe that this cooperation should remain separated or limited to basic academic research. Only in Bulgaria the majority of companies, that is two out of three, believe that university-business cooperation provides fundamental importance for research and development. Since the share of companies which believe the universities and companies should remain separate, we can say that they are in favour of cooperation, however they strive towards the commercialisation of this cooperation or at least to the common research and developmental activities.

Figure 5.1: ***Orientation of companies on university-business cooperation (in per cent)***



It is interesting to note from the figure below that in general and specifically in Slovenia and in Spain the share of companies which are in favour of commercialisation of the cooperation are those with non or minor extent of university-business cooperation what it can also means that nonexistence of application and commercial oriented cooperation is a barrier but would also mean a driver for those companies to include into the cooperation if it would follow those goals.

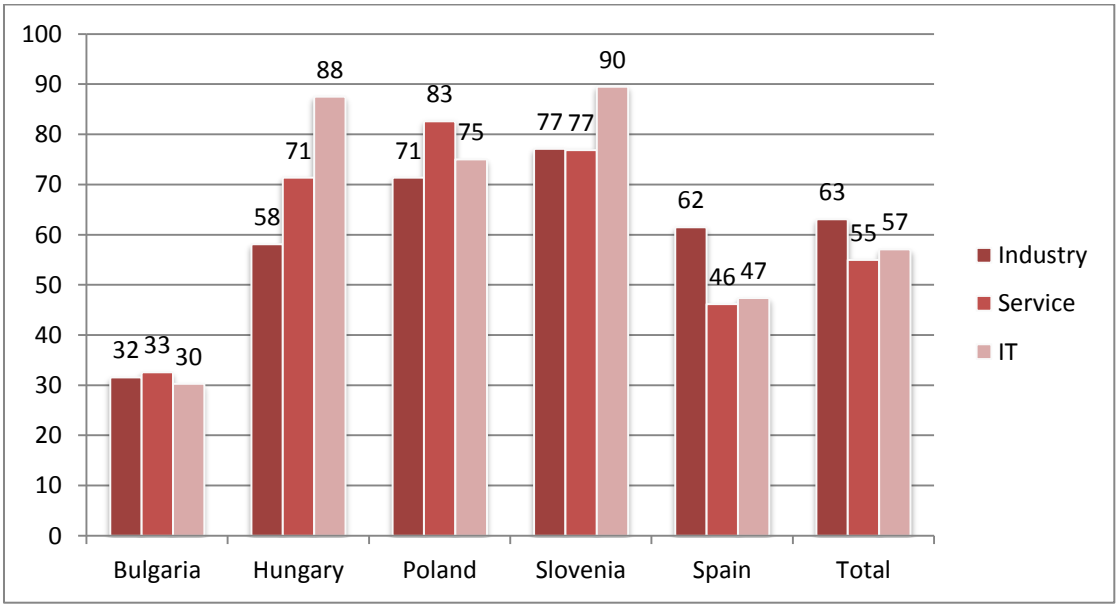
Figure 5.2*: Orientation of the company to upgrade the university-business cooperation for application and commercial exploitation, by the extent of UBC (in per cent)*



Question B3: Please indicate which statement describes the orientation of your enterprise. Responses: "We believe HE institutions-business cooperation should be upgraded for application and commercial exploitation

If we take a look to the results among different economic sectors and different sizes of the companies in general the differences are not significantly obvious. But there are more differences among countries. In Bulgaria, the share of companies which agree that university-business cooperation should be upgraded for application and commercial exploitation is significantly lower than in other countries. These percentages are the highest in Slovenia where more than three out of four companies agree that university-business cooperation should get more commercialised.

Figure 5.3*: Orientation of the company to upgrade the university-business cooperation for application and commercial exploitation, by sector (in per cent)*



Question B3: Please indicate which statement describes the orientation of your enterprise. Responses: "We believe HE institutions-business cooperation should be upgraded for application and commercial exploitation

The representatives of the companies were also asked to provide information on the future changes that should be implemented within higher education institutions and the priority order is as followed:

- Strategic cooperation with business [1]
- Increase the practical orientation of teaching [2]
- Enhance traineeships and internships [3]
- Support an international orientation [4]
- Focus on long-term skill development [5]
- Enabling the valorisation of applied research [6]
- Focus on research and development [7]
- Improvements in their financial systems [8]
- Focus on short-term skill development [9]

In general regardless the size of a company or the sector of their activity they unanimous agree the main developmental need is the establishment of strategic cooperation with business, followed by the need to increase the practical orientation of teaching and enhancing traineeships and internships. According to their responses the need emphasised the least is the focus of higher education institutions to development of short-term skills.

Table 0.4: *Development needs of universities* (rang, mean)

	Increase the practical orientation of teaching	Enhance traineeships and internships	Improvements in their financial systems	Focus on short-term skill development	Focus on long-term skill development	Support an international orientation	Focus on research and development	Enabling the valorisation of applied research	Strategic cooperation with business
Non/minor extent of UBC	**1.** 6,12	**3.** 5,71	**8.** 4,72	**9.** 4,62	**4.** 5,69	**5.** 5,45	**7.** 4,91	**6.** 4,94	**2.** 5,95
Medium extent of UBC	**2.** 6,10	**3.** 5,73	**8.** 4,96	**9.** 4,65	**5.** 5,35	**4.** 5,44	**7.** 5,24	**6.** 5,28	**1.** 6,25
High extent of UBC	**2.** 6,33	**3.** 5,96	**8.** 5,42	**9.** 4,64	**6.** 5,62	**4.** 5,83	**7.** 5,51	**5.** 5,81	**1.** 6,56

Question B4: In your view, to what extent should higher education institutions change in the future? Mean of responses of a 7-level scale where 1=”Not at all” and 7=”To a very high extent”.

When comparing the reported results among EMCOSU countries there are just minor differences regarding the developmental needs that should be implemented in the future in order to enhance university-business cooperation. Bulgarian, Slovenian and Spanish representatives reported that there should be tendencies towards the development of strategic cooperation with business, and Hungarian and Polish representatives reported that higher education institutions should increase practical orientation of teaching. Comparing to other countries there is a high tendency of Slovenian representative to support an international orientation. Lower emphasis for the future developments, however still with relatively high mean (4,61), was reported for focus on short-term skill development and improvements of the higher education financial systems (mean in total 4,99).

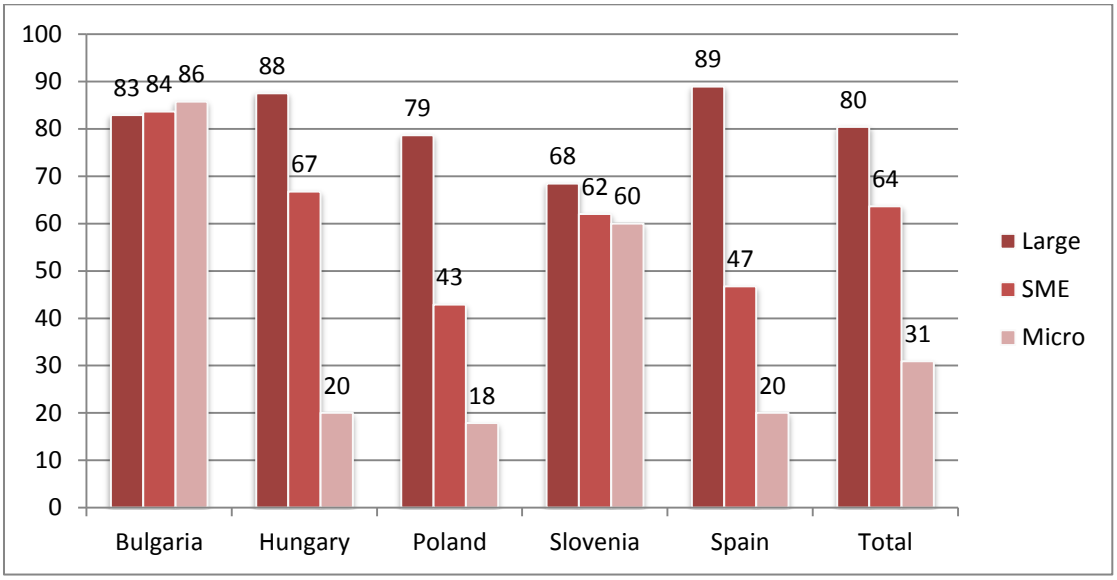
6 University-Business Cooperation and Employability: Acquired Competencies and Recruitment Mechanisms

It is not surprising that nowadays companies hire their new employee mostly through the internet and this was confirmed also by the reports from the employers. Here it needs to be pointed out that the questionnaire did not contain information what are the internet tools that the companies use, whether are these job-seeking web sites, their own web sites or even social networks. The companies are hiring the graduates also through internship placements and private contacts, but to a quite smaller extent through the employment agencies:

- Through the internet [1]
- Through an internship placement [2]
- Through private contacts [3]
- Through the help of HE institution [4]
- Through a private employment agency [5]
- Through a public employment agency [6]
- Through an advertisement in a newspaper [7]

In general there are no major differences regarding sector activities of the companies when it comes to the recruitment of new employees though the internet, but the differences are more obvious regarding the size of the company. Only in Bulgaria and partly in Slovenia the shares of percentages are more or less equally distributed among differently sized companies, but in the other countries mostly large companies hire employees using on-line tools and micro companies to a much lower extent. We can assume that usually large companies have more or less constant job vacancies, and on the other side micro companies have less vacancies and assumable hire more employees through personal contacts and/or internships.

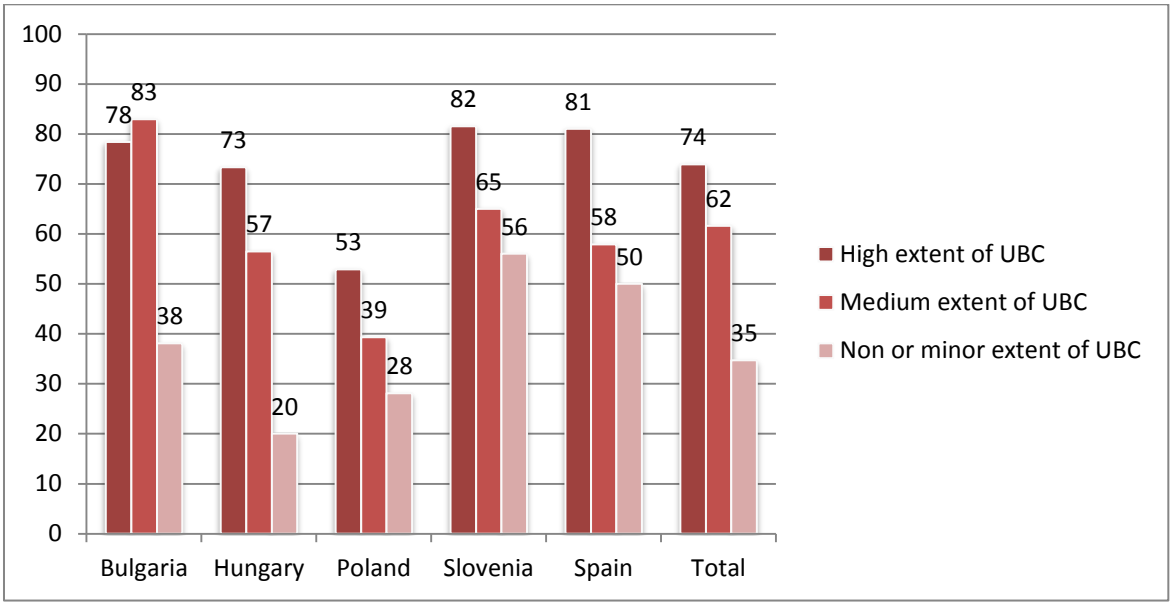
Figure 6.1*: Internet as a mechanism for hiring higher education graduates, by size of the company (in per cent)*



Question A5: How often does your organisation use the following recruitment mechanism for hiring higher education graduates in the last five years? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="Very often".

Companies with high extent of university-business cooperation more often hire new employees through internship placements as the others. Internship placements usually provide opportunities for the students to get familiar with the work, but at the same time they also provide opportunities for employer to recognize the abilities of students and their knowledge or as Slovenian representative of a company described: "*We cooperate with two faculties, organising work placement arrangements for students throughout the year. If a student proves herself/himself as a good worker at the first selection, she/he can do her/his pre graduate internship in our firm. After taking a degree, she/he becomes regularly employed with us. By then the work habits, responsiveness, communication skills and adaptability to the working environment and the co-workers have become manifest. The most successful ones also get additional training and are directed to the areas that in our view are the most appropriate for them."* Therefore one can say that internship is a reciprocal process where a graduate attains skills and knowledge necessary for his future work, and on the other side an employer gets an employee that already possesses required job-specific knowledge.

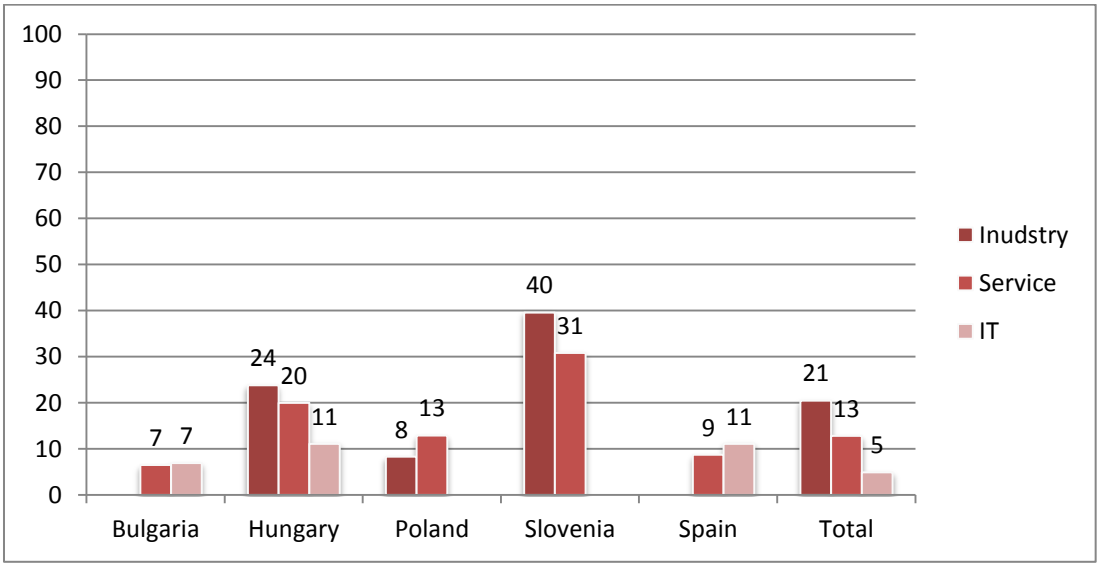
Figure 6.2*: Internship placement as a mechanism for hiring higher education graduates, by extent of UBC (in per cent)*



Question A5: How often does your organisation use the following recruitment mechanism for hiring higher education graduates in the last five years? Responses 5 to 7 on a scale of answers from 1=”Not at all” to 7=”Very often”.

The least used mechanism for hiring new employers are public employment agencies, where not even one out of four employers uses this way of finding new staff often or very often. This is especially true in the IT sector. Regarding the results the majority of the companies, with an exception of the IT sector, which use the public employment agency for hiring graduates often or very often are coming from Slovenia, and followed by Hungary. We can assume that public employment agencies are being replaced with other ways of hiring new employees.

Figure 6.3*: Public employment agencies as a mechanism for hiring higher education graduates, by size of company (in per cent)*

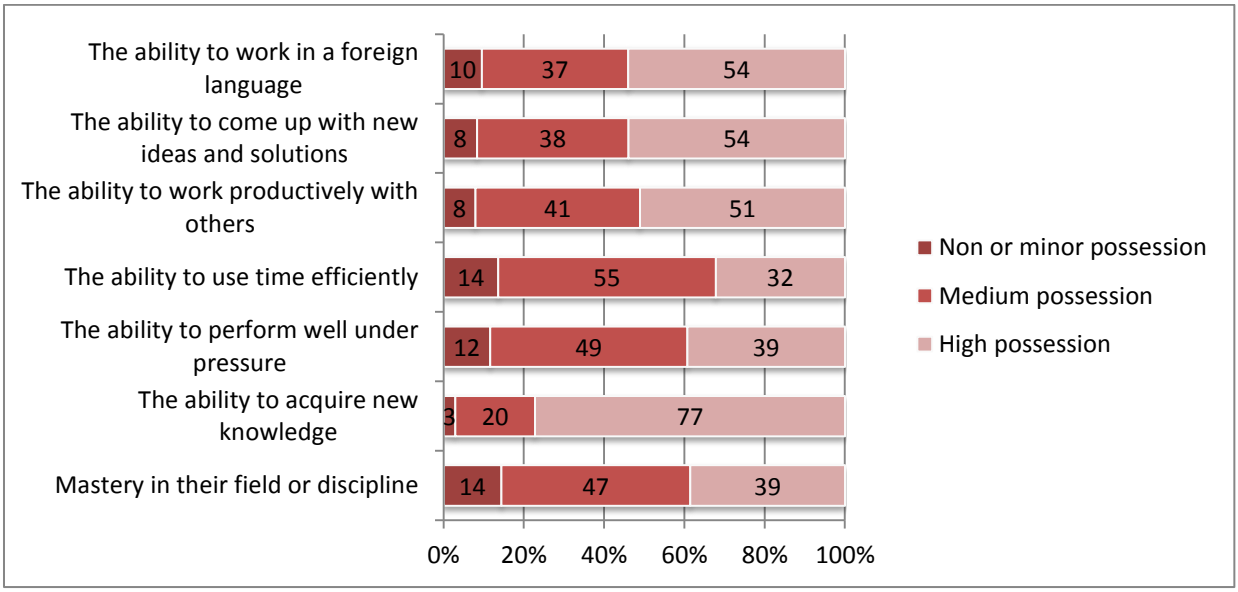


Question A5: How often does your organisation use the following recruitment mechanism for hiring higher education graduates in the last five years? Responses 5 to 7 on a scale of answers from 1=”Not at all” to 7=”Very often”.

The employers in EMCOSU countries were also asked to provide to what extent the higher education graduates possess different knowledge and skills. According to Allen, Pavlin, Van der Velden (2011) study "Competencies and Early Labour Market Careers of Higher Education Graduates in Europe" *»in the world of work, graduates are expected to be competent in a broad range of areas, comprising both field-specific and generic skills, as well as technical abilities in the areas of computer and internet usage. The competences that are most often required are the ability to use computers and the internet, the ability to use time efficiently, and the ability to work productively with others. Most graduates are highly competent in these areas, particularly with respect to the ability to use computers and the internet, but there are some shortages, of these and other competences, notably the mastery of one's own field or discipline and the ability to perform well under pressure«.*

Polish representative of a company pointed out that "f*or the company, it is important that person has specific knowledge of the industry, speaks a foreign language (including technical language that is specific to industry), and has the ability to propose new solutions and ideas."* (PL_Case study_4) The results of a survey shows that around three out of four graduates have a high ability to acquire new knowledge, following by the ability to work in a foreign language and the ability to come up with new ideas and solutions. The employers reported that the graduates are the least skilled in the efficient use of time, mastery in their field of discipline and work in the stressful situations where the percentages of graduates with none or minor possession of these skills are the highest.

Figure 6.4: ***Possession of skills by the graduates (in per cent)***



Question A6: Please provide information to what extent new graduates in your experience possess these skills? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="Very often".

7 University-Business Cooperation on the EU level

7.1 Selection of the countries/regions and approach

This part of the report includes also several other countries and regions that were involved in the large scale survey. Among the countries the survey was focused to Croatia, Czech Republic, Slovakia and Italy with additional regions comprising several countries, continental, ex-YU countries, Scandinavia and Russia. The figure below shows numbers of responding companies in large scale survey by countries/regions which in total reach 486 responses. In addition to the large scale survey analyses, this part of the report provides summary of 17 in-depth qualitative interviews on university-business cooperation in selected EU countries.

Figure 7.1*: Number of responding companies per country*

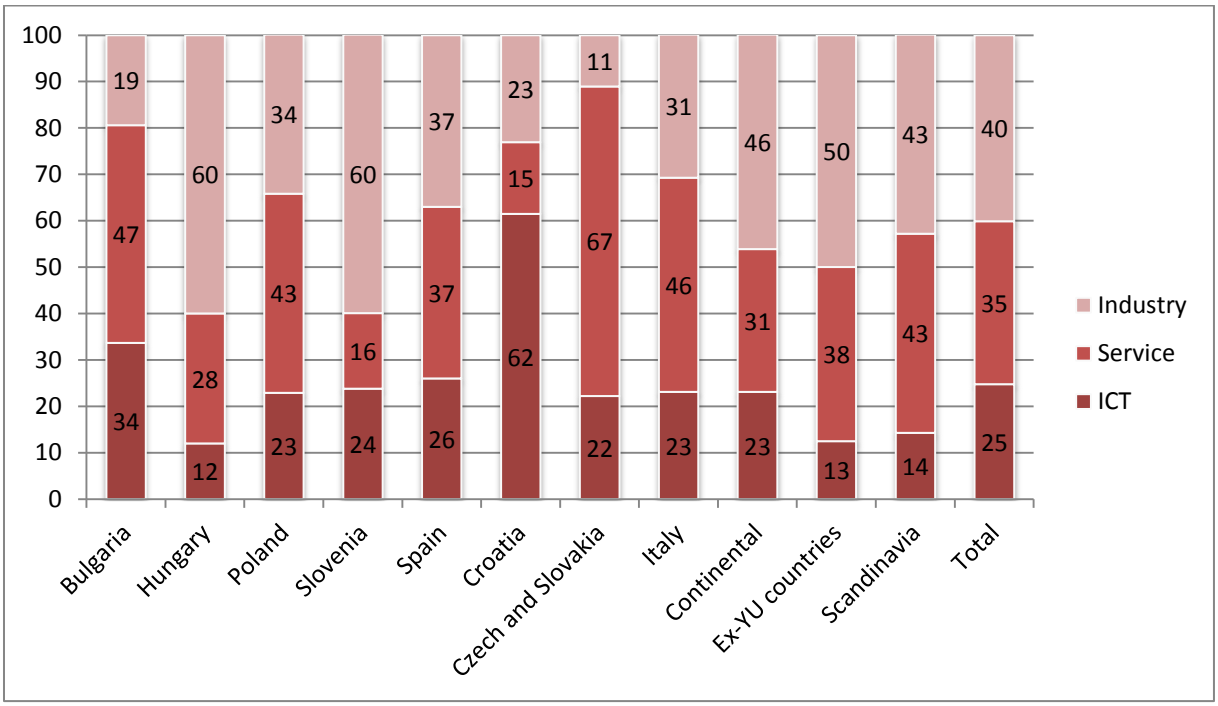
EMCOSU countries	Bulgaria	98
	Hungary	75
	Poland	70
	Slovenia	80
	Spain	74
Non-EMCOSU countries/regions	Croatia	13
	Czech and Slovakia	9
	Italy	13
	Continental	14
	Ex-YU countries	8
	Scandinavia	8
	Russia	24
Total		486

The analysed regions include the following countries:

- Continental: Austria, Belgium, France, Germany, Luxembourg, The Netherlands
- Ex-YU countries: Bosnia and Herzegovina, Macedonia, Serbia
- Scandinavia: Denmark, Finland, Sweden
- Russia

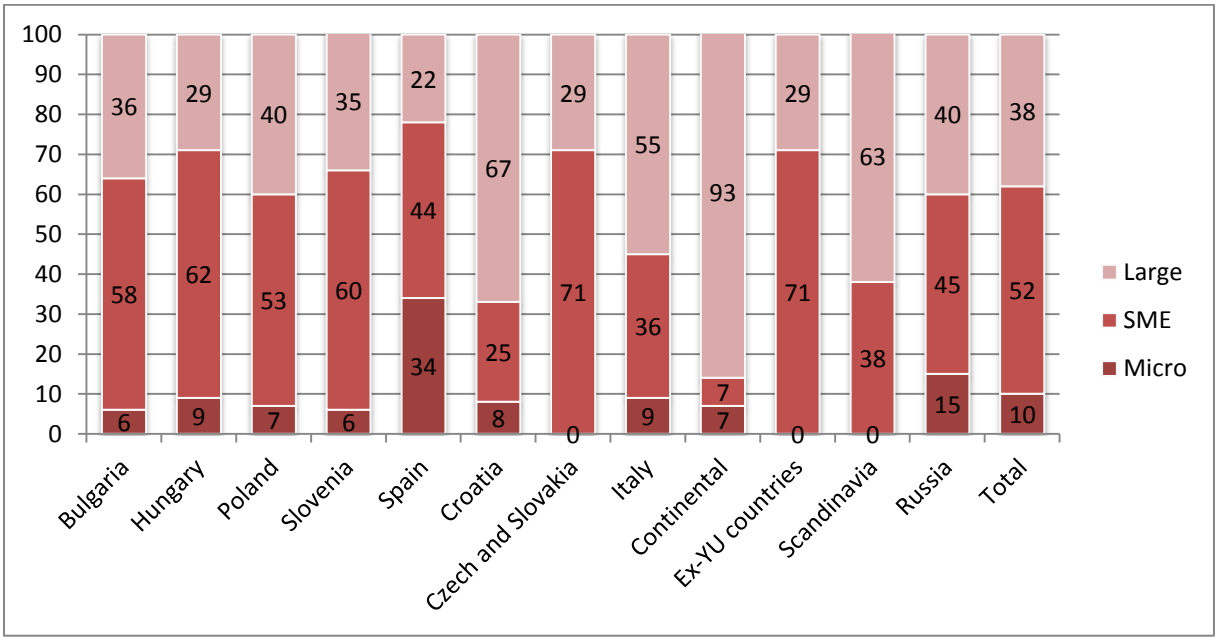
The large majority of the companies taken into consideration are private profit companies, with an exception of Ex-Yu region where about a third of the companies are coming from the public sector. The analysed sample of 486 companies includes 40 per cent of companies from the industry, 35 per cent of companies from service sector and one quarter of companies from ICT sector. In most of the countries the distribution of companies by economic sector is similar to the total, however Croatian sample includes around two thirds of companies from ICT and in Slovakia and Czech Republic the same share in services sector.

Figure 7.2*: Distribution of companies by economic sector (in per cent)*



Regarding the size of companies included in the survey one half of them are small and medium enterprises, following by over one third of large companies, and around 10 per cent of micro companies. In the continental region a larger share includes large companies, while on the other side in Czech and Slovakia and Ex-YU region small- and medium-sized companies.

Figure 7.3: ***Distribution of companies by their size (in per cent)***



7.2 Modes of University-Business Cooperation

Most of the employers cooperate with the universities by the mobility of students what is usually performed in a form of practical training and internships. This mode of cooperation ranks as the first one in most of the countries included in the large scale survey, with the exceptions of Czech and Slovakia and Scandinavia where it ranks as the third, and Bulgaria and Ex-YU countries where the most common mode of activity of cooperation with universities is adult education, training and short courses.

The mobility of students is followed by the research and development activities and adult education and training. The research and development is most common activity in Scandinavian countries, but not used to a very large extent in Croatia and Czech and Slovakia. However, the Croatian employer described one of the research and development cooperation modes: "*We are just starting one research with the faculty of civil engineering – for them, it would be a basis for a research within one PhD dissertation and for us it is interesting because the results of that research will be used for the improvement of our processes. So we finance that research and the faculty conducts it, and that is a good symbiosis with several benefits for both sides.*" (EU_Case study_CRO1)

Involvement of companies into curriculum development activities is most commonly used in Czech and Slovakia, also rather often in Bulgaria, Croatia, Scandinavia, Spain, Italy, and continental and Ex-YU regions but least commonly in Russia. Least common activity of university-business cooperation reported by the companies is in all countries and regions with exception of Italy the mobility of academics.

Table 7.4*: Most common modes of activities of cooperation with universities (rank)*

	Research and development	Mobility of academics	Mobility of students	Curriculum development and delivery	Adult education, training and short curses
Bulgaria	3			2	1
Hungary	2		1		3
Poland	2		1		3
Slovenia	2		1		3
Spain	2		1	3	
Croatia			1	2	3
Czech and Slovakia			3	1	2
Italy	2		1	3	
Continental	2		1	3	
Ex-YU countries	2			3	1
Scandinavia	1		3	2	
Russia	2		1		3
Total	2		1		3

Question B1: To what extent does your organisation cooperate with higher education institutions regarding the following activities? 1=most common activity.

The table below shows the ranks of the most frequent modes of companies' engagement in the activities in relation to universities. In general the employers and other representatives of the companies most often participate in study, teaching and research activities, and only in Slovenia and in the region of continental countries they most often cooperate with institutions focused on university-business cooperation. Otherwise, this activity ranks in total as third most frequent. In Russia, the employers reported they are most frequently involved in the participation in the activities of alumni networks.

The least frequent mode reported by the representatives of companies is in total participation of academics on company boards. But in the continental region and in the Ex-YU countries this mode reaches third and second rank. On the other side is the participation of business people on university boards least frequent activity in continental countries, but reaches second rang in Ex-YU countries, and third rank in Scandinavian countries. There are still some other differences among the countries and regions included in the large scale survey. In Slovenia and in Spain employers reported they quite frequently cooperate with incubators for the development of new businesses, but the least in Italy and Ex-YU countries. Similarly is regarding the participation in the activities of alumni networks – rather frequent mode of university-business cooperation in Bulgaria, Croatia and in Ex-YU countries, but least frequent mode in Poland and Italy. Especially companies in Bulgaria, Croatia and Italy also reported on their frequent cooperation with universities' career offices.

Table 7.5*: Most frequent modes of engagement in the activities in relation to universities (rank)*

	Participation of academics on company boards	Participation of business people on HEIs boards	Participation in the activities of alumni networks	Cooperation with HEIs career offices	Cooperation with institutes focused on UBC	Cooperation with incubators for the development of new businesses	Participation of business people in study, teaching and research activities
Bulgaria			3	1			2
Hungary				2	3		1
Poland		3			2		1
Slovenia					1	3	2
Spain					3	2	1
Croatia			3	1			2
Czech and Slovakia				3	2		1
Italy				1	2		1
Continental					1		2
Ex-YU countries		2	3				1
Scandinavia		3			2		1
Russia			1		3		2
Total				2	3		1

Question B5: How often does your organisation engage in the following activities in relation to higher education institutions? 1=most frequent mode.

To make an overall view of the table on most frequent modes of activities of university-business cooperation one can say that undoubtedly the most frequent mode reported by majority of employers is participation in study, teaching and research activities, while on the

other side they least frequently cooperate by participation of academics on their company boards but regarding other modes of cooperation they rather diverse among countries.

7.3 Barriers to the University-Business Cooperation

The employers included in the large scale survey were also asked to provide the relevance of the barriers to their cooperation with universities. In total the main barrier is in mostly all countries and regions the bureaucracy within or external to higher education institutions, with the exception of Scandinavian countries. But as the Slovakian employer emphasised, also the companies are facing the bureaucratic processes within their own companies: *"Since our company is large, the approval processes for cooperation are rather long and several people from different departments need to be involved. On the other side the universities are mostly public what means they have to respect the state regulations and have for example public procurement when purchasing some equipment*" (EU_Case study_SK2).

The second most relevant barrier to cooperation with higher education institutions are different time horizons as the dynamic business environment acquires flexibility and rapid response or as reported from Croatian IT employer: *"Very often an industry or business comes with some concrete problem and requires a solution in a very short time but university is not always ready to do that in such a way. They need some time to understand the problem, to solve the problem and they are not, and cannot be fully dedicated to solving such industry problems and fulfil the time requirements*" (EU_Case study_CRO3).

The bureaucratic obstacles to university-business cooperation and different time horizons are followed by different motivation and values and as the previous table showed the common motives is one of the main drivers to university-business cooperation.

In Hungary, Czech and Slovakia, Italy, continental countries, Scandinavia and Russia the employers also reported that among the most relevant barriers to university-business cooperation are different modes of communication and language between the two actors, but this is the least relevant barrier in Slovenia. The barriers of misunderstanding between companies and universities was described also by Swedish employer: *"I think the biggest barrier is that we really haven't reached the full understanding of the different types of environments that universities live in, compared to business and vice versa. We put a lot of focus on having strategic discussions, learning how to understand each other. I'll give you one experience: universities sometimes, when being approached or when they approach us, only think that we are a source of money. They think that we will provide money to the universities. We do that in a number of cases and with a fair amount of money, but this is not really the big issue for us. We want to have common projects that our researchers are engaged with the academic research and we run common projects, which is both based on the research challenge and the business challenge"* (EU_Case study_SW1). This case can also show as that the elimination of one barrier enhances the important drivers which lead to the university-business cooperation.

The employers from Bulgaria, Hungary, Croatia, Czech and Slovakia, Ex-YU countries and Russia also reported they have difficulties in finding the appropriate persons within the universities for the aims of cooperation, but it is the least relevant barrier in Scandinavia. Otherwise, the least relevant barrier to university-business cooperation in total is the current financial crisis but also the tendency of universities for publishing confidential results, with an exception of Bulgaria where this barrier ranks as the second one.

Table 7.6*: Relevance of the barriers to university-business cooperation (rank)*

	Different modes of communication and language	Different time horizons	Different motivation and values	Difficulty in finding the appropriate persons within HEI	Bureaucracy within or external to the HEI	HEIs want to publish confidential results	Limited ability of knowledge transfer	The current financial crisis
Bulgaria				1	3	2		
Hungary	2		3	2	1			
Poland		3	1		2			
Slovenia		3	2		1			
Spain		3	2		1			
Croatia		3	2	2	1			
Czech and Slovakia	2		3	2	1		3	
Italy	3	2			1			
Continental	3	2	1		2			
Ex-YU countries			1	3	2			
Scandinavia	3	2	1					
Russia	2	3		3	1			
Total		2	3		1			

Question B7: How relevant are the following barriers to higher education institutions-business cooperation? 1=most relevant barrier.

7.4 Developmental Needs and Drivers and Impacts of University-Business Cooperation

The employers from EMCOSU countries and countries and regions outside the project consortium included in the large scale survey reported that the major developmental need that the universities should focus on in the future is to provide strategic cooperation with business and there are no large differences among countries with an exception of Czech and Slovakia where the strategic cooperation is not among top three developmental needs.

In total, the second developmental need that should be, as reported by employers, implemented into the higher education system is the increase of practical orientation of teaching and the third is to enhance traineeships and internships.

Italian employers reported that universities should mainly focus on supporting an international orientation of their institutions; the enhanced internationalisation was also strongly emphasized to a large extent in Slovenia, Czech and Slovakia, Ex-YU countries and Scandinavian region. The Croatian and Italian employers see relatively high need of future

development of universities also in enabling the valorisation of applied research. The employers from Poland and Continental, Ex-YU and Scandinavian regions see one of the major developmental needs also in focus on the development of long-term skills which is on the contrary the least reported change among Bulgarian employers.

The majority of all employers included in the large scale survey reported that by their opinion the focus on short-term skill development is the least needed change the universities should focus on among the provided variables, and Hungarian and Polish employers reported that this is the improvement of higher education institutions' financial systems but we can also assume that employers are not always familiar with the financial systems of universities.

Table 7.7*: Future developmental needs of universities (rank)*

	Increase the practical orientation of teaching	Enhance traineeships and internships	Improvement in HEIs financial system	Focus on short-term skill development	Focus on long-term skill development	Support an international orientation	Focus on R&D	Enabling the valorisation of applied research	Strategic cooperation with business
Bulgaria	2	3							1
Hungary	1	3							2
Poland	1				3				2
Slovenia	3					2			1
Spain	2	3							1
Croatia	2	3						3	1
Czech and Slovakia	1	3				2			
Italy						1		3	2
Continental	3	3			2				1
Ex-YU countries	1				3	2	3		1
Scandinavia					3	2			1
Russia	3	1							2
Total	2	3							1

Question B4: In your view, to what extent should higher education institutions change in the future? 1=most reported change.

The ranks of the most common drivers of university-business cooperation in total show that employers reported they mostly cooperate with universities basing on the existence of mutual trust and commitment, followed by the existence of shared motives and prior relationships with universities with an exception of Italy where employers reported that this is the least common factor facilitating their cooperation with universities.

One of the most commonly mentioned drivers of university-business cooperation is also interest of universities to access the practical knowledge – most common in Hungary and Czech and Slovakia, followed by Spain and Italy, and Poland, Slovenia, Croatia and continental countries.

In total the least common driver is flexibility of higher education institutions, but it is interesting to note that Scandinavian employers included in the large scale survey and the ones from Ex-YU countries reported this is second and third most common driver of their cooperation with universities. Otherwise, there are some differences among analysed

countries and regions regarding the least common driver: in Slovenia, Croatia, Czech and Slovakia and continental regions these are the financial resources for working with universities and in Hungary, Spain, continental regions, Scandinavian countries and Russia this is the access to the research and development facilities of universities.

Table 7.8*: Drivers of university-business cooperation (rank)*

	Existence of shared motives	Financial resources for working with HEI	Flexibility of HEI	Interest of HEI in accessing practical knowledge	Access to HEI's R&D facilities	Close geographical distance of HEI	Existence of mutual trust and commitment	Prior relationship with HEI
Bulgaria	1				3			2
Hungary	2			1			2	3
Poland				3			1	2
Slovenia	2			3			1	
Spain				2		3	1	
Croatia	1			3			3	2
Czech and Slovakia	2			1			3	1
Italy	3			2			1	
Continental	2			3			1	
Ex-YU countries	2		3				1	2
Scandinavia	1		2				1	3
Russia	3						1	2
Total	2						1	3

Question B6: How much do the following statements facilitate your organisation's cooperation with higher education institutions? 1=most common facilitating factor.

Regarding the drivers of university-business cooperation we can conclude that it is important that the companies and universities strive to the same goals and are reliable and trustworthy partners in this process.

It is interesting to note that in all countries and regions the employers see the most common benefit of university-business cooperation in the development of skills of students that are relevant for the labour market. The exceptions are only Italy and Russia where it ranks as the second most common benefit. In those two countries the main benefits are the innovative capacities of the enterprise in Italy and regional development and cohesion in Russia.

However, the employers did not share such equal opinion on the most common benefits regarding the other variables. According to their responses the university-business cooperation also positively impacts the innovative capacities of the enterprise, but this benefit is least common in Scandinavian countries. In general the least common benefit that the university-business cooperation affects is the overall performance of business, but this is true for employers in Poland, Spain, Croatia, Czech and Slovakia, and continental countries, but on the other hand it was listed as second or third rank benefit of university-business cooperation in Bulgaria, Hungary, Ex-YU countries and in Scandinavia. That the business performance can be enhanced by the university-business cooperation was also described by a Swedish employer: *"You need access to the best scientists and you need to really assure that the scientific results can also be implemented in the real product or service. If we don't have*

cooperation with the universities and the access to the brightest and smartest people, we will no longer be able to compete and to be one of the world leaders in the field that we are active in. For us it's the matter of long term survival" (EU_Case study_SW1).

There is a similar picture of different levels of reported benefits regarding the impact on regional development and social cohesion where employers from Bulgaria, Hungary, Slovenia and Scandinavia reported this is the least common benefit of university-business cooperation, but is on the other hand rather important in Spain, Croatia, Czech and Slovakia, Italy, continental countries and as already mentioned before, in Russia. Cooperation with universities also importantly improves the knowledge of academics regarding the reports of employers from Hungary, Poland, Czech and Slovakia, continental countries, Ex-YU countries, Scandinavian countries and Russia.

Table 7.9*: Benefits of university-business cooperation (rank)*

	Performance of business	Skills of students relevant to the LM	The knowledge of academics	The practical skills of professionals from organisations	The innovative capacities of the enterprise	Regional development and social cohesion
Bulgaria	2	1			3	
Hungary	3	1	2		3	
Poland		1	2		3	
Slovenia		1		3	2	
Spain		1			2	3
Croatia		1			3	2
Czech and Slovakia		1	2			3
Italy		2			1	3
Continental		1	2			3
Ex-YU countries	2	1	3		3	
Scandinavia	2	1	3			
Russia		2	3			1
Total		1	3		2	

Question B9: Please indicate to what extent you agree with the following statements: HEI-business cooperation importantly improves … 1=most common benefit.

Despite the fact that university-business cooperation mostly impacts the development of skills of students needed on the labour market we cannot conclude that the benefits are mostly on the side of the students. Thus, the employers receive more competent employees with specialised knowledge or as it was explained by the Slovakian employer form the sector of industry: "*The university-business cooperation makes the students and teachers more aware of the usage of technology in the real word. On the other hand, employees and company itself benefit from the creative ideas of teachers and students and also have the opportunity to hire the best students and graduates of technical universities. The university-business cooperation is therefore beneficial for both parties and its developments help in the above mentioned areas"* (EU_Case study_SW1).

7.5 Employability of the graduates

The main recruitment mechanism that the companies use for hiring the graduates is the internet, followed by internship placements and private contacts. Only in Ex-YU countries the main mechanism is still advertising in the newspaper which is in EMCOSU countries the least used mechanism. Public employment agencies are least frequently used in the Western Europe – Italy, Continental region and Scandinavia and on the other side private ones in Eastern Europe (with exception of some countries) – Hungary, Poland, Croatia and Ex-YU region.

Table 7.10*: Recruitment mechanisms (rank)*

	Advertisement in the newspaper	Public employment agency	Private employment agency	Internet	Internship placement	Private contacts	Help of HEI
Bulgaria				1	3	2	
Hungary				1	3	2	
Poland				1	2	3	
Slovenia				2	1	3	
Spain				2	1	3	
Croatia				1	1		3
Czech and Slovakia			3	1		2	
Italy					1	3	2
Continental				1	2	3	
Ex-YU countries	1			2	3		
Scandinavia				1	3	2	
Russia				3	1		2
Total				1	2	3	

Question A5: How often does your organisation use the following recruitment mechanism for hiring higher education graduates in the last five years? 1=most common mechanism.

The table below represent the ranks of the skills possessed by new graduates. The approached employers emphasised to what extent the new graduates possess different skills. With the exception of Scandinavia where this skill is on the second place, the employers reported the graduates have the highest ability in acquiring new knowledge, followed by the ability to work productively with others. Only is Spain the employers reported that the lowest level of possessed skills is the ability to work in a foreign language, while on other countries, especially in Scandinavia, this ability possessed by graduates is quite high. In total and also in most countries and regions the lowest possessed skill by higher education graduates is the ability to efficiently use the time, but in Czech and Slovakia, Italy and Ex-YU region this is the mastery in the field or discipline.

Table 7.11*: Possession of skills by HE graduates (rank)*

	Mastery in the field or discipline	Ability to acquire new knowledge	Ability to perform well under pressure	Ability to use time efficiently	Ability to productively work with others	Ability to come up with new ideas and solutions	The ability to work in a foreign language
Bulgaria		1				2	3
Hungary		1			2	3	
Poland		1			3		2
Slovenia		1				3	2
Spain		1			2	3	
Croatia		1			3		2
Czech and Slovakia		1			2	3	
Italy		1		3	2		
Continental		1			2		3
Ex-YU countries		1		3	2		
Scandinavia	3	2					1
Russia		1			3	2	
Total		1				3	2

Question A6: Please provide information to what extent new graduates in your experience possess these skills? 1=most commonly possessed.

7.6 Case Studies of University-Business Cooperation

Within the project there were conducted 17 in-depth interviews among employers from different EU countries in order to gather examples of the good practices of university-business cooperation and thorough view of the employers' perspective on the cooperation with universities. Among the selected companies there are six of them from the industry sector, three from the services sector and three from the IT sector.

Modes of cooperation[3]

The analyses of the interviews implemented among the representative of different companies from various EU countries shows that the companies cooperate with the universities mostly in the following activities: mobility of students, research and development, engagement in educational process, mobility of academics and other, more company-specific modes.

Mobility of students: Most often the companies provide internship placements for students with duration of several weeks up to one year. Within the internships students are involved in the research projects or they perform usual work tasks and most often are supervised by the senior mentor who is an employee of a company. One company described they invite to their internship placements also international students for work in internationally oriented activities of the company and one company keeps continuous relations with universities and their placement offices to recruit the best students. Several companies reported that internship placements often lead also to the full employment. Companies also organise summer camps with an aim of participation on a special project (for example with an aim to develop new

[3] Please see also Appendix Case Studies for examples of UBC.

software together with a mentor) or they recruit students to help and cooperate with senior employees in research projects. Regarding the mobility of students several companies also reported they provide funding for PhD candidates who perform researches that are of an interest for the companies.

Research and development: The representatives of selected companies described different modes of cooperation with universities regarding the research and development activities. Most often they approach university staff in order to discuss the developmental and technological issues they are facing with what can often lead also to the implementation of research projects that envisage involvement of both sides: company and university, often also with a support of students. One company reported they yearly provide funding for selected university research project and one company reported they have long-term contracts with universities regarding the research activities (and also education processes) – however they select the strong areas/departments of specific universities and cooperate only in these areas.

Engagement in education process: There have been several cases described from the selected representatives of companies on the participation of their employees into the university lectures as invited speakers what is most common engagement of business people into the teaching processes. Two representatives reported their staff engages also in the curriculum development of the study programmes and one of them also participates in the services of accreditation of study programmes. One company also reported they share the implementation of the elective course at one university together with five more companies where they provide lectures to students on different business models.

Mobility of academics: The inclusion of academics into university-business activities is two folded: some representatives of selected companies reported they provide academics with training courses in order to acquaint them with their technology and business processes and on the other side they invite academics of specific expertise to provide lectures and training courses to their employees.

Others: Representatives of selected companies reported also about other modes of cooperation they have with universities. Two of them are regularly participating on universities' career days presenting their company and jobs they offer, they provide advice, consultation and support to students who are preparing their theses, they provide special foundation for supporting students activities (for example student research project etc.), and they offer seminars and courses in a form of non-formal education.

Barriers to cooperation

The representatives of different EU companies reported on various barriers that they face with when cooperating with the universities. Even though there are a large variety of reported barriers, their responses mostly refer to the differences among universities and companies and their working environments and bureaucratic obstacles.

One of the biggest barriers to university-business cooperation that was reported by the employers was different motives, interests, and therefore different goals on the both sides. By their opinion the academics are not interested to a large extent to practical issues and applied research. Academics should also lack of business thinking and real business experiences what would encourage and motivate them to cooperate with business.

Representative of companies also pointed out the non-flexibility of higher education institutions, especially regarding regular adaptations and changes into the curricula by following new technologies and new trends in the area. In this respect students would also gain more adequate knowledge that employers expect from them. The respondents also emphasized that the universities expect financing of the cooperation, however they do not have clear ideas what this cooperation should be.

Regarding the bureaucracy the respondents reported on several different barriers, especially the documentation that is needed to establish any kind of cooperation. One of the respondents reported that even the internships for the mobility of students demand a lot of paperwork. The employers also referred to university-business cooperation within EU funded projects, however the amount of documentation needed for the application is rather time consuming, since they are not part of regular schedule and they are not enough market and profit oriented. A representative of a large multinational also reported that cooperation with universities demands inclusion of several company's departments what extents the formal processes, and on the other side state regulations for public universities are too rigid.

Several employers reported on the issues regarding the "time". Two respondents stated the university-business cooperation is not structured within the company; therefore the cooperation depends on the voluntary will of the employees outside the regular working time. In the employers' responses it was also emphasized that the fact that universities use academic year may mean an obstacle to planning activities of cooperation. One company also reported that their business is mostly seasonal; therefore it is also difficult to get support from universities throughout the summer. The representative of the companies also reported that universities often cannot follow the need for rapid and immediate problem solving and response to the market flows.

Benefits of cooperation

The representatives of selected companies agree that the benefits of university-business cooperation are mutual. By their opinion the academics hold pioneer knowledge in very specific areas that can be further developed in products and /or services. Universities also receive input and examples from practice and on the other side, the companies get support in research and development. In this respect companies can become more competitive and access to the academic knowledge, and universities can provide more practical knowledge to their students and get an access to the top technologies. And what is more, the university-business cooperation allows share use of financial and infrastructural resources and the development of new ideas.

The benefits of university-business cooperation also refer to the development of skills and knowledge of the graduates that are needed for the successful entrance to the labour market. Internship placements also help employers to find the best and most adequate graduates for the possible later recruitment into the company.

Conclusion

The selected companies that provided an insight into their university-business cooperation described several modes of cooperation where the most common one is the mobility of students, especially in a form of internship placement. Companies have also established cooperation in research and development where they use the knowledge and resources of both, academics staff as well as students. However, the representatives of companies are also often engaged into the educational processes at the universities.

The employers emphasise the mutual benefits of the cooperation, especially regarding the knowledge transfer, however they pointed out also the barriers to their cooperation that can be of a very bureaucratic nature to more personal, such as sharing common interests and motives. But to enhance the university-business cooperation it is important to establish a regular communication to understand each other and to come to common understanding what the needs are and what are the potentials of the successful cooperation.

8 Employers' Associations and University-Business Cooperation

The EMCOSU large scale survey includes also responses from employers' associations which are mostly chambers of commerce and industry. A majority of associations covers all economic sectors and are private non-profit. The analyses include 14 employers' associations from Bulgaria, 30 from Poland, 19 from Slovenia, and 6 from EU countries that are not partners in EMCOSU project (non-EMCOSU countries). The employers' associations thus reported on their cooperation with higher education institutions.

As shown in the table below the employers' associations mostly cooperate with universities in adult education and lifelong learning programmes, followed by the research and development activities and mobility of students. Cooperation of employers' associations in lifelong learning programmes reaches the highest rank in all countries with an exception of Slovenia where activities of research and development presents most common mode of cooperation but are closely followed by the adult education and lifelong learning programmes. On the other hand the least common modes of cooperation of employers' associations with universities are mobility of academics and curriculum development. The reported values on the extent of cooperation with universities are significantly low in Bulgaria, followed by Poland, while the highest extent of cooperation was reported by the non-EMCOSU countries, followed by Slovenia.

Table 8.1: ***Most common modes of university-business cooperation (ranks and means)***

	Research and development	Mobility of academics	Mobility of students	Curriculum development	Adult education, LLL
Bulgaria	**3** (1,7)	**3** (1,7)		**2** (2,3)	**1** (3,6)
Poland	**2** (3,5)			**3** (2,9)	**1** (3,7)
Slovenia	**1** (4,8)		**3** (4,3)		**2** (4,4)
Non_EMCOSU			**2** (4,8)	**3** (4,7)	**1** (5,2)
Total	**2** (3,6)		**3** (3,1)		**1** (4)

Question B1: To what extent does your organisation cooperate with HE institutions regarding the following activities? Means of responses on a scale from 1="Not at all" to 7="To a very high extent".

In total the representatives of employers' associations reported that they and their member organisations most often participate in study, teaching and research activities of higher education institutions closely followed by cooperation with institutes focused on university-business cooperation and with incubators for development of business. Least often they are engaged in the activities of alumni networks and higher education boards and vice-versa – the academics least often participate on companies' boards.

The modes of engagement in university-business activities however differ among countries. The mean values of most frequent modes of engagement of employers' associations in the activities in relation to university are much higher in Bulgaria than in other countries in which values are slightly above of a medium level. Bulgarian representatives of employers' associations reported that they cooperate to a very large extent with universities' career offices, activities of alumni networks and also participate in the study, teaching and research activities. It is interesting to note that one of the most frequent modes of cooperation with universities among surveyed Polish and non-EMCOSU representatives are participation of academics on company boards and participation of business people on higher education boards, while in other countries those two modes are not frequent.

Table 8.2: ***Most frequent modes of engagement in the activities in relation to universities (ranks and means)***

	Participation of academics on company boards	Participation of business people on HE boards	Participation in the activities of alumni networks	Cooperation with HEI's career offices	Cooperation with institutes focused on UBC	Cooperation with incubators for development of business	Participation of business people in study, teaching, research activities
Bulgaria			**3** (6,3)	**1** (6,5)			**2** (6,4)
Poland	**2** (3,7)	**3** (3,6)			**1** (3,8)		
Slovenia					**2** (4,4)	**1** (4,6)	**3** (3,7)
Non_EMCOSU	**2** (4,5)	**2** (4,5)	**3** (4,3)	**2** (4,5)	**1** (5,7)	**1** (5,7)	**1** (5,7)
Total					**2** (4,1)	**3** (4)	**1** (4,3)

Question B5: How often does your organisation engage in the following activities in relation to HE institutions? Means of responses on a scale from 1="Not at all" to 7="To a very high extent".

Regarding the future developmental needs of universities the employers' associations' representatives reported that universities should put more focus to increase practical orientation of teaching, develop strategic cooperation with business and enhance traineeships and internships. All these future developmental needs gained high mean values in all countries thus meaning that these future developmental needs occur in majority of national systems regarding university-business cooperation and that representatives of employers' associations perceive those changes at universities as necessary. In Bulgaria and non-EMCOSU countries valorisation of applied research and focus on research and development were also perceived important future developmental needs of universities and thus ranked high. Moreover Bulgarian representatives exposed that future developmental needs of universities should focus on short-term skill development and improvements in financial systems of universities, while Polish representatives of employers' associations ranked high long term skill development. Supporting an international orientation was reported as least important future developmental needs of universities by the representatives of employers' associations.

Table 8.3: ***Future developmental needs of universities (ranks and means)***

	Increase the practical orientation of teaching	Enhance traineeships and internships	Improvements in their financial systems	Focus on short-term skill development	Focus on long-term skill development	Support an international orientation	Focus on R&D	Enabling valorisation of applied research	Strategic cooperation with business
Bulgaria		**3** (6,3)	**3** (6,3)	**2** (6,4)			**2** (6,4)	**1** (6,6)	
Poland	**1** (6,5)	**3** (5,7)			**3** (5,7)				**2** (5,9)
Slovenia	**2** (6,5)	**3** (6,4)							**1** (6,8)
Non_EMCOSU	**3** (6,3)	**2** (6,7)					**3** (6,3)	**1** (6,8)	**1** (6,8)
Total	**1** (6,4)	**3** (6,1)							**2** (6,3)

Question B4: In your view, to what extent should higher education institutions change in the future? Mean of responses of a 7-level scale where 1=”Not at all” and 7=”To a very high extent”.

From the table below three major barriers to university-business cooperation that were reported from the representatives of employers’ associations can be identified. Namely, different motivations and values, different time horizons and bureaucracy within or external to higher education. All these barriers gained high mean values in all countries, therefore it can be said these are general barriers that occur in majority of national systems regarding university-business cooperation. On the other hand the least common barriers are current financial crisis and willingness for confidential publication of results.

In general non-EMCOSU countries and Bulgaria have the highest common value of means what it can also mean that the barriers to university-business cooperation are there the highest. On the other side, these values are the lowest in Poland and Slovenia. However this does not mean that there are no barriers at all, on contrary, the values are still relatively high.

Table 8.4: ***Relevance of the barriers to university-business cooperation (ranks and means)***

	Different modes of communication	Different time horizons	Different motivations and values	Difficulty in finding appropriate persons within HEI	Bureaucracy within or external to HEI	HEI wants to publish confidential results	Limited ability of knowledge transfer	Current financial crisis
Bulgaria	**2** (5,3)	**1** (5,8)	**3** (4,8)		**3** (4,8)			
Poland	**3** (4,0)	**2** (4,3)	**1** (4,7)	**3** (4,0)	**1** (4,7)		**3** (4,0)	
Slovenia		**3** (4,7)	**1** (5,3)		**2** (5,1)			
Non_EMCOSU	**2** (5,3)	**1** (5,7)	**1** (5,7)	**2** (5,3)	**2** (5,3)	**3** (3,8)	**1** (5,7)	
Total		**3** (4,8)	**1** (5,0)		**2** (4,9)			

Question B7: How relevant are the following barriers to HE institutions-business cooperation? Mean of responses of a 7-level scale where 1=”Not at all” and 7=”To a very high extent”.

According to the reported results the university-business cooperation brings relatively high level of improvement and benefits of different areas, most notably it improves to a very high extent the skills of students, following by practical skills of professionals from organisations and innovative capacities of the enterprises. The university-business cooperation should be the least beneficial for the knowledge of academics and the development of social cohesion but the values are high, thus it can be said that the impact on it is not negligible.

Regarding the county specific benefits of university-business cooperation Bulgaria has the highest mean values therefore it can be said that benefits of university-business cooperation are perceived very important among their representatives of employers' associations while on the other hand Poland has the lowest mean values but still relatively high which means that benefits of university-business cooperation are also important for representatives of employers' associations in Poland.

Table 8.5: ***Benefits of university-business cooperation (ranks and means)***

	Performance of business	Skills of students	Knowledge of academics	Practical skills of professionals from organisations	Innovative capacities of the enterprise	Regional development and socila cohesion
Bulgaria	**1** (6,8)	**1** (6,8)		**2** (6,7)	**3** (6,6)	**3** (6,6)
Poland		**1** (5,3)	**2** (4,8)	**3** (4,7)		
Slovenia	**3** (5,5)	**1** (6)		**2** (5,9)	**2** (5,9)	
Non_EMCOSU		**1** (6,8)	**3** (6,2)		**2** (6,3)	
Total		**1** (5,9)		**2** (5,6)	**3** (5,5)	

Question B9: Please indicate to what extent you agree with the following statements: HEI-business cooperation importantly improves…? Mean of responses of a 7-level scale where 1="Not at all" and 7="To a very high extent".

We can identify three major drivers of university-business cooperation that were reported from the representative of employers' associations. These are existence of mutual trust and commitment, interest of higher education institutions in accessing practical knowledge and prior relationship with higher education institutions. As seen from the table below the least common drivers are financial resources for working with higher education institutions and flexibility of the higher education institution.

In general Bulgaria has the highest common values of means which also mean that drivers for university-business cooperation are perceived important to a very high extent among their representatives of employers' associations. Poland has the lowest mean values but still more than one point above medium level which means that drivers of university-business cooperation are also important for all representatives of employers' associations.

Table 8.6: ***Relevance of drivers of university-business cooperation (ranks and means)***

	Existence of shared motives	Financial resources for working with HEI	Flexibility of HEI	Interest of HEI in accessing practical knowledge	Access to HEI's R&D facilities	Close geographical distance of HEI	Existence of mutual trust and commitment	Prior relationship with HEI
Bulgaria					**3** (6,2)	**1** (6,6)	**2** (6,4)	
Poland				**2** (4,9)		**3** (4,8)	**1** (5,4)	**1** (5,4)
Slovenia	**2** (5,0)			**1** (6,3)			**3** (4,8)	
Non EMCOSU	**2** (5,8)						**1** (6,0)	**3** (5,7)
Total				**2** (5,4)			**1** (5,5)	**3** (5,3)

Question B6: Please indicate How much do the following statements facilitate your organisation's cooperation with higher education institutions? Mean of responses of a 7-level scale where 1="Not at all" and 7="To a very high extent".

In a nutshell, this chapter focused on the reported results of a large scale survey among representatives of employers' associations in EMCOSU countries (Bulgaria, Poland and Slovenia) and several countries outside the project consortium (non-EMCOSU countries), from which are mostly chambers of commerce and industry.

The analyses of results show that the perspective of employers' associations to university-business cooperation does not differ to a large extent to the aspects on the topic from the employers' side. They mostly cooperate through the adult education and lifelong learning programmes, mobility of students and research and development activities. They see the main barriers to this cooperation in different motivations and values and bureaucracy within or external to higher education, together with different perception of time horizons. Representatives of employers' associations also agree that university-business cooperation importantly improves firstly skills of students, followed by practical skills of professionals from organisations and innovative capacities of the enterprise. The university-business cooperation should by their opinion orient towards commercialisation and practical application.

9 Specific Sector Experts' Views on University-Business Cooperation

The EMCOSU large scale survey includes also responses from experts of particular branch in the observed economic sectors of industry, services and information and communication technology who were mostly representatives of different employers' associations. The survey among specific sector experts focused on the university-business cooperation in the sector itself and not within the association of the respondent. The analyses include responses of 25 specific sector experts from Hungary, 26 from Spain and 18from non-EMCOSU countries.

As shown in the table below the specific sector experts of industry, services and IT in general reported that university-business cooperation is mostly developed regarding the research and development activities, mobility of students and adult education and lifelong learning programmes. The least common modes of cooperation in specific sectors are curriculum development and mobility of academics. Nevertheless the mean value of mobility of academics as reported by specific sector experts in industry and IT is slightly above medium level which means that the mobility of academics should also be identified as the mode of cooperation.

Comparison between specific sectors shows that research and development is the most common mode of cooperation in sectors of industry and IT while specific sector experts in services reported that most common mode of cooperation with universities in their sector is mobility of students, closely followed by the research and development. The mean values of those activities are in all three sectors above medium level by almost one point or more, which means that they are identified to a high extent as common modes of university-business cooperation. Curriculum development and delivery is identified by specific sector experts in all sectors as the least common mode of cooperation.

Regarding the country specific specific sector experts in Spain and non-EMCOSU countries reported that research and development is the most common mode while Hungarian representatives ranked mobility of students the highest. In general the highest mean values of the most common modes of university-business cooperation are in non-EMCOSU countries, closely followed by Hungary and Spain. It is interestingly to note that the reported mean values in IT sector in Spain are significantly low, which means that cooperation between universities and business as stated by the representatives of employers' associations is modest.

Table 9.1: ***Most common modes of university-business cooperation (ranks and means)***

Country	Sector	Research and development	Mobility of academics	Mobility of students	Curriculum development and delivery	Adult education, training and short courses
Non-	Industry	1 (5)	2 (4,7)	3 (4,3)	2 (4,7)	
	Services	1 (5,5)	2 (4,3)	2 (4,3)	3 (3,3)	2 (4,3)

EMCOSU	IT	1 (5,5)	2 (5)	2 (5)	3 (3)	2 (5)
	Industry	2 (4,9)		1 (5,2)		3 (4,1)
	Services	3 (3,8)		1 (5)	2 (4)	1 (5)
Hungary	IT	2 (4,3)	3 (4,2)	3 (4,2)		1 (4,5)
	Industry	1 (5,1)		2 (4,2)	3 (3,7)	
	Services	2 (4)	3 (3,8)	1 (4,6)		
Spain	IT	1 (3)	2 (1)	2 (1)	2 (1)	2 (1)
	Industry	1 (5)	3 (3,8)	2 (4,6)		
	Services	2 (4,4)		1 (4,6)		3 (4,2)
Total	IT	1 (4,4)	3 (4)	3 (4)		2 (4,2)

Question B1: To what extent do organisations in the identified sector cooperate with HE institutions regarding the following activities? Means of responses on a scale from 1="Not at all" to 7="To a very high extent".

In total specific sector experts reported that the most frequent modes of engagement with universities are cooperation with incubators for the development of new businesses, closely followed by cooperation with institutes focused on university-business cooperation and by participation of the business people in study, teaching and research activities. As stated by the specific sector experts, there is least often cooperation through the participation on higher education institutions boards and vice-versa – the academics least often participate on company boards in these sectors. Moreover, participation in the activities of alumni networks and cooperation with higher education institutions' career offices are also not perceived as common modes of cooperation by the representatives of employers' associations in specific sectors.

Regarding the differences in specific sectors it is importantly to expose that even though in total participation of business people on higher education institutions boards is one of the least frequent, the representatives of specific sector experts in services in non-EMCOSU countries pointed this mode as the most frequent engagement. Furthermore specific sector experts in industry sector ranked as third most frequent modes of engagement cooperation with higher education institutions' career offices while the representatives of IT sector ranked third participation in the activities of alumni networks. The mean values of most frequent modes of university-business cooperation in specific sector were the highest in the sector service, closely followed by the IT and industry.

In Spain specific sector experts in all sectors ranked cooperation with institutes focused on higher education institutions-business cooperation as the most frequent mode of engagement. To the contrary in Hungary and non-EMCOSU countries specific sector experts in different sectors ranked most frequent modes of engagement with universities differently. The highest mean values of most frequent modes of engagement are in non-EMCOSU countries, followed by Hungary and Spain. Once again Spain has the lowest mean values in IT sector, all bellow medium level.

Table 9.2: ***Most frequent modes of engagement in the activities in relation to universities (ranks and means)***

Country	Sector	Participation of academics on company boards	Participation of business people on higher education institutions boards	Participation in the activities of alumni networks	Cooperation with higher education institutions' career offices	Cooperation with institutes focused on higher education institutions-business cooperation	Cooperation with incubators for the development of new businesses	Participation of business people in study, teaching and research activities
Non-EMCOSU	Industry					2 (5,3)	3 (4,3)	1 (5,7)
	Services		1 (5)			3 (3,7)	2 (4,3)	2 (4,3)
	IT			3 (5)			1 (6,5)	2 (5,5)
Hungary	Industry				1 (4,2)	3 (3,8)	2 (4,1)	2 (4,1)
	Services					2 (4,4)	3 (4,2)	1 (4,6)
	IT		2 (3,8)	2 (3,8)	3 (3,7)	1 (4,2)	3 (3,7)	
Spain	Industry				3 (3,5)	1 (3,9)	2 (3,8)	
	Services		3 (2,8)	2 (3)	3 (2,8)	1 (4,5)	1 (4,5)	3 (2,8)
	IT	2 (2)	2 (2)	2 (2)	2 (2)	1 (3)	1 (3)	2 (2)
Total	Industry				3 (3,7)	1 (4)	1 (4)	2 (3,8)
	Services					2 (4,3)	1 (4,3)	3 (3,9)
	IT			3 (3,9)		2 (4,1)	1 (4,2)	

Question B5: How often do organisations in the identified sector engage in the following activities in relation to HE institutions? Means of responses on a scale from 1="Not at all" to 7="To a very high extent".

We can identify two major drivers of university-business cooperation that were reported from the specific sector experts for their own sectors. These are existence of mutual trust and commitment and prior relationship with higher education institutions. The reported values on the extent of relevance of these two drivers are very high, more than two points above the medium level. Nevertheless also existence of shared motives, financial resources for working with HE institutions, interests of HE institutions in accessing practical knowledge and access to HE institutions' research and development facilities were exposed as important drivers. As seen from the table below the least common drivers are close geographical distance of HE institutions and their flexibility.

Important differences are also between specific sectors. For the IT sector the most relevant drivers are existence of shared motives and mutual trust and commitment. The most relevant driver for the sector of industry is prior relationship with HE institutions while for the services sector existence of mutual trust and commitment. Specific sector experts in the services also ranked high interest of HE institutions in accessing practical knowledge and access to higher education institutions' research and development facilities while in the sector of industry and IT these two drivers were not indicated as relevant to a high extent.

In Hungary and to some extent also in Spain financial resources for working with HE institutions is one of the most relevant drivers while in non-EMCOSU countries with an exception of industry sector this driver is not relevant to a high extent. Especially in Spain and non-EMCOSU countries the existence of mutual trust and commitment is one of most relevant drivers for specific sector experts in all observed sectors.

Table 9.3: ***Relevance of drivers of university-business cooperation (ranks and means)***

Country	Sector	Existence of shared motives	Financial resources for working with higher education institutions	Flexibility of higher education institutions	Interest of higher education institutions in accessing practical knowledge	Access to higher education institutions' research and development facilities	Close geographical distance of higher education institutions	Existence of mutual trust and commitment	Prior relationship with higher education institutions
Non-EMCOSU	Industry		2 (5)		3 (4,7)	3 (4,7)		1 (6)	1 (6)
	Services				3 (5,5)			1 (6,3)	2 (6)
	IT			3 (5,5)	2 (6)	1 (6,5)	1 (6,5)	2 (6)	1 (6,5)
Hungary	Industry		1 (6,1)		2 (5,9)			3 (5,7)	1 (6,1)
	Services	3 (5,2)	2 (5,6)		3 (5,2)		1 (5,8)	2 (5,6)	
	IT	2 (5,7)	1 (5,8)					2 (5,7)	3 (5,3)
Spain	Industry		3 (5,1)	2 (5,5)				1 (5,7)	1 (5,7)
	Services		3 (5,3)		2 (6)			1 (6,3)	2 (6)
	IT	1 (7)	3 (4)	3 (4)	3 (4)	2 (5)	2 (5)	2 (5)	2 (5)
Total	Industry		3 (5,4)					2 (5,7)	1 (5,9)
	Services	3 (4,8)			2 (5,5)	3 (4,8)		1 (6)	2 (5,5)
	IT	1 (5,7)	3 (5,4)					1 (5,7)	2 (5,6)

Question B6: Please indicate How much do the following statements facilitate e cooperation of organisations in the identified sector with higher education institutions? Mean of responses of a 7-level scale where 1="Not at all" and 7="To a very high extent".

From the table below three major barriers to university-business cooperation that were reported from the specific sector experts can be identified. Namely, different motivations and values, different time horizons and bureaucracy within or external to higher education. In general all these barriers gained high mean values therefore it can be said that these are common barriers that occur in majority of national systems and in all specific economic sectors. Different modes of communication and language between higher education institutions and business can also be identified as a relevant barrier but to a lower extent. On the other hand the least common barriers are limited ability of knowledge transfer, publishing of confidential result by the HE institutions, difficulty in finding the appropriate persons within HE institutions and current financial crisis.

Comparison between specific sectors shows that the most relevant barriers as reported by the specific sector experts in the services are different time horizons between higher education institutions and business, while in the sector of industry and the IT the major barriers to university-business cooperation are different motivations and values between higher education institutions and business and additionally for the IT also bureaucracy within or external to the higher education institutions. The mean values are the highest in the sector of industry, closely followed by the IT sector, meaning that the representatives in these two sectors perceive barriers to university-business cooperation to a very high extent. Also in the services sector the mean values are more than one point above medium level which is only slightly lower than in other two sectors.

In Spain the most relevant barrier is bureaucracy within or external to higher education institutions, closely followed by the different time horizons between higher education institutions and business and different motivation and values. In non-EMCOSU countries the most relevant barriers as reported by the representatives of specific sector experts are different time horizons between higher education institutions and business and bureaucracy while in Hungary the most relevant barriers are different motivations and values between higher education institutions and business. With an exception of Spanish IT sector the barriers of

limited ability of knowledge transfer and publishing of confidential results by the HE institutions are not regarded as important to a high extent. Moreover the high mean values for all the barriers were reported by the Spanish representatives of employers' associations for the IT sector, meaning that they perceive all barriers as important to a high extent.

Table 9.4: ***Relevance of the barriers to university-business cooperation (ranks and means)***

Country	Sector	Different modes of communication and language between higher education institutions and business	Different time horizons between higher education institutions and business	Different motivations and values between higher education institutions and business	Difficulty in finding the appropriate persons within higher education institutions	Bureaucracy within or external to the higher education institutions	Higher education institutions want to publish confidential results	Limited ability of knowledge transfer	The current financial crisis
Non-EMCOSU	Industry			3 (5)	2 (5,3)	1 (5,7)			
	Services		1 (4,8)			3 (3,8)			2 (4,5)
	IT	3 (5)	1 (6,5)	2 (5,5)		1 (6,5)			
Hungary	Industry	1 (5,9)	2 (5,8)	2 (5,8)	3 (5,7)	3 (5,7)			
	Services	3 (4,8)	2 (5,2)	1 (5,6)		2 (5,2)			
	IT	3 (5)		1 (5,7)		2 (5,2)			
Spain	Industry	3 (4,)	2 (5,8)	1 (5,9)		2 (5,8)			
	Services		3 (5,3)			1 (5,8)			2 (5,7)
	IT	2 (6)	1 (7)	2 (6)	3 (5)	1 (7)	3 (5)	3 (5)	3 (5)
Total	Industry	3 (5,1)	2 (5,7)	1 (5,8)		2 (5,7)			
	Services		1 (5,1)	3 (4,9)		2 (5)			
	IT	3 (5,1)	2 (5,2)	1 (5,7)		1 (5,7)			

Question B7: How relevant are the following barriers of the cooperation between higher education institutions and organisations in the identified sector? Mean of responses of a 7-level scale where 1="Not at all" and 7="To a very high extent".

According to the reported results of specific sector experts the university-business cooperation brings relatively high level of improvement and benefits of different areas, most notably it improves to a very high extent the skills of students and the innovative capacities of the enterprises. Moreover regional development and social cohesion and to a smaller extent the performance of business and practical skills of professionals from organisations are also ranked as benefits by the specific sector experts. In total the only benefit of university-business cooperation that was not recognized as highly beneficial is improved knowledge of academics.

In the IT sector the most beneficial activity of university-business cooperation are skills of students relevant to labour market careers, closely followed by the performance of business. For the services sector skills of students are also the major benefit, followed by the practical skills of professionals from organisation. The specific sector experts reported for the sector of industry that the innovative capacities of the enterprise are the most important benefit. In general in all sectors the mean values of highly ranked benefits of university-business cooperation are high which means that specific sector experts perceive those benefits as important improvements of UBC.

In Hungary the skills of students relevant to labour market careers were ranked the highest while the regional development and social cohesion was not perceived as an important benefit by the Hungarian representative of specific sectors. In non-EMCOSU countries specific sector experts of all sectors ranked innovative capacities of the enterprise as the most important

benefit for their sectors and also the mean value was very high, meaning that they see benefits of the UBC for innovative capacities of the enterprise to a high extent. In the non-EMCOSU countries representatives of the IT sector valued almost all benefits very high and quite the opposite in the IT sector in Spain all the benefits were valued quite low, just slightly above the medium level.

Table 9.5: ***Benefits of university-business cooperation (ranks and means)***

Country	Sector	The performance of business	The skills of students relevant to labour market careers	The knowledge of academics	The practical skills of professionals from organisations	The innovative capacities of the enterprise	Regional development and social cohesion
Non-EMCOSU	Industry	2 (5,7)	3 (5,3)	3 (5,3)	2 (5,7)	1 (6)	1 (6)
	Services		2 (5,5)	3 (5,3)		1 (6)	
	IT	1 (6,5)	2 (6)		3 (5,5)	1 (6,5)	3 (5,5)
Hungary	Industry		1 (6)		3 (5,7)	2 (5,8)	
	Services		1 (5,6)	3 (5)	2 (5,4)		
	IT	2 (5,7)	1 (6)	2 (5,7)		3 (5,5)	
Spain	Industry		2 (5,5)	3 (5,4)		1 (5,8)	
	Services		1 (6,4)		3 (5,8)	3 (5,8)	2 (6,2)
	IT	2 (4)	1 (5)	1 (5)	2 (4)	2 (4)	2 (4)
Total	Industry		2 (5,6)			1 (5,8)	3 (5,4)
	Services		1 (5,9)		2 (5,4)	2 (5,4)	3 (5,2)
	IT	2 (5,7)	1 (5,9)			3 (5,6)	

Question B9: Please indicate to what extent you agree with the following statements: HEI-business cooperation importantly improves…?
Mean of responses of a 7-level scale where 1=”Not at all” and 7=”To a very high extent”.

Regarding the future developmental needs of universities the specific sector experts reported that universities should put more focus to increase practical orientation of teaching in order to enhance cooperation with business in all three economic sectors. Strategic cooperation with business, support an international orientation, enabling the valorisation of applied research, focus on research and development and enhancing traineeships and internship were also identified as important future developmental needs of universities by specific sector experts. All these future developmental needs gained high mean values thus meaning that representatives of employers’ associations perceive those changes at universities as necessary for enhancing cooperation with companies in specific sector that they represent. In general the only two future developmental needs that were not recognized as important to a high extent were improvements in financial systems of universities and focus on short-term skill development.

As shown in the table below the specific sector experts in all three economic sectors ranked the highest the need to increase of practical orientation of teaching. Specific sector experts in industry also ranked the highest support an international orientation which were not recognized by the services and IT sectors experts as important future developmental needs.

Regarding the country specifics it is interesting to note that the reported mean values in IT sector in Spain are significantly high. Five out of eight future developmental needs were valued by the highest mean value while also other three were above the medium level. This means that future developmental needs of universities are highly important to enhance cooperation with the IT sector in Spain. In Hungary the most important future developmental

need is to increase practical orientation of teaching while in Spain experts of all three economic sectors stated that strategic cooperation is the most important to enhance cooperation with organisations in these sectors. Improvement in the financial systems of universities and focus on short-term skill development were perceived as important future developmental needs of universities only by specific sector experts in Spain and not by representatives from other countries.

Table 9.6: ***Future developmental needs of universities (ranks and means)***

Country	Sector	Increase the practical orientation of teaching	Enhance traineeships and internships	Improvements in their financial systems	Focus on short-term skill development	Support an international orientation	Focus on research and development	Enabling the valorisation of applied research	Strategic cooperation with business
Non-EMCOSU	Industry	3 (5)				2 (5,3)	1 (5,7)	1 (5,7)	2 (5,3)
	Services		3 (5,3)			3 (6)	2 (6,3)		1 (6,7)
	IT	3 (5,5)	1 (6,5)			3 (5,5)	3 (5,5)	2 (6)	
Hungary	Industry	2 (6)				3 (5,9)	1 (6,3)		
	Services	1 (6,2)	2 (5,4)			3 (5)	2 (5,4)	3 (5)	
	IT	1 (6,3)					2 (6,2)		3 (5,8)
Spain	Industry	2 (6)				2 (6)		3 (5,8)	1 (6,2)
	Services	2 (6,4)	2 (6,4)	3 (6)				3 (6)	1 (6,6)
	IT	1 (7)	1 (7)	3 (4)	2 (5)	3 (4)	1 (7)	1 (7)	1 (7)
Total	Industry	1 (5,9)				1 (5,9)	3 (5,5)	2 (5,8)	1 (5,9)
	Services	1 (6)	3 (5,8)						2 (5,9)
	IT	1 (6,2)	3 (6)				2 (6,1)		

Question B4: In your view, to what extent should higher education institutions change in the future to enhance cooperation with organisations from identified sector? Mean of responses of a 7-level scale where 1=”Not at all” and 7=”To a very high extent”.

10 Conclusions and Policy Implications

University-business cooperation (UBC) is currently one of the key strategic challenges facing higher education in Europe. It holds implications for support for graduates' career success, international mobility, modernisation of curricula and the more practical orientation of higher education in general. In a survey among 700 enterprises and enterprise associations in Hungary, Bulgaria, Poland, Slovenia, Spain and other countries, the EMCOSU consortium sought answers to three interrelated questions: i) which are the most relevant modes and results of cooperation; ii) what determines cooperation; and iii) which are the future developmental needs? While at the moment many countries are developing university-business cooperation policies there is still room for improvement in terms of more efficient communication, legal support and better integration of various stakeholders. Although some economic sectors, such as information and communication technology, already have a long established tradition of cooperation with universities, others are still lagging behind due to national and disciplinary limitations. The most general factors that facilitate UBC are *common goals* in terms of mutual benefits, needs and aims, *commitment* of the 'right people' starting from the leadership and involving all levels, and *communication* that includes open dialogue and a shared understanding of the challenges[4]. The EMCOSU project's main findings are presented according to the following headings: diversification and mutual facilitation of modes of cooperation, the centrality of tacit elements, bureaucratic obstacles, the development of competencies, companies' expectations of universities, the importance of work experience, future surveys, the role of employers' associations, own consortium experiences, and future challenges.

There are highly diverse forms of university-business cooperation, yet one form of cooperation facilitates another

The EMCOSU project has identified and analysed various modes and best practices of university-business cooperation such as internships, cooperation with career centres, curriculum development, the establishment of quality standards for work placements in enterprises, entrepreneurial modules, research projects, start-up enterprises, alumni centres etc. Other strategic areas of cooperation include research and technological development with the exchange of know-how and innovation, management- and governance-related collaborations such as the participation of companies on university boards and the establishment of common bodies and new training/entrepreneurship centres. The particularities of these modes are largely determined by the country-specific transition patterns of graduates from education to the labour market as well as differences in professional domains.

[4] See Rakovska, N., Pavlin, S., Melink, M. (2013): Assessment of cooperation between higher education institutions and employers in Europe – Conclusions. EMCOSU report on Workpackage 4.

In general, companies report that among the various cooperation modes they are the most strongly engaged in activities related to student mobility and research and development. This is also consistent with the survey among higher education institutions[5]. One out of three companies report that they practise these activities to a large extent. As expected, stronger engagement in these activities is reported by large enterprises. This brings onto the policy agenda the call for special institutional support for small and medium enterprises. Moreover, the enterprises report that they most often participate in study, teaching and research activities and cooperate with an HEI's career offices. Common participation in company or higher education bodies is the least experienced form of participation. Similarly to the past survey among higher education institutions[6], the survey among enterprises also finds that one form of UBC strengthens another: the existence of students' internships, for example, also opens the door to other modes of UBC like, for example, research and development, curriculum or adult learning. This means that for a company or higher education institution any single UBC mode is a good potential investment.

Tacit aspects are more important facilitators of university-business cooperation than external ones: greater understanding is needed in this area

The most important facilitators of UBC are mutual trust and commitment and shared motives: more than every second enterprise considers these two elements as important facilitators to a large extent. These two factors were also identified as the most important ones in the survey among higher education institutions[7]. Moreover, a considerable number of interviewees from enterprises stressed that fruitful cooperation depends on the mutual benefits of universities and enterprises, continuity and an understanding of each other's views. Some interviewees also say that universities and enterprises should be involved in establishing transparent and unambiguous legal regulation that ensures state support for research and development programmes. Other interviewees express their expectation of greater flexibility from higher education institutions.

Still other interviewees warn that all parties involved in UBC should be clear that any such cooperation needs a monetary return, even though currently an important motive for cooperation is often the need to substitute reduced governmental funding, which cannot be the prime motive for UBC. UBC should always be seen as a strategic investment: "*UBC brings new ideas from business to the university as well as new ways for looking at things and processes, which helps them ensure greater efficiency…*" (from the EMCOSU interviews). While motives, interests and values represent the main drivers of UBC, at the same time they represent some of the key barriers.

[5] Davey, T., Baaken, T., Galan Muros V. & Meerman A. (2011b): The State of European University-Business Cooperation. Final Report – Study on the cooperation between Higher Education Institutions and public and private organisations in Europe. Accessed: http://ec.europa.eu/education/higher-education/doc/studies/munster_en.pdf (15.8.2013)

[6] See footnote 2

[7] See footnote 2

Bureaucratic obstacles should be removed because enterprises regard them as the biggest barrier to cooperation with universities

The survey reveals that bureaucracy within or external to higher education institutions is regarded by enterprises as the biggest obstacle to cooperation – even bigger than the different expectations and time horizons of universities and business. Two out of three companies agree to a large extent that bureaucratic obstacles pose a relevant barrier to UBC. Somewhat surprisingly, the current financial crisis is perceived as the least important factor in cooperation.

Bureaucratic obstacles are particularly stressed in the case of small and medium enterprises. Interviewees, for example, complained about the huge amount of formal documents required for internships and research. They also find problematic the formal rules of UBC within EU-funded projects especially because UBC often appears as an additional activity to core business. One interviewee reports "*there is a strong trend to bureaucratise all the activities … in some cases even the length and timing of the traineeships are prescribed on the institutional level but not dictated by the logic and goals of the programme… wider cooperation is often hampered by the need for multi-step decisions at different levels*" (from the EMCOSU interviews). Interviewees report that bureaucracy is not only a technical issue but reflects the rigidity of national laws in a state's legal system related to higher education governance and intellectual property protection.

Another key barrier relates to the different time horizons between higher education institutions, motives and values. Several interviewees state that enterprises have a different way of thinking: people from the world of work are described as market-oriented while academics are primarily engaged in the creation and dissemination of science – as one representative of a Spanish company claims: "*The activity of research groups at universities and technology centres is (often) far from the needs of businesses. For companies the most important is the generation of patents for commercial exploitation, but the priority for universities is to publish the results of research… The work of researchers is measured by the number of publications they have, not by its practical outcome*" (from the EMCOSU interviews). A number of interviewees from enterprises complain that universities do not have an intrinsic need to change and that cooperation with the world of work is insufficiently represented as a success factor in academic achievements. Apparently, there is a need for greater institutional support to facilitate dialogue between the two spheres.

The development of competencies is perceived as the key outcome of UBC, and the performance of business as the least important

Students' skills relevant to labour market career development are perceived by employers as the most important outcome of university-business cooperation – four out of five companies agree to a large extent that this is an important outcome of UBC. The same factor was also identified as the most important outcome of UBC in the survey among higher education institutions. The EMCOSU project has also found that companies assess graduates' ability to

acquire new knowledge very highly, but much less their ability to use time efficiently, perform well under pressure and facilitate mastery in their field of discipline. Employers also believe the performance of business is the least important outcome of UBC but they agree that it improves the innovative capacities of enterprises, which is perceived as the second most important outcome of UBC. Therefore, it can be understood that employers improve their innovative capacities through better skills of students and graduates. The interviewees observed that higher education graduates are significantly lacking in practical experience. However, in general the EMCOSU project has found that most forms of UBC were evaluated highly, and employers are well aware of the benefits of cooperation with universities: UBC… "*has direct tangible benefits for both the company and the student. What is important for the company is that students have the chance to acquire valuable new knowledge, which in turn can be used for the strategic development of the company*" (from the EMCOSU interviews); "*At the end of the traineeships, the students are usually integrated into the business. This is a beneficial policy for the company because the costs associated with recruitment are minimised. First, the training provided to the students is essential for the performance of their job when they are hired. In addition, risks are minimised because the company hires a person who already has had a background in the business for a long enough time to know if they are fit for the work*" (from the EMCOSU interviews).

The interviews indicate that higher education institutions will in most cases never provide better practical training than enterprises, and cooperation in this respect is mandatory. Some generic competencies related to socialisation into an occupation can only be developed with situation learning forms and in real-life work environments. At the same time, enterprises cannot become a substitute for the traditional learning environment because that form of learning provides better analytical thinking and other competencies important for the application of professional knowledge, identity and career mobility. However, when it comes to the question of skill development, there are differences in perceptions among higher education institutions and enterprises. Already earlier studies[8] stressed that higher education institutions find themselves as the key actor in the development of professional competencies, while employers consider that their own role is just as important as that of universities.

Companies do not agree with the idea that university-business cooperation should be limited to basic research or even remain separate from industry

In the EMCOSU survey only a few enterprises report that UBC should be limited to basic research or even remain separate from industry. In general, two out of three companies claim UBC should be upgraded for application and commercial exploitation and one out of three that UBC is fundamentally important for research and development with some differences among countries. According to the EMCOSU survey, the opinions of enterprises on UBC are

[8] Pavlin, S. & Svetlik, I. (2009): Future Development of Higher Education. In Pavlin S. (ed.): Report on the Qualitative Analysis of Higher Education Institutions and Employers in Five Countries: Development of Competencies in the World of Work and Education. Hegesco Project. Ljubljana: University of Ljubljana. Access: http://www.decowe.org/static/uploaded/htmlarea/finalreportshegesco/Qualitative_Analysis_of_HEIs_and_Employers_in_Five_Countries.pdf (30.8.2013)

much more homogenous than is the case with universities. Other studies[9] among higher education institutions have found that academics hold a wider range of positions on UBC like, for example, the traditional academic who believes the academic sector and industry should be separate or those who believe that only some form of cooperation should exist. As one interviewee reported, "*I would like to emphasise the poor treatment of academic entrepreneurship as one of the most conspicuous negative indicators. Academic entrepreneurship is not perceived as something positive; moreover, there is a great amount of new legislation at the national level which is preventing its development*" (from the EMCOSU interviews).

Enterprises believe higher education should increase the practical orientation of teaching and enhance traineeships and internships – both processes have been identified as the main strategic developmental path

In contrast to the common belief that enterprises' foremost preference vis-à-vis higher education is the production of ready-made skills, the EMCOSU survey finds that this is not the case. Above all, employers believe universities should develop strategic cooperation with business, particularly the practical orientation of teaching, and enhance traineeships and internships. As found in the survey, in addition to the Internet, internships are reported to be the central recruitment mechanism used by three out of four large companies and approximately every second SME. This means they would like to develop a much more integral approach to training young graduates. In this context, it is important to stress that higher education institutions and employers perceive the centrality of practical learning very differently. An earlier study[10] reported that almost every second employer sees the practical orientation of study programmes as one of the most obvious developmental trends in higher education, yet this is only recognised by one out of ten academics. As one interviewee notes: "*In the past, universities created curricula by themselves, with no consideration of the practical needs of employers. They took into account what the students required plus what capacities they had*" (from the EMCOSU interviews). In order to facilitate better cooperation, several interviewees stress that improvements should be made to the culture of UBC among researchers and policies developed "*to make UBC outcomes as important as research outcomes for career progress purposes*" (from the EMCOSU interviews). Hence, big challenges are entailed in making further improvements to the development of the professional relevance of higher education. Based on the EMCOSU survey, as well as the earlier DEHEMS project[11], employers are calling for the recognition of work experience in

[9] …for example Lam, A. (2010): From 'Ivory Tower Traditionalists' to 'Entrepreneurial Scientists'? Academic Scientists in Fuzzy University-Industry Boundaries, Social Studies of Science, vol. 40 no. 2, pp. 307-340.

[10] Pavlin, S. & Svetlik, I. (2009): Future Development of Higher Education. In Pavlin S. (ed.): Report on the Qualitative Analysis of Higher Education Institutions and Employers in Five Countries: Development of Competencies in the World of Work and Education. Hegesco Project. Ljubljana: University of Ljubljana. Access: http://www.decowe.org/static/uploaded/htmlarea/finalreportshegesco/Qualitative_Analysis_of_HEIs_and_Employers_in_Five_Countries.pdf (30.8.2013)

[11] Pavlin, S. (ed.) (2012): Employability of graduates and higher education management systems: Conference proceedings, Vienna and Ljubljana; September 2011 and 2012 [Ljubljana]: Faculty of Social Sciences, cop. 2012. http://www.dehems-project.eu/static/uploaded/files/files/deliverables/Conference_Proceedings_Part_I_-_Vienna.pdf.

terms of traineeships and internships. An interviewee even suggests that one of the priorities in the academic community is to create lifelong learning programmes which are needed by industry. "*The current situation is that industry is more oriented to different industrial certificates and academic institutions offer broad lifelong learning programmes. It is the responsibility of academic institutions to create and offer lifelong learning programmes that would be recognised by industry*" (from the EMCOSU interviews).

Further work

Considering future comparative surveys on similarities and differences among a larger group of countries

Among other factors, the similarities and differences among countries are rooted in historical traditions of relations between education and employers, including established human resources and training practices and general qualification and legal frameworks. The EMCOSU project has given most attention to four EU transition countries – Bulgaria, Hungary, Poland and Slovenia – and Spain ("EMCOSU countries") but has also considered other EU countries, particularly Croatia, Germany, France, Czech Republic, Slovakia, Italy, ex-Yugoslav countries, Sweden and Russia. The number of cases in the other countries was significantly lower than with the EMCOSU countries yet the consortium was able to develop a hypothesis on how certain countries can be different from all others. For example, it presumed that in Croatia, and the Czech and Slovak Republics research and development is less developed compared to other UBC factors relative to other countries under observation. Bureaucracy is not such a concern in Scandinavian countries. Italian companies do not consider that their universities need a practical orientation as much as elsewhere. The list of these insights stemming from different EU countries is long and requires further investigation.

Employers' associations have the potential to become stronger promoters of UBC

The EMCOSU project shows that employers' associations in some countries hold relatively limited systematic knowledge regarding UBC. However, at the same time the results indicate that the perspective of employers' associations on UBC does not vary much from the employers' side. Employers' associations also cooperate in the mobility of students and research and development activities. Similarly to employers, they find bureaucracy and different motives and values to be the key barriers to cooperation and also complain that universities have a different perception of time horizons. In general, they believe that UBC should be oriented towards commercialisation and practical application. Based on the outcomes of the EMCOSU project, employers' associations have good operational potential to become supporters of UBC – particularly in representing the interests of SMEs. If the political idea is that employers are expected to become a driver of UBC that is equal to universities, then special attention and support would have to be provided to support special bodies that would include representatives of universities, employers and associations.

The EMCOSU project is an excellent example of raising awareness of university-business cooperation among employers

The EMCOSU partners believe the project is an example of a UBC success story. In two and a half years, all of the partners have appreciated working together in a European partnership: although the findings indicate that universities and enterprises are often two separate worlds, the support the consortium received from the European community has enabled the development of team building and strong mutual respect among the members. University representatives have appreciated the excellent responsiveness and on-time delivery of the deliverables and process execution of partners from the world of work, while the employers' representatives have appreciated the research qualities of their partners. The consortium has learned to understand intercultural and interorganisational diversity, and also the particular expertise of individual members in terms of discipline-specific knowledge, methodological skills and efficiency at meetings and the overall approach.

Future challenges

First, it would be very valuable to examine how mutual trust among employers and academics is developed: this process contains many other elements that have been investigated in the EMCOSU project such as national legislation, governance, barriers to UBC cooperation, or outcomes. Second, much of the attention has recently been placed on case studies of large multinational companies and very well-known universities, but UBC cooperation with SMEs and NGOs is not so much promoted. It would be especially valuable to establish common bodies and institutions that would facilitate communication among both parties. This is particularly important because the emerging practical orientation of higher education is increasingly leading to the hybridisation of academic roles and the nature of academic certificates. In this respect, the consortium has proposed guidelines for the development and integration of new policy tools.

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Appendix

Figure A.0.1: *High extent of university-business cooperation regarding different activities (in percent)*

Country	Research and development	Mobility of academics	Mobility of students	Curriculum development and delivery	Adult education, training and short courses
Bulgaria	12,0	11,1	11,1	52,5	69,4
Hungary	16,2	4,0	29,3	12,0	9,5
Poland	31,3	18,2	32,3	21,2	28,6
Slovenia	49,5	18,2	47,5	27,3	30,3
Spain	49,3	16,7	57,6	23,0	20,0
Total	31,7	13,6	35,6	27,2	31,5

Questions B1_1-B1_5: Please describe the extent of cooperation regarding the following activities? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very often«.

Figure A.0.2: *Frequent engagement in different activities in relation to higher education institutions (in percent)*

Country	Participation of academics on company boards	Participation of business people on higher education institutions boards	Participation in the activities of alumni networks	Cooperation with higher education institutions' career offices	Cooperation with institutes focused on higher education institutions-business cooperation	Cooperation with incubators for the development of new businesses	Participation of business people in study, teaching and research activities
Bulgaria	21,2	22,0	44,0	80,0	18,0	27,0	54,0
Hungary	9,5	12,0	6,7	26,7	10,8	6,8	28,0
Poland	18,2	23,2	12,1	23,2	30,3	19,2	33,3
Slovenia	8,1	10,1	17,2	18,2	35,4	27,3	28,3
Spain	10,5	10,7	14,0	27,9	40,6	41,3	51,6
Total	13,5	15,6	18,8	35,2	27,0	24,3	39,0

Questions B5_1-B5_7: How often does your organisation engage in the following activities in relation to higher education institutions? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very often«.

Figure A.0.3: *Factors facilitating cooperation with higher education institutions (in percent)*

Country	Existence of shared motives	Financial resources for working with higher education institutions	Flexibility of higher education institutions	Interest of higher education institutions in accessing practical knowledge	Access to higher education institutions' research and development facilities	Close geographical distance of higher education institutions	Existence of mutual trust and commitment	Prior relationship with higher education institutions
Bulgaria	59,0	23,5	7,0	30,0	42,0	34,0	42,0	44,0
Hungary	50,0	35,1	44,6	53,3	36,5	30,7	52,7	52,7
Poland	57,6	45,5	46,4	58,6	45,5	55,6	70,4	63,6
Slovenia	57,6	38,4	41,4	51,5	41,4	42,4	61,6	51,5
Spain	61,0	48,2	50,0	61,0	46,8	57,4	71,0	56,7
Total	57,0	38,1	37,9	50,9	42,4	44,0	59,5	53,7

Questions B6_1-B6_8: How much do the following statements facilitate your organisation's cooperation with higher education institutions? Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.4: *High relevance of different barriers to higher education institutions-business cooperation (in percent)*

Country	Different modes of communication and language between higher education institutions and business	Different time horizons between higher education institutions and business	Different motivations and values between higher education institutions and business	Difficulty in finding the appropriate persons within higher education institutions	Bureaucracy within or external to the higher education institutions	Higher education institutions want to publish confidential results	Limited ability of knowledge transfer	The current financial crisis
Bulgaria	57,0	56,0	12,5	74,0	60,0	68,0	60,0	32,0
Hungary	53,3	41,9	44,6	44,0	54,1	25,7	40,0	32,9
Poland	43,0	43,0	58,0	42,0	51,5	32,3	37,4	21,1
Slovenia	37,4	57,6	61,6	37,4	62,6	34,3	39,4	44,4
Spain	59,4	77,6	78,5	34,8	75,8	27,9	35,5	57,4
Total	50,0	55,2	51,0	46,4	60,8	37,6	42,5	37,6

Questions B7_1-B7_8: How relevant are the following barriers to higher education institutions-business cooperation? Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.5: ***Strong positive influence of higher education institutions-business cooperation on different attributes (in percent)***

Country	The performance of business	The skills of students relevant to labour market careers	The knowledge of academics	The practical skills of professionals from organisations	The innovative capacities of the enterprise	Regional development and social cohesion
Bulgaria	89,6	96,9	80,0	84,2	88,4	81,1
Hungary	57,3	81,1	60,8	52,0	56,9	32,7
Poland	17,2	59,6	48,0	40,8	42,9	40,6
Slovenia	70,7	86,9	68,7	80,8	82,8	58,6
Spain	35,9	81,2	56,9	59,4	86,6	70,8
Total	54,1	81,1	62,9	63,4	71,5	56,8

Questions B9_1-B9_6: Please indicate to what extent you agree with the following statements. Higher education institutions-business cooperation importantly improves… Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.6: ***High extent of agreement with the necessity of different changes in higher education institutions (in percent)***

Country	Increase the practical orientation of teaching	Enhance traineeships and internships	Improvements in their financial systems	Focus on short-term skill development	Focus on long-term skill development	Support an international orientation	Focus on research and development	Enabling the valorisation of applied research	Strategic cooperation with business
Bulgaria	90,0	90,0	76,0	76,0	72,0	79,0	81,0	81,8	95,0
Hungary	94,7	87,7	45,1	53,4	81,1	73,0	61,3	58,1	86,1
Poland	95,0	77,0	45,9	62,6	84,0	57,6	49,0	50,5	86,9
Slovenia	86,9	76,8	71,7	36,4	82,8	91,9	77,8	78,8	92,9
Spain	80,8	90,0	72,3	26,2	69,8	83,8	57,4	82,9	97,3
Total	89,5	84,3	62,2	50,9	78,0	77,1	65,3	70,4	91,6

Questions B4_1-B4_9: In your view, to what extent should higher education institutions change in the future? Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.7: ***Most often used recruitment mechanisms for hiring higher education graduates in the last five years (in percent)***

Country	Through an advertisement in a newspaper	Through a public employment agency	Through a private employment agency	Through the Internet	Through an internship placement	Through private contacts	Through the help of a higher education institution
Bulgaria	5,4	5,4	58,9	83,5	71,6	78,8	38,1
Hungary	31,1	21,1	21,9	67,1	42,7	45,2	36,5
Poland	15,2	13,3	9,2	45,9	40,0	34,7	24,5
Slovenia	32,3	36,4	32,3	59,6	71,7	61,6	33,3
Spain	6,0	5,8	13,7	47,5	66,1	42,1	41,3
Total	18,0	16,4	27,2	60,7	58,4	52,5	34,7

Questions A5_1-A5_7: How often does your organisation use the following recruitment mechanisms for hiring higher education graduates in the last five years? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very often«.

Figure A.0.8: ***High extent of new graduates' possession of different skills (in percent)***

Country	Mastery in their field or discipline	The ability to acquire new knowledge	The ability to perform well under pressure	The ability to use time efficiently	The ability to productively work with others	The ability to come up with new ideas and solutions	The ability to work in a foreign language
Bulgaria	36,4	74,0	37,0	22,2	24,0	53,0	54,0
Hungary	26,7	84,0	57,3	36,0	74,7	67,6	49,3
Poland	22,2	64,0	23,0	28,0	41,0	32,0	42,0
Slovenia	55,6	84,8	43,4	37,4	57,6	67,7	77,8
Spain	52,8	81,9	40,3	42,3	69,4	52,8	42,9
Total	38,7	77,8	40,2	33,2	53,3	54,6	53,2

Questions A6_1-A6_7: Below is a list of skills. Please provide information to what extent new graduates in your experience possess these skills? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very high«.

Figure A.0.9: ***High extent of university-business cooperation regarding different activities (in percent, by economic sectors)***

Country	Sector	Research and development	Mobility of academics	Mobility of students	Curriculum development and delivery	Adult education, training and short courses
Bulgaria	Industry	15,0	10,5	5,3	63,2	78,9
	Service	4,3	4,3	8,5	46,8	70,2
	IT	21,2	21,2	18,2	54,5	62,5
Hungary	Industry	18,2	6,7	33,3	13,3	9,1
	Service	9,5		9,5	9,5	14,3
	IT	22,2		55,6	11,1	
Poland	Industry	37,1	17,1	40,0	14,3	37,1
	Service	32,6	19,6	23,9	17,4	22,2
	IT	6,7	13,3	40,0	46,7	26,7
Slovenia	Industry	54,2	12,5	47,9	22,9	27,1
	Service	61,5	38,5	38,5	53,8	30,8
	IT	21,1	10,5	42,1	21,1	15,8
Spain	Industry	66,7	23,8	56,5	20,0	23,8
	Service	30,8	13,0	60,0	29,2	21,7
	IT	52,6	12,5	55,6	17,6	12,5
Total	Industry	38,2	14,1	36,6	26,7	35,2
	Service	27,7	18,8	28,1	31,3	31,8
	IT	24,8	14,4	42,3	30,2	29,4

Questions B1_1-B1_5: Please describe the extent of cooperation regarding the following activities? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very often«.

Figure A.0.10: ***Frequent engagement in different activities in relation to higher education institutions (in percent, by economic sector)***

Country		Participation of academics on company boards	Participation of business people on higher education institutions boards	Participation in the activities of alumni networks	Cooperation with higher education institutions' career offices	Cooperation with institutes focused on higher education institutions-business cooperation	Cooperation with incubators for the development of new businesses	Participation of business people in study, teaching and research activities
Bulgaria	Industry	31,6	35,0	65,0	95,0	5,0	30,0	75,0
	Service	17,0	14,9	27,7	68,1	17,0	14,9	34,0
	IT	21,2	24,2	54,5	87,9	27,3	42,4	69,7
Hungary	Industry	6,8	13,3	8,9	24,4	8,9	6,8	26,7
	Service	19,0	4,8	4,8	28,6	15,0		14,3
	IT		22,2		33,3	11,1	22,2	66,7
Poland	Industry	25,7	31,4	17,1	28,6	31,4	14,3	40,0
	Service	15,2	15,2	4,3	10,9	30,4	17,4	26,1
	IT	6,7	20,0	20,0	46,7	33,3	40,0	46,7
Slovenia	Industry	4,2	12,5	8,3	12,5	27,1	14,6	18,8
	Service	23,1	7,7	23,1	46,2	61,5	46,2	53,8
	IT			21,1	10,5	15,8	10,5	31,6
Spain	Industry	10,0	5,0	10,5	31,6	33,3	33,3	63,6
	Service	9,1	9,5	14,3	29,2	48,0	54,2	52,2
	IT	13,3	20,0	17,6	22,2	38,9	33,3	35,3
Total	Industry	15,7	19,5	22,0	38,4	21,1	19,8	44,8
	Service	16,7	10,4	14,8	36,6	34,4	33,2	36,1
	IT	13,7	21,6	28,3	40,1	25,3	29,7	50,0

Questions B5_1-B5_7: How often does your organisation engage in the following activities in relation to higher education institutions? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very often«.

Figure A.0.11: ***Factors facilitating cooperation with higher education institutions (in percent, by economic sector)***

Country		Existence of shared motives	Financial resources for working with higher education institutions	Flexibility of higher education institutions	Interest of higher education institutions in accessing practical knowledge	Access to higher education institutions' research and development facilities	Close geographical distance of higher education institutions	Existence of mutual trust and commitment	Prior relationship with higher education institutions
Bulgaria	Industry	60,0	30,0	5,0	40,0	65,0	45,0	65,0	50,0
	Service	57,4	8,7	4,3	19,1	31,9	27,7	31,9	38,3
	IT	60,6	40,6	15,2	33,3	42,4	36,4	42,4	48,5
Hungary	Industry	48,9	42,2	51,1	55,6	42,2	33,3	61,4	60,0
	Service	45,0	20,0	25,0	42,9	20,0	28,6	33,3	30,0
	IT	66,7	33,3	55,6	66,7	44,4	22,2	55,6	66,7
Poland	Industry	54,3	51,4	38,2	54,3	51,4	65,7	71,4	74,3
	Service	60,0	42,2	48,9	58,7	48,9	45,7	66,7	52,2
	IT	56,3	37,5	53,3	60,0	18,8	53,3	73,3	66,7
Slovenia	Industry	52,1	45,8	43,8	52,1	47,9	37,5	64,6	60,4
	Service	61,5	30,8	38,5	61,5	53,8	46,2	61,5	69,2
	IT	63,2	26,3	42,1	47,4	10,5	42,1	63,2	21,1
Spain	Industry	63,2	50,0	35,3	38,9	57,1	55,0	70,0	57,9
	Service	63,6	54,5	68,2	82,6	39,1	60,9	83,3	56,5
	IT	55,6	37,5	41,2	55,6	44,4	55,6	55,6	55,6
Total	Industry	55,7	43,9	34,7	48,2	52,7	47,3	66,5	60,5
	Service	57,5	31,2	37,0	53,0	38,8	41,8	55,4	49,2
	IT	60,4	35,1	41,5	52,6	32,1	41,9	58,0	51,7

Questions B6_1-B6_8: How much do the following statements facilitate your organisation’s cooperation with higher education institutions? Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.12: ***High relevance of different barriers to higher education institutions-business cooperation (in percent, by economic sector)***

Country		Different modes of communication and language between higher education institutions and business	Different time horizons between higher education institutions and business	Different motivations and values between higher education institutions and business	Difficulty in finding the appropriate persons within higher education institutions	Bureaucracy within or external to the higher education institutions	Higher education institutions want to publish confidential results	Limited ability of knowledge transfer	The current financial crisis
Bulgaria	Industry	50,0	60,0	38,9	72,2	65,0	65,0	55,0	25,0
	Service	57,4	55,3	39,1	76,1	59,6	72,3	53,2	31,9
	IT	60,6	54,5	40,6	71,9	57,6	63,6	72,7	36,4
Hungary	Industry	48,9	35,6	42,2	48,9	50,0	24,4	37,8	29,5
	Service	52,4	50,0	45,0	23,8	47,6	19,0	33,3	35,0
	IT	77,8	55,6	55,6	66,7	88,9	50,0	66,7	44,4
Poland	Industry	42,9	37,1	51,4	31,4	42,9	31,4	37,1	24,2
	Service	39,1	41,3	58,7	47,8	56,5	39,1	37,0	18,2
	IT	56,3	62,5	62,5	43,8	53,3	13,3	33,3	20,0
Slovenia	Industry	37,5	56,3	58,3	37,5	64,6	37,5	37,5	45,8
	Service	38,5	61,5	53,8	23,1	46,2	30,8	38,5	53,8
	IT	26,3	57,9	57,9	57,9	73,7	26,3	42,1	36,8
Spain	Industry	63,2	85,0	89,5	25,0	90,0	29,4	38,9	61,1
	Service	53,8	74,1	70,4	40,7	66,7	24,0	40,0	56,0
	IT	63,2	75,0	78,9	36,8	73,7	31,6	26,3	55,6
Total	Industry	48,5	54,8	56,1	43,0	62,5	37,6	41,3	37,1
	Service	48,3	56,4	53,4	42,3	55,3	37,1	40,4	39,0
	IT	56,8	61,1	59,1	55,4	69,4	37,0	48,2	38,6

Questions B7_1-B7_8: How relevant are the following barriers to higher education institutions-business cooperation? Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.13: ***Strong positive influence of higher education institutions-business cooperation on different attributes (in percent, by economic sector)***

Country		The performance of business	The skills of students relevant to labour market careers	The knowledge of academics	The practical skills of professionals from organisations	The innovative capacities of the enterprise	Regional development and social cohesion
Bulgaria	Industry	95,0	100,0	84,2	94,7	100,0	94,7
	Service	84,4	95,6	73,3	75,6	77,8	71,1
	IT	93,5	96,8	87,1	90,3	96,8	87,1
Hungary	Industry	62,2	88,9	60,0	55,6	62,8	32,3
	Service	38,1	55,0	50,0	38,1	42,9	37,5
	IT	77,8	100,0	88,9	66,7	62,5	25,0
Poland	Industry	11,4	57,1	45,7	40,0	40,0	32,4
	Service	23,9	58,7	51,1	44,4	46,7	38,6
	IT	13,3	60,0	46,7	20,0	40,0	53,3
Slovenia	Industry	66,7	85,4	66,7	77,1	77,1	54,2
	Service	92,3	100,0	92,3	92,3	100,0	76,9
	IT	52,6	73,7	57,9	68,4	73,7	47,4
Spain	Industry	33,3	78,3	59,1	47,6	78,3	71,4
	Service	36,0	92,9	70,4	77,8	100,0	77,8
	IT	38,9	66,7	31,3	43,8	75,0	58,8
Total	Industry	53,7	81,9	63,1	63,0	71,6	57,0
	Service	55,0	80,4	67,4	65,6	73,5	60,4
	IT	55,2	79,4	62,4	57,8	69,6	54,3

Questions B9_1-B9_6: Please indicate to what extent you agree with the following statements. Higher education institutions-business cooperation importantly improves… Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.14: ***High extent of agreement with the necessity of different changes in higher education institutions (in percent, by economic sector)***

Country		Increase the practical orientation of teaching	Enhance traineeships and internships	Improvements in their financial systems	Focus on short-term skill development	Focus on long-term skill development	Support an international orientation	Focus on research and development	Enabling the valorisation of applied research	Strategic cooperation with business
Bulgaria	Industry	90,0	95,0	70,0	65,0	75,0	80,0	90,0	75,0	95,0
	Service	91,5	87,2	72,3	74,5	70,2	70,2	70,2	85,1	93,6
	IT	87,9	90,9	84,8	84,8	72,7	90,9	90,9	81,3	97,0
Hungary	Industry	91,1	86,7	35,7	46,7	82,2	77,8	66,7	64,4	90,7
	Service	100,0	84,2	47,6	57,9	70,0	55,0	42,9	35,0	70,0
	IT	100,0	100,0	87,5	77,8	100,0	88,9	77,8	77,8	100,0
Poland	Industry	94,3	74,3	45,7	71,4	85,7	62,9	48,6	45,7	82,9
	Service	93,5	80,4	53,3	52,2	82,6	55,6	53,3	53,3	88,9
	IT	100,0	75,0	26,7	66,7	81,3	56,3	40,0	50,0	93,8
Slovenia	Industry	79,2	68,8	58,3	37,5	75,0	89,6	72,9	70,8	91,7
	Service	92,3	92,3	100,0	30,8	92,3	100,0	84,6	84,6	92,3
	IT	89,5	63,2	78,9	31,6	89,5	89,5	78,9	84,2	89,5
Spain	Industry	83,3	87,0	73,7	30,0	78,9	90,0	59,1	95,8	95,8
	Service	86,2	92,9	70,4	19,2	76,9	89,3	53,6	75,0	96,6
	IT	70,0	89,5	73,7	31,6	50,0	70,0	61,1	77,8	100,0
Total	Industry	87,6	82,3	56,7	50,1	79,4	80,0	67,4	70,4	91,2
	Service	92,7	87,4	68,7	46,9	78,4	74,0	60,9	66,6	88,3
	IT	89,5	83,7	70,3	58,5	78,7	79,1	69,7	74,2	96,0

Questions B4_1-B4_9: In your view, to what extent should higher education institutions change in the future? Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.15: ***Most often used recruitment mechanisms for hiring higher education graduates in the last five years (in percent, by economic sector)***

Country		Through an advertisement in a newspaper	Through a public employment agency	Through a private employment agency	Through the Internet	Through an internship placement	Through private contacts	Through the help of a higher education institution
Bulgaria	Industry			84,2	94,4	94,4	95,0	83,3
	Service	6,5	6,5	34,8	80,9	60,0	72,3	17,4
	IT	6,9	6,9	80,0	81,3	75,0	78,1	42,4
Hungary	Industry	36,4	23,8	22,7	68,2	40,0	47,7	35,6
	Service	28,6	20,0	15,0	60,0	38,1	30,0	30,0
	IT	11,1	11,1	33,3	77,8	66,7	66,7	55,6
Poland	Industry	8,6	11,4	5,7	42,9	41,2	31,4	20,0
	Service	17,8	17,8	11,1	40,0	33,3	31,1	17,8
	IT	25,0		13,3	80,0	64,3	53,3	53,3
Slovenia	Industry	31,3	39,6	31,3	60,4	75,0	56,3	25,0
	Service	38,5	30,8	15,4	38,5	61,5	46,2	30,8
	IT			31,6	57,9	57,9	78,9	31,6
Spain	Industry	5,6		15,8	47,4	77,8	27,8	38,1
	Service	4,5	8,3	13,6	56,5	62,5	50,0	42,3
	IT	10,0	10,0	10,0	35,3	57,1	46,7	43,8
Total	Industry	20,4	24,9	31,9	62,7	65,7	51,6	40,4
	Service	19,2	16,7	18,0	55,2	51,1	45,9	27,6
	IT	13,3	9,3	33,6	66,4	64,2	64,7	45,3

Questions A5_1-A5_7: How often does your organisation use the following recruitment mechanisms for hiring higher education graduates in the last five years? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very often«.

Figure A.0.16: ***High extent of new graduates' possession of different skills (in percent, by economic sector)***

Country		Mastery in their field or discipline	The ability to acquire new knowledge	The ability to perform well under pressure	The ability to use time efficiently	The ability to productively work with others	The ability to come up with new ideas and solutions	The ability to work in a foreign language
Bulgaria	Industry	5,3	85,0	30,0	15,8	20,0	65,0	65,0
	Service	55,3	72,3	40,4	27,7	29,8	53,2	46,8
	IT	27,3	69,7	36,4	18,2	18,2	45,5	57,6
Hungary	Industry	24,4	84,4	60,0	31,1	73,3	65,9	40,0
	Service	23,8	76,2	47,6	38,1	71,4	57,1	61,9
	IT	44,4	100,0	66,7	55,6	88,9	100,0	66,7
Poland	Industry	20,6	74,3	20,0	37,1	54,3	28,6	40,0
	Service	17,4	56,5	28,3	28,3	32,6	32,6	39,1
	IT	37,5	68,8	12,5	6,3	37,5	37,5	62,5
Slovenia	Industry	58,3	87,5	39,6	35,4	54,2	72,9	81,3
	Service	61,5	76,9	61,5	46,2	61,5	61,5	69,2
	IT	57,9	78,9	31,6	31,6	52,6	52,6	63,2
Spain	Industry	60,9	78,3	47,8	43,5	60,9	39,1	34,8
	Service	46,4	78,6	32,1	32,1	67,9	57,1	53,8
	IT	52,4	90,5	42,9	55,0	81,0	61,9	38,1
Total	Industry	33,9	81,9	39,5	32,6	52,5	54,3	52,2
	Service	40,9	72,1	42,0	34,5	52,6	52,3	54,2
	IT	43,9	81,6	38,0	33,3	55,6	59,5	57,6

Questions A6_1-A6_7: Below is a list of skills. Please provide information to what extent new graduates in your experience possess these skills? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very high«.

Figure A.0.17: ***High extent of university-business cooperation regarding different activities (in percent, by size of company)***

Country	Sector	Research and development	Mobility of academics	Mobility of students	Curriculum development and delivery	Adult education, training and short courses
Bulgaria	Micro				42,9	85,7
	SME	8,6	10,5	12,3	50,9	67,2
	Large	20,0	14,3	11,4	57,1	69,7
Hungary	Micro				20,0	20,0
	SME	20,6	2,9	14,7	5,9	12,1
	Large	20,0	12,5	50,0	6,3	6,3
Poland	Micro	27,6	13,8	17,2	20,7	31,0
	SME	33,3	19,0	28,6	19,0	22,0
	Large	32,1	21,4	53,6	25,0	35,7
Slovenia	Micro	60,0	40,0	40,0	20,0	40,0
	SME	50,0	16,0	52,0	24,0	28,0
	Large	52,6	10,5	57,9	36,8	47,4
Spain	Micro	25,0	11,1	63,6	25,0	27,3
	SME	68,8	25,0	47,1	13,3	6,7
	Large	66,7	12,5	77,8	44,4	44,4
Total	Micro	37,5	21,6	40,3	25,7	40,8
	SME	36,3	14,7	30,9	22,6	27,2
	Large	38,3	14,2	50,1	33,9	40,7

Questions B1_1-B1_5: Please describe the extent of cooperation regarding the following activities? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very often«.

Figure A.0.18: ***Frequent engagement in different activities in relation to higher education institutions (in percent, by size of company)***

Country		Participation of academics on company boards	Participation of business people on higher education institutions boards	Participation in the activities of alumni networks	Cooperation with higher education institutions' career offices	Cooperation with institutes focused on higher education institutions-business cooperation	Cooperation with incubators for the development of new businesses	Participation of business people in study, teaching and research activities
Bulgaria	Micro			28,6	100,0	28,6	42,9	57,1
	SME	24,1	24,1	48,3	74,1	15,5	20,7	44,8
	Large	20,6	22,9	40,0	85,7	20,0	34,3	68,6
Hungary	Micro	20,0	20,0	20,0	20,0	25,0	20,0	60,0
	SME	3,0	8,8	5,9	17,6	5,9	9,1	26,5
	Large	6,3	6,3	12,5	43,8	12,5		18,8
Poland	Micro	27,6	20,7	6,9	10,3	27,6	20,7	27,6
	SME	14,3	21,4	9,5	21,4	38,1	19,0	31,0
	Large	14,3	28,6	21,4	39,3	21,4	17,9	42,9
Slovenia	Micro	20,0		20,0		40,0	20,0	20,0
	SME	8,0	8,0	18,0	20,0	40,0	32,0	26,0
	Large	5,3	15,8	26,3	31,6	52,6	21,1	36,8
Spain	Micro	12,5		10,0	33,3	41,7	45,5	63,6
	SME	15,4	15,4	33,3	28,6	60,0	56,3	53,3
	Large		37,5	22,2	44,4	33,3	12,5	37,5
Total	Micro	20,0	20,3	17,1	40,9	32,6	29,8	45,7
	SME	13,0	15,6	23,0	32,4	31,9	27,4	36,3
	Large	11,6	22,2	24,5	49,0	28,0	21,4	40,9

Questions B5_1-B5_7: How often does your organisation engage in the following activities in relation to higher education institutions? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very often«.

Figure A.0.19: ***Factors facilitating cooperation with higher education institutions (in percent, by size of company)***

Country		Existence of shared motives	Financial resources for working with higher education institutions	Flexibility of higher education institutions	Interest of higher education institutions in accessing practical knowledge	Access to higher education institutions' research and development facilities	Close geographical distance of higher education institutions	Existence of mutual trust and commitment	Prior relationship with higher education institutions
Bulgaria	Micro	85,7	14,3	14,3		14,3	14,3	14,3	14,3
	SME	53,4	15,5	6,9	27,6	41,4	34,5	41,4	43,1
	Large	62,9	39,4	8,6	34,3	48,6	37,1	48,6	51,4
Hungary	Micro	40,0	40,0	60,0	40,0	60,0	60,0	60,0	40,0
	SME	39,4	24,2	39,4	52,9	30,3	14,7	39,4	45,5
	Large	68,8	50,0	56,3	68,8	43,8	50,0	75,0	81,3
Poland	Micro	51,7	51,7	44,8	69,0	58,6	55,2	65,5	69,0
	SME	54,8	40,5	43,9	45,2	40,5	40,5	65,9	57,1
	Large	67,9	46,4	51,9	67,9	39,3	78,6	82,1	67,9
Slovenia	Micro	60,0	40,0	60,0	60,0	80,0	20,0	80,0	40,0
	SME	60,0	40,0	40,0	52,0	38,0	44,0	56,0	48,0
	Large	57,9	52,6	57,9	63,2	57,9	42,1	68,4	68,4
Spain	Micro	63,6	40,0	63,6	75,0	41,7	46,2	58,3	76,9
	SME	71,4	53,8	41,7	41,7	64,3	53,8	78,6	66,7
	Large	75,0	44,4	37,5	33,3	44,4	62,5	66,7	37,5
Total	Micro	60,2	37,2	48,5	61,0	50,9	39,1	55,6	48,0
	SME	55,8	34,8	34,4	43,9	42,9	37,5	56,2	52,1
	Large	66,5	46,6	42,4	53,5	46,8	54,1	68,2	61,3

Questions B6_1-B6_8: How much do the following statements facilitate your organisation's cooperation with higher education institutions? Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.20: ***High relevance of different barriers to higher education institutions-business cooperation (in percent, by size of company)***

Country		Different modes of communication and language between higher education institutions and business	Different time horizons between higher education institutions and business	Different motivations and values between higher education institutions and business	Difficulty in finding the appropriate persons within higher education institutions	Bureaucracy within or external to the higher education institutions	Higher education institutions want to publish confidential results	Limited ability of knowledge transfer	The current financial crisis
Bulgaria	Micro	71,4	71,4	50,0	83,3	85,7	100,0	71,4	42,9
	SME	55,2	55,2	40,0	72,7	56,9	63,8	58,6	27,6
	Large	57,1	54,3	37,1	74,3	60,0	68,6	60,0	37,1
Hungary	Micro	80,0	40,0	100,0	80,0	60,0	60,0	80,0	25,0
	SME	41,2	33,3	36,4	44,1	50,0	24,2	38,2	38,2
	Large	75,0	68,8	43,8	37,5	53,3	31,3	56,3	33,3
Poland	Micro	37,9	34,5	65,5	34,5	48,3	31,0	41,4	25,0
	SME	48,8	48,8	55,8	58,1	59,5	35,7	33,3	17,5
	Large	39,3	42,9	53,6	25,0	42,9	28,6	39,3	22,2
Slovenia	Micro	60,0	60,0	80,0	40,0	80,0	40,0	40,0	40,0
	SME	44,0	62,0	70,0	38,0	68,0	44,0	50,0	48,0
	Large	42,1	78,9	68,4	47,4	63,2	31,6	26,3	31,6
Spain	Micro	66,7	57,1	78,6	38,5	61,5	41,7	53,8	75,0
	SME	64,3	80,0	78,6	21,4	80,0	7,1	7,1	40,0
	Large	55,6	55,6	87,5	33,3	66,7	22,2	25,0	62,5
Total	Micro	63,2	52,6	74,8	55,3	67,1	54,5	57,3	41,6
	SME	50,7	55,9	56,1	46,9	62,9	35,0	37,5	34,3
	Large	53,8	60,1	58,1	43,5	57,2	36,4	41,4	37,4

Questions B7_1-B7_8: How relevant are the following barriers to higher education institutions-business cooperation? Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.21: ***Strong positive influence of higher education institutions-business cooperation on different attributes (in percent, by size of company)***

Country		The performance of business	The skills of students relevant to labour market careers	The knowledge of academics	The practical skills of professionals from organisations	The innovative capacities of the enterprise	Regional development and social cohesion
Bulgaria	Micro	100,0	100,0	83,3	83,3	83,3	83,3
	SME	84,2	94,7	75,0	80,4	85,7	76,8
	Large	97,0	100,0	87,9	90,9	93,9	87,9
Hungary	Micro	80,0	100,0	80,0	100,0	75,0	50,0
	SME	52,9	73,5	48,5	44,1	45,5	29,2
	Large	68,8	93,8	68,8	62,5	66,7	50,0
Poland	Micro	20,7	72,4	48,3	55,2	55,2	46,4
	SME	21,4	50,0	46,3	41,5	34,1	30,0
	Large	7,1	60,7	50,0	25,0	42,9	50,0
Slovenia	Micro	100,0	100,0	80,0	100,0	100,0	60,0
	SME	72,0	90,0	68,0	82,0	84,0	62,0
	Large	68,4	84,2	63,2	73,7	73,7	52,6
Spain	Micro	16,7	76,9	53,8	61,5	100,0	61,5
	SME	40,0	81,3	60,0	60,0	81,3	53,3
	Large	22,2	88,9	33,3	55,6	88,9	88,9
Total	Micro	63,5	89,9	69,1	80,0	82,7	60,3
	SME	54,1	77,9	59,6	61,6	66,1	50,3
	Large	52,7	85,5	60,6	61,5	73,2	65,9

Questions B9_1-B9_6: Please indicate to what extent you agree with the following statements. Higher education institutions-business cooperation importantly improves… Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.22: ***High extent of agreement with the necessity of different changes in higher education institutions (in percent, by size of company)***

Country		Increase the practical orientation of teaching	Enhance traineeships and internships	Improvements in their financial systems	Focus on short-term skill development	Focus on long-term skill development	Support an international orientation	Focus on research and development	Enabling the valorisation of applied research	Strategic cooperation with business
Bulgaria	Micro	100,0	100,0	100,0	85,7	71,4	71,4	71,4	85,7	85,7
	SME	89,7	89,7	72,4	79,3	70,7	82,8	84,5	82,8	94,8
	Large	88,6	88,6	77,1	68,6	74,3	74,3	77,1	79,4	97,1
Hungary	Micro	80,0	100,0	60,0	40,0	100,0	50,0	100,0	75,0	80,0
	SME	94,1	87,9	45,2	48,5	73,5	76,5	64,7	61,8	84,8
	Large	93,8	87,5	40,0	80,0	100,0	81,3	43,8	56,3	86,7
Poland	Micro	93,1	75,9	44,8	62,1	75,9	51,7	51,7	53,6	75,9
	SME	95,3	81,4	51,2	54,8	83,7	64,3	48,8	51,2	88,1
	Large	96,4	71,4	39,3	75,0	92,9	53,6	46,4	46,4	96,4
Slovenia	Micro	100,0	100,0	60,0	40,0	100,0	100,0	80,0	80,0	100,0
	SME	90,0	86,0	72,0	38,0	88,0	90,0	82,0	84,0	94,0
	Large	73,7	68,4	73,7	31,6	84,2	94,7	73,7	68,4	89,5
Spain	Micro	78,6	85,7	78,6	23,1	71,4	78,6	64,3	78,6	92,9
	SME	82,4	93,8	86,7	35,3	73,3	82,4	62,5	93,8	94,1
	Large	88,9	77,8	44,4	12,5	37,5	66,7	44,4	88,9	100,0
Total	Micro	90,3	92,3	68,7	50,2	83,7	70,3	73,5	74,6	86,9
	SME	90,3	87,7	65,5	51,2	77,9	79,2	68,5	74,7	91,2
	Large	88,3	78,7	54,9	53,5	77,8	74,1	57,1	67,9	93,9

Questions B4_1-B4_9: In your view, to what extent should higher education institutions change in the future? Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.23: ***Most often used recruitment mechanisms for hiring higher education graduates in the last five years (in percent, by size of company)***

Country		Through an advertisement in a newspaper	Through a public employment agency	Through a private employment agency	Through the Internet	Through an internship placement	Through private contacts	Through the help of a higher education institution
Bulgaria	Micro			28,6	85,7	71,4	71,4	14,3
	SME	3,8	3,8	55,6	83,6	64,2	77,6	36,4
	Large	8,8	8,8	70,6	82,9	82,9	82,4	45,7
Hungary	Micro	20,0	40,0	20,0	20,0		60,0	
	SME	21,2	24,2	12,1	66,7	29,4	33,3	26,5
	Large	25,0	20,0	31,3	87,5	68,8	62,5	62,5
Poland	Micro	7,1	25,0	7,1	17,9	33,3	28,6	10,7
	SME	18,6	9,5	4,8	42,9	34,1	42,9	19,0
	Large	17,9	7,1	17,9	78,6	55,6	28,6	46,4
Slovenia	Micro	40,0	40,0		60,0	60,0	60,0	60,0
	SME	30,0	40,0	36,0	62,0	74,0	72,0	44,0
	Large	52,6	26,3	36,8	68,4	73,7	42,1	21,1
Spain	Micro		10,0	12,5	20,0	66,7	66,7	54,5
	SME	23,1	7,7	16,7	46,7	53,3	42,9	41,2
	Large		11,1	22,2	88,9	88,9	44,4	44,4
Total	Micro	22,4	28,8	17,1	40,7	57,9	57,3	34,9
	SME	19,3	17,1	25,0	60,4	51,0	53,7	33,4
	Large	26,1	14,7	35,8	81,2	73,9	52,0	44,0

Questions A5_1-A5_7: How often does your organisation use the following recruitment mechanisms for hiring higher education graduates in the last five years? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very often«.

Figure A.0.24: ***High extent of new graduates' possession of different skills (in percent, by economic sector)***

Country		Mastery in their field or discipline	The ability to acquire new knowledge	The ability to perform well under pressure	The ability to use time efficiently	The ability to productively work with others	The ability to come up with new ideas and solutions	The ability to work in a foreign language
Bulgaria	Micro	42,9	71,4	57,1	14,3	28,6	28,6	14,3
	SME	38,6	75,9	29,3	21,1	29,3	56,9	58,6
	Large	31,4	71,4	45,7	25,7	14,3	51,4	54,3
Hungary	Micro	40,0	80,0	80,0	20,0	100,0	100,0	40,0
	SME	26,5	82,4	55,9	38,2	79,4	66,7	55,9
	Large	25,0	93,8	68,8	31,3	75,0	68,8	56,3
Poland	Micro	24,1	62,1	20,7	24,1	37,9	20,7	37,9
	SME	20,9	60,5	25,6	30,2	39,5	34,9	41,9
	Large	22,2	71,4	21,4	28,6	46,4	39,3	46,4
Slovenia	Micro	40,0	80,0	20,0	20,0	40,0	60,0	80,0
	SME	56,0	82,0	48,0	36,0	60,0	68,0	78,0
	Large	63,2	94,7	47,4	36,8	63,2	78,9	84,2
Spain	Micro	78,6	85,7	42,9	50,0	92,9	71,4	61,5
	SME	44,4	66,7	44,4	44,4	61,1	50,0	52,9
	Large	55,6	88,9	33,3	33,3	55,6	44,4	44,4
Total	Micro	45,1	75,8	44,1	25,7	59,9	56,1	46,8
	SME	37,3	73,5	40,6	34,0	53,9	55,3	57,5
	Large	39,5	84,0	43,3	31,1	50,9	56,6	57,1

Questions A6_1-A6_7: Below is a list of skills. Please provide information to what extent new graduates in your experience possess these skills? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very high«.

Figure A.0.25: ***High extent of university-business cooperation regarding different activities (in percent, by extent of U-B cooperation)***

Country		Research and development	Mobility of academics	Mobility of students	Curriculum development and delivery	Adult education, training and short courses
Bulgaria	Non or minor				4,2	16,7
	Medium	3,4	1,7	5,1	66,1	83,1
	High	57,1	64,3	57,1	78,6	100,0
Hungary	Non or minor	2,5		12,5		2,5
	Medium	28,6	7,1	39,3	17,9	21,4
	High	60,0	20,0	100,0	80,0	
Poland	Non or minor	2,9		17,1	5,7	2,9
	Medium	40,0	20,0	34,0	26,0	34,0
	High	76,9	61,5	69,2	46,2	76,9
Slovenia	Non or minor	3,7		3,7		
	Medium	51,2	4,9	53,7	12,2	34,1
	High	87,1	51,6	77,4	71,0	51,6
Spain	Non or minor	11,1		38,9		
	Medium	55,6	14,8	55,6	25,9	18,5
	High	90,0	50,0	70,0	50,0	50,0
Total	Non or minor	5,0		18,1	4,9	7,3
	Medium	35,7	9,7	37,5	29,6	38,2
	High	74,2	49,5	74,8	65,1	69,6

Questions B1_1-B1_5: Please describe the extent of cooperation regarding the following activities? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very often«.

Figure A.0.26: ***Frequent engagement in different activities in relation to higher education institutions (in percent, by extent of U-B cooperation)***

Country		Participation of academics on company boards	Participation of business people on higher education institutions boards	Participation in the activities of alumni networks	Cooperation with higher education institutions' career offices	Cooperation with institutes focused on higher education institutions-business cooperation	Cooperation with incubators for the development of new businesses	Participation of business people in study, teaching and research activities
Bulgaria	Non or minor	33,3	33,3	45,8	54,2		4,2	12,5
	Medium	11,9	13,6	37,3	84,7	22,0	30,5	67,8
	High	23,1	28,6	64,3	100,0	35,7	50,0	64,3
Hungary	Non or minor	2,6		5,0	10,0	5,1	5,0	12,5
	Medium	17,9	21,4	10,7	39,3	14,3	7,4	50,0
	High	20,0	60,0		60,0	40,0	20,0	40,0
Poland	Non or minor	2,9		2,9	14,3	14,3	5,7	5,7
	Medium	22,0	28,0	14,0	22,0	36,0	20,0	44,0
	High	46,2	69,2	30,8	53,8	53,8	53,8	69,2
Slovenia	Non or minor				11,1	11,1	3,7	3,7
	Medium	9,8	7,3	19,5	12,2	29,3	12,2	24,4
	High	12,9	22,6	29,0	32,3	64,5	67,7	54,8
Spain	Non or minor			5,6	11,1	27,8	44,4	27,8
	Medium	12,0	12,0	16,0	19,2	40,7	33,3	48,1
	High	25,0	37,5	28,6	62,5	50,0	37,5	77,8
Total	Non or minor	12,9	33,3	14,8	20,1	14,6	12,6	12,4
	Medium	14,7	16,5	19,5	35,5	28,5	20,7	46,9
	High	25,4	43,6	38,2	61,7	48,8	45,8	61,2

Questions B5_1-B5_7: How often does your organisation engage in the following activities in relation to higher education institutions? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very often«.

Figure A.0.27: ***Factors facilitating cooperation with higher education institutions (in percent, by extent of U-B cooperation)***

Country		Existence of shared motives	Financial resources for working with higher education institutions	Flexibility of higher education institutions	Interest of higher education institutions in accessing practical knowledge	Access to higher education institutions' research and development facilities	Close geographical distance of higher education institutions	Existence of mutual trust and commitment	Prior relationship with higher education institutions
Bulgaria	Non or minor	12,5	13,0	8,3	12,5	16,7	8,3	25,0	33,3
	Medium	76,3	20,3	8,5	28,8	47,5	37,3	45,8	45,8
	High	71,4	42,9		57,1	50,0	64,3	57,1	57,1
Hungary	Non or minor	35,0	27,5	32,5	40,0	27,5	22,5	35,0	32,5
	Medium	59,3	40,7	51,9	60,7	40,7	39,3	66,7	70,4
	High	100,0	80,0	100,0	100,0	80,0	60,0	100,0	100,0
Poland	Non or minor	31,4	22,9	37,1	40,0	25,7	40,0	42,9	34,3
	Medium	72,0	58,0	49,0	68,0	62,0	64,0	84,0	78,0
	High	76,9	61,5	61,5	76,9	30,8	61,5	92,3	92,3
Slovenia	Non or minor	44,4	25,9	37,0	44,4	33,3	51,9	55,6	25,9
	Medium	51,2	39,0	36,6	46,3	34,1	24,4	56,1	61,0
	High	77,4	48,4	51,6	64,5	58,1	58,1	74,2	61,3
Spain	Non or minor	41,2	31,3	47,1	52,9	29,4	52,9	52,9	35,3
	Medium	65,4	61,5	48,0	61,5	46,2	55,6	80,8	57,7
	High	87,5	37,5	28,6	62,5	33,3	75,0	75,0	62,5
Total	Non or minor	32,9	24,1	32,4	38,0	26,5	35,1	42,3	32,3
	Medium	64,8	43,9	38,8	53,1	46,1	44,1	66,7	62,6
	High	82,7	54,1	60,4	72,2	50,4	63,8	79,7	74,6

Questions B6_1-B6_8: How much do the following statements facilitate your organisation’s cooperation with higher education institutions? Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.28: ***High relevance of different barriers to higher education institutions-business cooperation (in percent, by extent of U-B cooperation)***

Country		Different modes of communication and language between higher education institutions and business	Different time horizons between higher education institutions and business	Different motivations and values between higher education institutions and business	Difficulty in finding the appropriate persons within higher education institutions	Bureaucracy within or external to the higher education institutions	Higher education institutions want to publish confidential results	Limited ability of knowledge transfer	The current financial crisis
Bulgaria	Non or minor	29,2	29,2	9,5	66,7	37,5	41,7	29,2	45,8
	Medium	64,4	64,4	50,0	72,4	64,4	72,9	69,5	25,4
	High	64,3	57,1	50,0	85,7	78,6	92,9	78,6	35,7
Hungary	Non or minor	52,5	41,0	52,5	52,5	61,5	35,0	40,0	35,9
	Medium	53,6	42,9	33,3	32,1	42,9	17,9	39,3	25,0
	High	60,0	40,0	60,0	40,0	60,0		60,0	75,0
Poland	Non or minor	45,7	42,9	60,0	40,0	42,9	25,7	22,9	15,2
	Medium	38,0	38,0	60,0	40,0	54,0	42,0	44,0	20,4
	High	46,2	53,8	46,2	53,8	61,5	15,4	53,8	41,7
Slovenia	Non or minor	44,4	55,6	59,3	48,1	59,3	29,6	48,1	37,0
	Medium	36,6	51,2	56,1	46,3	53,7	31,7	31,7	43,9
	High	32,3	67,7	71,0	16,1	77,4	41,9	41,9	51,6
Spain	Non or minor	66,7	77,8	72,2	38,9	77,8	11,1	38,9	47,1
	Medium	60,0	76,9	80,8	24,0	77,8	32,0	24,0	44,0
	High	37,5	62,5	75,0	25,0	62,5	12,5	25,0	62,5
Total	Non or minor	47,7	49,3	50,7	49,2	55,8	28,6	35,8	36,2
	Medium	50,5	54,7	56,0	43,0	58,5	39,3	41,7	31,7
	High	48,0	56,2	60,4	44,1	68,0	40,7	51,9	53,3

Questions B7_1-B7_8: How relevant are the following barriers to higher education institutions-business cooperation? Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.29: ***Strong positive influence of higher education institutions-business cooperation on different attributes (in percent, by extent of U-B cooperation)***

Country		The performance of business	The skills of students relevant to labour market careers	The knowledge of academics	The practical skills of professionals from organisations	The innovative capacities of the enterprise	Regional development and social cohesion
Bulgaria	Non or minor	91,3	91,3	69,6	82,6	87,0	82,6
	Medium	85,7	98,2	85,7	83,9	85,7	80,4
	High	100,0	100,0	78,6	85,7	100,0	85,7
Hungary	Non or minor	50,0	80,0	57,5	47,5	50,0	18,5
	Medium	64,3	77,8	59,3	53,6	60,7	39,1
	High	100,0	100,0	100,0	80,0	100,0	100,0
Poland	Non or minor	5,7	42,9	22,9	20,0	20,0	23,5
	Medium	22,0	70,0	58,0	56,0	52,0	46,9
	High	30,8	69,2	76,9	38,5	69,2	61,5
Slovenia	Non or minor	66,7	85,2	74,1	81,5	77,8	66,7
	Medium	65,9	82,9	63,4	75,6	75,6	41,5
	High	80,6	93,5	71,0	87,1	96,8	74,2
Spain	Non or minor	29,4	82,4	41,2	52,9	70,6	64,7
	Medium	25,0	77,8	69,2	57,7	92,3	65,4
	High	55,6	80,0	30,0	44,4	90,0	90,0
Total	Non or minor	48,6	76,3	53,0	56,9	61,1	51,2
	Medium	52,6	81,3	67,1	65,4	73,3	54,7
	High	73,4	88,6	71,3	67,1	91,2	82,3

Questions B9_1-B9_6: Please indicate to what extent you agree with the following statements. Higher education institutions-business cooperation importantly improves… Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.30: ***High extent of agreement with the necessity of different changes in higher education institutions (in percent, by extent of U-B cooperation)***

Country		Increase the practical orientation of teaching	Enhance traineeships and internships	Improvements in their financial systems	Focus on short-term skill development	Focus on long-term skill development	Support an international orientation	Focus on research and development	Enabling the valorisation of applied research	Strategic cooperation with business
Bulgaria	Non or minor	87,5	83,3	75,0	70,8	91,7	83,3	70,8	62,5	87,5
	Medium	94,9	93,2	81,4	81,4	64,4	79,7	83,1	93,2	98,3
	High	78,6	85,7	64,3	57,1	64,3	64,3	85,7	78,6	100,0
Hungary	Non or minor	97,5	87,2	41,0	53,8	77,5	72,5	57,5	55,0	84,2
	Medium	92,9	88,9	44,4	51,9	81,5	70,4	64,3	59,3	85,2
	High	100,0	100,0	100,0	60,0	100,0	100,0	100,0	100,0	100,0
Poland	Non or minor	88,6	77,1	34,3	62,9	80,0	62,9	48,6	47,1	77,1
	Medium	98,0	76,0	52,0	60,0	84,0	52,0	53,1	48,0	92,0
	High	100,0	84,6	53,8	69,2	100,0	69,2	38,5	69,2	92,3
Slovenia	Non or minor	92,6	81,5	66,7	40,7	77,8	88,9	77,8	77,8	96,3
	Medium	80,5	65,9	65,9	29,3	78,0	90,2	70,7	73,2	90,2
	High	90,3	87,1	83,9	41,9	93,5	96,8	87,1	87,1	93,5
Spain	Non or minor	82,4	100,0	87,5	25,0	66,7	94,1	43,8	82,4	100,0
	Medium	74,1	85,2	73,1	20,0	76,0	80,8	59,3	81,5	96,3
	High	90,0	80,0	66,7	30,0	70,0	90,0	60,0	80,0	100,0
Total	Non or minor	89,7	85,8	60,9	50,7	78,7	80,3	59,7	64,9	89,0
	Medium	88,1	81,8	63,3	48,5	76,8	74,6	66,1	71,0	92,4
	High	91,8	87,5	73,7	51,7	85,6	84,1	74,3	83,0	97,2

Questions B4_1-B4_9: In your view, to what extent should higher education institutions change in the future? Responses 5-7 on a scale from 1-»Not at all« to 7-»To a very high extent«.

Figure A.0.31: ***Most often used recruitment mechanisms for hiring higher education graduates in the last five years (in percent, by extent of U-B cooperation)***

Country		Through an advertisement in a newspaper	Through a public employment agency	Through a private employment agency	Through the Internet	Through an internship placement	Through private contacts	Through the help of a higher education institution
Bulgaria	Non or minor	19,0	14,3	18,2	69,6	38,1	72,7	14,3
	Medium	1,8		68,4	84,1	79,1	82,2	40,0
	High		15,4	84,6	92,9	82,8	79,3	48,3
Hungary	Non or minor	32,5	34,2	20,5	55,3	20,5	52,6	10,5
	Medium	28,6	3,7	21,4	75,0	62,5	41,7	50,0
	High	40,0	20,0	40,0	88,9	80,0	22,2	90,0
Poland	Non or minor	11,4	8,6		41,2	32,4	17,6	5,9
	Medium	14,3	16,7	10,2	46,3	34,2	39,0	25,0
	High	15,4	15,4	30,8	50,0	63,6	54,5	54,5
Slovenia	Non or minor	29,6	29,6	22,2	48,0	56,0	60,0	16,0
	Medium	26,8	31,7	46,3	65,6	68,8	65,6	21,9
	High	41,9	48,4	22,6	61,9	83,3	59,5	52,4
Spain	Non or minor			7,1	42,9	41,7	25,0	40,0
	Medium	4,8	4,5	18,2	50,0	69,6	36,4	22,7
	High	22,2	11,1	22,2	46,2	84,6	53,8	71,4
Total	Non or minor	23,2	21,7	17,0	51,4	37,7	45,6	17,3
	Medium	15,2	14,2	32,9	64,2	62,8	53,0	31,9
	High	29,9	22,1	40,0	68,0	78,9	53,9	63,3

Questions A5_1-A5_7: How often does your organisation use the following recruitment mechanisms for hiring higher education graduates in the last five years? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very often«.

Figure A.0.32: ***High extent of new graduates' possession of different skills (in percent, by extent of U-B cooperation)***

Country		Mastery in their field or discipline	The ability to acquire new knowledge	The ability to perform well under pressure	The ability to use time efficiently	The ability to productively work with others	The ability to come up with new ideas and solutions	The ability to work in a foreign language
Bulgaria	Non or minor	34,8	60,9	26,1	21,7	30,4	39,1	69,6
	Medium	44,4	84,4	37,8	17,8	20,0	60,0	46,7
	High	20,7	69,0	44,8	31,0	24,1	55,2	51,7
Hungary	Non or minor	28,2	79,5	59,0	41,0	71,8	68,4	48,7
	Medium	29,2	83,3	45,8	33,3	79,2	58,3	45,8
	High	10,0	100,0	70,0	20,0	80,0	80,0	50,0
Poland	Non or minor	23,5	70,6	29,4	38,2	50,0	38,2	50,0
	Medium	23,8	59,5	19,0	26,2	35,7	31,0	33,3
	High	19,0	63,6	22,7	18,2	40,9	27,3	50,0
Slovenia	Non or minor	36,0	64,0	36,0	28,0	44,0	60,0	68,0
	Medium	65,6	90,6	34,4	34,4	46,9	53,1	78,1
	High	59,5	92,9	54,8	45,2	73,8	83,3	83,3
Spain	Non or minor	26,7	60,0	20,0	35,7	60,0	40,0	46,7
	Medium	68,0	80,0	36,0	36,0	56,0	44,0	33,3
	High	50,0	100,0	57,1	42,9	92,9	71,4	46,2
Total	Non or minor	29,8	67,0	34,1	32,9	51,2	49,2	56,6
	Medium	46,2	79,6	34,6	29,5	47,6	49,3	47,5
	High	31,9	85,1	49,9	31,5	62,3	63,4	56,2

Questions A6_1-A6_7: Below is a list of skills. Please provide information to what extent new graduates in your experience possess these skills? Responses 5-7 on a scale from 1-»Not at all« to 7-»Very high«.

Case studies

This appendix provides the description of three case studies from different companies on different cooperation modes: internship in a bank, research in the IT company, and university-business cooperation with a large industry company.

Case study 1 - Internship in a bank

Talented students can get the opportunity to try out the banking world - internships in the bank, to be involved in specific work tasks, have their own development plan, participate in bank training, to be mentored by managers, receive feedback on, and get advice for their personal development and ultimately working position in the bank .The target group are students of the last year of studies in the fields of economy, humanities, law, IT, mathematics. Through the acquisition of real work experience students can form their own idea of the banking world, define direction after school, or get an interesting job.

The funding of the internship is fully the responsibility of bank. The first two months, students do not get any compensation. Next 5 months student are compensated. The whole project is for 7 months.

The bank's intention is to attract and help students that are initiative and do things that exceed the regular (work or study) expectations. The bank also uses this opportunity to recruit the best students.

There are several positions and areas involved in the project. The human resources department is responsible for the organizational aspects and then there are managers involved in the mentoring part of the project.

The internship help students in gaining relevant job experience, promote the banking sector, recruit the most talented students, build a positive image of the organization. Weaknesses are: bureaucratic and time burden for employees, students we invested the money in, can choose a job at competitors'. The project is continuing with 23 students accepted in the program in 2014. We are expecting a similar number in 2015.

Case study 2 - Research in the IT company

We have an agreement on projects of interest that include yearly based assignments. Yearly based means that every year we define what will be the real projects and what will be the request of the project – what we expect as an outcome for the specific year. At the beginning of the year we make exact project specification on what will be the research topics and what will be the output of that. We have quarterly reviews on the research progress and what we request from each of these projects is that we have a prototype of the defined topic at the end of the year. If we have some additional research possibilities or problems that we don't know how it will look like, we put some topics in this additional investigation by the students during the summer camp. As I said, at the end, we always expect a prototype, whatever it is. The money regarding that is always planned on a yearly base and the company finances that. What is important in these projects is that people from our company and people from the

university are together in that project. We always want to have also our people there because it is important that the people in the university are aware that result must be produced in time.

Case study 3 - Cooperation with a large industry company

The company has a long-term cooperation with a technical university. This university has a bachelor's program in the area of company's interest. The cooperation is on on-going basis and includes the following:

- employees provide lectures at this university
- students come to the company and attend the lectures directly in the company's premises
- company's employees serve as advisors on students' bachelor thesis
- company organizes a trip to the company's headquarters which is in the other country
- company organizes teambuilding events for students such as "school of hydroplaning"
- students write proposals for some projects, e.g. how to reduce the waste, how to protect the environment, and company provides the funding and awards
- students write proposals related to the corporate social responsibility
- company provides funding to establish laboratories at technical university
- company helped to rebuild the study rooms at the school's dormitory
- company pays for the textbooks, software or language courses for students

The company signed a contract with technical university. They invested money into the labs and study rooms and university officials, faculty or students have to come up with the project proposals. Foundation officials consult it, approve and fund selected projects. Company wants to support people that are initiative and do things that exceed the regular (work or study) expectations. The company wants to build a good name for the company plus support interest in the technical field.

The strengths of cooperation are: help to the university (faculty, students, university itself), promotion of technical field in education, recruitment of the best graduates, building the reputation of the company, helping the community. Weaknesses are: bureaucracy, time constraints and likelihood that the students they invested the money in, might choose another job.

There is a big sustainability of these projects since the company usually picks those projects that have long-term durability (e.g. the establishment of the laboratory). If there are enough funds, the company plans to cooperate with the university also in the future. The company also wants to teach universities how they can get funding from businesses. By setting an example, they believe universities will be prone to approach other companies as well.