EMCOSU
Emerging Modes of Cooperation between Private Sector Organisations and Universities

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Emerging Modes of Cooperation between Private Sector Organisations and Universities

National Reports and Case Studies Summaries

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Introduction

Presented study includes separated national reports, elaborated on the basis of the surveys, focused on university-business cooperation (UBC), executed within the framework of EMCOSU project among 396 companies in five countries – Bulgaria, Hungary, Poland, Slovenia and Spain. Conducted study allowed to identify modes of cooperation between the private sector and universities and to present results of this cooperation. The original survey questionnaire was elaborated in English by the Project partners and later translated to national languages. The survey was conducted between October 2013 and June 2014.

National reports are grouped in five specific areas:

1. Modes and activities of university-business cooperation
2. Drivers and barriers of university-business cooperation
3. University and business cooperation outcomes and impact, lessons learned.
4. Enterprises' perceptions of universities and university-business cooperation
5. Anticipated changes at universities in the future.

Each national report includes presentation of the most important survey findings. Conducted survey includes also open questions. Part of the obtained comments, together with additional phone interviews were used to prepare ten case studies for each country, presenting some details related to companies and organizations with experience in the field of university-business cooperation. This analysis has revealed several cases of success, it has allowed to identifying in detail the problems and threats that this kind of collaboration has got, it has shown how it is financed. Summaries of these case studies are included into the study after each national report. Project team has anticipated that completed study contribute to further development of University Business Cooperation.

Partners included in the project and in the preparation of the national reports are the following:

Bulgarian Business Foundation for Education (BFE) was founded in 2005 to continue and further develop the labor market initiatives of USAID reinforcing the competitive workforce development in Bulgaria. BFE collaborates with national authorities, business and academic counterparts on strengthening the liaison between educational and

training system and corporate world. The Foundation is an acknowledged leader in the field of vocational training of career professionals in Bulgaria and an active lifelong learning and guidance promoter, having initiated the establishment of career services in education, public institutions and private sector by training and certifying more than 1000 counselors. BFE has successfully implemented a lot of projects that facilitate learning opportunities, enhance the development of competencies throughout lifespan and help individuals in their personal and professional realization. BFE represents National Board for Certified Counselors in Bulgaria and collaborates with the Career Consultants Association.

The team of BFE combines the experience of experts in project management; guidance counselling, education, workforce development and labour market; development of training programs and public communications, proved in number of successful projects since 2005.

The activities and the recognition which Business Foundation of Education has achieved since its establishment prove the effective and efficient operational and financial management of the organization. The team of the Foundation has implemented as a coordinator or as a partner more than 20 European and international projects and initiatives. High quality standards have been always the milestones of BFE's activities. This can be also seen from the numerous successful projects including one that was awarded a Quality Award by the Bulgarian National LLP Agency and one that was awarded a Language Label for innovativeness.

The **Hungarian Chamber of Commerce and Industry of County Zala** was founded on 9th January, 1995. Among its main activities the chamber provides a general representation of interests, including the promotion of economic interests of the membership. In order to achieve its objectives, the chamber cooperates and if necessary enters into an agreement with local governments, state and social organizations. The chamber's program includes the economic renewal of the economic interest organization, the protection the economic interests of the Hungarian entrepreneurs and becoming a service-centred organization.

At international level the aim of the chamber is to help to the Hungarian entrepreneurs to enforce the foreign markets, to develop the EU cooperation opportunities - especially in neighboring countries - in order to improve their competitiveness. Its most important additional activities are: professional meetings, training courses, conferences, taking part on exhibitions and fairs, company information services, document authentication, master courses and examination, dealing with student contracts, composing the Chamber News, consultations, investment opportunities, operation of the Hungarian-Slovenian Committee, Arbitration Board, operation of the chamber portal (www.zmkik.hu), Internet business databases, the Chamber Newsletter.

Polish Chamber of Commerce (PCC) founded in 1990 is the largest economic self-government institution in Poland. Its mission is to establish and develop strong economic self-government institution and to support Polish entrepreneurs on both Polish and integrated EU market. One of the key areas of the PCC activity is to promote innovation. PCC organized two large international conferences, related to innovation in enterprises and provide significant input to the debate on instrument supporting innovation in companies. Part of PCC recommendation was included into legislation supporting innovative economy. PCC activities related to promoting innovative economy include also project related to cooperation with academia. This includes publication of Entrepreneurial University and manual for university professors interested in starting the spin off companies. PCC promotes Corporate Social Responsibility and encourages Polish entrepreneurs to implement the highest standards of business ethics.

PCC represents the interests of Polish entrepreneurs vis-a-vis the government and local bodies of State administration and cooperates with the Parliament providing opinions on new draft regulations concerning the economy. We are one of the major social partners in the legislative process, and at the stage of discussion on new bills we can identify potential pitfalls as well as propose changes. We are actively involved in drafting the law on freedom of business activity, tax laws, regulations on social insurance system, investment support, business promotion, public tenders, public support for enterprise, labour law and other acts.

PCC cares about entrepreneurs in the international arena doing its best to increase the recognition of Poland and Polish economy. We organize national exhibitions (EXPO – Hanover, Aichi), invite entrepreneurs to the international trade, fairs, trade missions, economic forums, multi and bilateral business meetings and other forms of foreign trade promotion. We also help foreign companies with finding business partners on the Polish market.

The **Chamber of Commerce and Industry Slovenia** (CCIS) is a non-profit, non-governmental, independent business organization representing the interest of its members. With more than 160 years of tradition it is the most influential business organization in Slovenia. It has more than 13.000 member companies of CCIS coming from all sectors and all regions in Slovenia. CCIS unites 25 branch associations, representing all important industry sectors of Slovenia. CCIS has 13 regional offices in Slovenia. The 115 employees of CCIS can provide knowhow, expertise and knowledge in a broad spectrum of areas and topics.

CCIS has the status of a representative Chamber of Commerce and is thus partner for the government in preparing legislation and policy strategies. CCIS is member in numerous government bodies, boards and committees, in the area of education and learning for instance:

- Governing Board of the University of Ljubljana
- Council of the Republic of Slovenia for Higher Education
- Council of the Republic of Slovenia for the Education of Adults
- Council of the Republic of Slovenia for Vocational Education and Training and Further Education and Training
- Council of the Public Fund for the Development of Human Resources and Awarding of Grants
- Member in all Area Boards for Vocational Training Standards

Supporting governmental bodies with knowhow and expertise in these makes CCIS a key actor at national level in the area of adult education, lifelong learning and vocational education and training.

The **High Council of Official Chambers of Commerce, Industry and Navigation of Spain** is a public law entity, with its own legal status, and with full capacity to operate in order to carry out its activities.

Under the tutelage of the Government's Public Administration bodies, the Council develops the functions that have been assigned by law, among which:

- To defend the general interest of trade, industry and navigation nation-wide.
- To represent all chambers at all national and international levels.
- To coordinate and promote actions affecting Spanish Chambers of Commerce.
- To inform, as provided for under the laws in force, on legislation of any rank that have a direct impact on commerce, industry and navigation.
- To advise the government, on matters related to commerce, industry and navigation.
- To perform the administrative functions assigned to it which affect the entire country.
- To coordinate the actions included in the Chambers' Plan for Export Promotion
- To act as an arbitrator at the national and international levels.

The High Council of Official Chambers of Commerce, Industry and Navigation of Spain represents the 88 Spanish Chambers of Commerce at national and international levels. It acts as an intermediary between the private sector and the national government, coordinates the actions and initiatives of the Chamber of Commerce networks and fosters relations between them.

1 BULGARIA

National report prepared by: Gergana Andreeva and Nadejda Paunova

1.1 Introduction and Methodological Approach

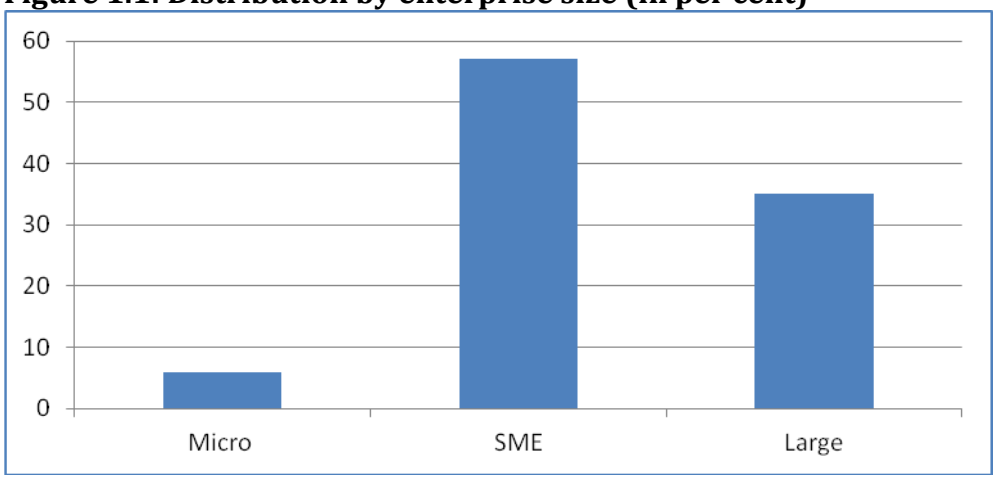
Within the framework of EMCOSU project the Business foundation for Education conducted a survey among companies and business associations to identify modes of cooperation between the private sector and UBC. Invitations to participate in the survey were sent out to more than 200 companies and employers' associations selected following the guidelines of the project and the arrangements agreed upon by the partners. The respond rate was very low and later on we have to organize face to face and phone interviews in order to collect a requested number of 100 filled-in questionnaires. The survey contained closed questions related to modes of cooperation, drivers for cooperation, as well as prevailing barriers. The conducted survey also allowed us to identify UBC outcomes and impact, lesson learned, as well as to get to know how Bulgarian companies perceive UBC. The survey was carried out from November 2013 till June 2014. Given the size of the company, 57 questionnaires were returned by SMEs and 35 were obtained from large corporations and 6 from micro enterprises. Sect orally, 19 questionnaires were returned by industrial companies, 46 by the services sector and 33 by the ICT sector. The results in Bulgaria are very promising, interesting and in many ways they show good modes of cooperation between enterprises and universities mainly related to graduates transition to the labour market (internships and placement programs, facilitated by the university career centres and career fairs initiatives). We also found more curriculum development and joint programs development initiatives.

All received questionnaires were saved in the electronic form. The paper versions are stored in ring folders. Collected data has been entered into template files drawn up by the project leader in order to be further analysed. The codebook for the questionnaire was used while entering data into the files. The following report presents the results of the survey.

1.2 Modes and Activities of UBC

In order to follow the EMCOSU project's main objectives the sampling plan of the large scale survey in Bulgaria 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. The general distribution of the survey respondents is presented in Figure 1. Micro enterprises are those with 1 to 10 employees, SMEs with 11-250 employees and large enterprises are those with 251 and more employees.

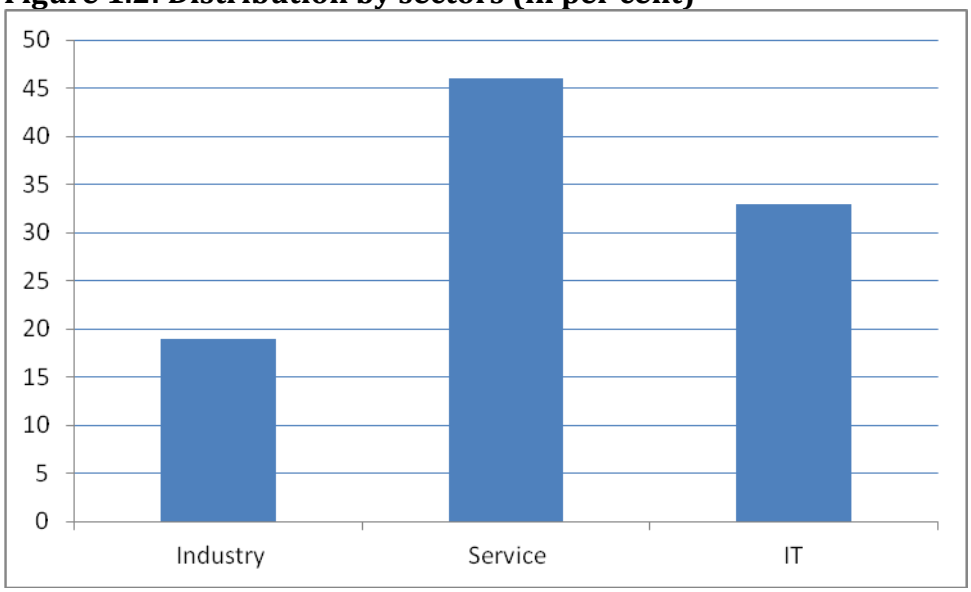
Figure 1.1: Distribution by enterprise size (in per cent)



Source: EMCOSU Large Scale Survey Analyses

Figure 1.2 represents the general distribution of the respondents by sectors. The survey included representatives of three sectors – industry, ICT and service, their distribution is presented below.

Figure 1.2: Distribution by sectors (in per cent)



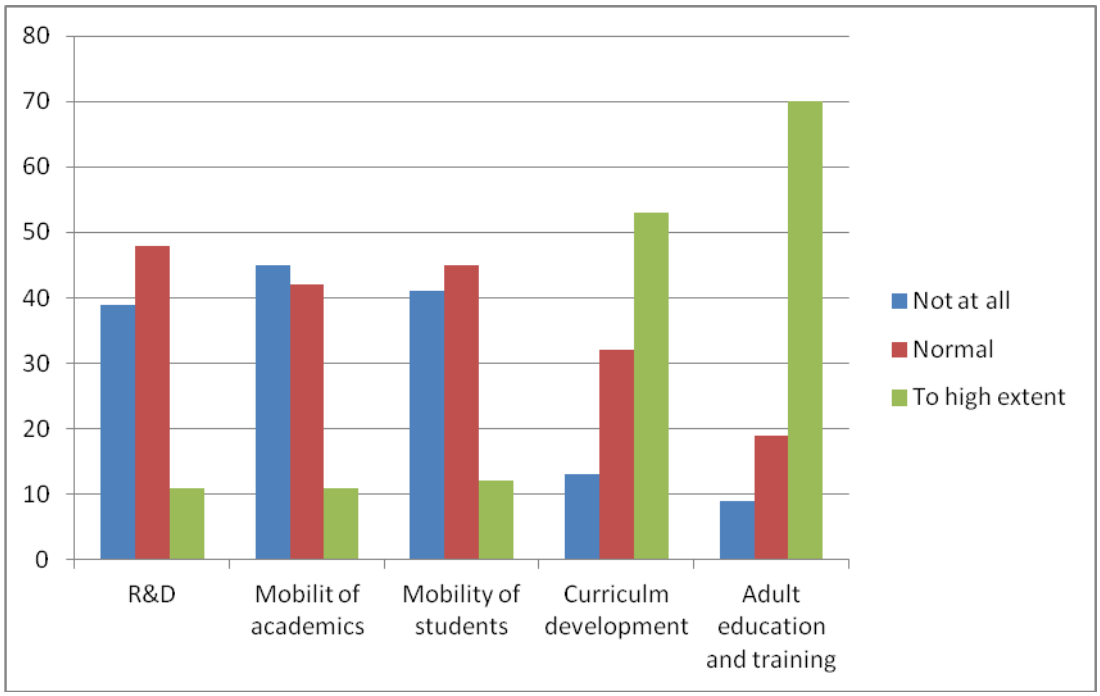
Source: EMCOSU Large Scale Survey Analyses

In question B1 the respondents were asked about the extent of cooperation with universities in the following areas:

1. research and development (R&D) e.g. (inter)national projects, commissioned research;
2. mobility of academic staff (their training or research in your organization);
3. mobility of students e.g. direct recruitment, traineeships;
4. curriculum development and delivery (including university lectures);
5. adult education, training and short courses and other "lifelong learning activities";
6. other.

Figure 1.3 shows the extent of universities and business cooperation for micro-enterprises, SMEs and medium-sized companies).

Figure 1.3: General distributions by modes of cooperation (in per cent)

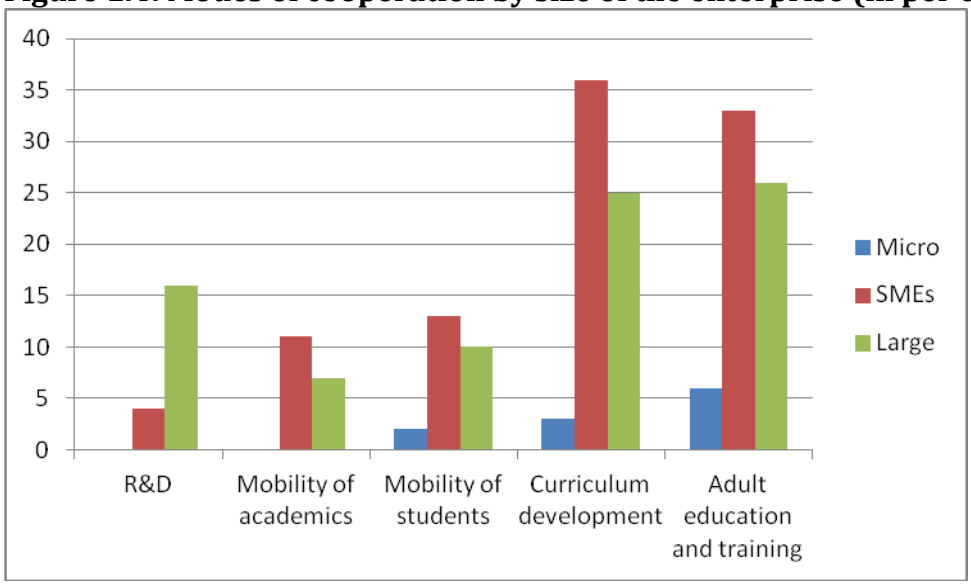


Source: EMCOSU Large Scale Survey Analyses

As is seen from the figure the most popular modes of cooperation are curriculum development (including university lectures) and trainings and short courses. Many other surveys also underline that Bulgaria still needs to increase the numbers of academics and students that attend different mobility initiatives. R&D mode of cooperation needs to be improved with more motivation and joint driving priorities from both sides.

Graph 1.4 bellow represents the high extent modes of cooperation divided by size of the enterprises. It is logical that we see more involvement from SMEs and large enterprises in different modes of cooperation because micro companies usually do not have capacity (human, financial, etc.) to participate in different activities with HEIs. As is seen the large companies has additionally to curriculum development and trainings, joint R&D activities with HEIs.

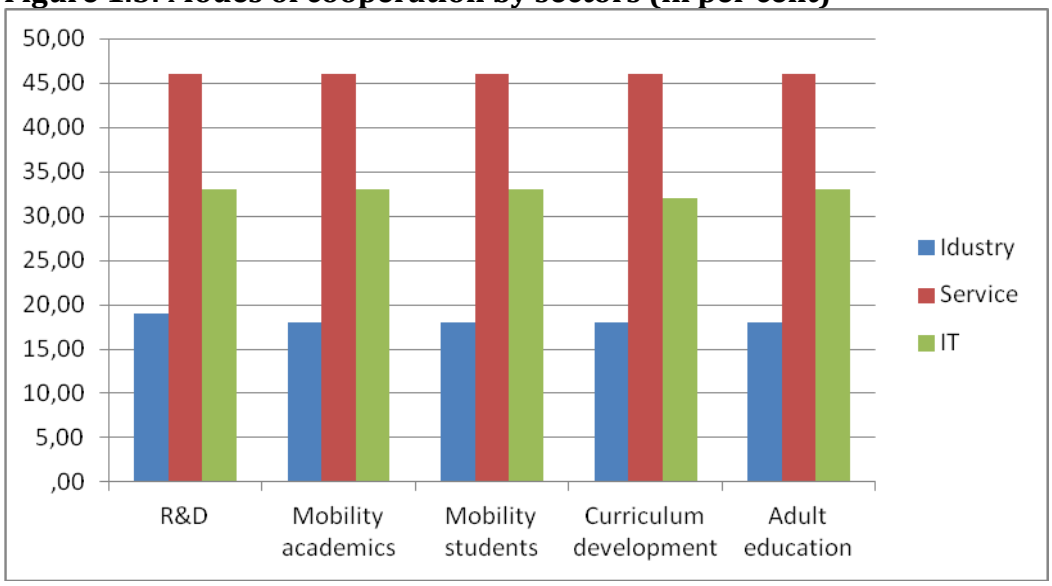
Figure 1.4: Modes of cooperation by size of the enterprise (in per cent)



Source: EMCOSU Large Scale Survey Analyses

The next figure represents the modes of cooperation by sectors. The in-depth data shows that industrial sector has more frequently R&D projects with HE institutions compared to service and IT sectors. IT sector enterprises are more engaged in curriculum development and teaching.

Figure 1.5: Modes of cooperation by sectors (in per cent)



Source: EMCOSU Large Scale Survey Analyses

We can assume that company representatives are often invited to participate in educational processes as invited lecturers or as organizers of additional presentations on specific topic. The case from Bulgaria (a company from the sector of food production)

(CS 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.

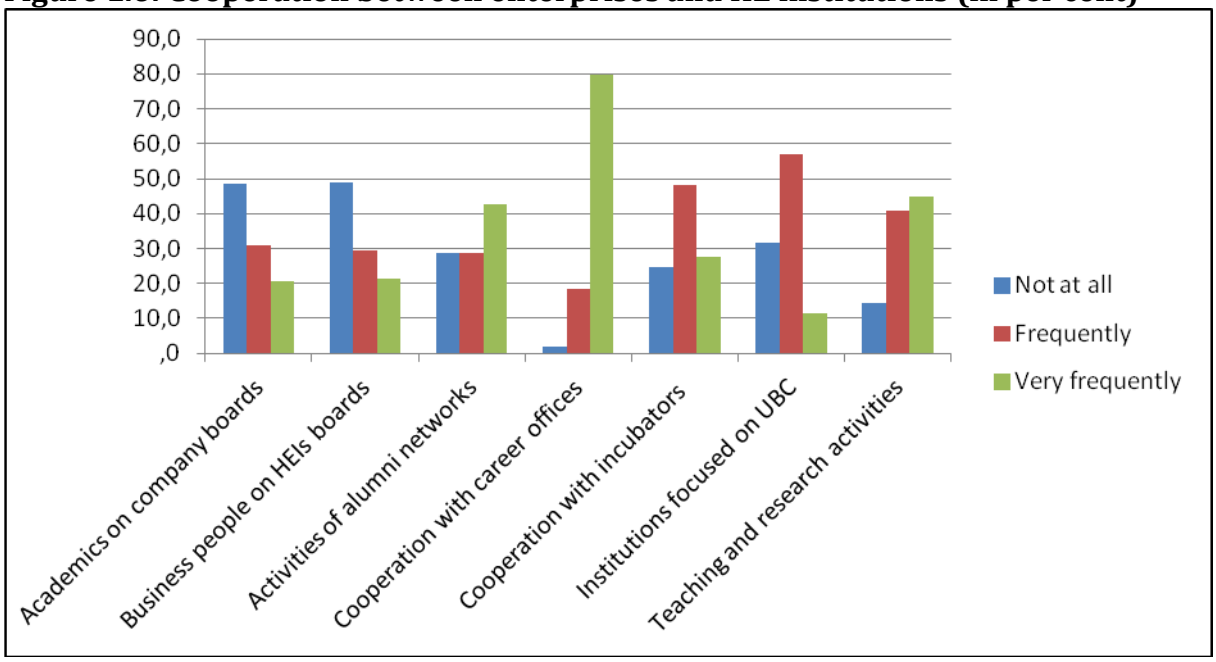
Taking the above into consideration, the results of the survey indicate that Bulgarian companies are changing their attitude — they have become more interested in cooperation between universities and business.

The survey (question B5) analysed how often Bulgarian entrepreneurs are involved in projects carried out jointly with universities. The following areas were surveyed:

1. academic staff sitting on company management boards;
2. business people sitting in university boards;
3. participation in the activities of alumni networks;
4. cooperation with university career offices;
5. cooperation with institutes focused on university-business cooperation;
6. cooperation with business incubators;
7. active involvement of business representatives in study, teaching and research activities.

The next figure represents the existing cooperation between enterprises and HE institutions. The figure clearly presents that cooperation with career offices, alumni networks and teaching and research activities are the ones that are more commonly used in Bulgaria.

Figure 1.6: Cooperation between enterprises and HE institutions (in per cent)



Source: EMCOSU Large Scale Survey Analyses

During the last years we noticed that cooperation between enterprises and HEIs goes through career and alumni services and enterprises gradually increase their offers for soft skills courses and programs for students. At the same time the boards' participation are not common in Bulgaria.

More than 70% of the enterprises participated to some extent in cooperation with alumni networks and career centres. The distribution is not different based on sector and follows the general findings. The representative of a marketing company from Bulgaria emphasized 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." (Bulgaria, case study 9).*

It is clear from the survey results and cases studies that business – education cooperation is very important for the enterprises. They are more and more interested to support the HEIs to prepare better tailored to their own needs workforce.

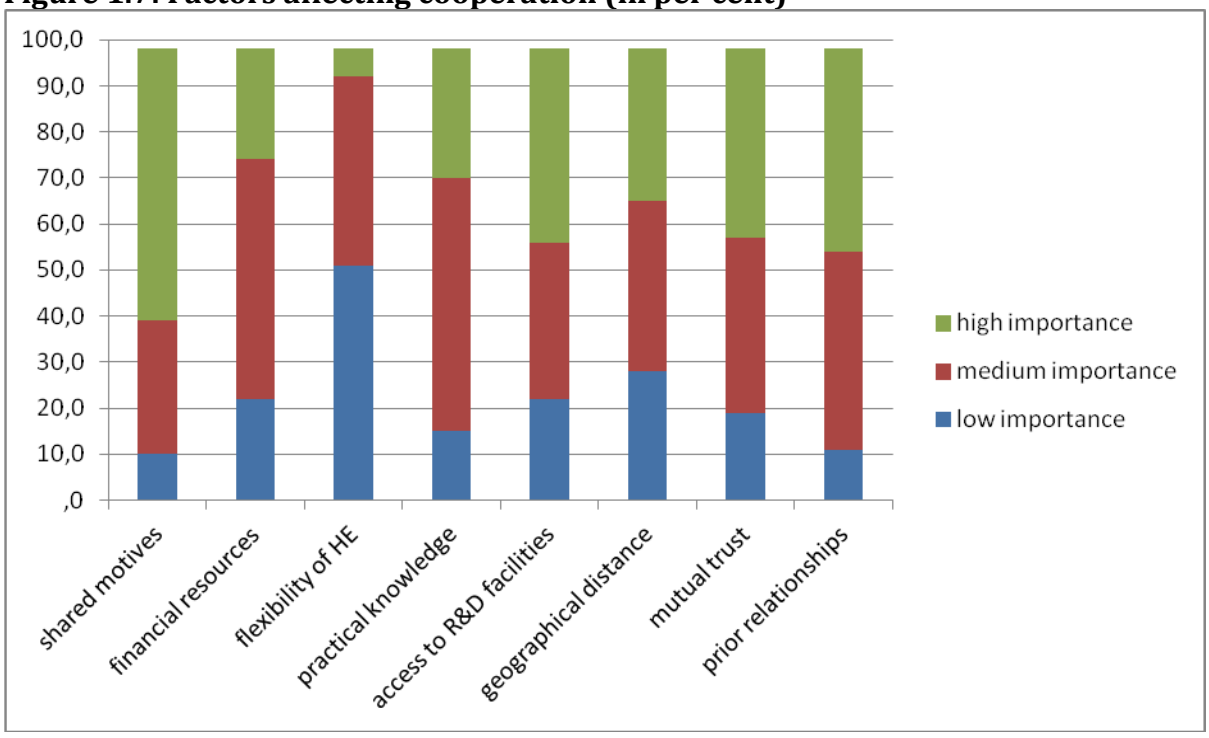
1.2 Drivers and Barriers of University-Business Cooperation

In the survey the companies were asked to assess the importance of factors facilitating university-business cooperation. The following factors were assessed:

1. existence of shared motives;
2. financial resources for working with universities;
3. flexibility of universities;
4. interest of universities in accessing practical knowledge;
5. access to universities' research and development facilities:
6. close geographical distance of universities;
7. existence of mutual trust and commitment;
8. prior relationship universities.

The following figure illustrates the importance of individual factors.

Figure 1.7: Factors affecting cooperation (in per cent)



Source: EMCOSU Large Scale Survey Analyses

The obtained results show that shared motives is the most important factor for good cooperation. Prior relationship (45%), mutual trust (42%) and access to R&D (42%) were also perceived as important. The fact that shared motives were ranked as the most

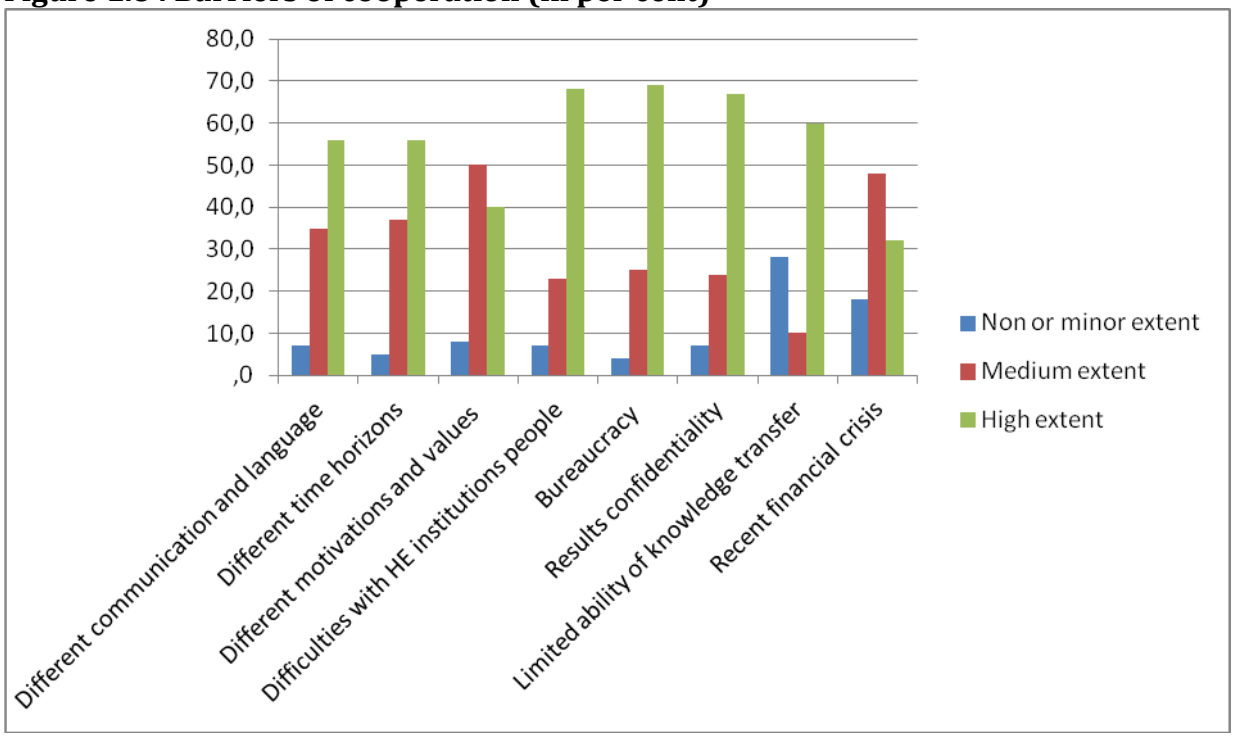
important factor for 60% of companies shows that companies were interested to work and invest their resources for joint cooperation with HEIs when their own current needs were considered. In many cases this fact creates some problems in cooperation because HEIs and companies have different time horizons. Companies usually are more interested in short time goals and finding appropriate workforce for their current needs, as the HEIs are more long term oriented. Prior relationships such as previous joint experience, personal relationships, etc. were also important for companies as factors for future cooperation with HEIs

Given the size of the company, it can be said that factors important for all companies are equally important for medium-sized as well as large companies. Shared values are important for 55 % of small and medium-sized enterprises (SMEs), for 77% of large companies and 50% of micro companies. The same tendency is seen for the shared values factor by sectors – 63% of industrial, 60% of IT and 59% of service companies had ranked is as highly important impacting the universities-business cooperation.

Bulgarian companies were also asked to describe the barriers in universities-business collaboration. The following obstacles were listed in the survey:

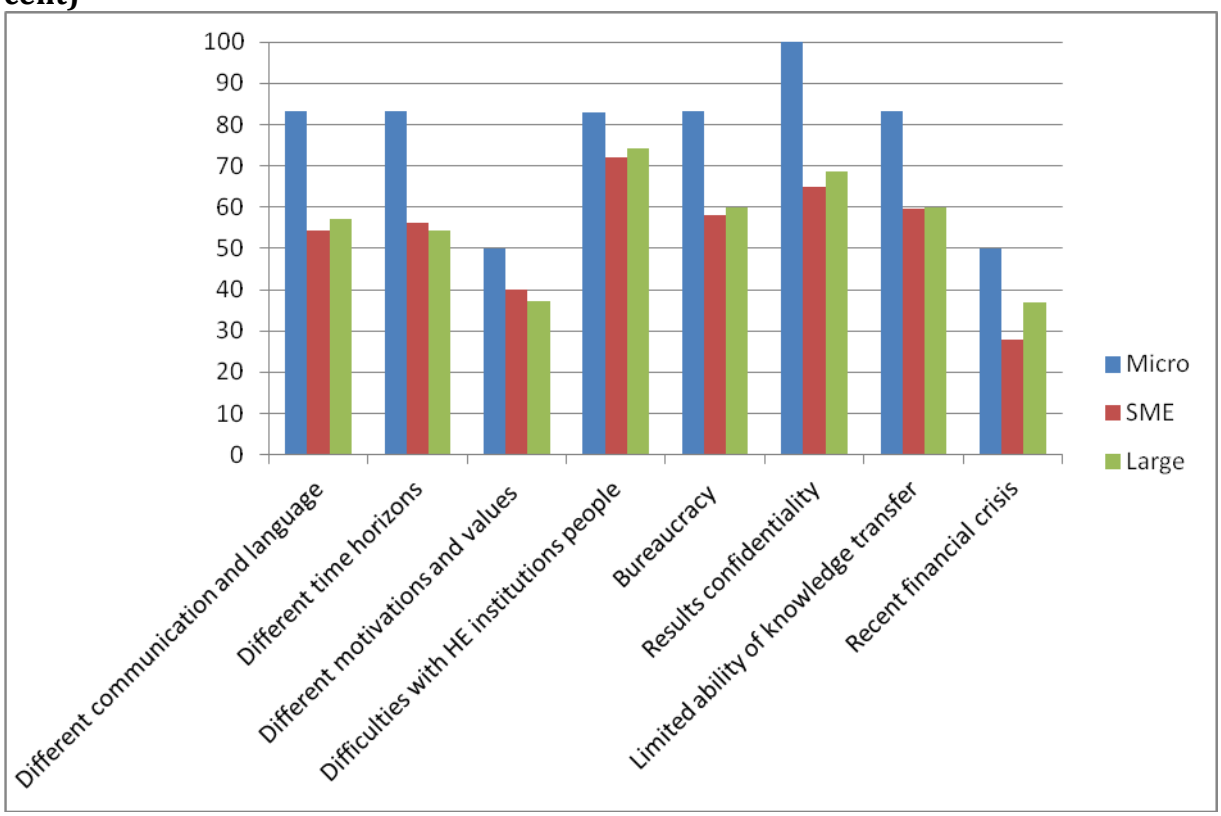
1. different modes of communication and language barriers between universities and business;
2. different time horizons between universities and business;
3. different motivations and values for universities and business;
4. difficulty in finding an appropriate partner at universities;
5. red-tape within universities and outside;
6. universities want to publish confidential results;
7. limited possibilities of knowledge transfer;
8. the current financial crisis.

Figure 1.8 : Barriers of cooperation (in per cent)



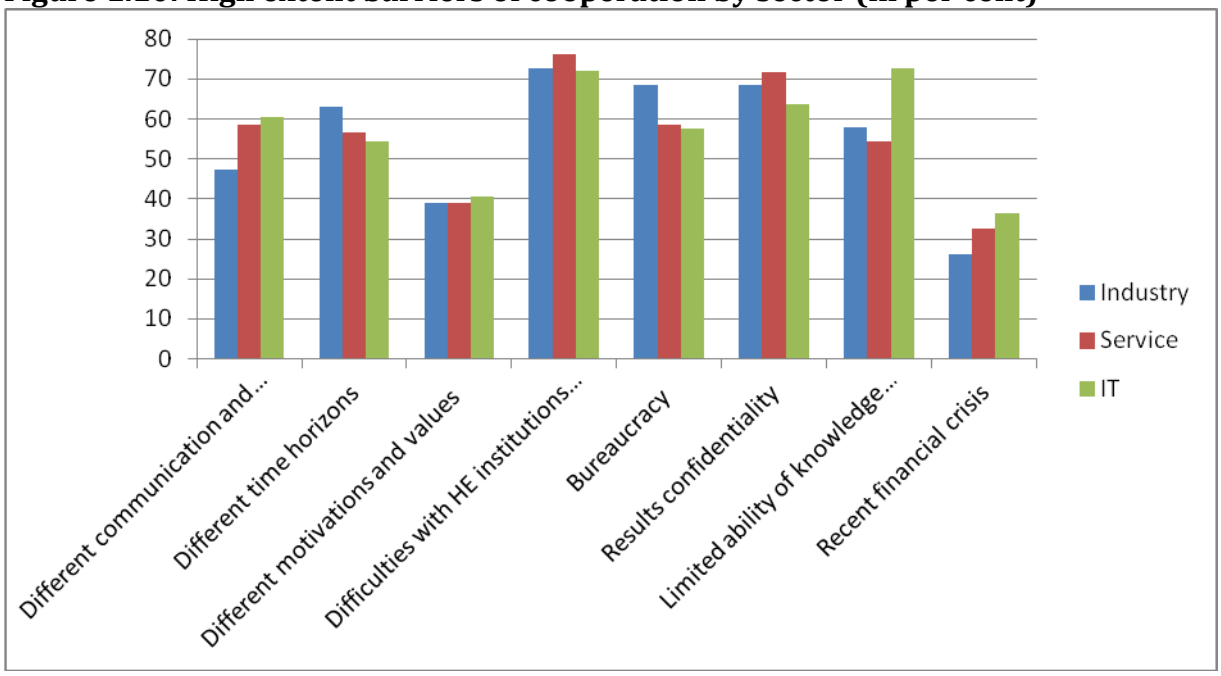
Source: EMCOSU Large Scale Survey Analyses

Figure 1.9: High extent barriers of cooperation by size of the enterprise (in per cent)



Source: EMCOSU Large Scale Survey Analyses

Figure 1.10: High extent barriers of cooperation by sector (in per cent)



Source: EMCOSU Large Scale Survey Analyses

We can notice that each of the proposed barriers of communication is seen as quite problematic by enterprises. The top three listed by enterprises are – bureaucracy, difficult communication with HE institutions' representatives and results' confidentiality. These three barriers clearly explain the lack of R&D modes of cooperation in Bulgaria that we already discussed above. Another explanation of these barriers is related with legislative gaps and with legal protection of the industrial property rights in Bulgaria. At the same time in many cases enterprises and HE institutions have different driving priorities for joint projects that result in difficulties in communication between them. For example different time horizons as we discussed already above. The results slight vary for different size companies and different sectors but in general they represent the situation in the country and barriers for companies related with bureaucracy and lack of adequate legislation.

Of course we have good practices - *one of the leading industry enterprises has declared "very well established partnerships with the leading technical HE institutions in Bulgaria - Technical Universities in Sofia, Plovdiv, Varna, Gabrovo (Bulgaria, case study 2).*

The results of this part of the survey indicate that all obstacles are significant for respondents. They should be taken into consideration when undertaking activities for fostering cooperation between business and HEIs.

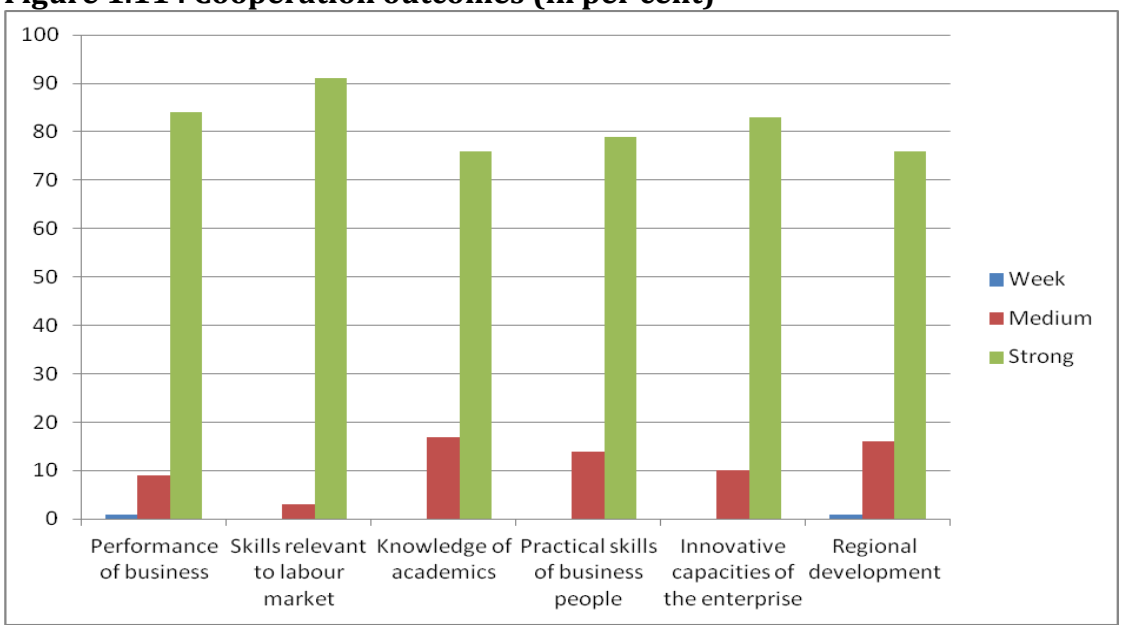
1.3 University and Business Cooperation Outcomes, Impact and Lessons Learned

Companies were asked in the survey to define the extent to which the universities and business cooperation in joint research improved the following factors.

1. the performance of business;
2. the skills of students relevant to labour market;
3. the knowledge of the academic staff;
4. the practical skills of professionals from organisations;
5. the innovative capacities of the enterprise;
6. regional development and social cohesion.

The following figure illustrates the importance of the factors mentioned above.

Figure 1.11 : Cooperation outcomes (in per cent)



Source: EMCOSU Large Scale Survey Analyses

The survey indicates that for majority of employers the university-business cooperation is mostly beneficial for students. In their opinion the cooperation helps students in gaining and developing skills important to be competitive in the labour market. Other important factor is the performance of the businesses that corresponds to already discussed factor of shared motives for cooperation between both sides.

The whole survey and answers to question A6 (skills of new graduates) clearly indicate that companies are convinced that skill as: working under pressure, team work,

creativity and time management are critical for students' employability. In other words, companies declare again those transferral skills are very important for them and they are ready to work with HEIs in order to improve those skills for students.

It is important to note that the companies see innovative capacity of the enterprises as also very important. We can argue that such capacity can be created through research or human development. The surveyed employers do see research as a potential way to improve their employees' qualifications.

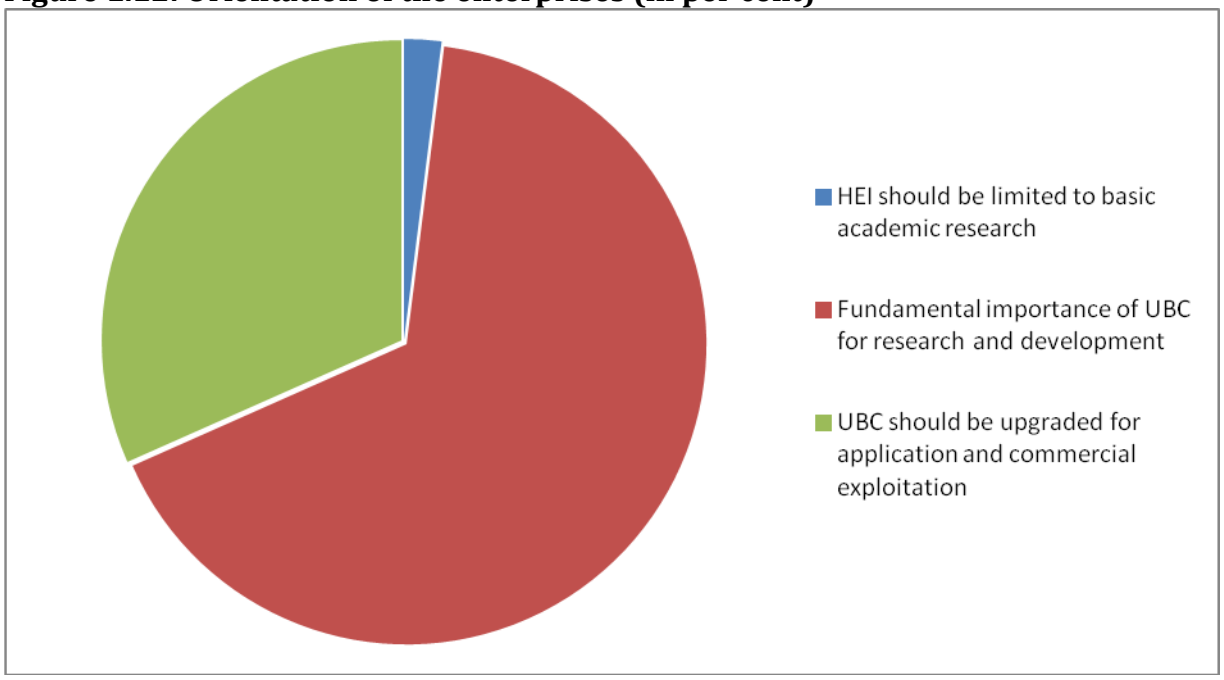
The majority of respondents do expect to that joint research projects will contribute to the improvement in regional development. Such effect is possible but we should underline the fact that the number of students and young researchers during the last recent years is decreasing. Many young people prefer to complete their studies abroad and this fact creates lots of problems for the HEIs. They compete for fewer students and usually do not get the best ones who study abroad.

1.4 Enterprises Perceptions of Universities and University-Business Cooperation

The majority of surveyed enterprises declared that university-business cooperation is of crucial importance both in curriculum development and training. Thus in their opinion it is very important that universities and business cooperate continuously in all possible areas. The next figure represents the opinion of the enterprises on certain general perceptions.

As it is presented in Figure 1.12. the majority of the enterprises (66.3%) believe in fundamental importance of the UBC for research and development. At the same time 31.6% of respondents believe that UBC should be upgraded for application and commercial exploitation. If we explore this question by sector we will noticed that primarily enterprises from IT sector believe that UBC should be upgraded for application and commercial exploitation. At the same time the representatives from industrial sector are primarily those who believe in fundamental importance of the UBC for research and development. This result represents the good will of the enterprises to cooperate with HE institutions for research and development but at the same time as is presented in Figure 1.4. the percentage of such projects is still very low.

Figure 1.12: Orientation of the enterprises (in per cent)

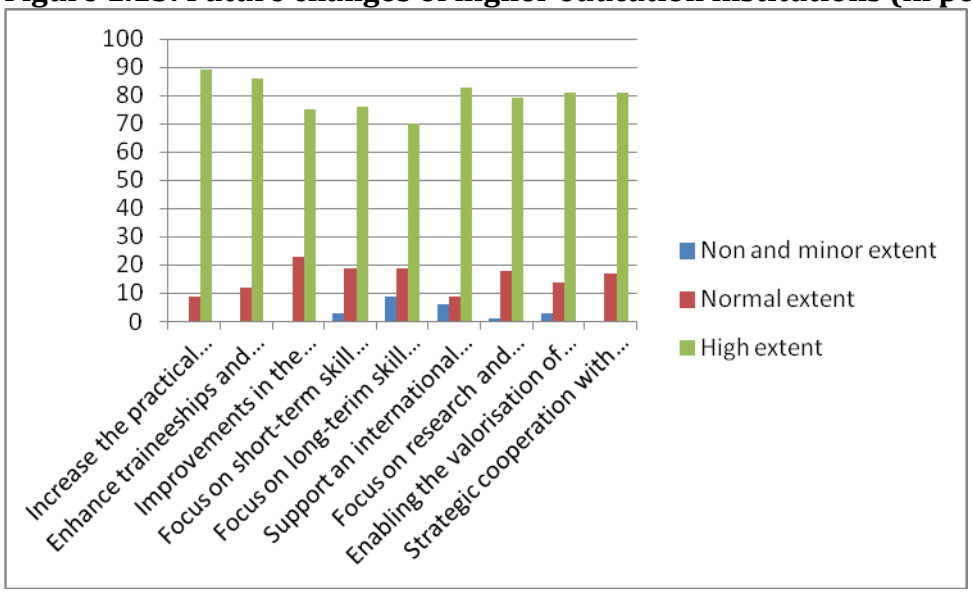


Source: EMCOSU Large Scale Survey Analyses

The surveyed companies are willing to start cooperating with universities with an aim to commercialise research results. The companies are aware of synergies such cooperation may lead to and are prepared to get involved.

The next figure demonstrates the perception of the enterprises towards future changes for HE institutions. All of the suggested changes have attracted the attention of the enterprises. The increase of the practical orientation of teaching has the highest percentage. The same conclusion can be made from the case study from Bulgaria (CS 10) that shows partnership between company from service sector and private university *"to create the Entrepreneurial Academy, which will prepare business managers. The Academy is open to both students and young professionals as well as to anyone looking for career growth or simply wishing to change their career in a new and better direction. The program includes core courses required for a manager at corporate level - Entrepreneurship, Planning and Analysis, Human Resource Management, Finance, Projects Development, Modern Marketing Theory, Managerial Competencies, etc. The theoretical part is led by some of the best speakers from the university and the practical part - by top managers from the company."(Bulgaria case study 10)*

Figure 1.13: Future changes of higher education institutions (in per cent)

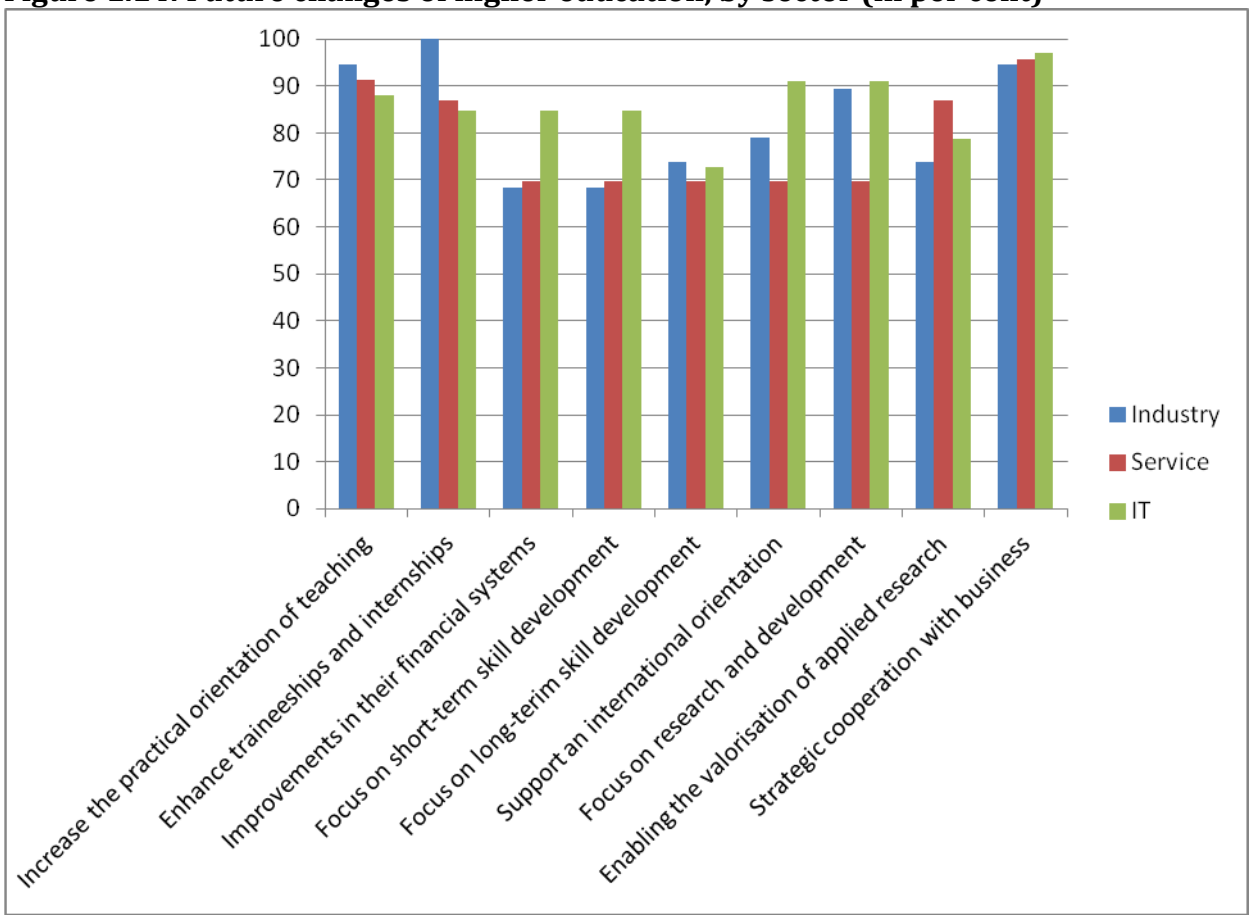


Source: EMCOSU Large Scale Survey Analyses

Figure 1.14 represents the opinion of the enterprises divided by sector on future changes for HE institutions. Again the practical education and teaching is very highly recommended by the enterprises but we also can identify certain preferences for each of the sectors. The enterprises from the industry sector assign the highest extent to the internships and traineeships. We have good practices for internships presented by industry sector enterprises (CS 5) –"*the company it is well recognized for the summer student internships as well as for the newly launched program "Young Specialists" which is comparatively new for the industry in Bulgaria. The information about our activities is spread among students in different years of education and by professors and the academic boards. Our partnership with the universities contributed to the improvement of the quality of the recruitment process of specialists for vacant positions in the company. The process requires a constant improvement of the level of training of mentors and the colleagues who participate in coaching. These activities contribute to our success in the field of the social and corporate responsibility." (Bulgaria case study 5).*

The enterprises from IT and services sector point with highest extent the strategic cooperation between HE institutions and employers. The enterprises from IT sector would like also to see more R&D focus in future changes of the HE institutions.

Figure 1.14: Future changes of higher education, by sector (in per cent)

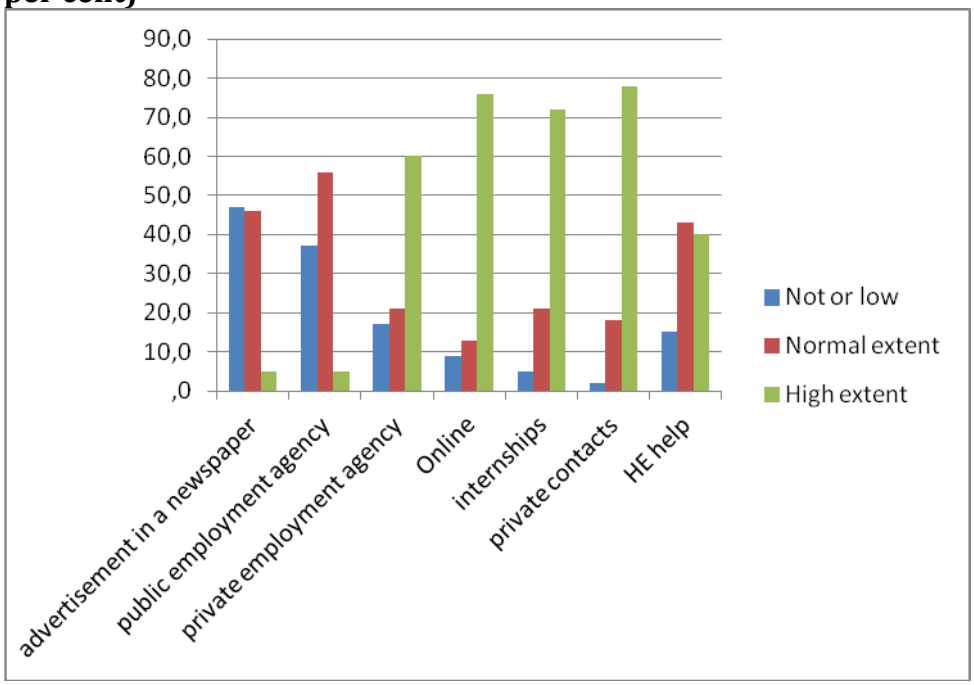


Source: EMCOSU Large Scale Survey Analyses

The next figure represents the different channels used by enterprises for hiring HE graduates. Obviously new communication channels are online recruitment and internships. As we seen already the career centres are another recruitment channel for hiring HE graduates. In Bulgaria career fairs are also very popular channel for hiring HE graduates and offering internships. The case from Bulgaria (a company from the service sector) (CS 1) presents career fairs option - "*National Career Days Forum started in 2002. The first event, held in the capital Sofia, was visited by 38 participating companies only but for first time they started offering internships for students in Bulgaria. The forum quickly developed and in 2008 a record number of companies (180) supported the initiative. Since 2012 the forum is taking place in 7 major university cities in Bulgaria: Sofia, Varna, Veliko Tarnovo, Rousse, Svishtov, Plovdiv and Bourgas. It is organized in March and is well known and expected as the event where the summer internships of the leading companies will be announced. Over the years the biggest national forum for students' internships and careers*

has been visited by 171 450 students and 717 leading companies have participated in the forum." (Bulgaria case study 1).

Figure 1.15: Recruitment mechanism for hiring higher education graduates (in per cent)

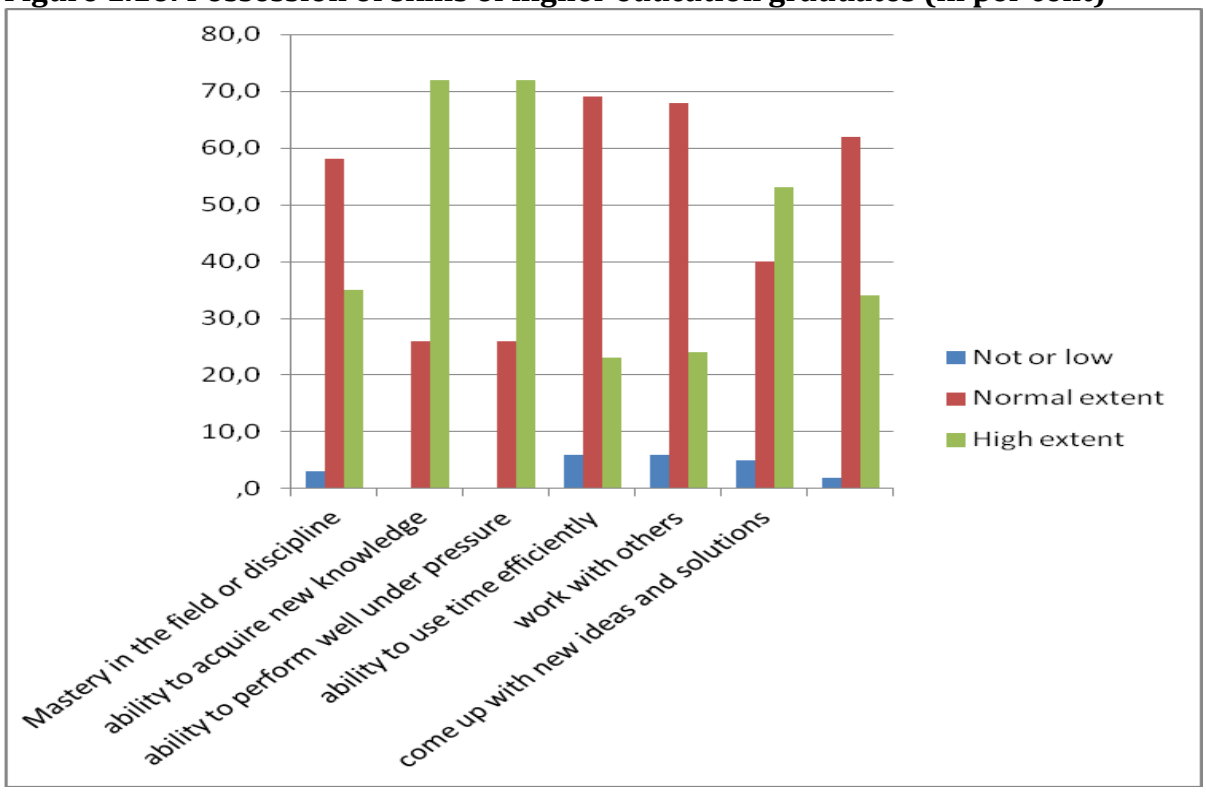


Source: EMCOSU Large Scale Survey Analyses

There are no specific differences on recruitment channels for the enterprises from the three different sectors with the exception of the IT sector where additionally to online recruitment the usage of private employment agencies is significant. The reason behind this finding is the fact that the gap between the number of IT graduates and the number of open positions is very significant and the unemployment rate for HE graduates from IT faculties is around 0.3% for academic year 2012/2013 according to the university rating system web site www.rsvu.mon.bg.

Next figure represents another significant issue related to UBC – the employability of the HE graduates. The employers have answered to the question "To what extent new graduates in your experience possess the skills?" for each of the presented skills. The general observation from this figure is the fact that graduates are well theoretically prepared in their field or discipline but lack the transferable skills such as team work, time management, etc. The ability to work in foreign language was problematic for HE graduates few years ago but we can see positive change in this direction.

Figure 1.16: Possession of skills of higher education graduates (in per cent)



Source: EMCOSU Large Scale Survey Analyses

To conclude this section we have to underline again that companies think university business cooperation is important. At the same time they do not rely on this cooperation as major source for their workforce and for improvement of their business processes. It indicates that the universities still need to adjust their work to the needs of economy. The survey indicated that there is a good will for cooperation but companies want to see their benefits and shared values from it. At this stage the cooperation is more seen as corporate social responsibility for bigger businesses instead of real partnerships.

1.5 Country conclusions

The survey results confirm that enterprises are interested to cooperate with HEIs in order to receive better trained workforce. The most common cooperation between the two sides goes through career offices and alumni networks. Enterprises are using them to reach the best students and to offer additional short term courses mainly for soft skills development. Curriculum development and trainings and short courses are also commonly used by enterprises in order to support HEIs. Unfortunately, R&D mode of

cooperation needs to be improved with more motivation and joint driving priorities from both sides.

The survey confirms that one of the most important factors for cooperation between enterprises and HEIs are shared values of partners and prior partnerships. The enterprises are interested to invest their resources for joint cooperation with HEIs when they see their own short term benefits. In many cases the time horizons of HEIs and enterprises are different and they cannot find mutual interests. Prior relationships such as previous joint experience, personal relationships, etc. are also important for companies because they rely on personal relations with academic side.

It is clear that companies expect HEIs to supply the market with well-prepared graduates. Unfortunately, the educational system cannot do it alone and seek for cooperation with the employers. According to a lot of enterprises, the main advantage of cooperation lies in acquiring practical knowledge and employability skills during internships, seminars, research projects. What is important is the fact that enterprises do not see HEIs as R&D centres and does not expect them to only conduct research. They rely more on their capacity to produce well prepared workforce.

Large and medium size companies are the most active in the field of cooperation with HEIs. They offer internships and short training courses, also attend career fairs and use career centres for their vacancies. They are significantly more involved in the preparation and implementation of curricula as well as in development of trainings, which enhance their competitiveness. Comparing the three sectors included in the survey we see that IT sector is far more involved in cooperation with HEIs compared to service and industrial sectors.

As a conclusion it is important to underline again that the competitiveness of Bulgaria depends on its capacity to innovate and to produce qualified workers for the knowledge society. This can be achieved by implementing joint UBC strategies in structured networks, which can mobilize resources and knowledge to respond to new market needs. This implies on continuous partnerships HE institutions and enterprises but also with policy-makers. Partnerships must be built on shared interests to solve relevant problems such as recruitment of HE graduates, R&D or skills development. They must be based on existing practices and common ideas with added value for both sides. They should rely on sharing responsibility and joint ownership of results. All partners benefit from increased quality in the curriculum, HE graduates well prepared to meet the needs

of the labour market, a better return on investment in R&D and cost savings in training programs.

1.6 Case Studies Summary

Being very ambitious, the EMCOSU project team has also conducted 10 case studies in each country additionally to the survey. Each partner selected 10 enterprises with positive and well-structured interaction experience with higher education (HE) institutions in order to present good modes of cooperation. The selection of the case studies was based on the answers to the survey questionnaires. Within the questionnaire, there was one open question that invited enterprises to focus on interesting initiatives conducted together with HE institutions. One of the key criteria for the selection was the information mentioned in those sections of the questionnaire. Another selection criterion was to ensure a good representation of enterprises from each of the selected three sectors – service, IT and industry.

Following the selection, the enterprises had been contacted and invited to participation in the case study analysis. They received guidelines for the interview. The experts studied in detail the questionnaire that had been filled in by the enterprises and prepared the interview by doing also some desktop research through the website of the company concerned and especially their careers section. In some cases the enterprises sent also complementary material after the interview. The text drafted subsequent to the interview was sent for approval to the interviewee.

The selected 10 enterprises represent service, IT and industrial sector with the following distribution - three of them are from services sector, four from IT sector and three from industry sector. Five of them are large enterprises and five are SMEs. They are also well spread geographically across Bulgaria.

The analysis of all case studies from Bulgaria shows that the most common modes of cooperation are:

- Above all - internship, graduate placement and scholarship programs;
- Cooperation directed to curriculum development, review and update;
- Practical trainings in employability and career management skills in which university career centres play a significant role;

- Very limited number of joint projects and initiatives - knowledge transfers, R&D.

Logically the most common modes of cooperation are related to graduates transition to the labour market (internship and placement programs, facilitated by the university career centres and national career days initiative); as well as curriculum development and practical teaching. There seems to be a general trend to stress increasingly on internships as most common mode of cooperation. The stronger focus on internships probably has to do with the fact that HE institutions in Bulgaria include internships as compulsory element of initial education.

It is clear that IT enterprises are very eager to teach specialized courses at HE institutions and to prepare the future workforce to work with specific technologies. This is their way to address the lack of well-prepared workforce for their rapidly growing enterprises.

In the same time, there are also internal barriers stated, such as the sluggish procedures for amendment of academic curricula and the patent legislation. The perception of the interviewees is that HE institutions and enterprises speak different languages due to the conservativeness of the educational system and the dynamic changes of the business processes. They also underline the lack of sustainability in University Business Cooperation (UBC) once a change in the leadership in the HE institution takes place.

Raised competitiveness and better skills match of graduates to the labour market needs are the most valuable impacts for the enterprises from UBC. They emphasize on the enhanced employability skills and career development of graduates.

As a conclusion it is important to underline again that the competitiveness of Bulgaria depends on its capacity to innovate and to produce qualified workforce for the knowledge-based society. This can be achieved by implementing joint UBC strategies in structured networks, which can mobilize resources and knowledge to respond to new market needs. This implies continuous partnerships between HE institutions and enterprises including also the involvement of policy-makers. Partnerships must be built on shared interests to solve relevant problems such as recruitment of HE graduates, R&D or skills development. They must be based on existing practices and common ideas with added value for both sides. They should rely on sharing responsibility and joint ownership of results. All partners benefit from increased quality in the curriculum, HE

graduates well-prepared to meet the needs of the labour market, a better return on investment in R&D and cost savings in training programs.

2 HUNGARY

National report prepared by: Renáta Fullérné Verger and Erika Simán

2.1 Introduction and Methodological Approach

The EMCOSU programme reinforces the link between education activities and HE graduates' employability needs and the promotion of cooperation with higher educational institutions. The main focus of the EMCOSU project is to strengthen the cooperation between higher education institutions and enterprises. Researchers from various EU countries are exploring how employers perceive modes of cooperation with higher education institutions, as well as the drivers and barriers involved in such cooperation. It involves studies in several EU countries and reinforces the link between educational activities and higher education graduates' employability needs and the promotion of cooperation with higher education tools in particular.

This report presents the finding of the study on the cooperation between HEIs and private organisations in Hungary, also introduces findings related to the barriers and drivers of university-business cooperation, and the most successful cases of collaboration.

One of the main components of the project is a major quantitative survey, which reflects different approaches to university business cooperation in Hungary. In Hungary the survey was conducted by the Chamber of Commerce and Industry of Zala County. The responses were collected from November 2013 to May 2014. First of all, data about companies was collected in three ways:

- Special sector: the chambers (there is one / each county), foundations for enterprise promotion and offices of Enterprise Europe Network – these organizations can give an overall picture about the special sector.
- Enterprises in Zala County: close relationship with them, it was possible to filter the bigger companies, according to sectors.
- Enterprises in Hungary: every county in Hungary publishes a TOP 100 brochure containing the most successful enterprises; data was collected from here and the internet.

After the conduction of large scale survey, the most relevant enterprises were asked again to participate in an interview about their most successful case.

During the survey we have collected 100 questionnaires: 75 from companies and 25 from special sector. Regarding the sector of the company 39 questionnaires were returned by industrial companies, 27 by the service sector and 9 by the ICT sector.

Industry	**52%**
Services	36%
ICT	12%

In Hungary, the university business cooperation is at an early stage of development, almost 50% of the respondents have some kind of relationship with higher educational institutions. On the contrary, the number of enterprises developing a UBC reflects a positive change in the last years, due to the grants of European Union, and the spread of dual training. For example, there is a current case, which mentions: "The Company participated in the foundation of the engineering faculty at the local university and in the elaboration of accreditation system very actively."

All received questionnaires were saved in the electronic form. The paper versions are stored in ring folders. Collected data has been entered into template files drawn up by the project leader in order to be further analysed. The codebook for the questionnaire was used while entering data into the files. The following report presents the results of the survey.

2.2 Modes of University-Business Cooperation

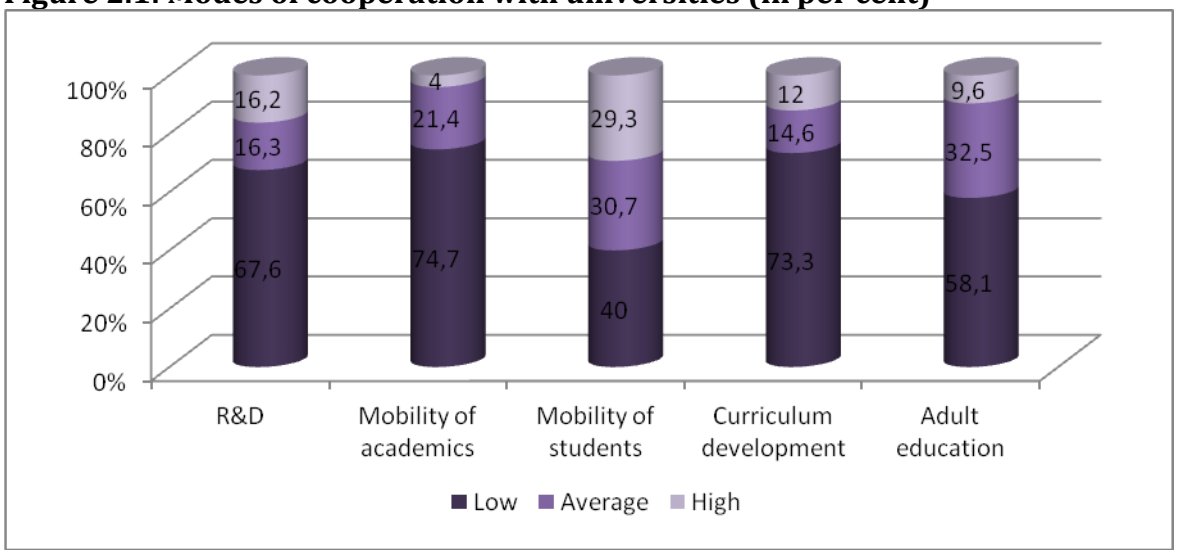
University-business relations are very complex and take place at many areas. In the questionnaire, entrepreneurs were asked about the extent of cooperation with universities in the following areas:

- research and development (R&D) e.g. (inter)national projects, commissioned research;
- mobility of academic staff (their training or research in your organization);
- mobility of students e.g. direct recruitment, traineeships;
- curriculum development and delivery (including university lectures);

- adult education, training and short courses and other "lifelong learning activities";
- other

It can be seen that the university business cooperation is done through multiple channels; but the most common mode of cooperation in Hungary is student mobility. The research and innovation cooperation is on the second place, and as one of the interviewee mentioned that *„there are several R&D mandates; for example the local university has more than 400 active contracts with enterprises".* Considering the answers, the least spread collaboration is mobility of academics from the viewpoint of companies. Although there may be interactions between the business and academic world, staff mobility between the higher education and business sector is very low and mainly concentrated on professors leaving universities for a job outside the academic world.

Figure 2.1: Modes of cooperation with universities (in per cent)

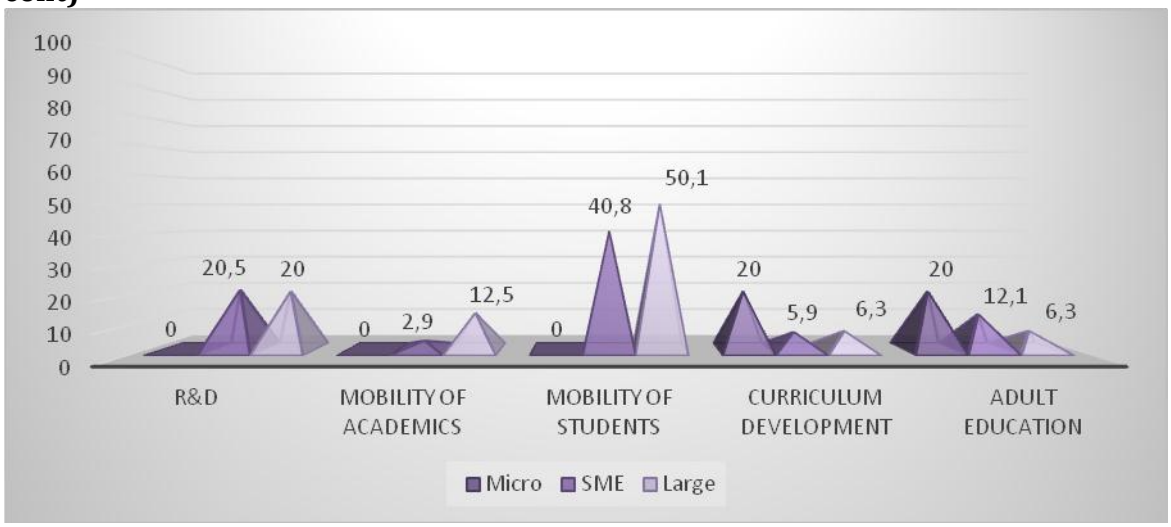


Question B1: To what extent does your organisation cooperate with HE institutions regarding the following activities? Responses grouped according to the following criteria: Low- 1 and 2. Average- 3 and 4. High - 5 and 7.

Regarding the companies by size, micro enterprises usually does not have any cooperation form at all, 20 % of them answered they only have cooperation in curriculum development and adult education, none of the micro companies mentioned the other. Interestingly, the micro enterprises said that they have not got any cooperation in mobility of academics and adult education with the highest rank of all size (74,7%). Among SMEs, the mobility of students is the highest per cent with 40,8%, and the lowest is mobility of academics with only 2,9%. Concerning the sizes of the

companies, the difference between the given answers of SMEs and large enterprises is low. Large enterprises have also chosen the mobility of students as most common, while the least common mode is the curricula development and the adult education. 6,3%).

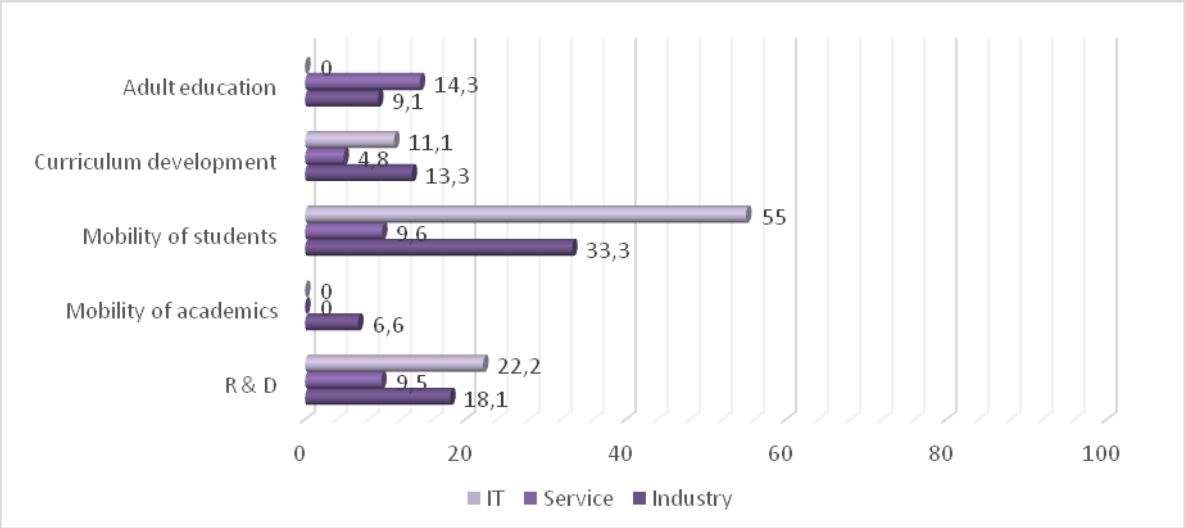
Figure 2.2: Extent of university-business cooperation, by size of a company (in per cent)



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".

If we look closely at sectors, they also gave different answers, although the values are sometimes similar. 22,2% of IT sector stated that they have a high cooperation in research and development, than 18,1% of industry sector have high collaboration in this. The least common mode is mobility of academics, by IT and service sector it is not common (more than 60% of these sectors answered that it is not common at all). Mobility of students is the highest in IT sector (55%), and also in the industry sector (33,3%). In the service sector, adult education and training is the most common, interestingly this mode in IT sector is not spread, 55,6% of IT answered to this question that they have no cooperation of this kind. For a clearer view, see the table below.

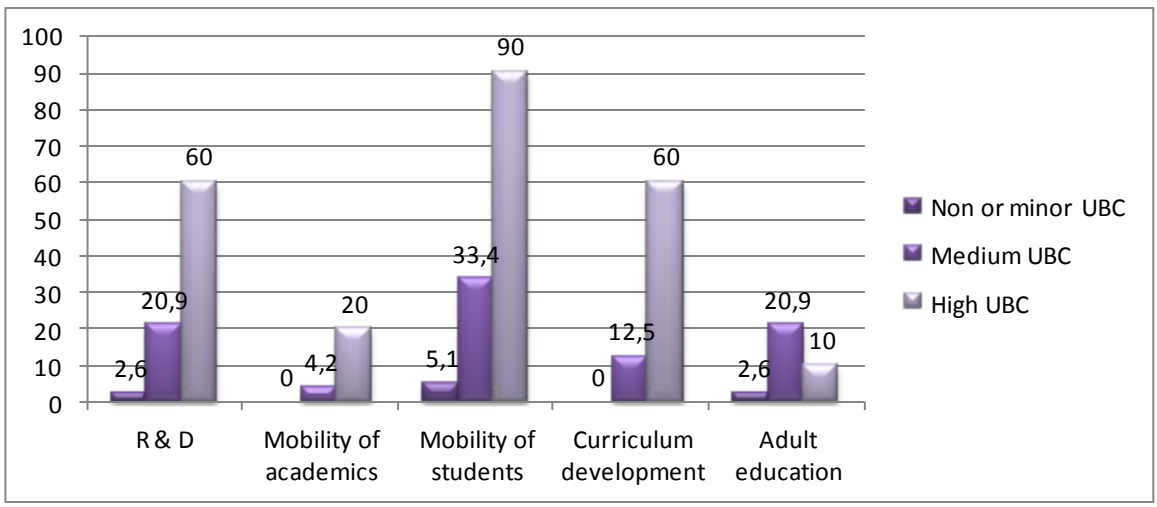
Figure 2.3: Extent of university-business cooperation, by sector (in per cent)



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".

Companies with high extent of university business cooperation, collaborate in R&D (60%) and also in curriculum development (60%). 90% of these companies cooperate in mobility of students the highest, which is also the highest value among the answers regarding the extent of UBC. 33,4% of companies with medium extent of UBC also cooperates in mobility of students, which is the highest value of all; and 5,1% companies with no or minor UBC considered also mobility of students the most common. Among companies with high extent of UBC, adult education is the rarest; among companies with medium extent the mobility of academics is not so common. Nearly all of the companies with no or minor extent of UBC has not cooperation form at all, except R&D and adult education.

Figure 2.4: Extent of university-business cooperation, by extent of cooperation (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".

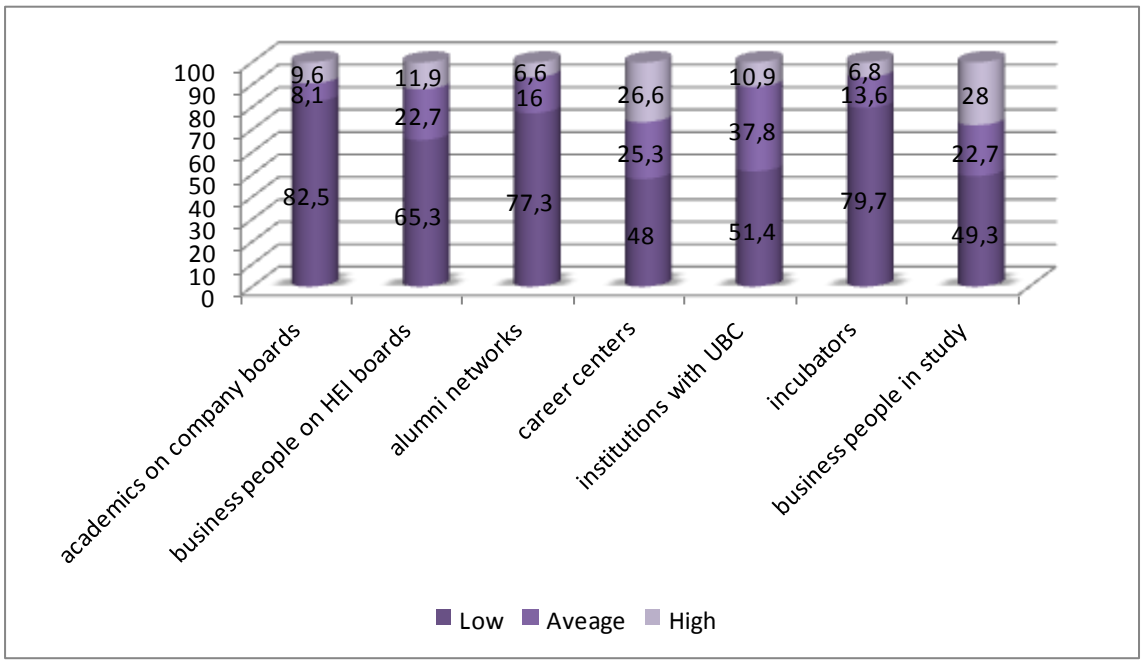
2.3 Engagement in Activities of University-Business Cooperation

Examining the UBC, we should examine how do enterprises engage or participate in the activities of the university field. The survey analysed how often entrepreneurs are involved in these, the following areas were questioned:

- participation of academics on company management boards;
- participation of business people in higher educational boards;
- participation in the activities of alumni networks;
- cooperation with university career offices;
- cooperation with institutes focused on university-business cooperation;
- cooperation with business incubators;
- active involvement of business representatives in study, teaching and research activities.

According to the respondents, the most common is cooperation with the career centres, while the least is the cooperation with incubators in Hungary. Since UBC is not very advanced, the rank of the answers is low. See the table below.

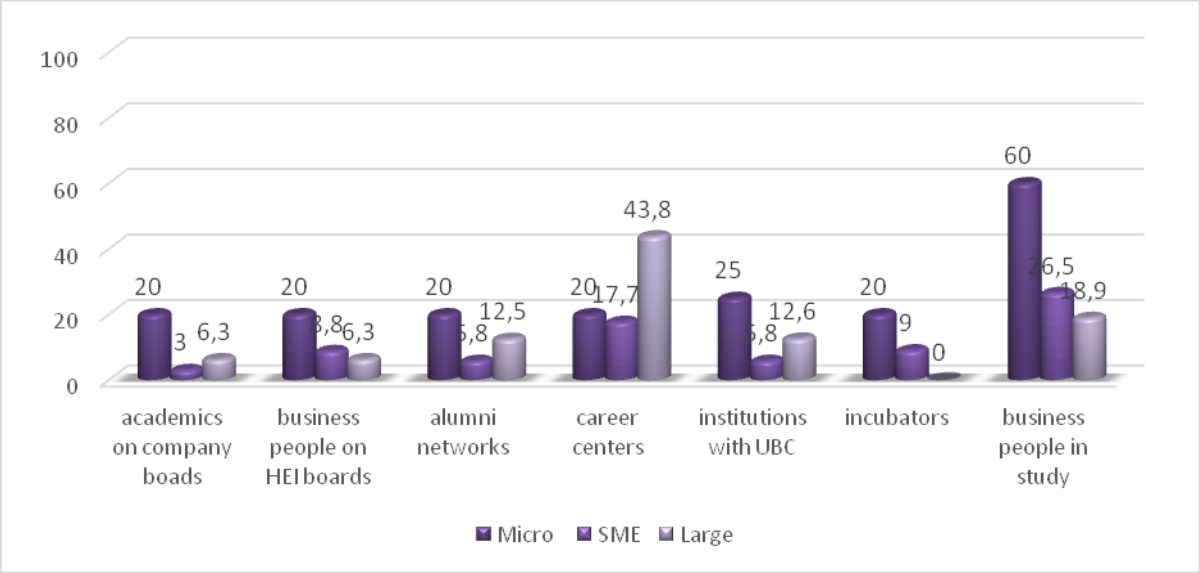
Figure 2.5: Engagement into university-business activities (in per cent)



Question B5: How often does your organisation engage in the following activities in relation to HE institutions? Responses grouped according to the following criteria: Low- 1 and 2; Average- 3 and 4; High - 5 and 7.

Regarding the size of the companies, slight differences can be reviewed. By micro and SME enterprises the most common engagement is participation in educational activities, but it is most common at micro enterprises (60%). At large enterprises cooperation with career centres is frequent.

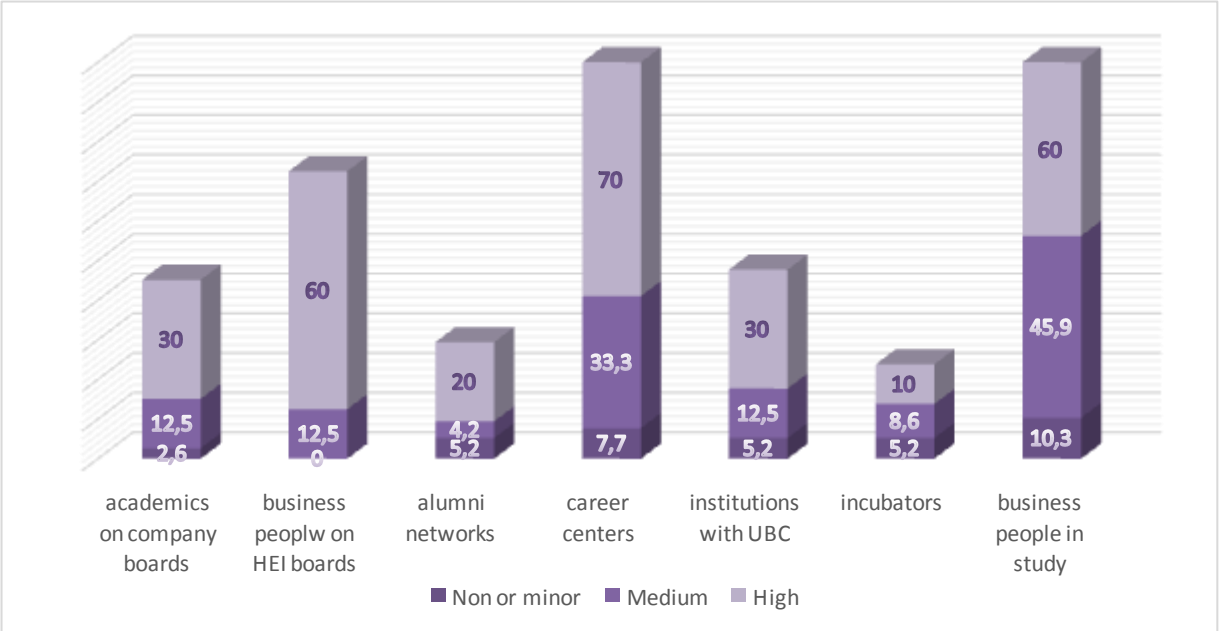
Figure 2.6: Engagement into university-business activities, by size of companies (in per cent)



Graph 6 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".

As expected, companies with small level of UBC have no or have very small engagement of all activities, but still participation in educational activities have the highest rank.

Figure 2.7: Engagement into university-business activities, by extent of cooperation (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".

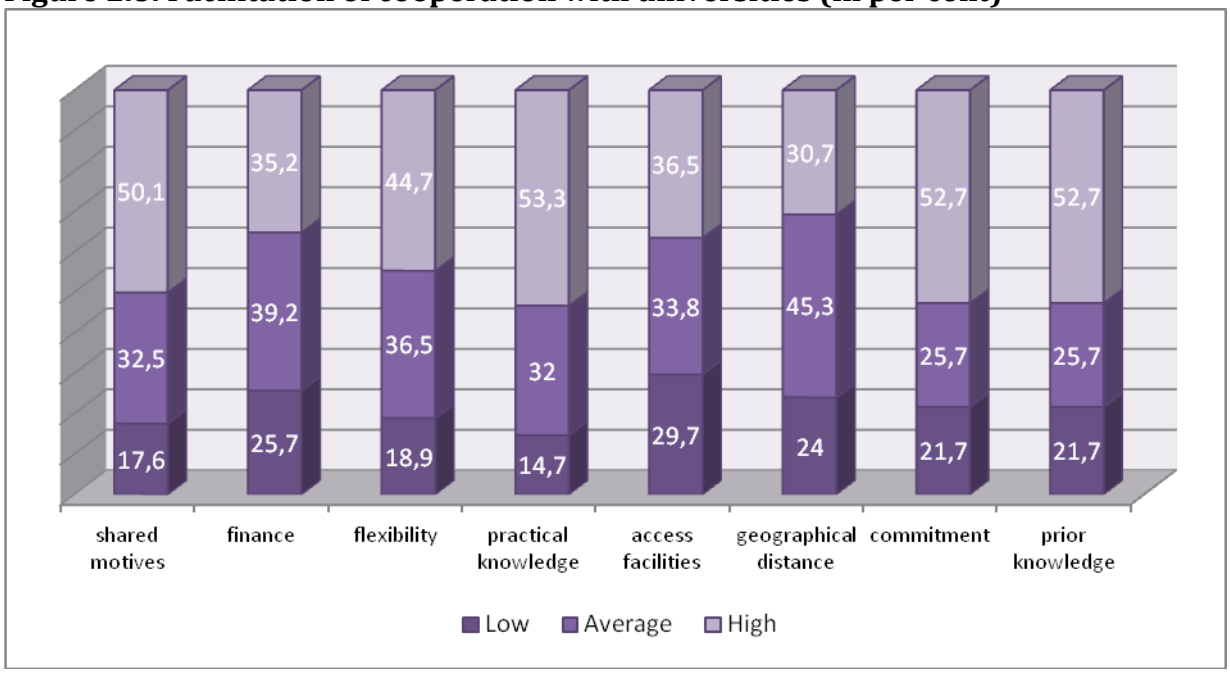
2.4 Drivers of University-Business Cooperation and its Enhancement

In the survey the entrepreneurs were asked to assess the importance of factors facilitating university-business cooperation. The following factors were assessed:

- existence of shared motives;
- financial resources for working with universities;
- flexibility of universities;
- interest of universities in accessing practical knowledge;
- access to universities' research and development facilities:
- close geographical distance of universities;
- existence of mutual trust and commitment;
- prior relationship universities.

According to the respondents, the most common way to facilitate UBC is the practical knowledge of the universities. The practical knowledge generated by businesses is an important complement to an academic education and provides a significant added value when incorporated with the otherwise more theoretical curricula of university education. Besides this, shared motives and prior knowledge of the universities are also important and the least attractive mode of UBC are financing and to access the universities facilities. These harmonise with the statement of one respondent mentioned „*large companies support or finance universities which are by the way in a difficult financial situation*." Also, another company brought up, that it is important to „*put on emphasis on the more practical training instead of the exaggerated theoretical knowledge.*"

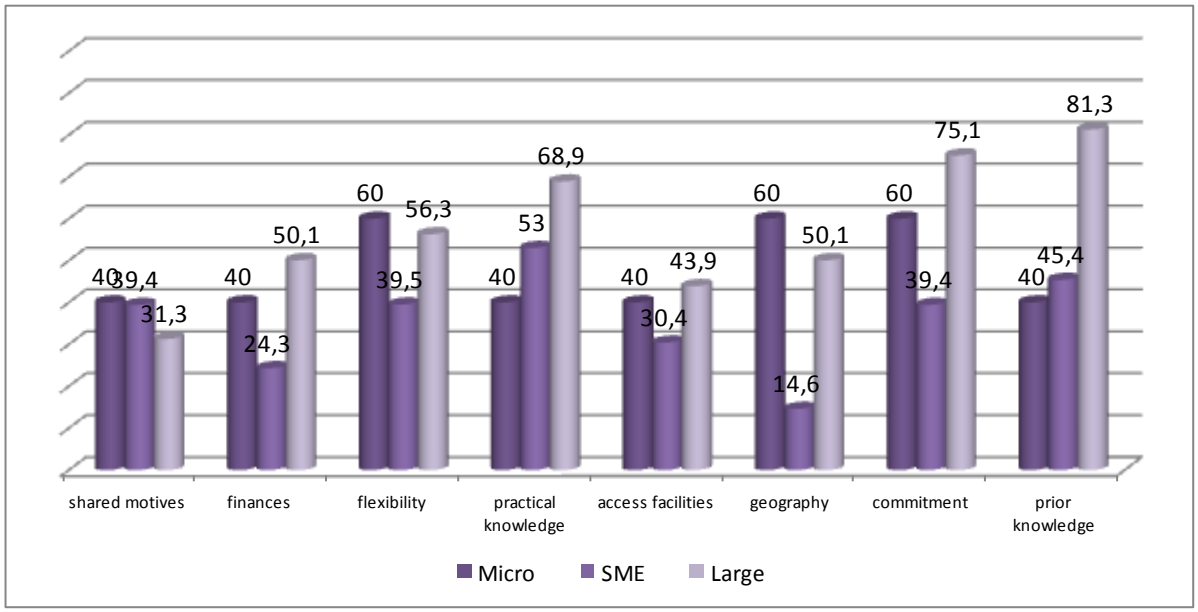
Figure 2.8: Facilitation of cooperation with universities (in per cent)



Question B6: How much do the following statements facilitate your organisation's cooperation with HE institutions? Responses grouped according to the following criteria: Low- 1 and 2; Average- 3 and 4; High - 5 and 7.

Concerning the size of the enterprises, usually large enterprises rank the highest of facilitation forms, while small and medium enterprises the lowest. The large enterprises considers prior relationship with higher educational institutions the most relevant 81,3%, SMEs believe that the most common drive is that HEIs would gain practical knowledge.

Figure 2.9: Facilitation of cooperation with universities, by size of company (in per cent)

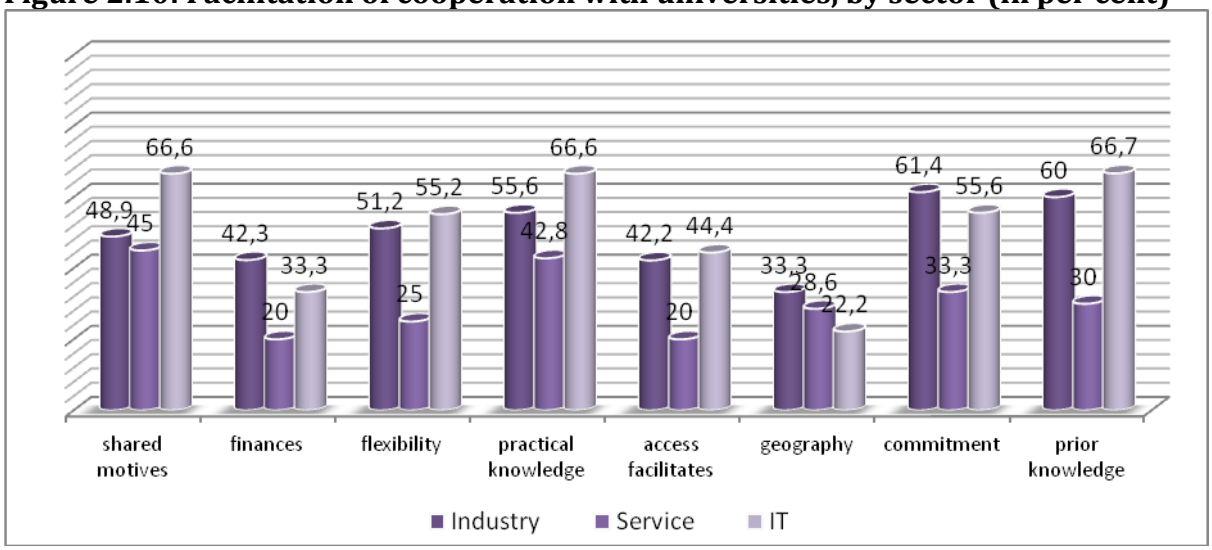


Question B6: How much do the following statements facilitate your organisation's cooperation with HE institutions? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="To a very high extent".

Small and medium enterprises think the geographical distance as the least relevant for UBC enhancement, while this is quite high rated at the other two sized companies. A table below shows the differences.

Regarding the sectors of the companies' only slighter differences can be seen between the answers. Usually service sector companies report the lowest enhancement, while IT sector the highest. Looking closer, it can be observed that there are no major differences between the answers.

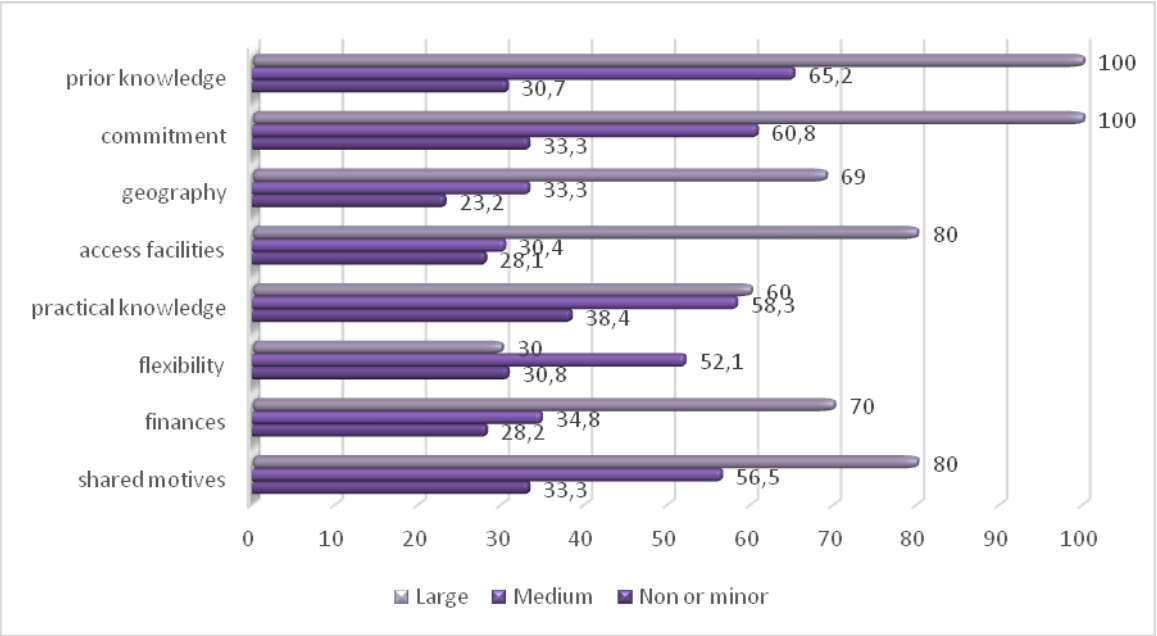
Figure 2.10: Facilitation of cooperation with universities, by sector (in per cent)



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".

By the extent a UBC of the companies, it is interesting that companies with high level of UBC regarded very high (100 per cent) as driver the prior knowledge and mutual trust and commitment. Enterprises with minor level of collaboration gave nearly the same points to all answers, generally the lowest if we consider all three sections. The data can be read below.

Figure 2.11: Facilitation of cooperation with universities, by extent of cooperation (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".

2.5 Barriers of University-Business Cooperation

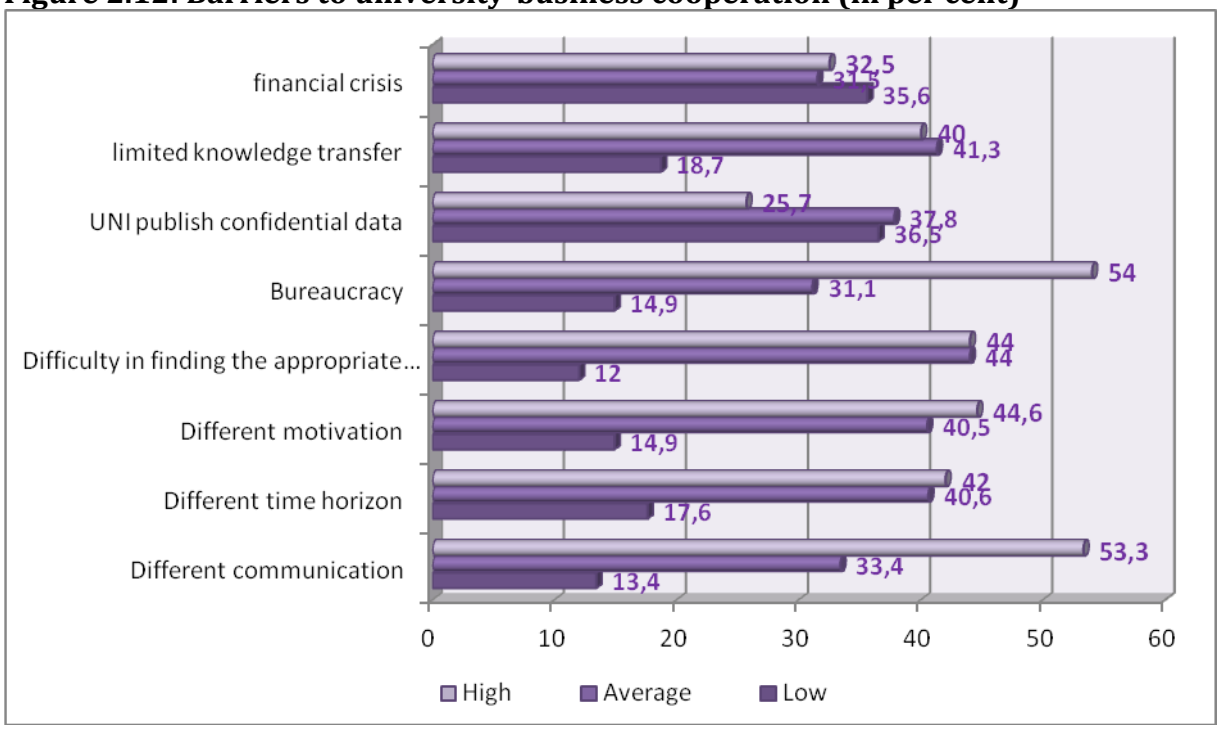
Entrepreneurs were also asked to describe the barriers in universities-business collaboration. The following obstacles were listed in the survey:

- different modes of communication and language barriers between universities and business;
- different time horizons between universities and business;
- different motivations and values for universities and business;
- difficulty in finding an appropriate partner at universities;
- red-tape within universities and outside;
- universities want to publish confidential results;
- limited possibilities of knowledge transfer;
- the current financial crisis.

Among these barriers, which enterprises face during the collaboration of a university, the most enterprises emphasized the bureaucracy of the higher educational institutions, and also the different modes of communication. As one of the interviewee mentioned

„the most significant problem of the cooperation is that the universities and enterprises do not speak the same language (the respondent also participated at a conference in this topic). The universities do not have the competences that an enterprise would require." (Case Study 10). Other interviewee shares this view, and he/she adds as weakness: „t*he different kind of thinking. The SME considers the benefit from the project, why is it good for them, while the universities are wondering the new results."* Enterprises consider that the smallest barrier is that universities would like to publish confidential data. For deeper information, investigate the table below.

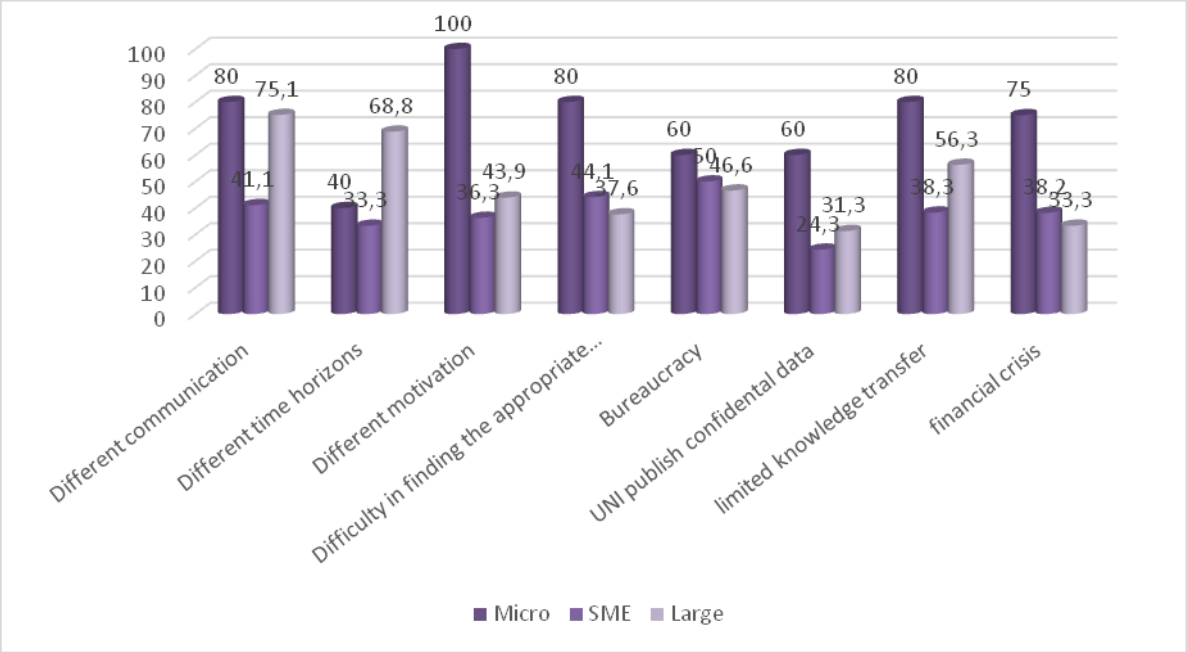
Figure 2.12: Barriers to university-business cooperation (in per cent)



Question B7: How relevant are the following barriers to HE institutions-business cooperation? Responses grouped according to the following criteria: Low- 1 and 2; Average- 3 and 4; High - 5 and 7

Micro sized companies ranked the barriers highest from all; they perceive that the biggest obstacle is the different motivation (100%). Small and medium enterprises graded the lowest the barrier forms, slightly higher the large companies. Regarding the size of the companies, the distribution of the barriers are the following.

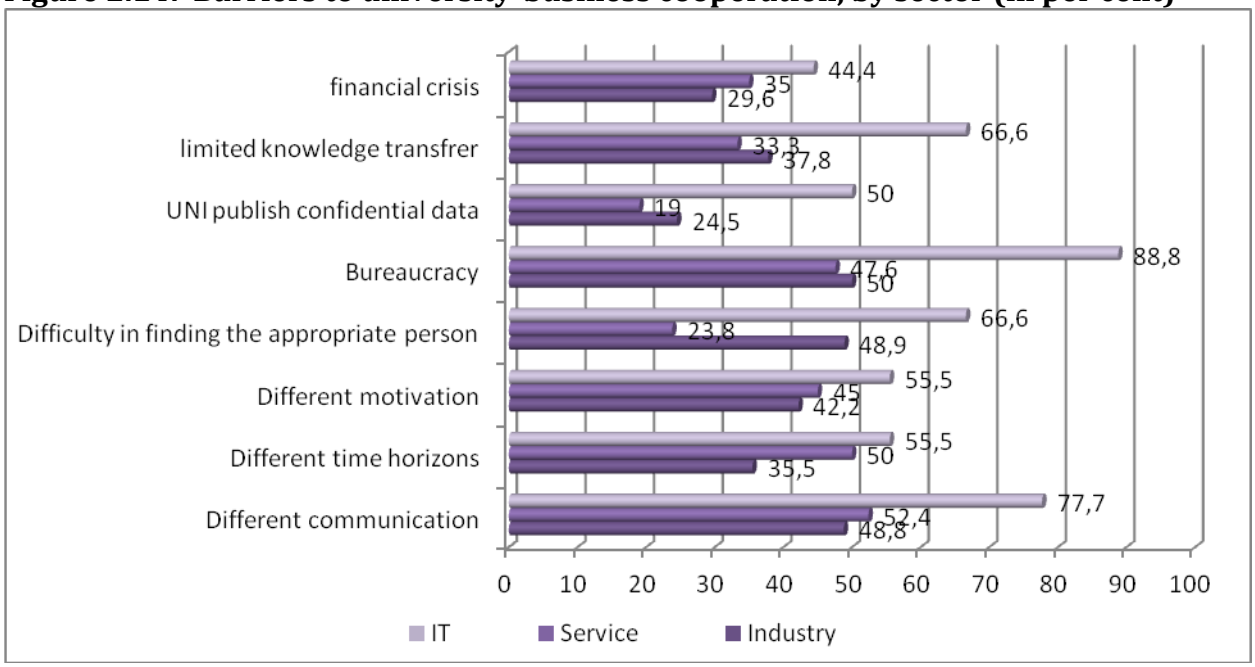
Figure 2.13: Barriers to university-business cooperation, by size of company (in per cent)



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".

Sector wise changes are shown below. As it can be clearly seen IT companies gave the highest answers, most of them rated bureaucracy as obstacle (88,8%). Companies from industry sector ranked the points the lowest, although the fact that university tries to publish confidential data reached 19% in service sector which is the lowest from all.

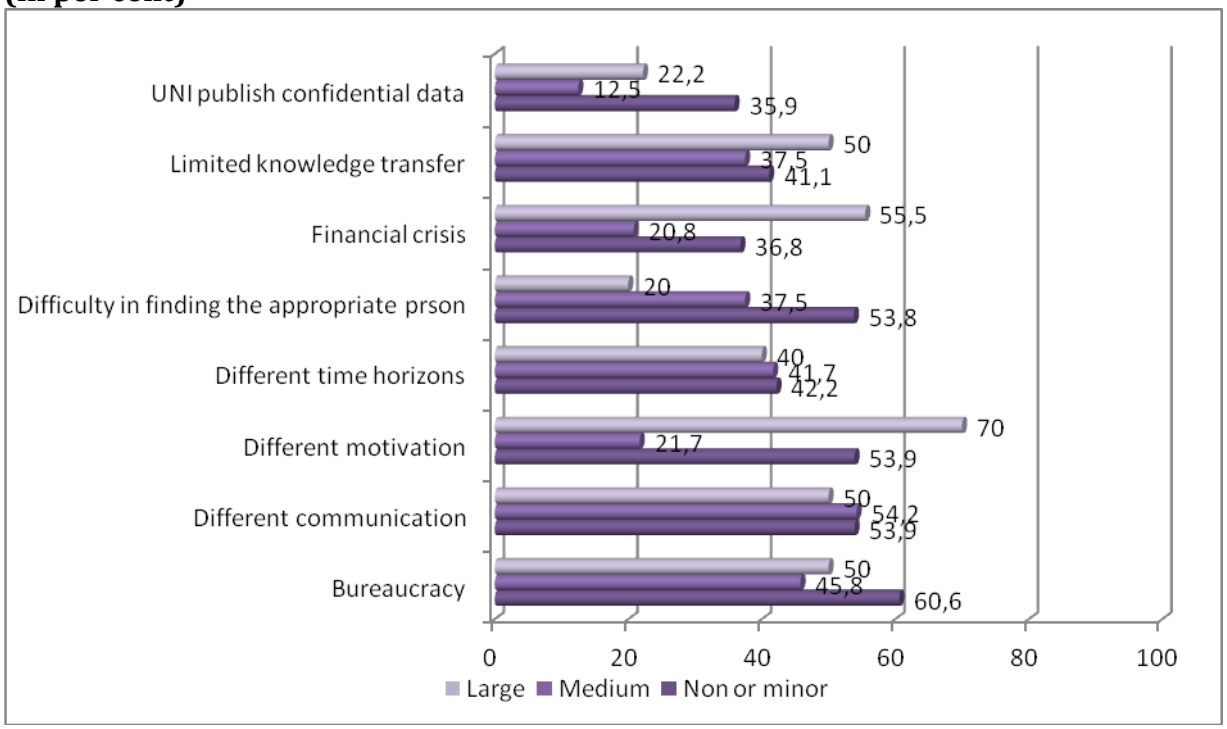
Figure 2.14: Barriers to university-business cooperation, by sector (in per cent)



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".

Examining the difficulties met by the extent of university business cooperation at companies, some changes can be investigated. Companies with high extent of UBC perceive different motivation the highest (70%), and also indicated financial crisis (55,5%) and bureaucracy (60,6%) as an important factor. Although high extent companies regards smaller obstacle the difficulty in finding the appropriate person at the university, this is relatively larger at the other two sectors. The figure below explains.

Figure 2.15: Barriers to university-business cooperation, by extent of cooperation (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".

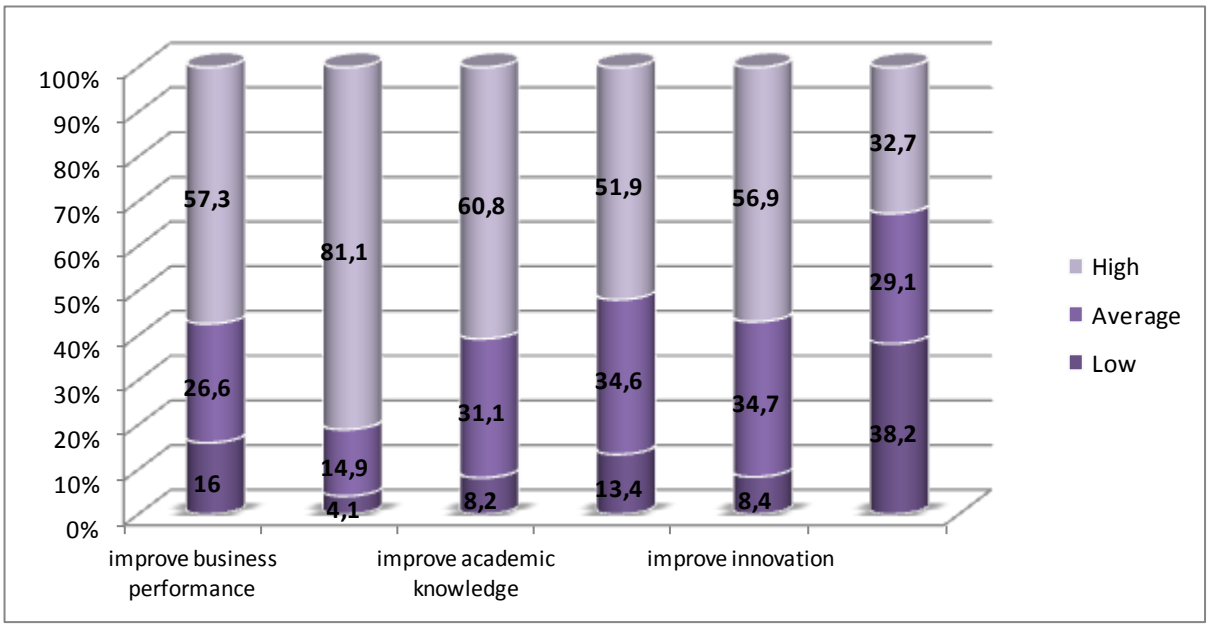
2.6 Benefits of Potential University-Business Cooperation

Entrepreneurs were asked in the survey to define the extent to which the universities and business cooperation in joint research improved the following factors.

- the performance of business;
- the skills of students relevant to labour market;
- the knowledge of the academic staff;
- the practical skills of professionals from organisations;
- the innovative capacities of the enterprise;
- regional development and social cohesion.

Enterprises agree that the greatest benefit of potential UBC is the improvement of students' skills. Over 80 per cent of the questioned enterprises recorded this answer, and is also appears in most case studies, too.

Figure 2.9: Benefits of university-business cooperation (in per cent)

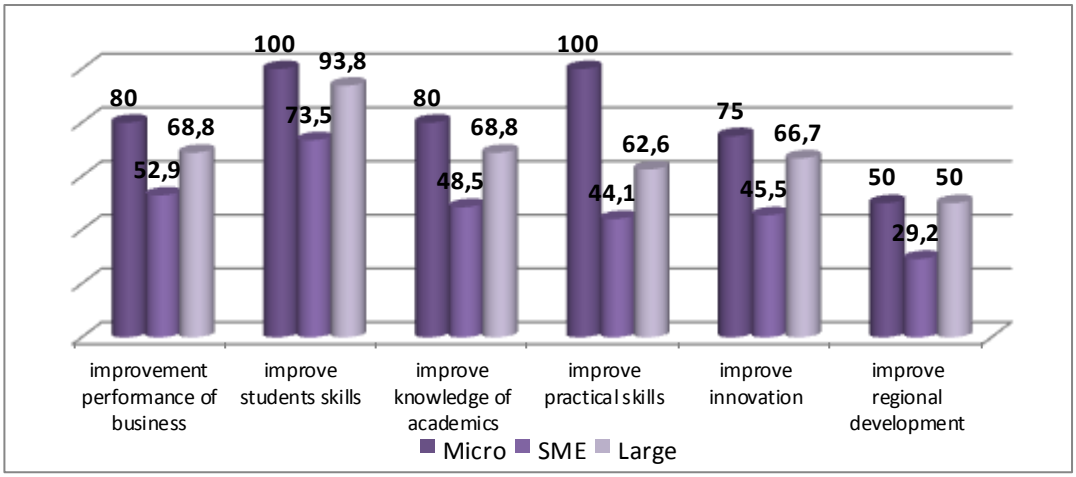


Question B9: Please indicate to what extent you agree with the following statements: HEI-business cooperation importantly improves. Responses grouped according to the following criteria: Low- 1 - 2. Average- 3 and 4. High - 5 and 7.

In Case Study 10 the respondent points out that „students leave university with such skills that after 1 month they are able to work *independently, they acquire abilities and competences that are important from the view of employment*." Another respondent mentions that "*The gained knowledge can be considered as an absolute benefit*" (Case Study 5). Nearly every enterprise emphasized the improvement of student's skills by reception of trainees at a company.

Considering the sizes of the companies, micro sized companies generally ranked the highest of the points.

Figure 2.10: Benefits of university-business cooperation, by size of company (in per cent)

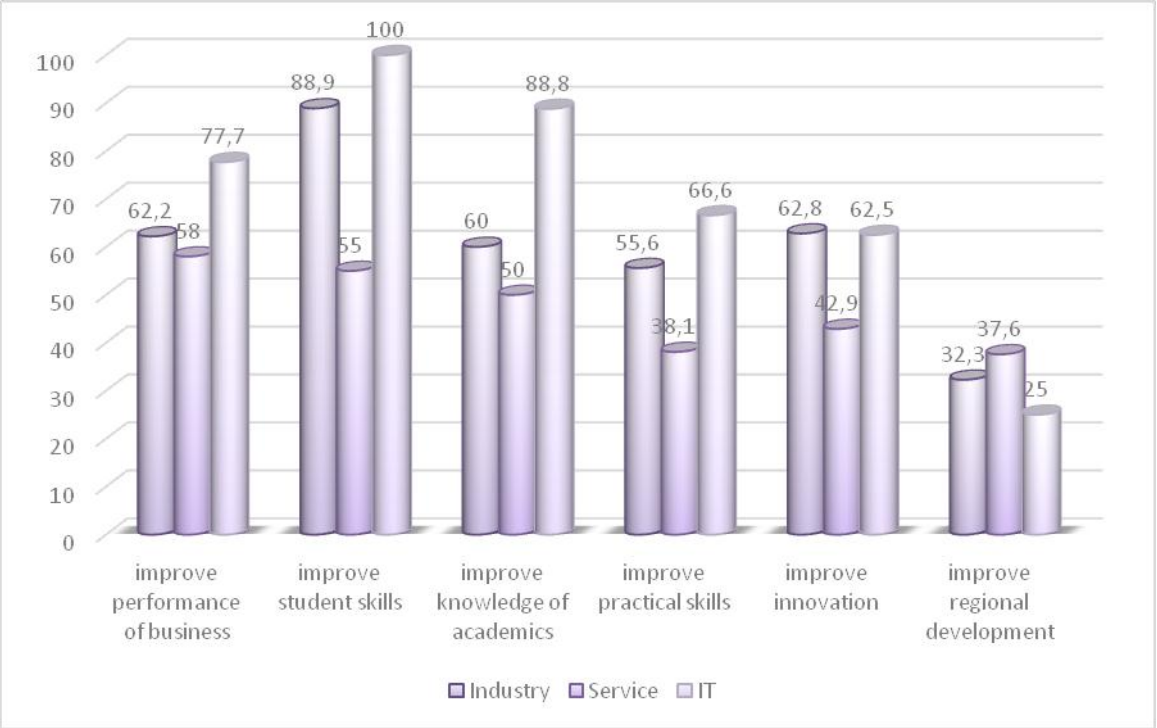


Question B9: Please indicate to what extent you agree with the following statements: HEI-business cooperation importantly improves? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="To a very high extent".

Small and micro enterprises gave the lowest percentage to the questions, while the results of large companies are similar to the micro enterprises. For further details, see table 17.

Regarding the sectors, IT sector considers the student skill improvement as the biggest benefit, 100% of the respondents of industry sector mentioned this. Also, companies of IT sector gave the highest answers, while service sector the lowest. Industry sector gave lowest, but similar points to IT sector. IT sector also mentioned the improvement of knowledge of academics beneficial with 88,8%, at the other two sectors it was rated significant only 50 or 60 % of the enterprises. Improvement of regional development reached the lowest points at every sector.

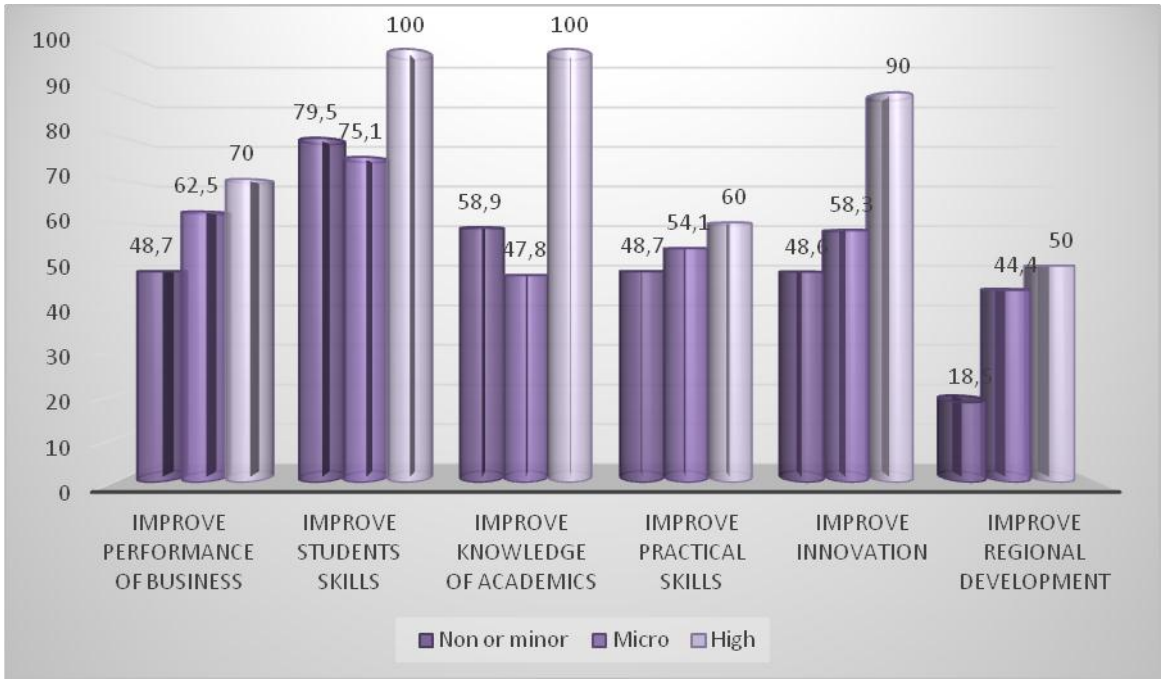
Figure 2.11: Benefits of university-business cooperation, by sector (in per cent)



Graph 0.1. 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".

Considering the extent of UBC the followings can be investigated. Enterprises with high extent of UBC usually rate higher than the other two companies. High extent of UBC considers that the biggest benefit is the improvement of student skills and also improvement of the knowledge of academics, 100% of these companies answered the importance of these. None or minor extent companies and micro extent companies gave similar answers, but still they also consider the improvement of student skills as largest benefit.

Figure 2.12: Benefits of university-business cooperation, by extent of cooperation (in per cent)

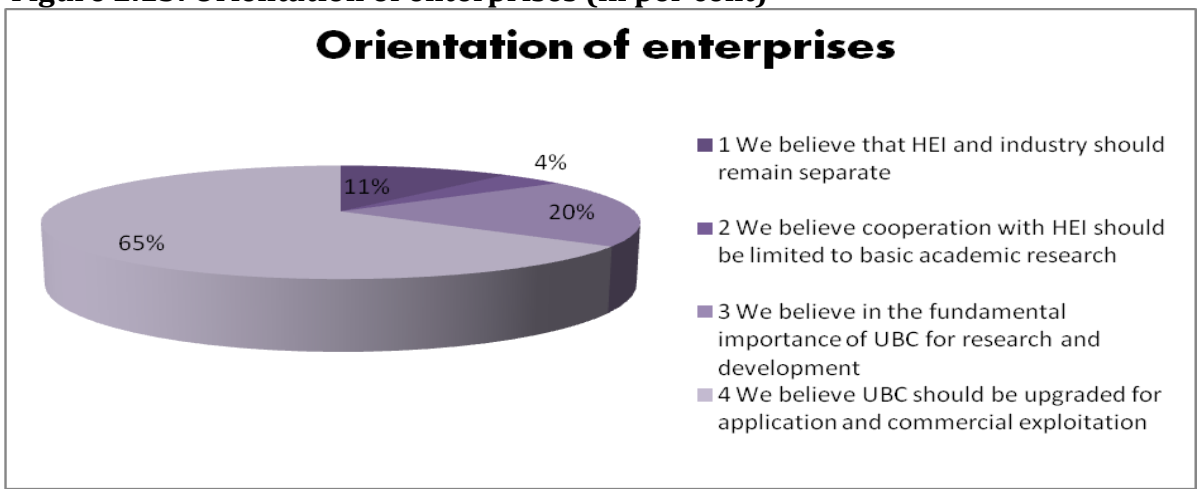


Graph 0.2. Question B9: Please indicate to what extent you agree with the following statements: HEI-business cooperation importantly improves…? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="To a very high extent".

2.7 Orientation of University-Business Cooperation

More than half of the approached companies (63%) reported that University Business Cooperation should be upgraded for application and commercial exploitation. Nearly one quarter of the companies consider that UBC has fundamental importance in R&D. On the other hand, 11 per cent of the companies regard that that the universities and enterprises should remain separate, while 4 per cent said that the cooperation should be limited to academic research. Regarding the size of the companies, 14,3 per cent of the large companies reported that HEI and industry should remain separate, which is the highest among the size of the enterprises. On the other hand, large companies also reported the highest, 71 per cent said that UBC should be upgraded. Sector-wisely, IT reported the highest per cent on UBC development, while industry sector reported the lowest (58,1 %).

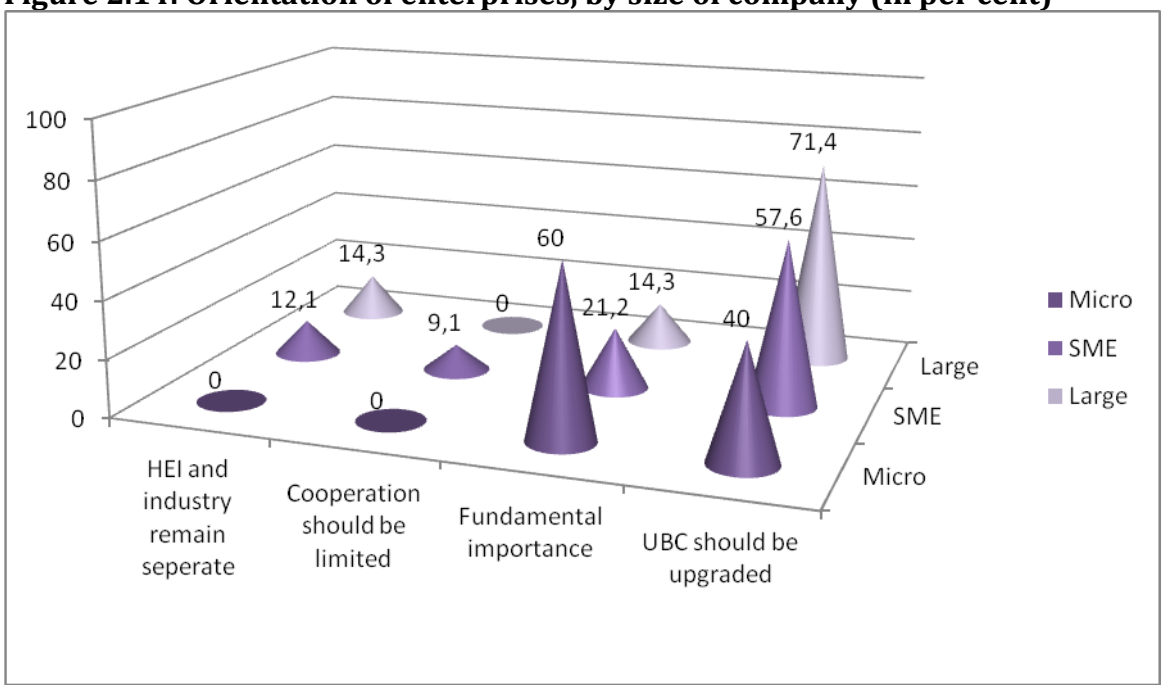
Figure 2.13: Orientation of enterprises (in per cent)



Question B3: Please indicate which statement describes the orientation of your enterprise

Interestingly no micro enterprises mentioned that, HEI and industry should remain separate, on the contrary 14,3 % of the large enterprises and 12,1 of micro enterprises mentioned that HEI and enterprise should remain separate. Generally, enterprises believe that UBC should be upgraded, with large companies the highest (71,4%). 60 % of micro enterprises consider that the UBC have fundamental importance, 54% of SMEs believe that it should be upgraded.

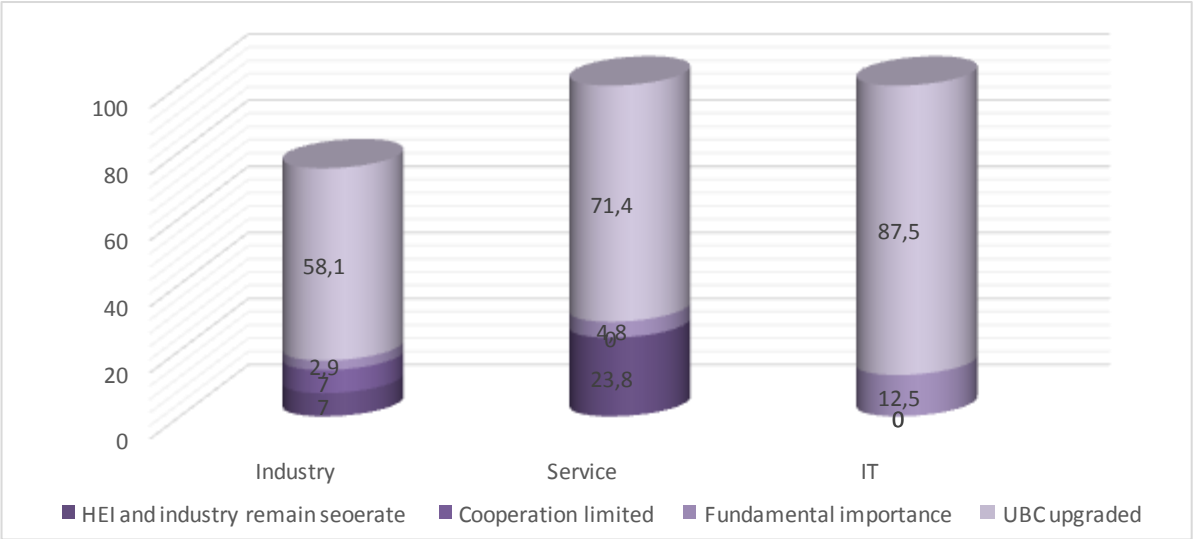
Figure 2.14: Orientation of enterprises, by size of company (in per cent)



Question B3: Please indicate which statement describes the orientation of your enterprise.

Looking at the answers sector-wise, it can be seen, that IT sectors value the importance of UBC the highest (87,5 %), and they are the only sector that did not mention that HEI and industry should remain separate. UBC is the least popular in the industry sector (58,1%). Only enterprises from the industry sector answered that the cooperation should be limited. In service sector, 23,8% of the enterprises mentioned that UBC is not necessary. The figure below shows detailed data.

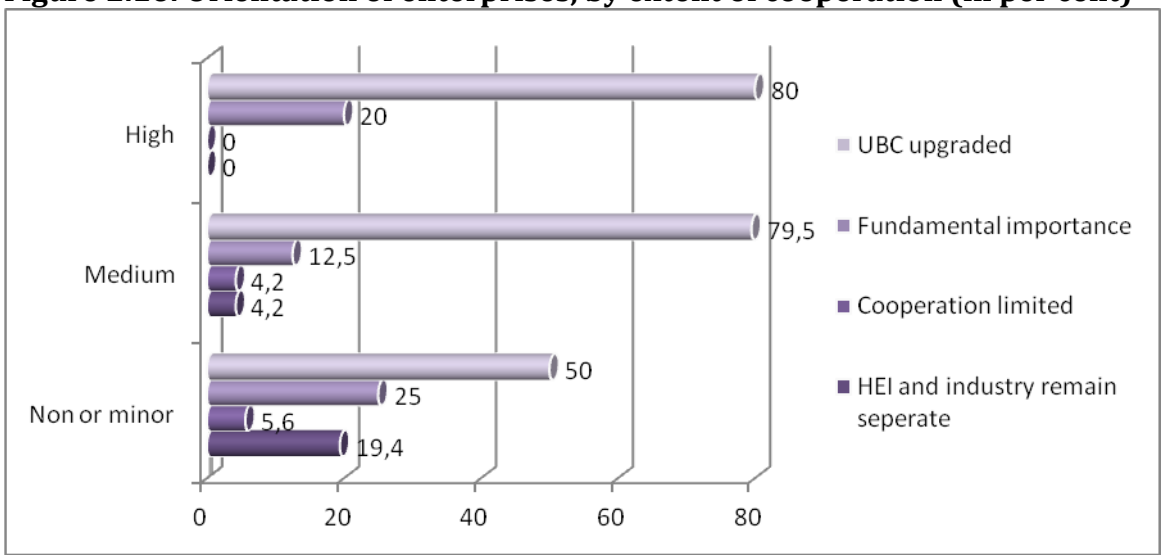
Figure 2.15: Orientation of enterprises, by sector (in per cent)



Question B3: Please indicate which statement describes the orientation of your enterprise.

Companies with high extent of UBC believe that the cooperation should be developed (80%) or have fundamental importance, and nearly 20 % of companies with minor extent of UBC consider that universities and enterprises should remain separate. Still, all three sectors gave the highest points to upgrade UBC, as the diagram shows.

Figure 2.16: Orientation of enterprises, by extent of cooperation (in per cent)

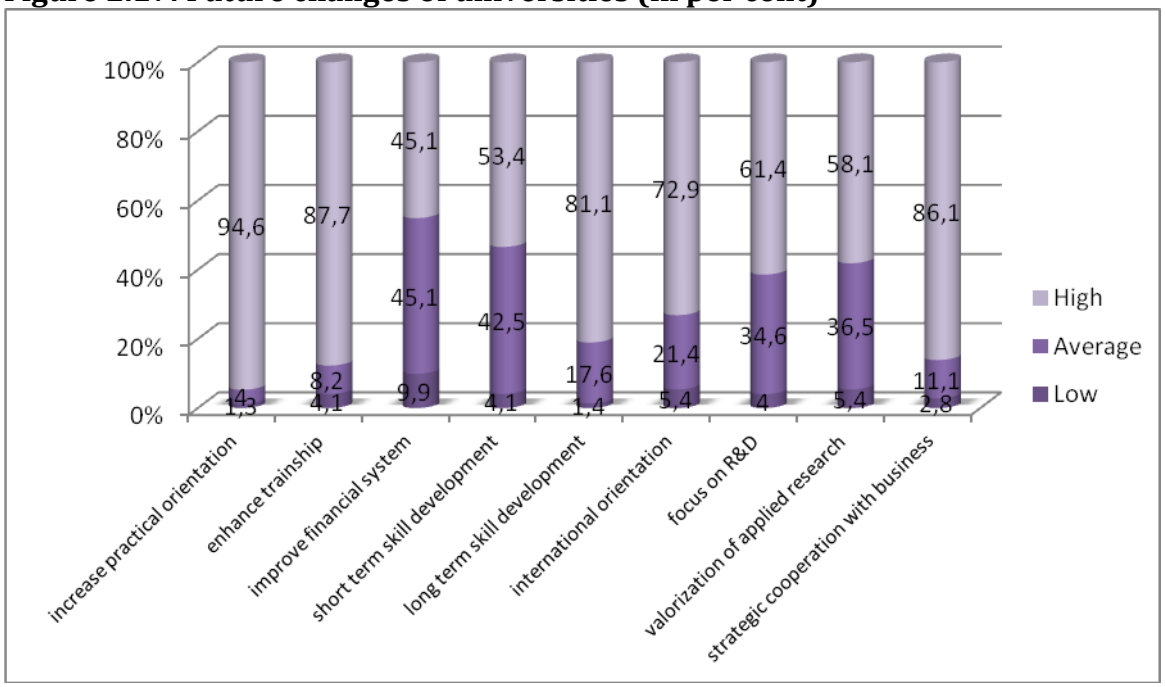


Question B3: Please indicate which statement describes the orientation of your enterprise

2.8 Future Changes of Universities

In this section, the question was that how should universities change in the future. Most of the respondents consider that the HEI should increase their practical orientation, and they regard the improvement of their financial system the least important. On the other side, according to some interviews, enterprises noted, that they did not encountered with any problem during UBC. For example, it can be read at Case Study 4: "*The respondent cannot point out any disadvantages or weaknesses, the company experienced maximum openness and flexibility from the university. The university tries to fulfil any requests of the company and they also solve the problems in time.*"

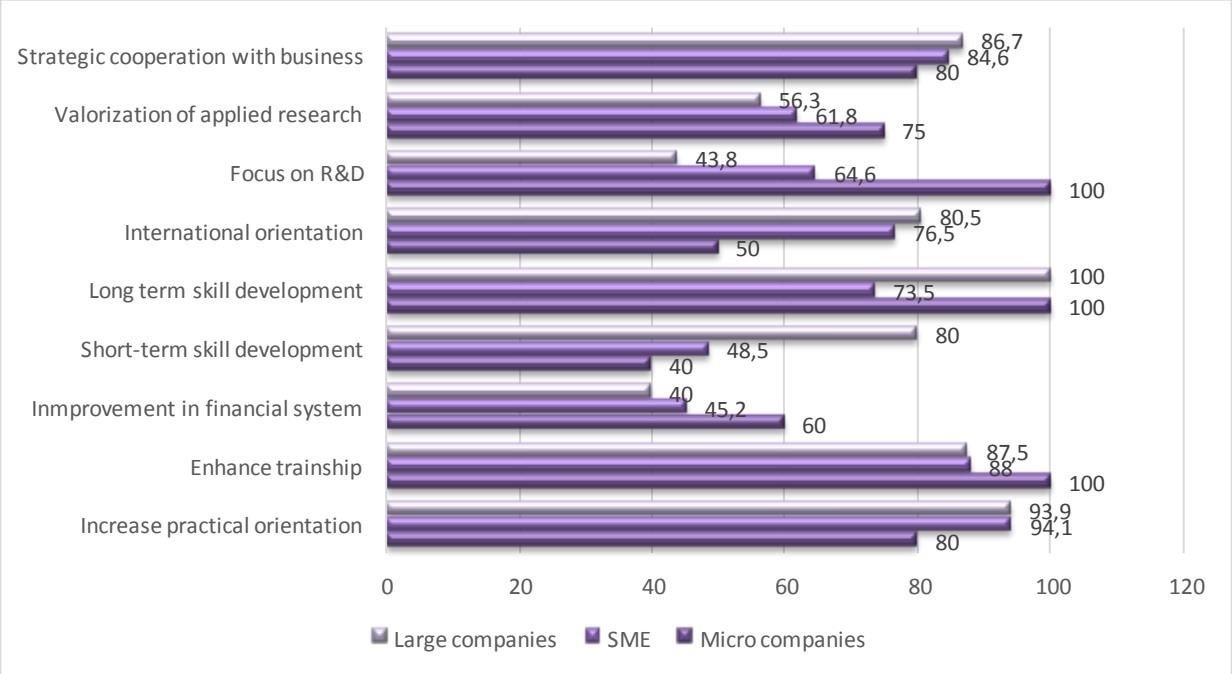
Figure 2.17: Future changes of universities (in per cent)



Question B4: In your view, to what extent should higher education institutions change in the future? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="To a very high extent

In the figure below, the opinions of different sized companies can be seen. As it can be seen, there are only minor differences between the answers, except from some cases.

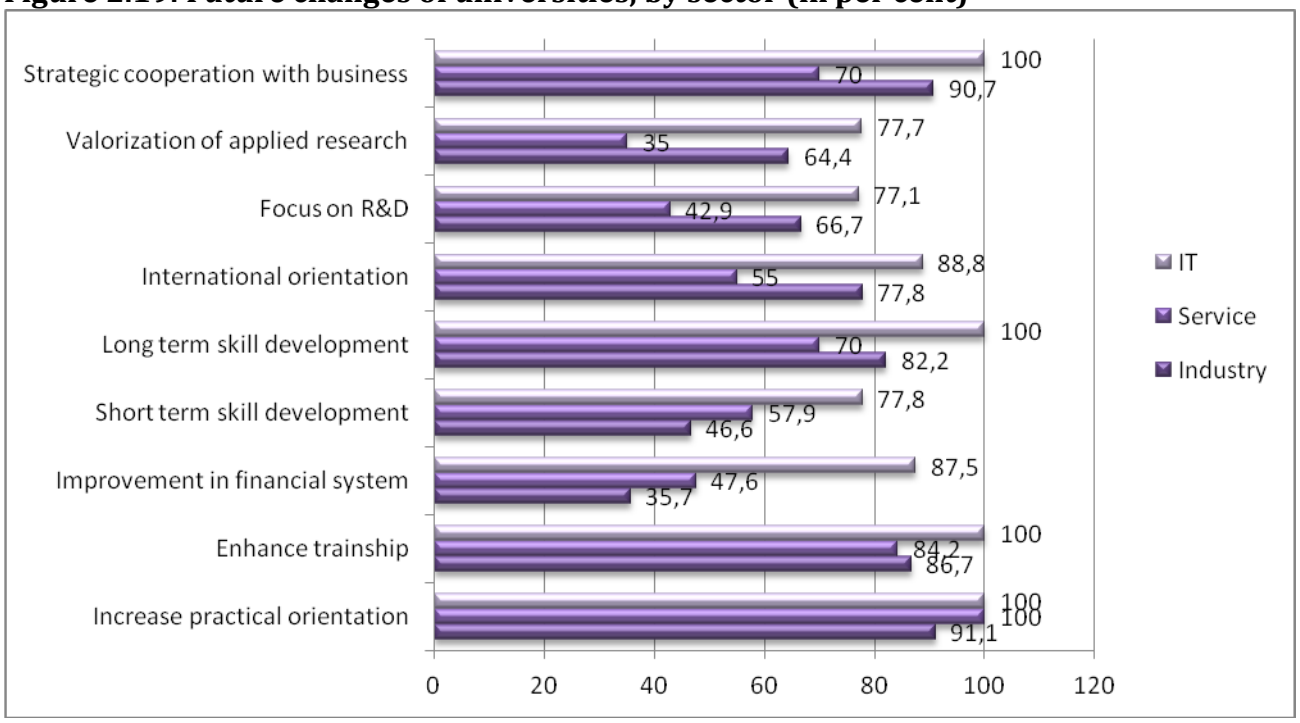
Figure 2.18: Future changes of universities, by size of company (in per cent)



Question B4: In your view, to what extent should higher education institutions change in the future? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="To a very high extent".

Investigating the sectors, IT companies gave the highest points to the answers, while the proportion is nearly the same at industry and service sector. See the figure below.

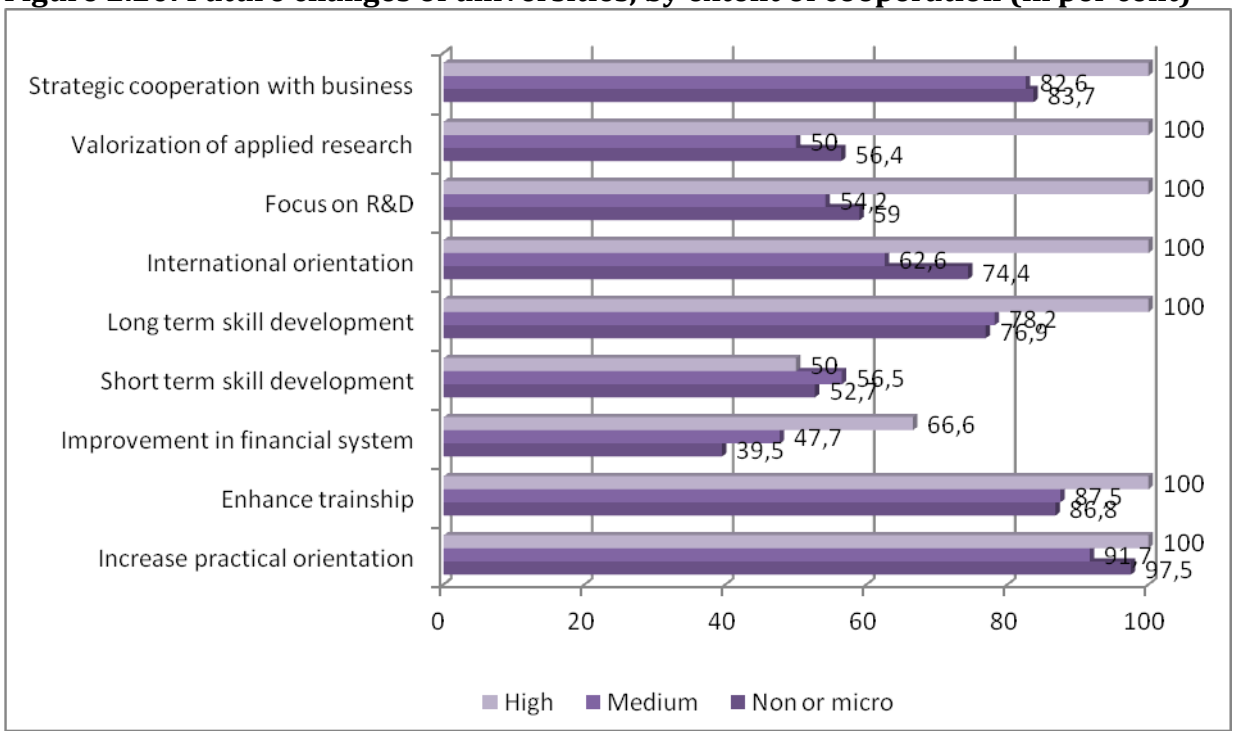
Figure 2.19: Future changes of universities, by sector (in per cent)



Question B4: In your view, to what extent should higher education institutions change in the future? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="To a very high extent".

Enterprises with high level of UBC gave the highest points to the questions (100%) except from two cases. Similarly to the sector specification, the same can be observed here; the results of companies with micro and medium level UBC are nearly the same and they usually consider less important the answers. For further details a figure is shown.

Figure 2.20: Future changes of universities, by extent of cooperation (in per cent)

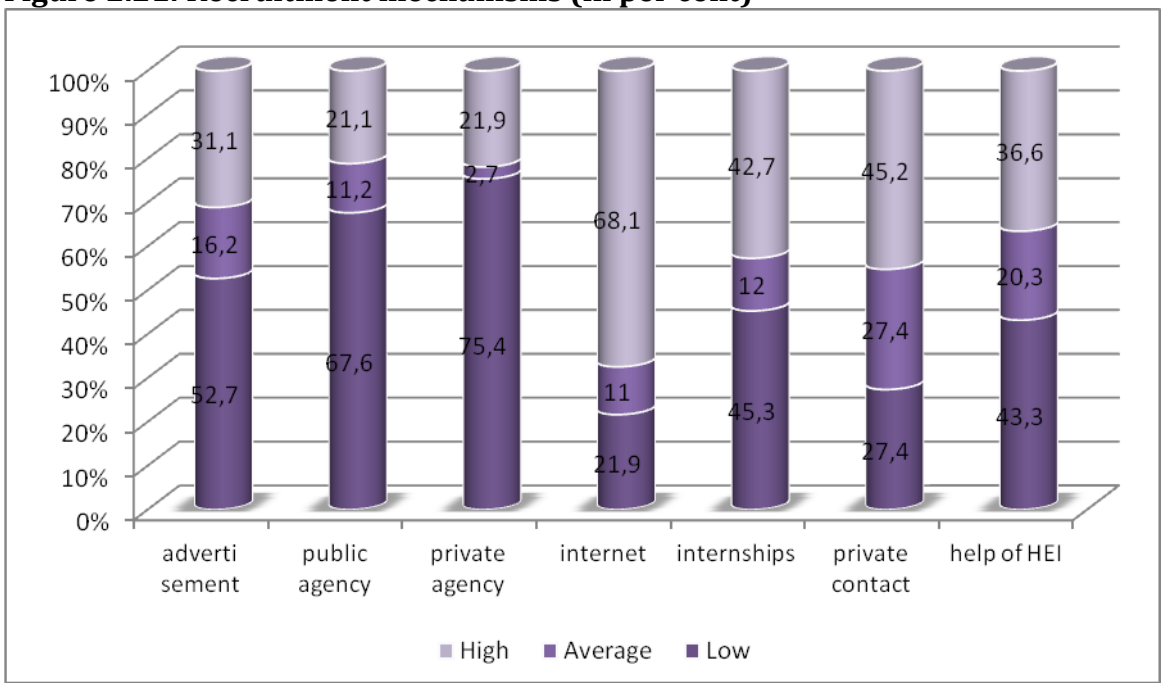


Question B4: In your view, to what extent should higher education institutions change in the future? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="To a very high extent".

2.9 Recruitment Mechanisms

Enterprises advertise job opportunities in different ways, but still the most popular mode is the internet with 67 per cent, and more than 40 % of the surveyed companies often use their personal contacts for hiring employees. On the third place the employment through internship can be found, which was referred in some interviews too. "*During the work of the interns, the employees of the company can become acquainted with the skills of the trainee. The hotel offers employment for the talented applicants*." (Case Study 7). There is another example of employing interns after they finished school: "*The enterprise receives several interns from the university, which means potential workforce for the company. The company automatically employs the best students"* (Case Study 4.). The percentage of companies who frequently use the help of public or private agencies is considerably smaller (only 20%), this mechanism is the less popular. On the diagram below, you can examine the recruitment mechanisms in detail.

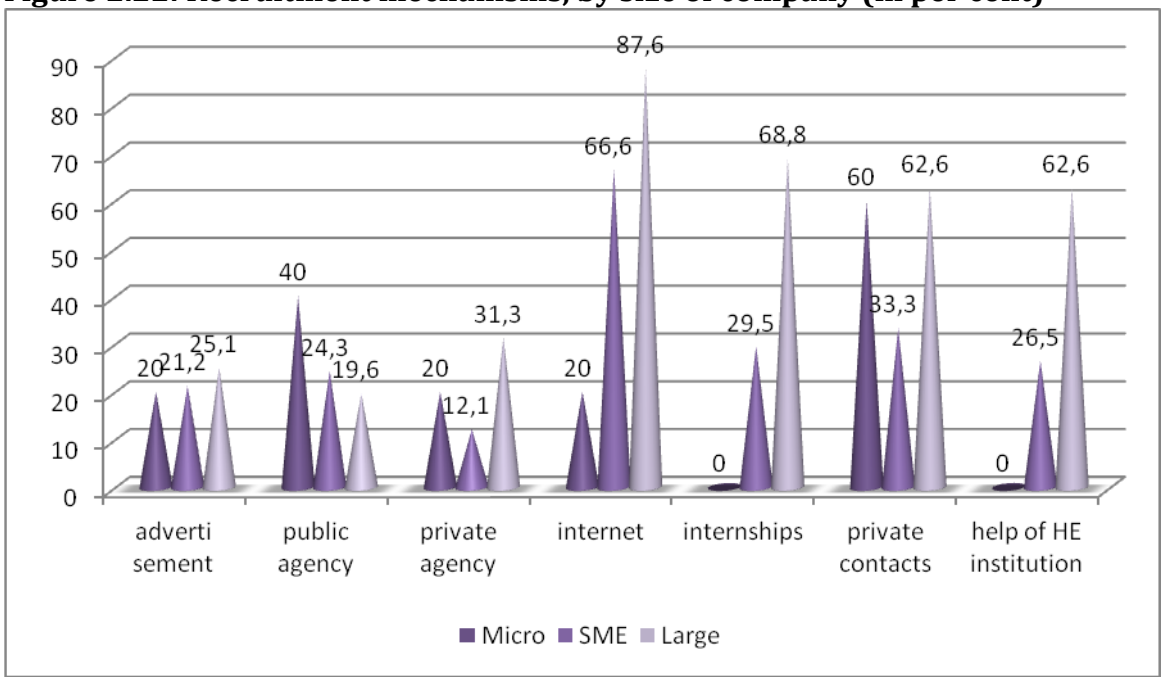
Figure 2.21: Recruitment mechanisms (in per cent)



Question A5: How often does your organisation use the following recruitment mechanism for hiring higher education graduates in the last five years? Responses grouped according to the following criteria: Low- 1 and 2. Average- 3 and 4. High - 5 and 7

According to the answers, internet is the most popular recruitment mechanism at large companies (87,6%), which is in contrast with micro enterprises where it is only 20%. Micro companies do not use the help of universities or internships at all, and private contacts are the most common used mechanisms by them. Small and medium enterprises also use the internet for hiring new employees.

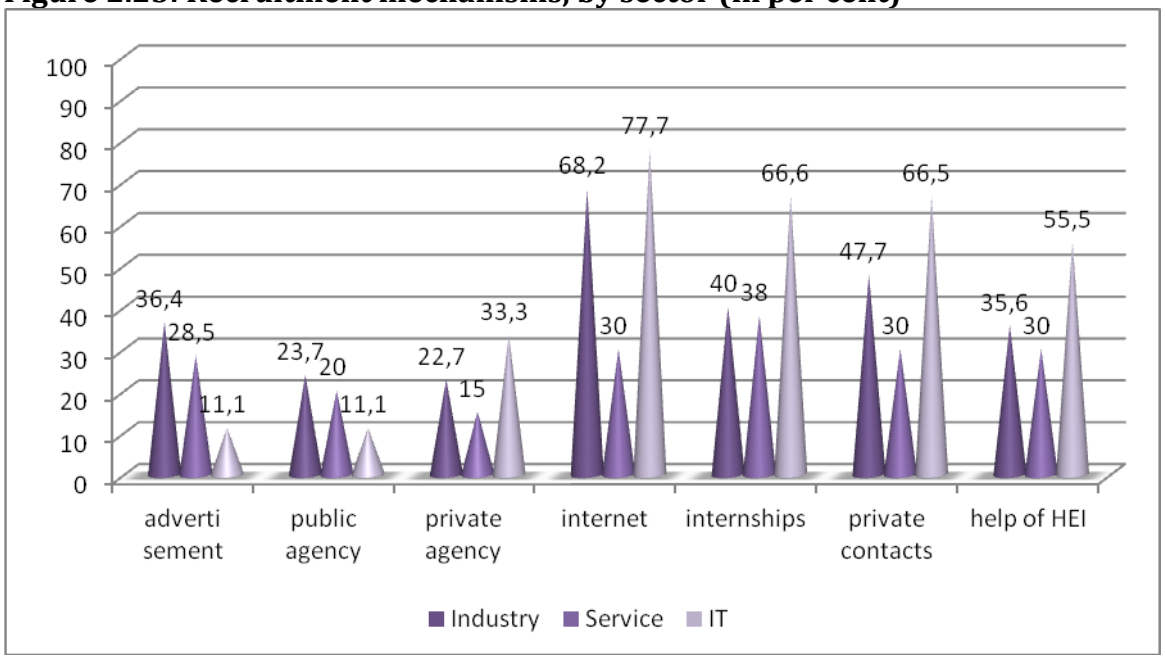
Figure 2.22: Recruitment mechanisms, by size of company (in per cent)



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".

Sector specifically there are only minor differences, internet and private contacts are the highest here, too. For further details, see the figure 2.30.

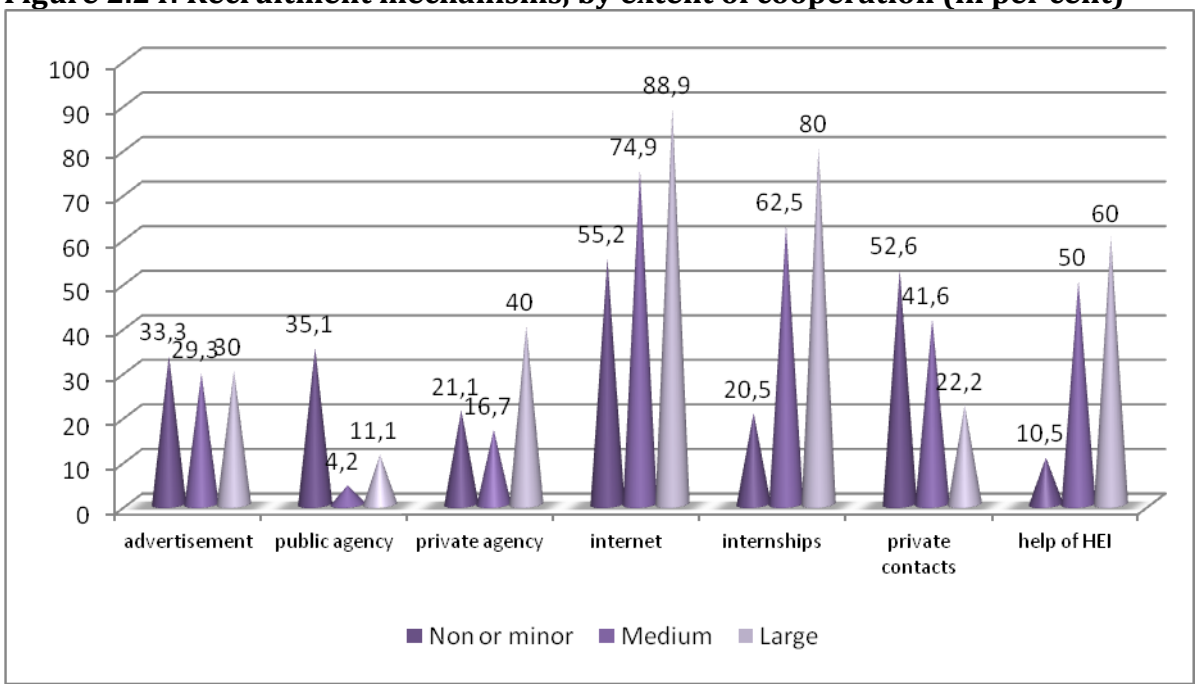
Figure 2.23: Recruitment mechanisms, by sector (in per cent)



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".

Considering the extent of UBC, companies with medium and high level cooperation tend to use the help of universities; they are more likely to employ an intern, too. Still, the internet is most common at all sections.

Figure 2.24: Recruitment mechanisms, by extent of cooperation (in per cent)



Graph 0.3. 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".

2.10 Graduates' Skills

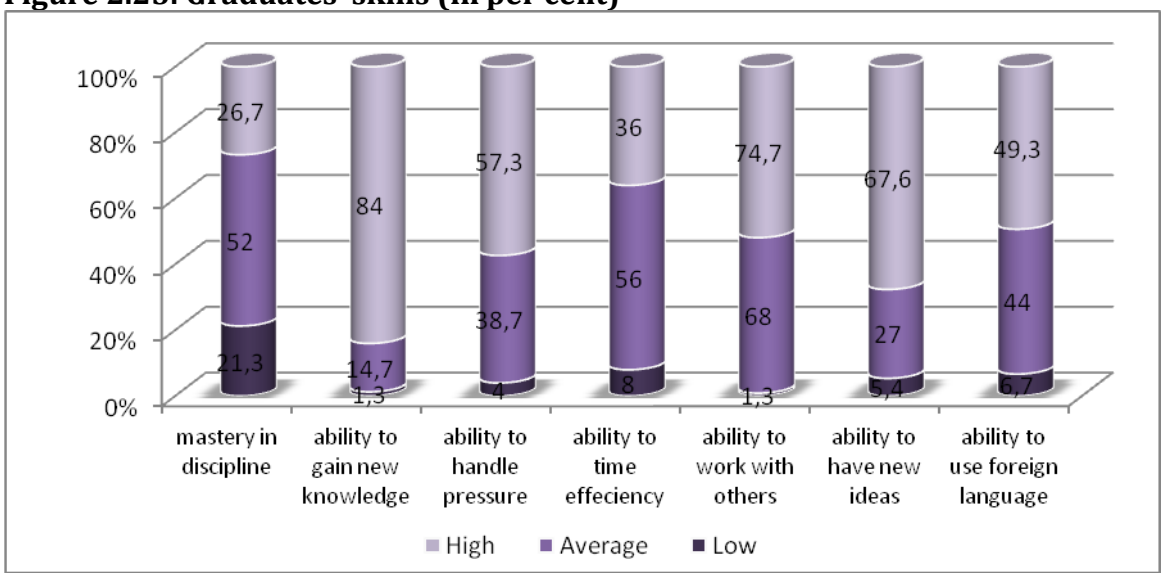
Companies were also asked to indicate, to what extent the university graduates have the following skills:

- mastery in a 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.

In this section, the acquired abilities and skills of the school leavers are examined from the perspective of an enterprise. Among the skills of the graduates, 84 per cent of the

companies surveyed regarded that the new graduates have the ability to acquire new knowledge win a high or very high extent. The graduates' ability to work productively with others (74,7%) and the ability to have new ideas (67,6%) were also acknowledged. According to the companies the students' mastery in their filed should be improved, only 26,7 per cent of the enterprises believe that the graduates have mastery in a high extent.

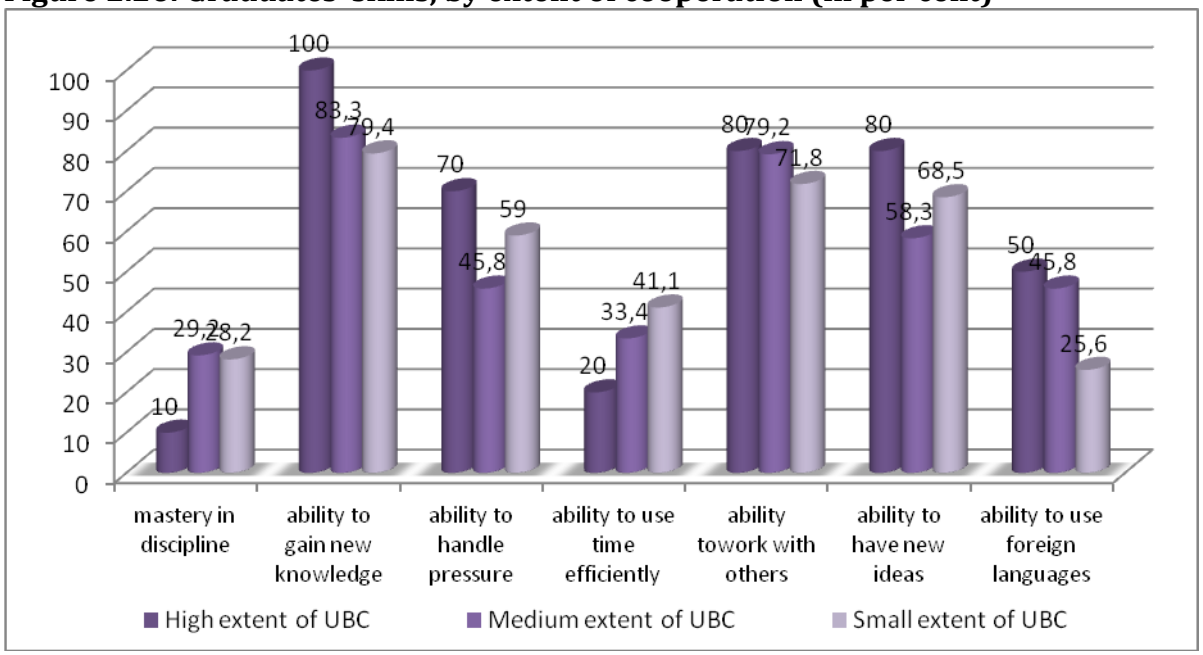
Figure 2.25: Graduates' skills (in per cent)



Question A6: Please provide information to what extent new graduates in your experience possess these skills? 1=most commonly possessed, 7=least commonly possessed. Responses grouped according to the following criteria: Low- 1 and 2. Average- 3 and 4.

Considering the UBC extent of the enterprises, some minor changes can be obtained. Companies with high extent of UBC usually rate the skills of a graduate higher than enterprises with lower extent of UBC.

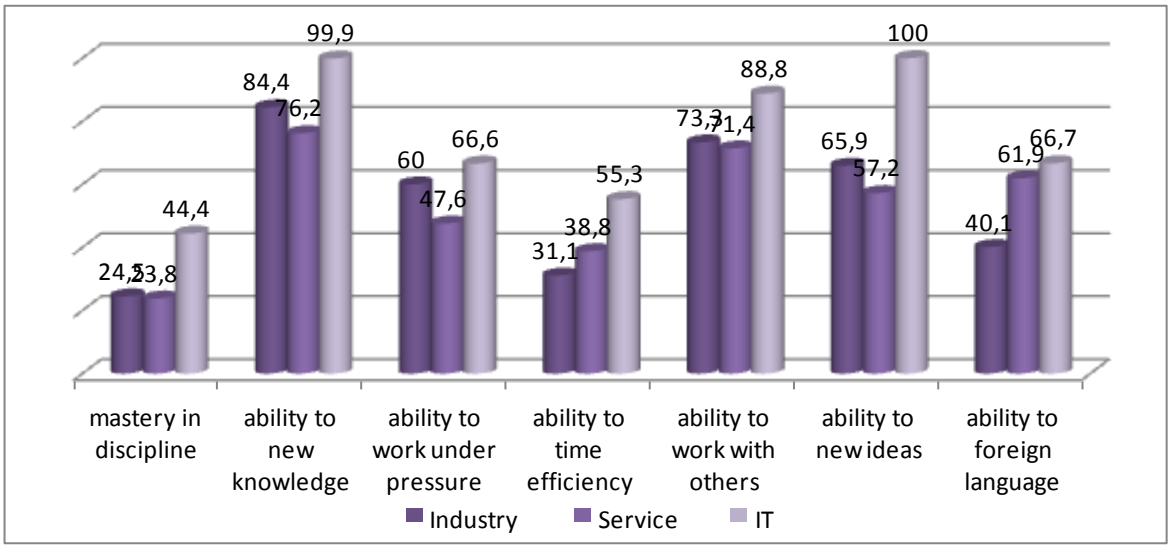
Figure 2.26: Graduates' skills, by extent of cooperation (in per cent)



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".

Looking at the sector specific answers, IT enterprises give higher points to newly graduates than other sectors in Hungary. Industry and service sector pointed similarly. The figure below shows the exact values.

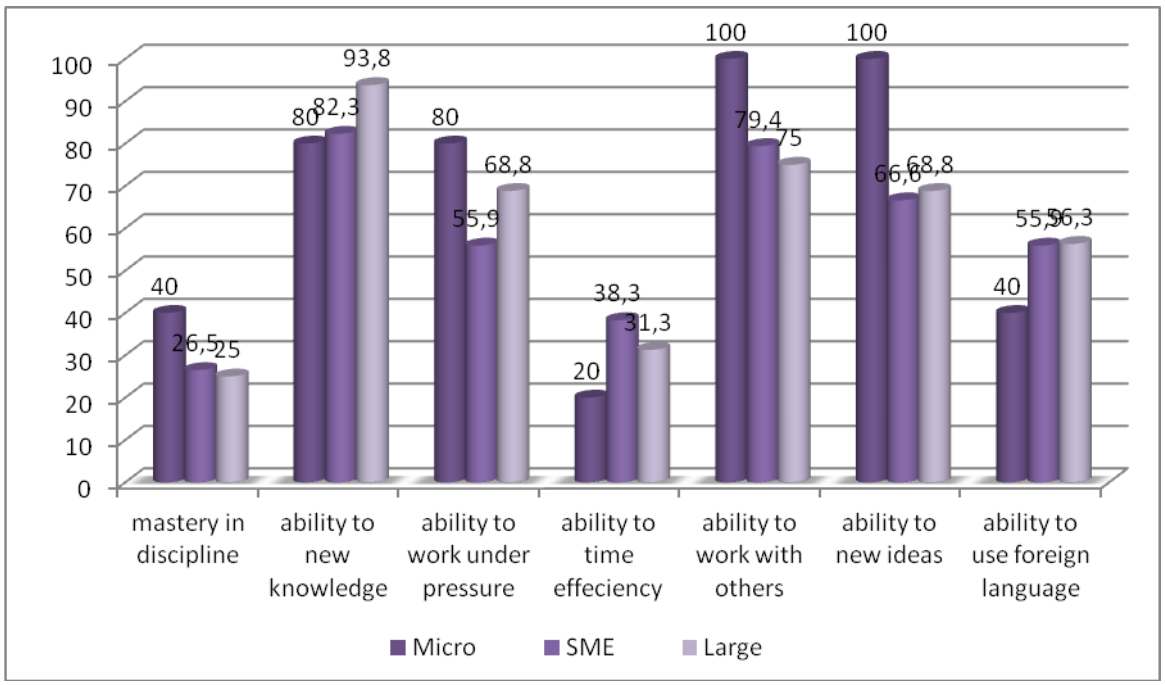
Figure 2.27: Graduates' skills, by sector (in per cent)



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".

Examining further, slight differences also appear if we look at the size of companies. Here, generally micro enterprises rated the skills highest, and the students ability to work with others and came up with new ideas reached 100 percent among micro companies. The result of SME and large enterprises are nearly the same.

Figure 2.28: Graduates' skills, by size of company (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"

2.11 Country Conclusions

It can be clearly seen, that UBC in Hungary is not well developed yet, although the enterprises agree that UBC is beneficial for both parties. The university-business cooperation brings recognized benefits but has also many barriers. Students improve their learning experience and develop skills for the future employment, companies improve their business performance. The barriers that restrict the university-business cooperation are mainly the bureaucracy and also lack of communication, different time horizons, difficulty of finding the suitable research partner, etc.

The enterprises have several expectations; they are not really satisfied with the mastery of the new graduates, which bears strategic importance for them. On the other hand, enterprises are ready to participate in the transformation process with personal

collaboration and also with financial support. Furthermore, there are national and EU sources that would help this process.

Although large enterprise already realized the importance of UBC, at SME and Micro enterprises UBC is still not common. Universities and enterprises should focus on joint projects, based on common interest. Curricula development is a very important segment of UBC, and also reducing bureaucracy inside universities is very essential.

In order to boost UBC, there is a need to investigate the market needs of the labour market, to detect the skill shortages and to constantly refresh them, to establish student tracking system, to organize practical trainings, to qualify and supervise practise places, as well as to spread business tasks, problems to the higher educational institution. Besides the steps taken to reduce the biggest obstacles (great bureaucracy, publication of confidential data, complicated hierarchy), the relationship could be improved with further joint projects, and researches.

The increase in the gravity of enterprises is indicated also by the transformation of the researchers' employment organization: from 2006, the enterprises employed the most researchers.

2.12 Case Studies Summary

EMCOSU team in Hungary conducted 10 additional surveys; elaborated short case studies based on the answers to open questions and additional information obtained from the companies and business associations. The most informative and best cooperation were selected from the 100asked companies and special sector. 10 interviewees were chosen from the service, industry and IT sector: 3 from industry sector, 3 services and 1 from IT. Also, four case studies of the special sector were also described.

Modes of cooperation

Usually an enterprise has closer relationship with the local higher education institute mostly the ones which are in their interest. The modes of cooperation can be between the companies and higher education institutes the following:

formally on the basis of cooperation agreement within fixed conditions and within specific projects Informally: the company and the higher educational institution have a good relationship. They have commonly arranged events, they inform each other about the actualities, and they share data and research results with each other.
continuous only for the duration of a project
direct indirect – in many cases, not a company corporate with the higher education institute, rather than an organisation (chamber, foundation, cluster) which represents the companies.

The most common forms of the cooperation are the following:

Common curricula development. The company participates in common curricula development with the university. They involve experts and instructors, and they ask the teachers of the university to be the lecturer of a training organized by them. The reason behind the cooperation is that the university has such technical background and professional basis that perfectly complements the theoretical knowledge basis that the experts prepared, and allows the online use of the curriculum as well as the widespread testing.

Trainee recruitment. One of the most important cooperation forms is the reception of trainees. A lot of company has elaborated a detailed trainee recruitment and reception programme. From the view of a student, it is a great advantage to spend their internship at this company, because this is considered to be a very good reference. The company advertises the opportunity of internship through the department of the HE institute; the students are selected by defined methods and criteria. In most cases practice time is spent in rotational system, so they spend a defined time at every department, and through this they can get to know the operation of the company.

Common R&D. That is beneficial for the university, as well as the implementation of projects for which the companies do not have any capacity or tool, but the universities do. In this case, the company can be a customer. In many cases, not a company has common projects, R&D with the higher education institute, rather than an organisation (chamber, foundation, cluster) which represents the companies.

Forming of common dual training. Companies, clusters and higher educational institution corporate in elaborating dual training system. The higher educational institution should take into consideration, that the training form should be suited for the credit system. The interest of a company is that the students leaving school should acquire a training which they can better utilize and which is more practice-oriented. A training programme should be established for the students which is worth the undertaking of the considerably more practise time, since instead of the 6 week practise defined in the dual training system, they have to spend more than one year in practice. During the establishment of dual training form, more companies participated in the curricula development. The curricula are being elaborated in a way that the involved companies can form the curricula to their own image. The training programme is the same, but can be applied with minor changes at different profiled companies.

Cooperation with career centres. The company sends their current job opportunities to the career centres. The career centres forward these opportunities to the registered students. A lot of carrier centres organize career day on the universities, where the companies gets invitations from them.

There are other UBCs besides the above mentioned the most common modes of cooperation:

the representatives of the company are the guest lecturer on the conference/lessons of the HE institute;

the company support one of the event of the HE institute with promotional materials/money;

a company established a faculty in the city of the company;

special example: »More usable knowledge – more useful workforce!« trainee programme, in which the students can expand their experiences at rotational system in real work environment at companies of regional clusters. The programme differs from an average internship in that the students can spend their practice time at many companies of a given cluster, and not only at one company, they can verify their skills at several company and they can apply the previously learned things. In this way they can acquire the practical training from first hand, and they can get to know more organizations, so they can gain wider experience. All of this helps the school leavers in their future employment, they can start their career with valuable knowledge and professional experience.

Barriers to cooperation

Companies and business associations identified following barriers:

Bureaucracy. According to the opinion of the respondents the most important barrier is the bureaucracy in and out of the higher educational institutions. They need to document everything; there is a lot of administration, despite the fact that an enterprise is only curious about the solution.

Hierarchy of higher educational institutions. Difficulty in finding the appropriate persons within higher education institutions.

Differences in thinking, mentality and the attitude. The companies and the universities have different objectives; the university is driven by the state aims, while the companies are driven by private, individual aims. The enterprises are result oriented; they insist on the deadlines of the tenders, so companies should be more flexible in this respect.

Lack of trust and openness. Flexibility from universities is missing, for example the universities should set up their programmes in a way that it adjusts to the needs of labour market and they should also take into account the practice time. The enterprises do not have enough time for a deep UBC.

20 % of the respondents cannot mention barriers, the company has only positive experience and the respondent considers that the cooperation is advantageous and beneficial for both sides. Probably the cooperation is permanent between the universities and enterprises, because both of them encountered only with positive experiences.

None of the respondents mentioned financial crisis, which is surprising. Only one respondent mentioned that just a few Hungarian enterprises can afford to spend money on R&D or they can spend very little.

Benefits

Well-trained students due to the common training material development. The main benefit for the company is that they can gain professionals who attended practical training which is relevant for them and acquired knowledge which is considered important for the company. It is also advantageous for the university, because they can put on emphasis on the more practical training instead of the exaggerated theoretical knowledge. The students leave university with such skills that after 1 month they are able to work independently, they acquire abilities and competences that are important from the view of employment

Matching the labour market needs due to trainee programmes and realistic, lifelike education. The coherent training time gives an opportunity for the enterprises to prepare the students for their future tasks, and to accordingly elaborate their thesis. The companies may receive a suitable workforce who is familiar with the future employees and also have a professional company-specific knowledge.

New research results due to the cooperation. The universities have known how, laboratories for the research what the companies need.

Financial benefit: large companies support or finance universities which are by the way in a difficult financial situation

Sources of financing

UBC is financed from following sources:

Company own resource. Internship programs, training programme materials are financed by the companies.

EU funds, e.g. FP7 what is a key tool to respond to Europe's needs in terms of jobs and competitiveness, and to maintain leadership in the global knowledge economy. Other opportunities are ERASMUS+ funds and Cross Border Operation Programmes – but they support mainly the indirect cooperation, not directly the UBC (Chamber-University projects).

Support of different foundation/alumni.

3 POLAND

National report prepared by: Mieczysław Bąk, Agnieszka Buze, Katarzyna Dwórznik, Przemysław Ruchlicki

3.1 Introduction and Methodological Approach

Within the framework of EMCOSU project the Polish Chamber of Commerce conducted a survey among companies and business associations to identify modes of cooperation between the private sector and UBC. Invitations to participate in the survey were sent out to chambers of commerce and companies selected following the guidelines of the project and the arrangements agreed upon by the partners. The list of Polish companies and business associations participating in the project was drawn up in an MS Office Excel file *BAZA_EMCOSU.xls*. However, this data-base proved insufficient and later on in order to collect a requested number of 100 filled-in questionnaires, we sent the additional invitations to selected companies, asking them to participate in the survey.

The survey contained closed questions related to modes of cooperation, drivers for cooperation, as well as prevailing barriers. The conducted survey also allowed us to identify UBC outcomes and impact, lesson learned, as well as to get to know how Polish companies perceive UBC. The survey was carried out from November 2013 till June 2014. During that period we received 100 questionnaires, 70 from companies and 30 from business associations. Given the size of the company, 72 questionnaires were returned by SMEs and 28 were obtained from large corporations. Sectorally, 41 questionnaires were returned by industrial companies, 43 by the services sector and 16 by the ICT sector. Over 80% of the received questionnaires indicate that the cooperation of universities and business is of crucial importance. All received questionnaires were saved in the electronic form. The paper versions are stored in ring folders. Collected data has been entered into template files drawn up by the project leader in order to be further analysed. The codebook for the questionnaire was used while entering data into the files. The following report presents the results of the survey.

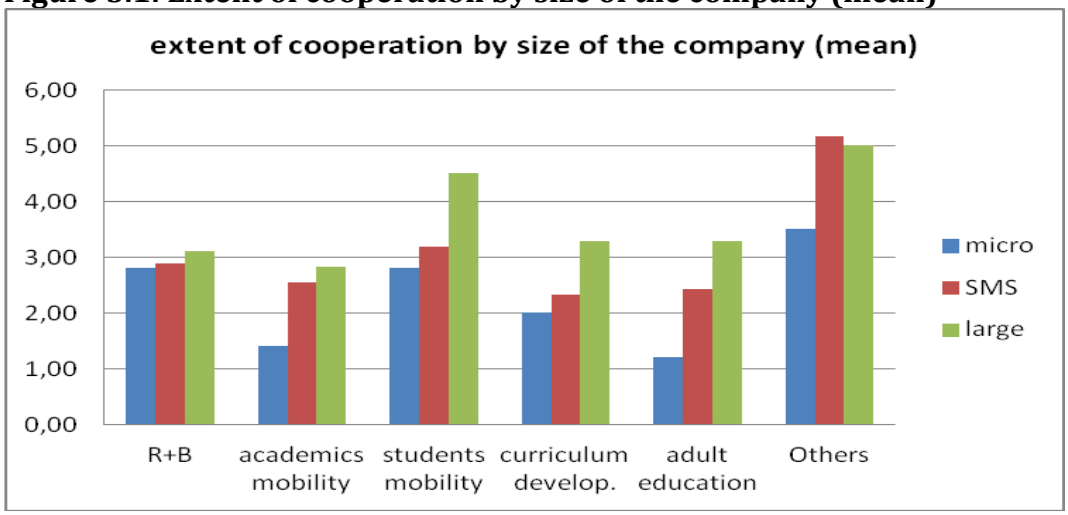
3.2 Modes and Activities of University-Business Cooperation

In one of the questions in the survey Polish entrepreneurs were asked (question B1) about the extent of cooperation with universities in the following areas:

1. research and development (R&D) e.g. (inter)national projects, commissioned research;
2. mobility of academic staff (their training or research in your organization);
3. mobility of students e.g. direct recruitment, traineeships;
4. curriculum development and delivery (including university lectures);
5. adult education, training and short courses and other "lifelong learning activities";
6. other.

The graph below shows the extent of universities and business cooperation for micro-enterprises, SMEs and medium-sized companies).

Figure 3.1: Extent of cooperation by size of the company (mean)



Source: EMCOSU Large Scale Survey Analyses

The data presented above shows that depending on their size companies' views on UBC vary.

The responses indicate that students' mobility: e.g. direct recruitment and traineeships is a very important form of cooperation for large companies.

Large companies are very often involved in preparing and implementing curricula, in cooperation with the academic staff, as well as in adult education, training and short courses and lifelong learning activities.

The survey was a source of extremely important information on how Polish companies view research and development (R&D). The responses indicate that practically for all surveyed groups: micro-enterprises, SMEs and large enterprises, research and development (R&D) is a very important form of cooperation. The Eurostat data shows that in 2012 0.9% of the GDP in Poland was allocated to R&D (which is over 20% more than in 2010). The Europe 2020 Strategy obliges Member States to spend 1.7% of their GDP on innovation.

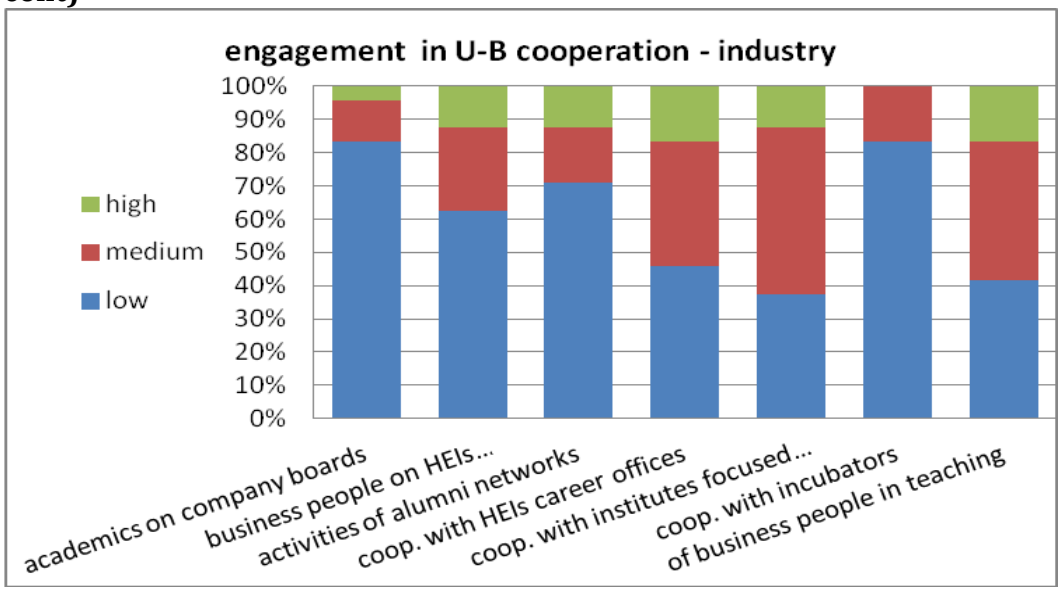
Taking the above into consideration, the results of the survey indicate that companies in Poland are changing their attitude — they have become more interested in cooperation between universities and business.

The survey (question B5) analysed how often Polish entrepreneurs are involved in projects carried out jointly with universities. The following areas were surveyed:

1. academic staff sitting on company management boards;
2. business people sitting in university boards;
3. participation in the activities of alumni networks;
4. cooperation with university career offices;
5. cooperation with institutes focused on university-business cooperation;
6. cooperation with business incubators;
7. active involvement of business representatives in study, teaching and research activities.

The following graphs illustrate the involvement in the joint universities and business projects (each bar shows the level of involvement (i.e. 1-2 (low); 3-5 (medium); 6-7 high) of three analysed sectors: industry, services and IT).

Figure 3.2: Engagement in universities-business cooperation — industry (in per cent)

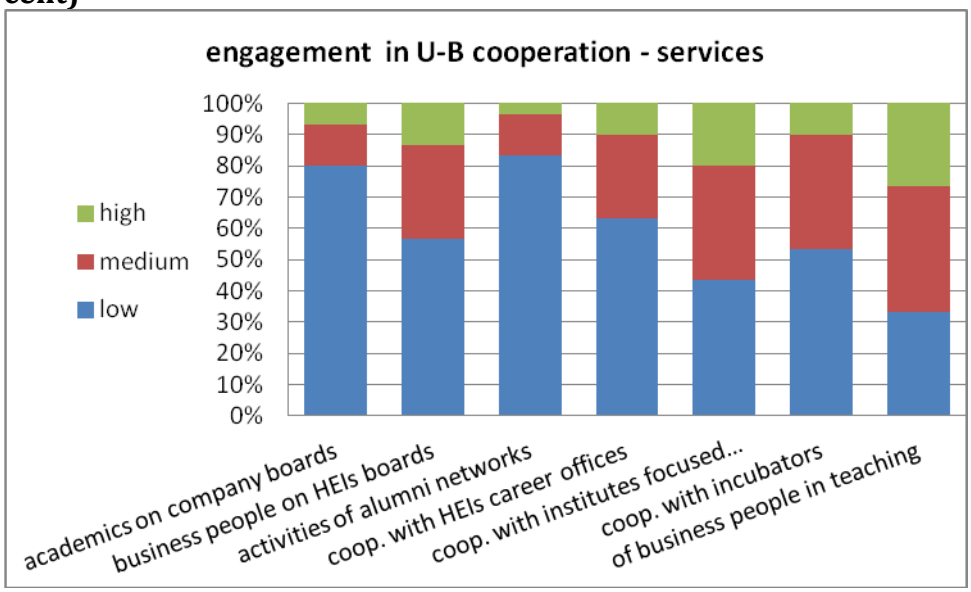


Source: EMCOSU Large Scale Survey Analyses

The involvement in the activities carried out in cooperation with universities (industry). The graph above shows that the industrial sector is involved in the cooperation, since academic staff sits in company boards and companies cooperate with business incubators (the least important).

The industrial sector cooperates to a certain extent (ranked as average) with career offices at universities and institutes carrying out activities focused on university-business cooperation. Entrepreneurs representing the industry sector take part in educational activities at universities, as well as in research.

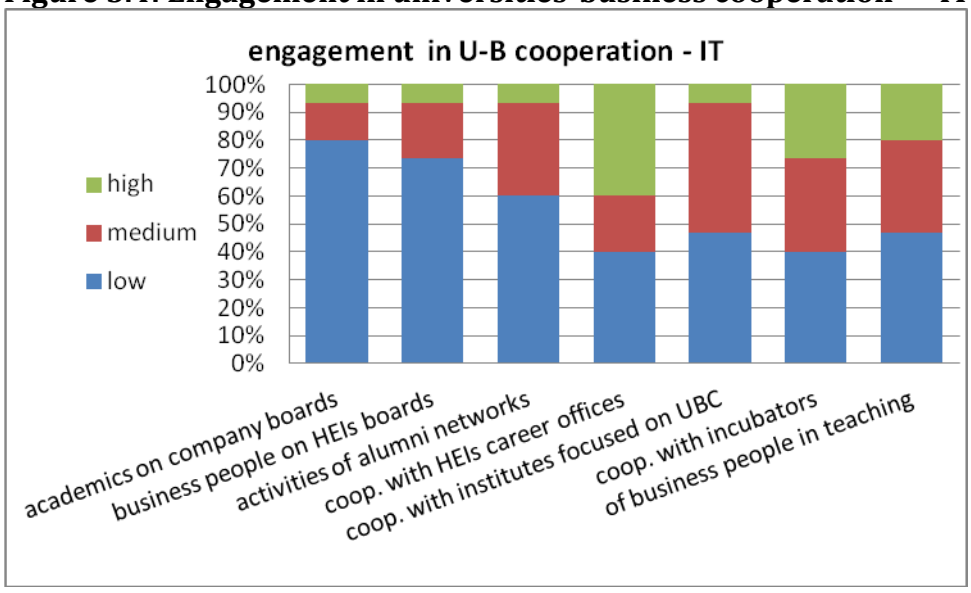
Figure 3.3: Engagement in universities-business cooperation — services (in per cent)



Source: EMCOSU Large Scale Survey Analyses

The involvement in activities carried out in cooperation with universities (services). Services sector is extensively interested in the involvement of business representatives in educational activities, analyses and research, as well as in the cooperation with institutes carrying out activities focused on the university-business cooperation.

Figure 3.4: Engagement in universities-business cooperation — IT (in per cent)



Source: EMCOSU Large Scale Survey Analyses

The involvement in activities carried out in cooperation with universities (IT).

The IT sector was mostly involved in the cooperation with career offices at universities. Secondly, the involvement with business incubators and engagement in educational activities, analyses and research was mentioned.

In the IT sector academic staff does not often sit in company's management boards, company employees do not often participate in the activities of academic committees.

The analysis of aggregated data presented in all three graphs for surveyed sectors: industry, services and IT, leads to a conclusion that practical aspects are most important in university-business cooperation. The involvement in the activities carried out in cooperation with universities is aimed at specific, measurable results. It is characteristic that all sectors did not perceive academic staff sitting in companies' management boards, employees' involvement in the activities of academic committees and participation in activities of alumni networks as crucially important (low involvement).

Polish companies were asked closed and open questions in the survey. In the open question C1 the entrepreneurs presented information on the most successful mode of cooperation with universities. The question referred to their experience in this respect. The respondents mentioned: students' gaining practical experience during traineeships and internships, joint development of university curricula, entrepreneurs lecturing at universities, as well as carrying out joint research and innovation projects. The responses clearly indicate that Polish entrepreneurs are open to an effective cooperation with universities. For them:

- a traineeship in a company is the best form of cooperation allowing students to learn in practice while performing a specific task. Practical experience gained while being a trainee supplements theoretical knowledge acquired at universities. Such a mode of cooperation is beneficial both to the student as well as to the company, which with such freshly acquired knowledge can develop in the right direction,
- practical workshops organised by a company at the university allowed the company for the initial assessment of students' knowledge and their active potential and selecting the most involved ones as future employees. Those students (depending on their knowledge) were invited to a meeting in the company, to send their applications for traineeships and vacant posts.

- joint preparation of university curriculum and launching a new study programme. It helps in preparing future human resources tailored to the needs of the company and transfer knowledge from a dynamically developing sector.

To sum up, for the economy sector (i.e. entrepreneurs) the science-business cooperation is very important, since it supports training of young people and the educational process is tailored to the needs of the labour market. Therefore the entrepreneurs are favourable of the efficient cooperation with universities.

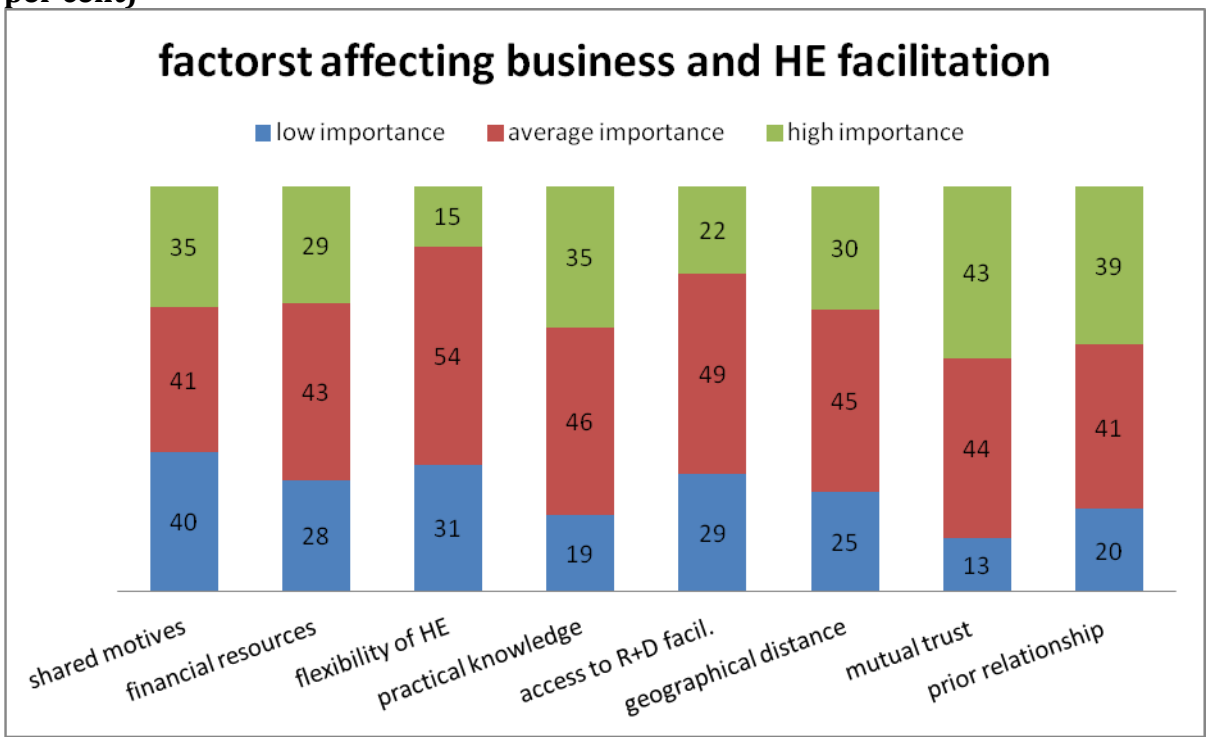
3.3 Drivers and Barriers of University-Business Cooperation

In the survey the entrepreneurs were asked to assess the importance of factors facilitating university-business cooperation. The following factors were assessed:

1. existence of shared motives;
2. financial resources for working with universities;
3. flexibility of universities;
4. interest of universities in accessing practical knowledge;
5. access to universities' research and development facilities:
6. close geographical distance of universities;
7. existence of mutual trust and commitment;
8. prior relationship universities.

The following graph illustrates the importance of individual factors.

Figure 3.5: Factors affecting business and universities cooperation facilitation (in per cent)



Source: EMCOSU Large Scale Survey Analyses

The obtained results show that mutual trust is the most important factor for good cooperation. Prior good relationship, common motives and the fact that the company is located close to the university were also perceived as important. The fact that mutual trust was ranked as the most important indicates that there is a need for measures, which can create such trust, such as for example. Common values systems, taking advantages for both sides into consideration, fostering understanding for economic activity conditions, more understanding for time constraints. Such measures could contribute to companies and universities finding common motives for their activities.

Experience in carrying out joint projects is another significant factor contributing to smooth cooperation. The above mentioned factor is important for almost 40% of respondents. Personal contacts constitute one of the most important factors impacting cooperation in business. Personal contacts i.e. knowing what to expect of a partner makes it easier to adapt to the company's needs Moreover, it facilitates creating mutual trust mentioned above. The analysis of the responses shows that we can hardly name the less important factors mentioned in the survey. The entrepreneurs attach relatively less importance to flexibility of research institutes; it does not mean however that this

flexibility does not play a role in the cooperation. It is a significant or a relatively significant factor for almost 70% of respondents.

Given the size of the company, it can be said that factors important for all companies are equally important for medium-sized as well as large companies. Mutual trust is important for 45.7 % of small and medium-sized enterprises (SMEs) and for 42.8% of large companies. This factor is important for 20% of micro-enterprises; however it might result from the fact that micro-enterprises were the least represented in the surveyed group. There are discrepancies in the importance of the second most important factor – prior good contacts with universities — in the case of SMEs (50% define this factor as important) and large companies (32.1%). It may result from attaching greater importance to personal contacts in SMEs.

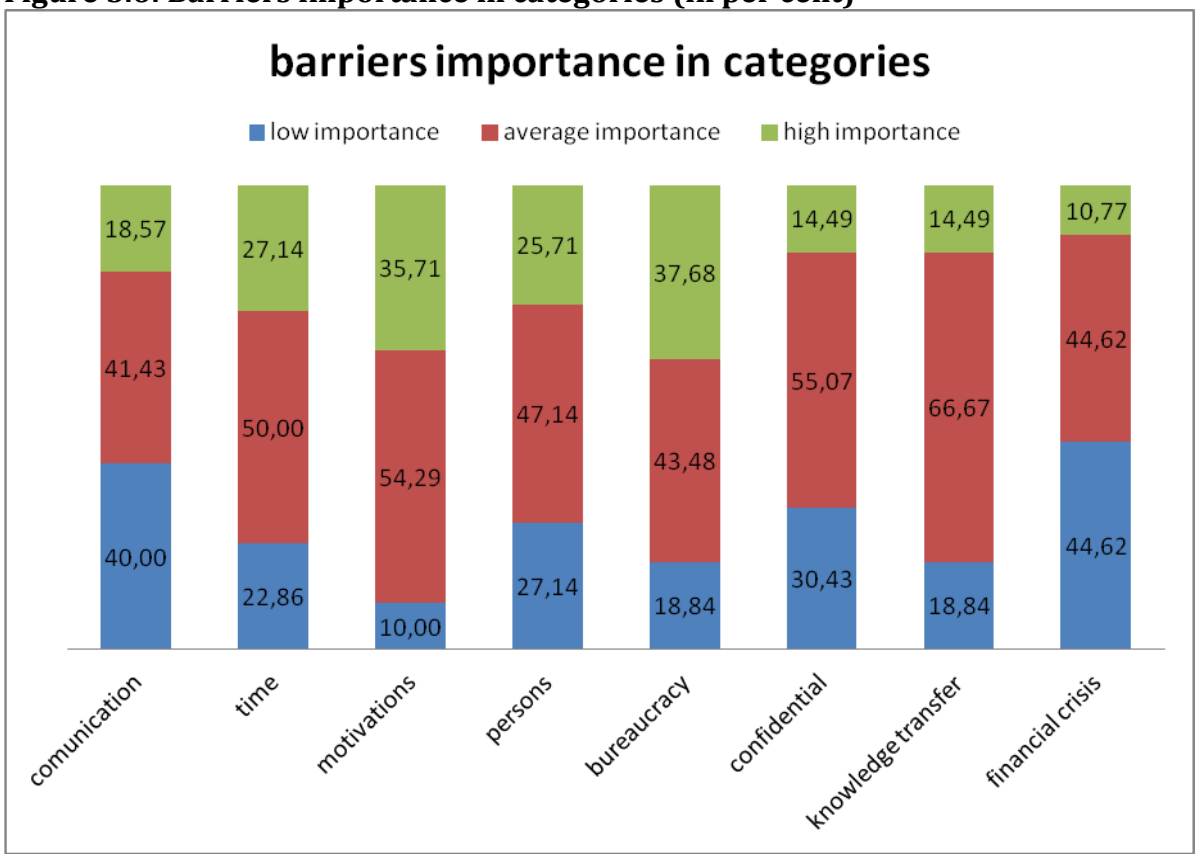
The IT sector views mutual trust as less important. In services mutual trust is important for 51.7% of respondents, in industry for 41.7% and in IT only for 26.7%. Prior good contacts with universities are more important for the IT sector. 53.3% of IT companies decided that this factor is the most important one, whereas it was important for 36.7% of companies in services and 33.3% of industrial companies. The collected data may indicate that there is a relatively big sectoral discrepancy in assessing the importance of factors impacting the universities-business cooperation.

Polish entrepreneurs were also asked to describe the barriers in universities-business collaboration. The following obstacles were listed in the survey:

1. different modes of communication and language barriers between universities and business;
2. different time horizons between universities and business;
3. different motivations and values for universities and business;
4. difficulty in finding an appropriate partner at universities;
5. red-tape within universities and outside;
6. universities want to publish confidential results;
7. limited possibilities of knowledge transfer;
8. the current financial crisis.

The respondents had a chance to name other obstacles not mentioned in the questionnaire. The following graph illustrates the responses:

Figure 3.6: Barriers importance in categories (in per cent)



Source: EMCOSU Large Scale Survey Analyses

Red-tape and divergent motives of business and academic circles were the most important obstacles named by entrepreneurs. Those obstacles are very important for as many as one third of the respondents and relatively significant for 50%. Excessive red-tape is due to public financial support for cooperation, mainly from the European Union funds, which in current Multiannual Financial Framework is allocated for innovation. Financial support was granted in a call for proposals and one of the conditions for a given company to take part in a project was submitting a lot of documents. Moreover, both during the project, as well as after it has been finished, a company is subject to numerous audits. It is also worth mentioning that entrepreneurs interested in such cooperation face bureaucratic constraints with the administration and decision making processes at the universities. In the majority of cases joint projects need first to be approved by the university authorities and then department heads, which prolongs the whole decision making process. Thus a very high percentage of responses pointed to bureaucratic obstacles as the most important. Taking into consideration that also in the forthcoming Multiannual Financial Framework the European Union funds will be

allocated to companies carrying out joint projects with research institutes and there will be a lot of formal steps to take in order to use public funds, there is little chance to minimise red-tape in universities-business cooperation.

Another significant obstacle in Poland is the discrepancy in motives and values for business and universities. Scientific attainment (number of publications and citations) is important for university employees. Scientific attainment is decisive if a member of academic staff is to be awarded a specific scientific title. Companies do not always want to reveal the results of the research quickly. Obtaining results which can be implemented in the company is more important than the number of publications.

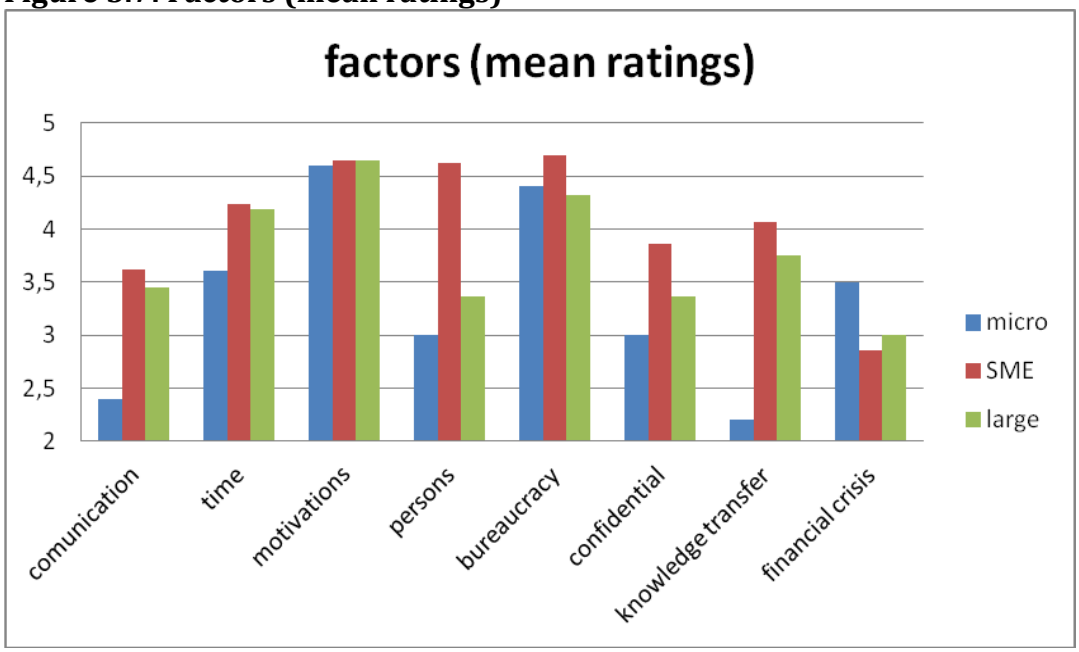
The other two significant groups of obstacles, important for over one fourth of respondents and relatively important for 50% of them are various time frames and difficulties in finding partners for cooperation at universities. It is important for the company to solve problems quickly. They are mostly interested in identifying the results of cooperation at a very beginning and in setting deadlines for the joint project to bring about those results, as well as deadlines for their practical implementation. Researchers do not act under severe time constraints and are used to calm work over a longer period of time. These discrepancies exacerbate problems in carrying out joint projects.

The collected data shows as well that companies have a lot of problems with identifying appropriate partners, who can make the cooperation possible, despite the fact that there are centres for technology transfer which were supposed to facilitate cooperation. Most probably it is due to lack of information on available cooperation networks, indices of activities that the industry can commission with researchers or regular meetings informing on cooperation opportunities and persons responsible for facilitating it. There are not enough address data bases, especially those containing information on those who at universities could take care of projects for industry.

The least mentioned obstacles are those related to communication problems and the financial crisis. It may indicate a significant improvement in communication, however viewed together with problems in identifying appropriate cooperation partners, shows that there are efficient communication channels, but still there is little clear information on whom to turn to in order to propose cooperation. Little importance of the financial crisis is probably due to the higher public financial support for cooperation (mostly structural funds). Relatively few projects carried out in Poland are financed from private sources and therefore initiatives are less exposed to the adverse effects of the crisis.

The following graph illustrates the importance of the obstacles mentioned above for all categories of enterprises.

Figure 3.7: Factors (mean ratings)

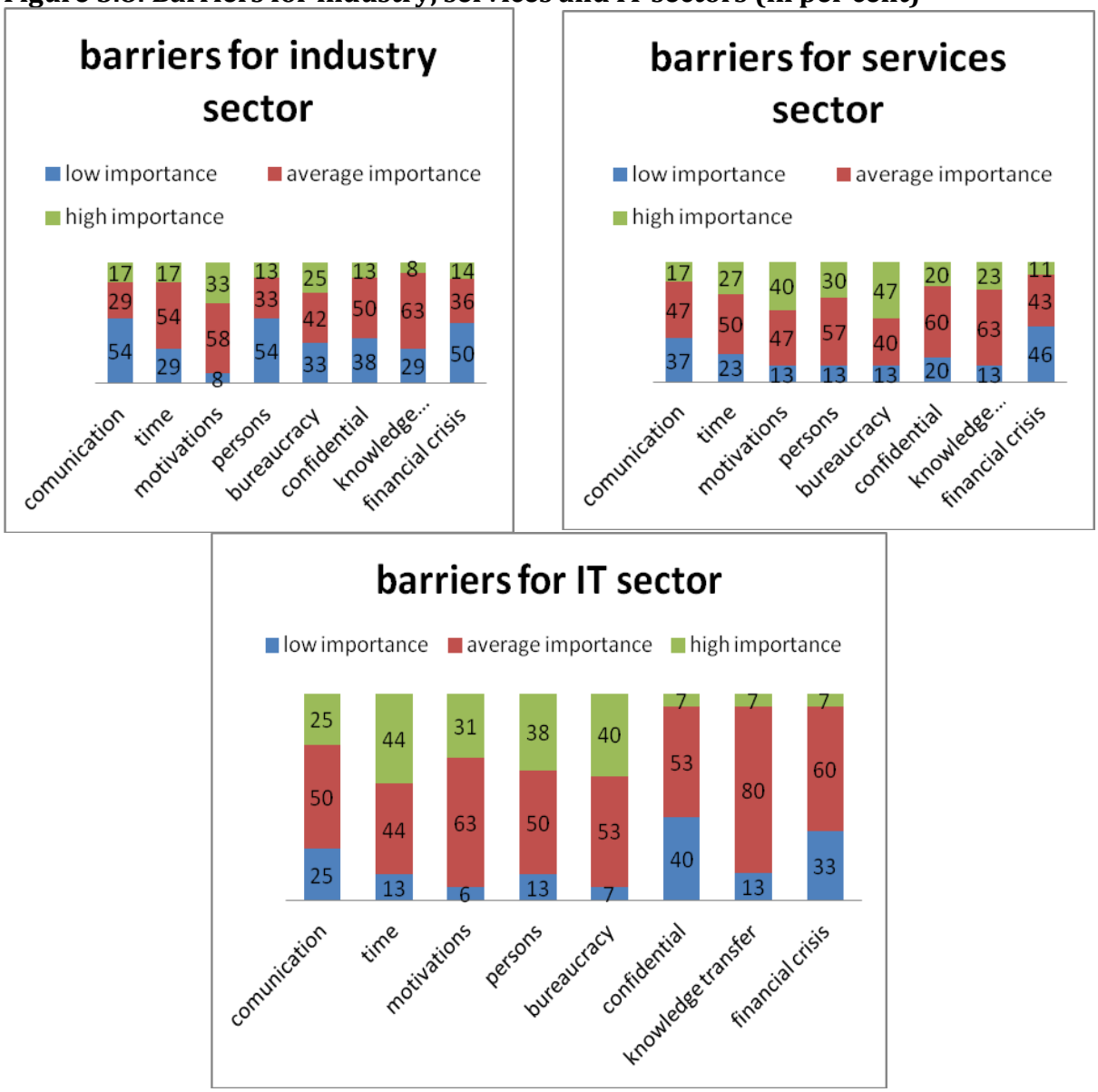


Source: EMCOSU Large Scale Survey Analyses

The graph shows that there is no big discrepancy in obstacles perception by SMEs and large companies. Lack of common motives is an obstacle for 40% of micro-enterprises, 35.1% SMEs and 35.7% large companies. There are slightly greater differences in defining red-tape as an obstacle for cooperation with universities. 44.4 % SMEs and 32.2% large companies pointed to that factor as a significant one. It is therefore evident that bureaucratic obstacles are perceived as much more significant by SMEs, which do not have an appropriate administration system to tackle university red-tape.

The following graphs illustrate the importance of obstacles for individual sectors.

Figure 3.8: Barriers for industry, services and IT sectors (in per cent)



Source: EMCOSU Large Scale Survey Analyses

The lack of common motives is the biggest obstacle for the industry. In general, the industry notices fewer obstacles, which may indicate that this sector is rather advanced in its cooperation with universities. None of the obstacles was marked by the industry as significant in 40% of cases. For the IT sector the most significant obstacle are time constraints and red-tape. Both obstacles were marked as such by over 40% of respondents. Red-tape is a significant obstacle also in the case of services, moreover the representatives of this sector indicate lack of common motives and difficulties in finding appropriate cooperation partners.

The results of the survey indicate that almost all mentioned obstacles are significant or averagely significant for entrepreneurs and business associations. None of the obstacles was marked as of little importance by at least 50% of respondents. Thus it is clear that all obstacles mentioned in the survey should be taken into consideration when undertaking activities for fostering cooperation between business and universities.

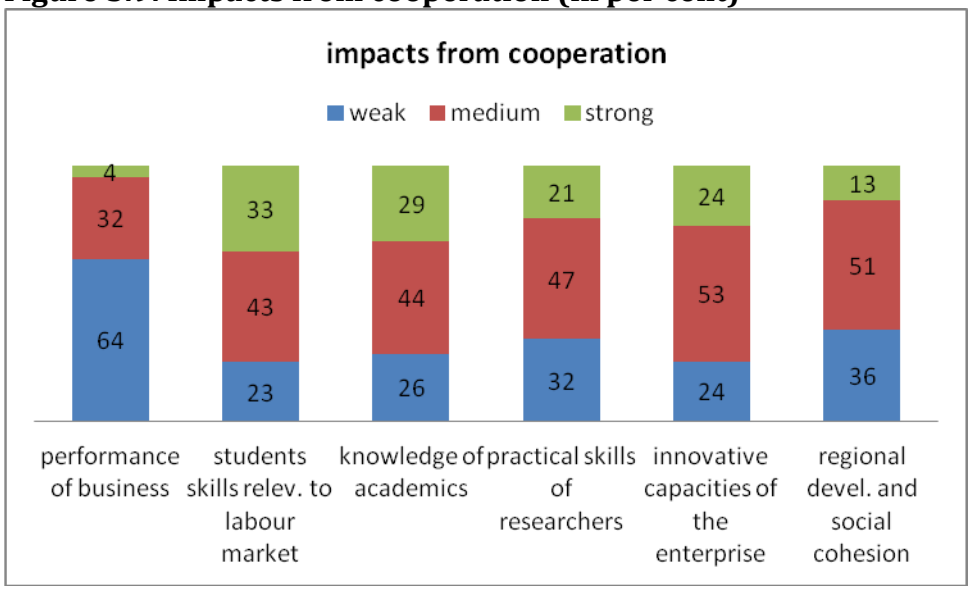
3.4 University and Business Cooperation Outcomes, Impact and Lessons Learned

Entrepreneurs were asked in the survey to define the extent to which the universities and business cooperation in joint research improved the following factors.

1. the performance of business;
2. the skills of students relevant to labour market;
3. the knowledge of the academic staff;
4. the practical skills of professionals from organisations;
5. the innovative capacities of the enterprise;
6. regional development and social cohesion.

The following graph illustrates the importance of the factors mentioned above.

Figure 3.9: Impacts from cooperation (in per cent)



Source: EMCOSU Large Scale Survey Analyses

The survey indicates that for one third of respondents university-business cooperation is mostly beneficial for students. In entrepreneurs' opinion the research helps students in gaining and developing skills important to be competitive in the labour market.

This observation is important both for universities, which should train graduates attractive to the labour market and for state authorities responsible for reducing the unemployment index among people below 30 years of age. The above observation indicates that carrying out research in cooperation with the business sector will help students to enter the labour market.

The whole survey and answers to question A6 (skills of new graduates) clearly indicate that companies are convinced that someone who participated in scientific research can improve in: working under pressure, team work, creativity and optimal time usage. Such skills are instrumental in the success of any business venture.

To sum up, the entrepreneurs believe that a student who participated in scientific research will be a pro-business oriented employee of the company, and therefore can live up to the employer's expectations.

Similarly the surveyed companies and business associations claim that joint research has a significant influence on academic staff gaining new insights (29%) and practical experience (21%).

The surveyed entities claim that the university-business cooperation has either a very significant or average impact on these areas- 68% of respondents (for practical skills of researchers), and 77% (for students' skills on the labour market).

It is important to note that the entrepreneurs see research as beneficial for universities rather than for their own company. It may indicate that they perceive joint research not as a way to develop further, but rather as if they were purchasing some services or commodities, in other words a business transaction aimed at a specific goal, which does not directly increase the company's potential, but rather allows for the development of a better product or service. Thus the surveyed entrepreneurs do not see research as a potential way to improve their employees' qualifications, although they are aware of the fact that such research may have a positive impact on researchers' development, widening theoretical background at universities.

As far as the impact of joint research projects on companies is concerned, the respondents pointed to improved opportunities for innovation in a company (23% of the respondents claimed that it is of significant importance, 53% that it is averagely

significant). Interestingly, almost one fourth of the respondents do not perceive joint university and business research projects as having impact on the innovativeness of the company. It might result from a narrow understanding of research — some entrepreneurs start cooperating with a university in order to improve a particular product or process, which for them not necessarily impacts the innovativeness of the whole company.

In turn two thirds of respondents do not expect joint research projects to contribute to the improvement in their economic activity. It indicates that the majority of the companies do not think about innovation in management processes in the company and marketing, focusing rather on research related to production processes (new product or improvements of an existing one). Such a result indicates that technical universities have most chances to cooperate with companies. The whole business sector is far less interested in cooperating with human science universities (management, sociology, advertisement and marketing departments). Such an approach of the business sector may be traced back to the way Polish companies developed after the systemic transformation in 1989. At first entrepreneurs tried to follow the steps of other successful companies, now they are concentrating on improving product quality. So far they have not thought about competing with the best companies on international markets, they are trying to improve their situation on the local and regional market. Innovation in management and sales will be the next stage in development when companies have produced goods which are of a comparable quality to those produced by world leading companies.

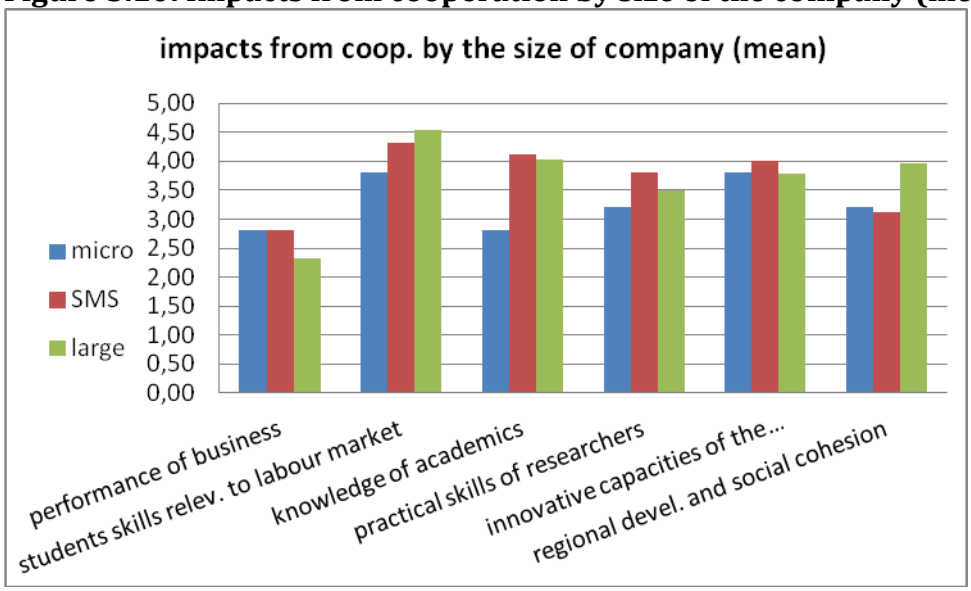
More than one third of companies do not see any relation between research and the development and cohesion of the region. Only 13% of respondents believe that such activities are of great importance.

The above mentioned approached must be criticised. It is however characteristic of the Polish educational system, as well as of the mind-set of entrepreneurs. For business a weak impact of universities and business cooperation on the development of the region may result from the following factors:

- the majority of students come from other regions of the country. It is mostly true for universities in big cities. Students do not have strong ties with the region where they go to university;

– The majority of students declare that in the final year or just after graduation they will leave the country and work abroad (in the so called old EU Member States and in the USA). Owing to this a gap on the labour market is created, especially with regard to employees with practical experience and skills (mostly alumni from technical universities). Such a gap can be bridged only with workers migrating from other countries. It is therefore rare that a student becomes the director of the company which ordered the research;
– Polish companies do not have strong ties with the region where they are active. Polish companies are mostly quite young, at an early stage of development which means that such ties have not developed yet. In some regions unfavourable public administration, including tax revenue offices is also of crucial importance. Large companies have stronger regional ties, which can be attributed to the fact that these are usually industrial plants with long-standing traditions. It is very difficult to relocate their production, as they employ whole multi generation families.

Figure 3.10: Impacts from cooperation by size of the company (mean)



Source: EMCOSU Large Scale Survey Analyses

Depending on the size of the surveyed companies the impact of the joint research projects is differently assessed. A general conclusion is that the smallest companies are the most reluctant to give an unambiguously positive assessment. The graph above shows that almost every factor was assessed as less important by micro enterprises than by medium-sized and large entities. The result is higher for micro enterprises than for

medium-sized ones only in the case of the impact of the cooperation on regional development.

As mentioned above the companies carry out research mostly related to products. It was confirmed also by the graph above. Large companies (predominantly industrial production plants) do not relate research to the improvements in the management of the company. For medium-sized and micro enterprises the average result is noticeably higher. Large companies responded that research mostly influences students acquiring skills necessary on the labour market and the regional development.

For students the result reflects problems mentioned by large companies in recent years with regard to finding properly qualified workers. Despite the fact that there are numerous universities in Poland, companies do not value graduates as apt for a job, mostly due to almost no practical experience.

In the case of regional development, large companies are mostly industrial production plants present on the market for several decades and employing a huge number of staff. It is characteristic of such companies to have strong ties with the region where they operate.

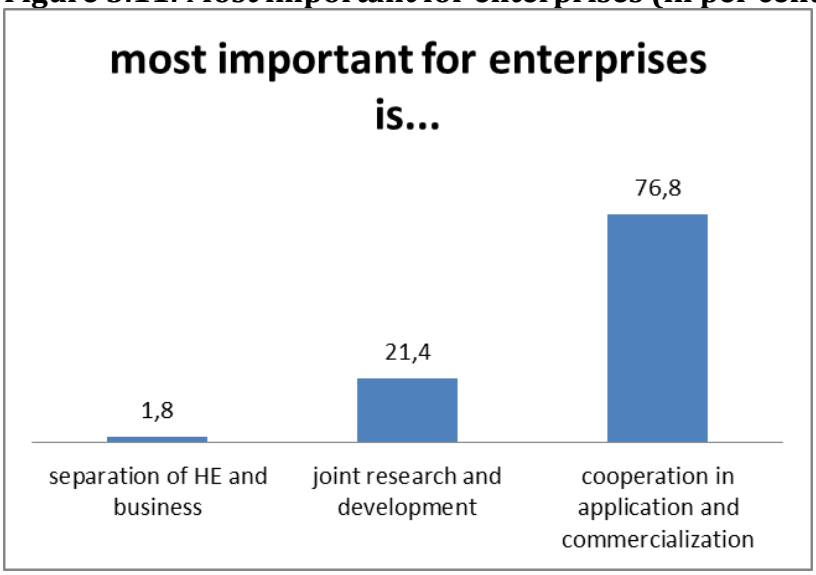
Medium-sized companies perceive joint research projects as mostly beneficial for researchers gaining practical insights and for company's innovativeness. It may result from the fact that SMEs, contrary to large companies, adjust themselves more quickly to the needs of the market, and contrary to micro enterprises have appropriate financial resources for research. It leads to SMEs mainly aiming at developing a product or service giving them a competitive advantage. To compete with large competitors, well established on the market, the developed product must be innovative.

3.5 Enterprises Perceptions of Universities and University-Business Cooperation

The majority of surveyed enterprises agree that university-business cooperation is of crucial importance both in R&D activities and training. Thus in their opinion it is very important that universities and business cooperate continuously in all possible areas. This is true for over 98% of respondents, a mere 2% claims that higher education institutions and business should work separately. Over 76% of respondents claim that universities and business cooperation should in the future also include the application of

research in practice and commercial use of research results. All respondents are of an opinion that cooperation with higher education institutions should not be limited only to basic research. The graph below illustrates answers to the following question: Please indicate which statement describes the orientation of your enterprise:

Figure 3.11: Most important for enterprises (in per cent)



Source: EMCOSU Large Scale Survey Analyses

The surveyed companies plan to start cooperating with universities with an aim to commercialise research results. It indicates that companies are ready to put on the market products, processes, services, etc. which were developed by academic teams from universities. The companies are aware of synergies such cooperation may lead to and are prepared to get involved.

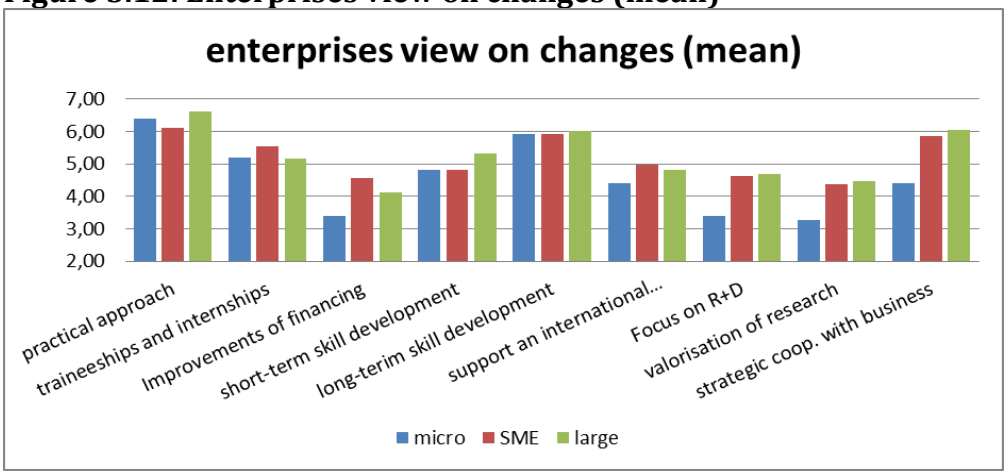
3.6 Changes at Universities in the Future?

For Polish entrepreneurs universities should draw much more attention to practical aspects of education and focus on the development of skills necessary in the long term perspective. A chance for a strategic cooperation with a university is also of crucial importance, especially for the medium-sized and large companies. The entrepreneurs expect graduates to be better prepared for work, especially with regard to practical skills, so that an alumnus does not have to adapt for a long time incurring additional costs for the company. At the same time entrepreneurs expect that the skills acquired at universities are up-up-date.

Further ranked changes were those related to internships and traineeships, international character of studies and development of currently needed skills. It should however be borne in mind that Polish entrepreneurs prefer the development of skills needed in the long term perspective.

The improvement in the functioning of universities' financing system and a possibility to validate applied research are of less importance to the company. The entrepreneurs see the multilevel character of university activities, including education and training, as well as research and development activities. Therefore a response that universities should focus more on research and development activities was ranked as of medium importance. The following graph presents the enterprises views on change:

Figure 3.12: Enterprises view on changes (mean)

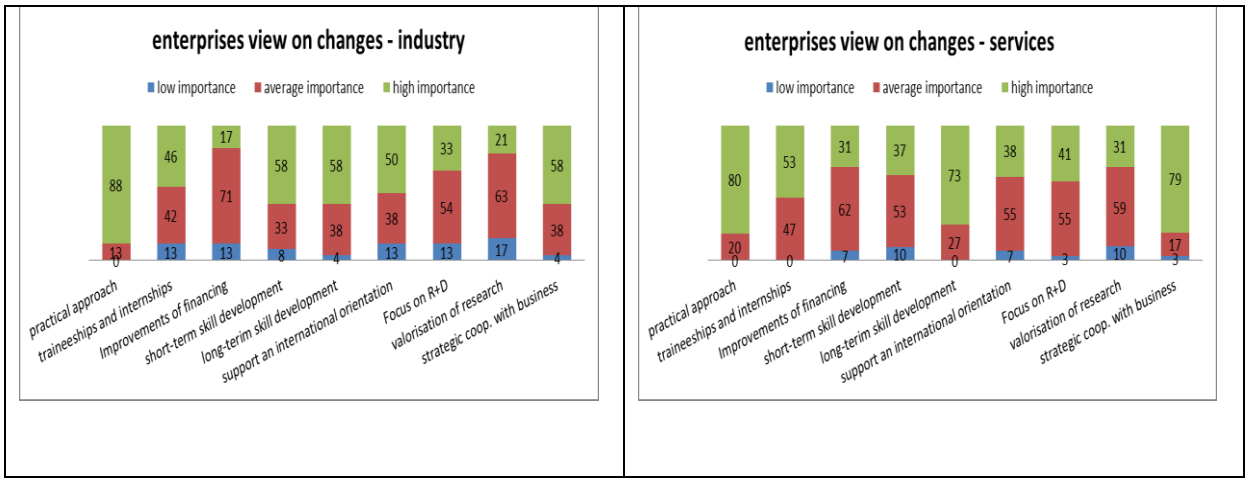


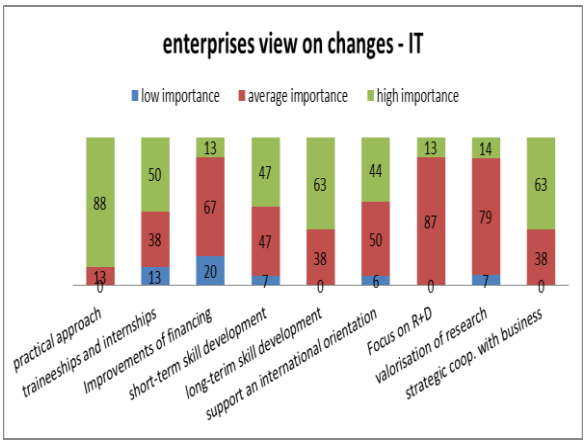
Source: EMCOSU Large Scale Survey Analyses

The graphs below illustrate the individual sectors' views on the expected changes in the functioning of universities. In general, the industry, services and IT sectors do not differ in their opinions from the general view of the respondents. 88% of the industry sector respondents, 80% of the services sector respondents and 88% of the IT sector respondents point to the need to draw more attention to practical aspects of education. 58% of the industry sector respondents, 73% of the services sector respondents and 63% of the IT sector respondents claim that the development of long-term skills is necessary. The enterprises also expect that universities will be involved in strategic cooperation with business. 58% of industry sector companies, 79% in services and 63% in the IT sector are in favour of such an approach. The enterprises would also like to see a significant change in the scope of internships and trainings (around 50% of

respondents). The respondents also indicate that university curricula should have an international character.

Figure 3.13: Enterprises view on changes — industry, services, IT sectors (in per cent)





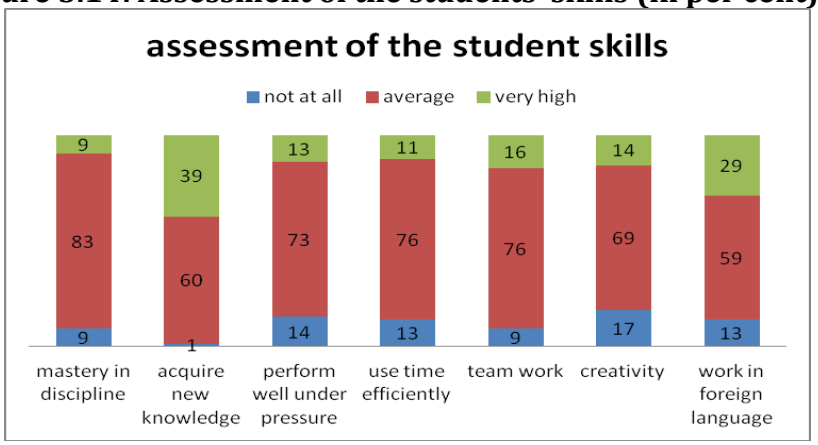
Source: EMCOSU Large Scale Survey Analyses

Polish entrepreneurs were also asked to indicate, to what extent the university graduates have the following skills:

1. mastery in a field or discipline;
2. the ability to acquire new knowledge;
3. the ability to perform well under pressure;
4. the ability to use time efficiently;
5. the ability to productively work with others;
6. the ability to come up with new ideas and solutions;
7. the ability to work in a foreign language.

The collected data indicates that the majority of the surveyed companies (approximately 70%) evaluate the preparation of university graduates to work with regard to the above mentioned skills as average. Approximately 20% of the employers evaluate their education positively, while approximately 10% of the respondents are of a negative opinion. The graph below illustrates detailed responses to this question:

Figure 3.14: Assessment of the students' skills (in per cent)



Source: EMCOSU Large Scale Survey Analyses

Students' ability to acquire new knowledge at universities as well as the ability to work in a foreign language was ranked as the most important by the entrepreneurs (39% and 29% respectively). On the other hand 17% of respondents claim that university graduates do not have an ability to come up with new ideas and solutions.

3.7 Results of Universities and Business Cooperation

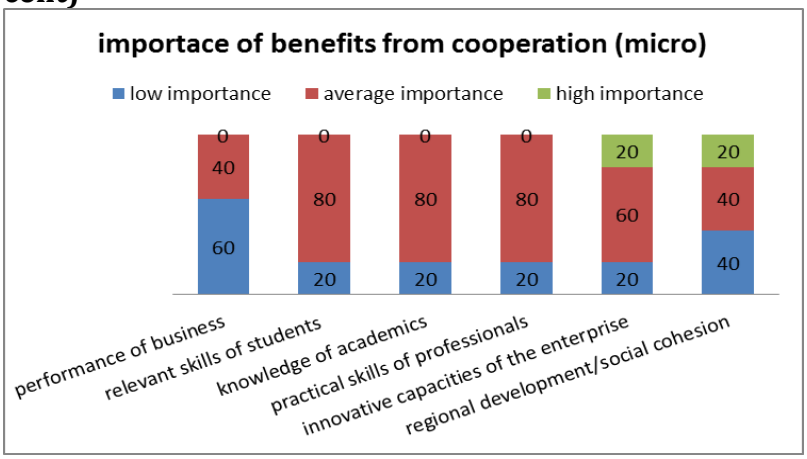
The following graph illustrates to what extent the cooperation between universities and business impacts the following:

1. the performance of business;
2. the skills of students relevant to labour market careers;
3. the knowledge of academic staff;
4. the practical skills of professionals from organisations;
5. innovative character of the company and
6. regional development and social cohesion.

In general the collected data shows that micro enterprises, SMEs and large companies (more than 60% of responses) do not see any impact of universities business

cooperation on the performance of the company. More than 41% SMEs do not see any impact of such cooperation on regional development and social cohesion. The evaluation of the remaining factors depends on the size of the company. The following graphs illustrate the responses:

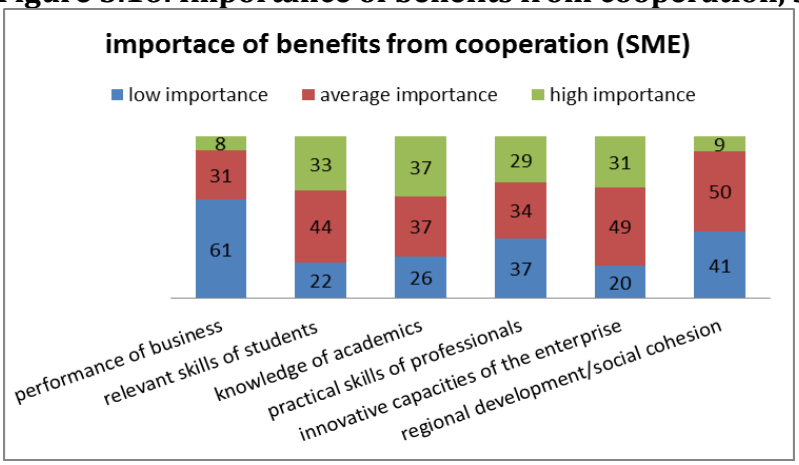
Figure 3.15: Importance of benefits from cooperation, micro companies (in per cent)



Source: EMCOSU Large Scale Survey Analyses

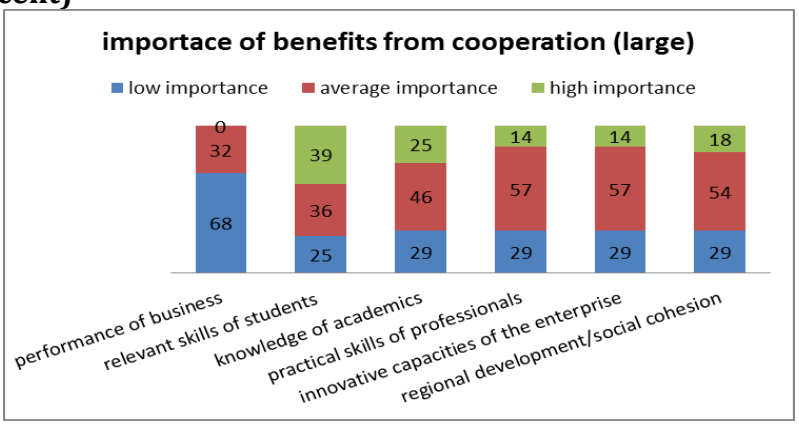
For micro-enterprises the cooperation with universities has a significant influence on the company's innovativeness level (20% of responses) and on the regional development and social cohesion. Assessing the impact of cooperation on the regional development and social cohesion the respondents gave very divergent answers: 40% of micro enterprises do not see any impact, 40% claims it is average and 20% ranks it as important. The assessment of universities-business cooperation benefits for companies of different sizes is presented below.

Figure 3.16: Importance of benefits from cooperation, SMEs (in per cent)



Source: EMCOSU Large Scale Survey Analyses

Figure 3.17: Importance of benefits from cooperation, large companies (in per cent)



Source: EMCOSU Large Scale Survey Analyses

SMEs and large companies gave similar answers. These companies indicate that the cooperation of universities and business impacts mainly: the development of students' skills (33% SMEs and 39% large companies), the chance for the academic staff to improve their knowledge (37% SMEs and 25% large companies); an opportunity of company employees to develop practical sills (29% SMEs and 14% large companies) and improvement of the innovative character of the company (31% SMEs and 18% large companies).

The presented data shows that companies think university business cooperation is important. At the same time more than 60% of respondents do not see any impact of such cooperation on the performance of the company. It indicates that the offer of universities is not adjusted to the needs of economy. The survey indicated that there is a good atmosphere for cooperation and companies believe that such cooperation may be beneficial and innovative. However the companies still do not see any results of such cooperation.

3.8 Country Conclusions

Factors triggering joint research

The survey confirms that one of the most important factors contributing to the decision to launch a joint research project is mutual trust of partners. It is especially important when partners' approaches towards the results of the research project vary significantly. The entrepreneur is interested in gaining competitive edge on the market, which sometimes can entail the necessity to keep the new technology secret. Another priority

is reimbursing investment costs as quickly as possible, which, at first stage, are understood as concluding the research project as soon as possible. On the other hand, academic staff is not used to working under time pressure and they want to publish their research results as quickly as possible.

One of the most important factors building up trust is sharing positive experiences, but there are few examples of research conducted that way. Given low levels of social capital in Poland and an unfavourable tax regime, entrepreneurs are unwilling to invest in research, mainly due to the fact that they do not know the partners with whom they would cooperate.

Trust levels vary among sectors. Trust is much more important for the industrial sector than for IT, where earlier cooperation is of paramount importance, which in practice translates itself into knowing the people with whom you are going to carry out an undertaking. This might result from a specific nature of innovation in the field of IT solutions, where an experienced manager is indispensable to conducting a project. If the manager works at university, they guarantee good cooperation.

When it comes to barriers, in order to encourage entrepreneurs to commission universities to conduct research, it is key to make the process of establishing cooperation less formal. According to entrepreneurs, red-tape at universities, e.g. lack of one decision making body and one person who would be responsible for establishing contacts with entrepreneurs, is one of the most important barriers to establishing cooperation. On the other hand, poor accessibility of universities does not come as a surprise to entrepreneurs, as 40% of them define as insignificant a barrier understood as communication problems. These two seemingly contradictory results show that a barrier defined as red-tape should mainly be understood as a large amount of documents which an entrepreneur needs to prepare in order to establish cooperation, as well as the process of concluding the contract and financial settlements of the project (very often co-financed from EU funds).

Interestingly, entrepreneurs do not consider lack of financial resources as an obstacle to commissioning research. For almost a half of Polish entrepreneurs, this does not pose a serious obstacle. The reason for that is probably the fact that the survey covered these entrepreneurs who usually either already cooperate with universities or conduct R&D activities themselves, so they have their research budgets secured. Problems with

funding remain significant only for micro-enterprises, which does not come as a surprise, given their low capitalisation.

Reaching the right person at university remains the key barrier for SMEs. This poses an obstacle neither for large companies, which have departments specialised in establishing research cooperation, nor for micro-entrepreneurs who act locally, in an environment that they are very well familiar with.

Expectations of Polish Entrepreneurs

Entrepreneurs expect universities to supply the market with well-prepared graduates. The current education system is not designed for this purpose. Entrepreneurs think that this disadvantageous phenomenon can be reversed in cooperation between business and science in the field of research. According to a lot of entrepreneurs, the main advantage of cooperation lies in acquiring practical knowledge from the field during the research, as well as in learning a pro-business approach towards tasks.

What is important, business does not perceive universities as research-development centres and does not expect them to only conduct research. Entrepreneurs do not think that focusing on research is the most important change that needs to be applied. Universities are also expected to provide high-level education for future employees.

It is clear what is expected from graduates. Entrepreneurs value highly the ability to acquire new knowledge and to work in a foreign language. Creativity, effective time usage and ability to work under pressure are valued very poorly. The three skills ranked lowest are easier to acquire in practice, and there are still too few practical classes in curricula at Polish universities. Hence, as already mentioned, commissioning studies is perceived by entrepreneurs as bringing short- and long-term benefits, in the form of graduates better prepared for work in business.

But there is a downside to the phenomenon as well. Entrepreneurs have been signalling for a long time that graduates lack skills which are indispensable to business, but pointing to the problem has not brought about any changes in curricula. Universities in their teaching processes do not respond to market needs. A pro-business approach is slowly entering the field of research. This is mainly the result of the need to acquire funding for research at the time of a demographic crisis. It is much easier for universities

to conduct commercial research than to transform the curriculum and change the habits of their academic staff.

Models of cooperation between business and science

Impact of the size of the company

Large companies are the most active in the field of cooperation with universities in areas other than R&D. This usually takes the form of organising internships and traineeships. Large companies are also significantly more involved in the preparation and implementation of curricula in cooperation with the academic staff and lifelong learning projects – courses and training for adults, which make it possible to widen their knowledge and enhance competences. Large companies are not interested in the mobility of academic staff. This can mean that either they are not planning to employ such people in their R&D departments or that they cooperate mainly with universities in the region where they are active. Low importance of academic staff mobility can be attributed to the fact that it is enough for companies to participate in research in cooperation with a university, and there is no need to employ researchers in companies.

What is most important for large companies is at the same time less attractive for entrepreneurs from micro-enterprises. They are the least interested in postgraduate education (lifelong learning). Neither is mobility of academic staff important for them.

Economic sectors

The level of involvement in university initiatives by entrepreneurs is low (industrial sector), and slightly higher in the sectors of services and IT. In the case of all analysed sectors, academic staff rarely sits in management bodies of companies. In the case of industry, cooperation with business incubators is limited to the minimum. The most common case is for entrepreneurs to engage in cooperation with the entities which merge business and science.

In the services sector, companies are mostly engaged in educational activities (business people in teaching), but they do not cooperate with career offices as much as the industry does. The difference can probably be attributed to the fact that the industrial sector needs a lot of employees with narrow, specialised knowledge, not necessarily experienced — when they conduct research, they gain most competences needed to take the position. The situation is similar in the IT sector, where cooperation with career offices is also very common. The IT sector also seeks employees with specialised knowledge, not broad competences.

In the case of services, companies prefer to look for employees “on the market”, where there is a greater choice of experienced workforce, with broader general knowledge and well developed soft skills, such as negotiating, team work coordination, building the brand image.

Significant involvement in the cooperation with business incubators is typical of the IT sector. This trend in Poland chimes with the world standards in the sector. The most innovative products are made in new micro-enterprises (a company is established in order to implement an already existing idea). Thanks to cooperation with incubators, large IT companies can quickly take over small, new companies, in order to take over their ideas.

Results of Cooperation (for Entrepreneurs)

Almost two-thirds of entrepreneurs do not see the influence of research on the operation of their enterprise. This means that Polish business is focused on product (commodity or service) development and does not seek innovative solutions in other fields (e.g. management or marketing). It is typical of an economy based on imitation. Polish entrepreneurs associate innovation mainly with acquiring a technology from the outside (e.g. a production line, more modern components), i.e. a product is manufactured by an entrepreneur who is at a higher level of development. This approach makes it impossible to acquire management and marketing innovations, which, as a rule, are not subject to sale, as they make for the ultimate competitive edge of a product or service of similar quality.

Due to low social capital, entrepreneurs do not notice any significant link between conducting research and regional development. Partially, this could be explained by the fact that a university and enterprise do not always operate in the same region, so there is no synergy effect (e.g. students participating in research will not be employed in the company which commissions the research). Another important factor is large migrations of students and graduates, who very often are not related to the region where they study, as well as a big wave of emigration of graduates to better developed countries.

The analysis of results, taking into account the size of enterprises, indicates that micro entrepreneurs are the least enthusiastic about research. Poor faith in “soft” results of research can be attributed to the scale at which they operate. Due to their economic

potential, micro-enterprises invest little in R&D, and therefore, the results of research do not influence the social and business surrounding as significantly as research conducted at a large scale.

3.9 Case Studies Summary

EMCOSU team in Poland, additionally to conducted survey elaborated 10 short case studies, basing on the answers to open questions and additional information obtained from the companies and business associations. The companies were selected to represent different branches, including two companies representing transport industry, two companies representing IT (software and hardware), two energy sector companies, one representing pharmaceutical industry and one defence industry. Also, two case studies of the regional chambers of commerce were also described. Short case studies allowed us to present most common modes of cooperation, barriers to cooperation, benefits and sources of financing. Below we are presenting the most important findings:

Modes of Cooperations

Basing on elaborated case studies of the Polish companies, the following modes of cooperation have been identified

1. Research and development. Companies order specific research which helps them to solve practical problems. R&D work is conducted by University staff, which are successful at research projects at the University. Companies use strategic development program of the National Centre for Research and Development, which helps company in development of innovative technologies. One of the large energy sector company created the research consortium with five universities, Polish Academy of Sciences and three other private companies. Other company collaborate in developing active substances for medicine.
2. Training of the company staff. Companies cooperate with universities in the field of adult education. Most often the courses are related to the operation and maintenance of the new plant. One of the companies actively participates in developing training programs and considers it as a one of the priorities.
3. Internship programs People taking the internship in company could gain experience in given area of company activity. Internship program are facilitated

by designated person at the company level. According to company, universities should put more emphasis on the practical nature of teaching, focusing inter alia on the practical skills of students. Besides internship companies offer specialized program, which help to plan the carrier path. E.g. Oracle helps the students to build a career in the twenty-first century. Within the program of Oracle Academy company is working closely with schools, regions and ministries who consider the importance of early preparation for a career. Using the software, services and educational Oracle products, universities can provide its students with the opportunity to develop technical skills and business skills. Students may also stand out to give specialized certificates, providing them an advantage over other job candidates. Institutions participating in the program receive licenses for educational use of selected products for database management, software development and application servers, which entitle them to install and update software on their own computer systems. Teaching staff can use this software during the classes. Internship programs are also organized for University staff. One of the companies participated at the in the project: 'Learning closer to business, business closer to science' within which six University employees held an internship at the company to know the existing market realities and business

4. Recruitment. Companies recruit not only graduates but sometimes also the students. Students are recruited through the special workshop, carried out in collaboration with student organizations. Business associations participate at cooperation of career services and organize students' internships and job fair. One of the companies organizes competition for students, to recruit best candidates as their staff members. . Participants are asked to elaborate 3-5 issues in the area of biotechnology and biomedicine. These issues are selected by company's research staff in a way which allows for original, innovative approach and cannot be based on available R&D results. Issues may include:
   - model laboratory processes, achievable in company's laboratory, with cost calculation;
   - examination of active substances, available on the market and its applicability to the development of new medical products;
   - examination how to combine different active substances with different impact on human body into single therapy

- Research of the innovative medical product through theoretical models of the new molecules

Similar competition is also organized by Energy sector company to identify the best energy-related engineering.

5. Business associations organize designated bodies, which should facilitate UBC. E.g. Silesian Chamber of Commerce organized the Council, which is an opinion-forming body in the region and helps to inform local authorities, parliamentarians and mass media about Silesian academics and business experts' opinions on economic issues important for the region. As of 2013 the Council has become a Consultative Council to the Marshal of Silesia.

Barriers to Cooperation

Companies and business associations identified following barriers:

1. Bureaucracy. Companies reported bureaucratic problems, mostly in the area of reporting and financing joint project. Especially projects, which are financed from the public sources require significant amount of paper work, monitoring, reporting and excessive length of proceedings. Bureaucratic barriers can be seen in internships programmes financed from the EU budget.
2. Financial crisis (reduction in the company's budget) implicated decrease of the involvement in cooperation with universities. Companies do not have sufficient funding to finance cooperation and most of the joint project is financed from public sources.
3. Identification of right person. In collaboration with universities one of the biggest problems is finding the right person to contact. This delay the start of the research process.
4. Obstacles to mutual cooperation are divergent methods of communication and language barrier between the two sectors. A different time perspective and different motivations are undoubtedly perceived as obstacle to conducting cross-sectoral cooperation . As a problem in establishing cooperation.
5. The biggest problem perceived by the lack of initiative on the side of the university in providing research and development. Universities should be more focus on commercialization of the research results and the research itself should be

organized on a commercial basis – started only after the cooperation with the entrepreneur starts.

Benefits

One of the main benefits is the raise of a competence among future staff. Companies reported improved skills of employees. This has significant impact on e.g. product quality. According to one of the companies, the main factor influencing product quality is the experienced, well-educated staff. Therefore company is working with Universities on educational process especially on preparation of new workforce, who knows the specific needs of the company. Special emphasis is placed on identifying the students with competencies that are in demanded by industry.

Cooperation with Universities put emphasis on the practical nature of teaching and focus on the training of practical skills. For the company it is essential to acquire workforce with practical skills, therefore graduates should possess knowledge and skills adapted to the prevailing market realities. According to company, the best and most effective form of cooperation with universities is enabling students to acquire the practical knowledge in a particular position in the workplace. Experience gained in the training acquired seniority allows supplementing the theoretical knowledge of the industry -specific know-how.

The main advantage of internships is the ability to transfer practical knowledge to future employees, which reduces training time after employment. Cooperation with universities is also seen as a key factor in building human capital in the region. Also joint research and development projects resulted in the growth of innovativeness of the company.

In conclusion, the collaboration between enterprise and universities had a definite influence on the acquisition of skills needed by students in the labour market, influenced the outcome of the company and its innovation.

Sources of Financing

UBC is financed from following sources:

1. Company own resource. Especially internship programs are financed by the companies. However part of the internship programs are financed by EU funds

2. Labour offices, which finance facilitation of entering university graduates on the labour market.
3. EU funds, which are used to finance R&D project conducted by partnership, composed of Universities and companies as well as transfer of Research results to business sector. Special form of financing R&D project are so call Research Voucher in the amount of 25 000 PLN or 50 000 PLN (6000 – 12000 Euro) which can be spend on, research and development activities and standard compliance analyses.

4 SLOVENIA

National report prepared by: Mojca Osojnik, Andrej Brvar, Simona Rataj

4.1 Introduction and Methodological Approach

Within the framework of WP5 — EMCOSU project the Chamber of Commerce and Industry of Slovenia conducted a survey among companies and business associations/chambers to identify modes of cooperation between the private sector and universities.

For the purposes of the survey the invitation letter and questionnaire were translated into Slovenian language. We also used a special web site platform to set up an online survey questionnaire. The codebook for the questionnaire was used while preparing the survey. Majority of questionnaries were completed via an online questionnaire and were saved directly in the electronic codebook form. The rest, questionnaires done in person and received in paper versions were stored in ring folders.

The survey was carried out from November 2013 till June 2014. Invitations to participate in the survey were sent out to companies and chambers of commerce/business associations selected following the guidelines of the project. We have selected 102 companies and 20 chambers and professional associations. Soon after we started surveying we found out that this selection of companies was not sufficient.

Due to poor response to the survey, we sent the additional invitations to 250 selected companies, asking them to participate in the survey. We have choosen 50 companies that have received Award of the Chamber of Commerce and Industry of Slovenia for exemplary business and entrepreneurial achievements and 200 companies with excellent business results. Till June 2014 we received 99 filled in questionnaires, 80 from companies and 19 from business associations.

4.2 Rewiev of Companies and Associations Surveyed

Table 4.1: Number of companies and associations surveyed, by sector and size

Sector/size	Large	SME	total
Industry	18	25	43
Services	4	15	19
ICT	1	17	18
Associations			19
Total	23	57	99

Given the size of the company, more than half of the questionnaires were completed by SMEs and 23 were obtained from large corporations. Sectorally, 43 questionnaires were returned by industrial companies, 19 by the services sector and 18 by the ICT sector. Some companines (big) are classified in industry sector by their main activity, but could also be a part of services by their subsidiaries. Considering the type of organisation private profit companies were mostly represented (90 %).

Half of these companies have over 30 per cent of college graduates on staff. Over 30% of them have a percentage of higher institutions graduates 70% or more of total workers.

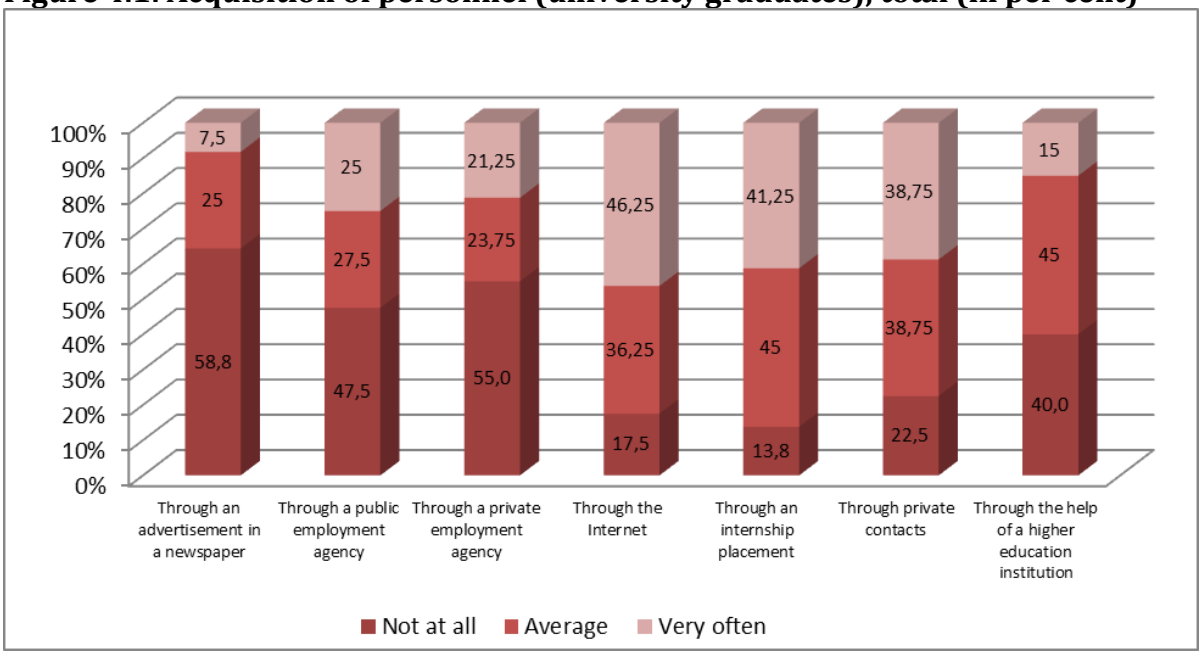
Table 4.2: Percentage of higher education graduates in the surveyed firms

less than 30%	50,6%
from 30% to 69%	19,2%
70% or more	31,4%

4.3

4.4 Review of Recruitment Mechanisms and Graduate Skills

Figure 4.1: Acquisition of personnel (university graduates), total (in per cent)

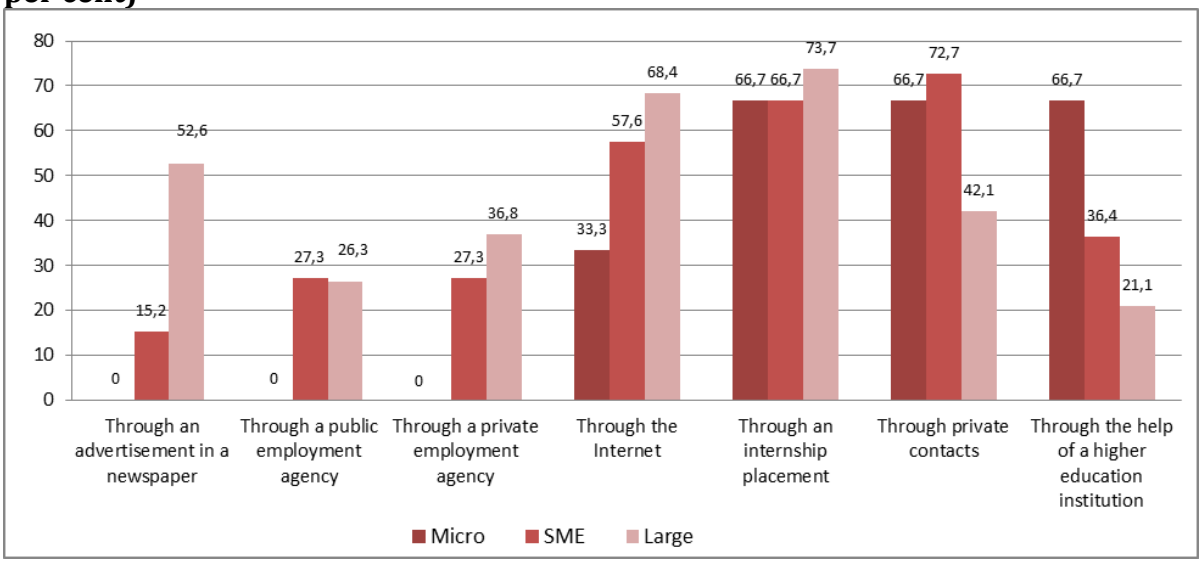


Question A5: How often does your organisation use the following recruitment mechanisms for hiring university graduates? Responses 1 to 7 on a scale of answers from 1 -2 "Not at all", 3-5 "Average" and 6-7"Often to very often".

Results show that the most commonly used recruitment mechanisms (for obtaining personnel among graduates) are internet, internship placements and private contacts. Majority of respondents uses these mechanisms very often. Through internship placements, companies recruit university graduates which carried out practice in their company as part of their regular study obligations. A minority of respondents employs university graduates through advertisements in newspaper and with help of higher education institutions while public and private employment agencies are modestly used. From the graph below it is evident that the size of company results in different outcomes compared with the results in total; however recruitment of university graduates through internship placement still dominates. Largest number of university graduates is recruited through this mechanism by large companies, which is quite understandable considering that the need for personnel is higher. The same mechanism of internship placement is predominating at SMEs and micro companies as well. The other two modes of recruiting university graduates used by large companies are internet and newspaper advertisements which are not practiced by small companies.

Micro companies have, as it would be expected, the smallest percentage of employability of graduates, but they in generally use assistance of higher education institution or private contacts.

Figure 4.2: Acquisition of personnel (university graduates), by companies' size (in per cent)



Question A5: How often does your organisation use the following recruitment mechanisms for hiring university graduates? Responses 5 to 7 on a scale of answers from 1="Not at all" to 7="To a very high extent".

4.5 Modes and Activities of University-Business Cooperation

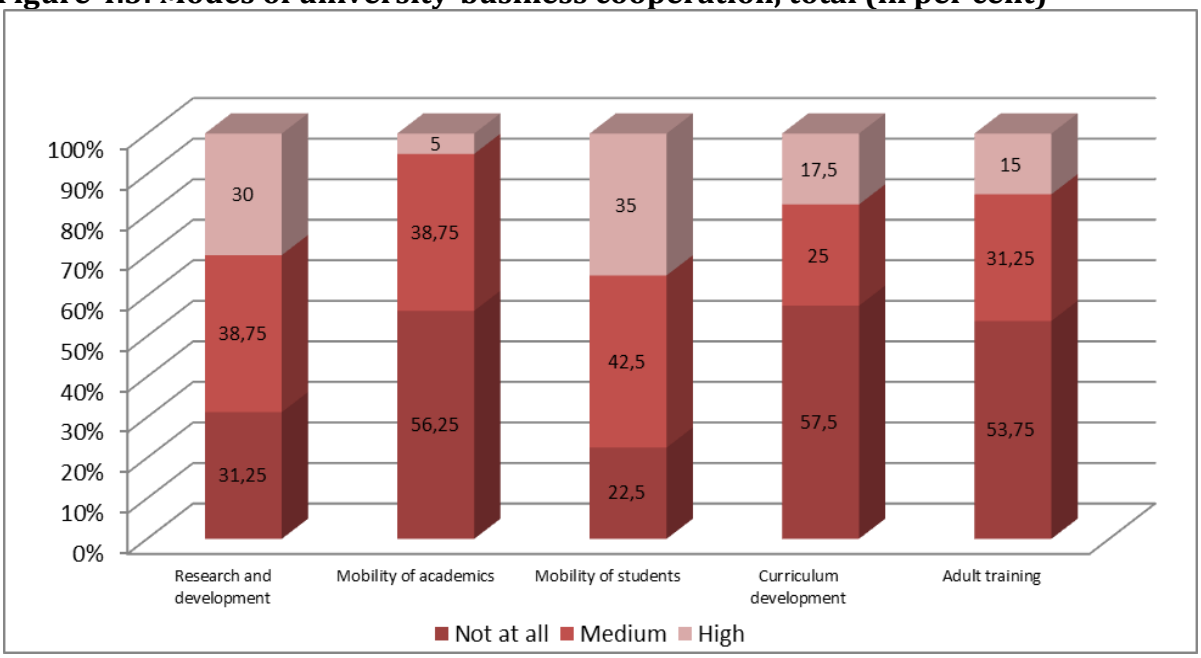
In the survey we wanted to find out in **what extend Slovene companies cooperate with universities** in the following areas:

1. Research and development (R&D) e.g. (inter)national projects, commissioned research;
2. Mobility of academic staff (their training or research in your organization);
3. Mobility of students e.g. direct recruitment, traineeships;
4. Curriculum development and delivery (including university lectures);
5. Adult education, training and short courses and other "lifelong learning activities";
6. Other.

The results show that most common modes of cooperation between companies and universities in Slovenia are mobility of students and research and development as it was indicated by one third of all respondents as high to very high extend. This still weak

result regarding R&D is in close connection to other results particularly with extremely small mobility of academics to companies and small involvement of curriculum development from business side. The adult training is taking small steps onward as well.

Figure 4.3: Modes of university-business cooperation, total (in per cent)



Question B1: To what extent does your organisation cooperate with HE institutions regarding the following activities? Responses 1 to 7 on a scale of answers from 1 -2 "Not at all", 3-5 "Average" and 6-7 "high to very high extent".

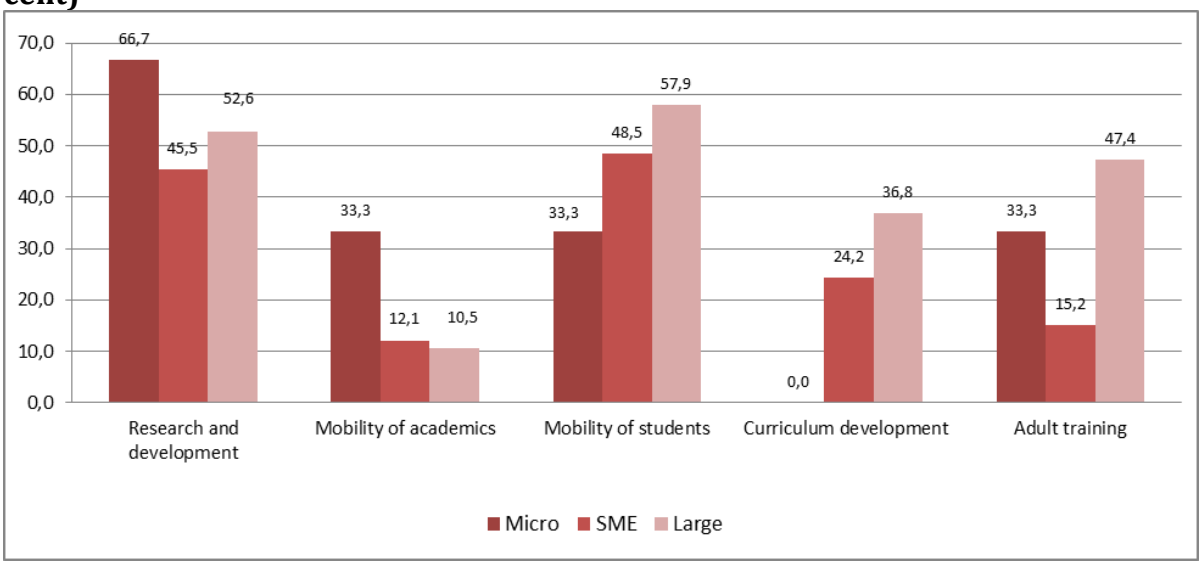
The graph below shows the extent of high and very high cooperation between universities and business for micro, SMEs and large companies. **For all types of companies research and development (R&D) is the most important form of cooperation**, especially for micro companies. This is understandable since micro companies usually do not have their own technical equipment nor have enough specialists for R&D.

The **students' mobility** (direct recruitment and traineeships) is a very important form of cooperation for more than half of large companies. A respondent from a company provided the following examples of different phases of student mobility - from practical training to employment: »*We work with two Faculties and throughout the year we guarantee the possibility of pursuing practice and practical training of students. If the student turns out well at first selection, he can work in our company during his pre-graduation seniority. When he obtains a degree, we employ him on a regular basis."*

Large companies also cooperate with universities in adult education, training and short courses and lifelong learning activities. While they are often involved in preparing and

implementing **curricula**, they are not in favour to cooperate with academics on the spot – company premises. On contrary, the micro companies give higher importance to mobility of academics which is directly connected to importance of R&D activities performed in cooperation with universities.

Figure 4.4: Modes of university-business cooperation by companies' size (in per cent)

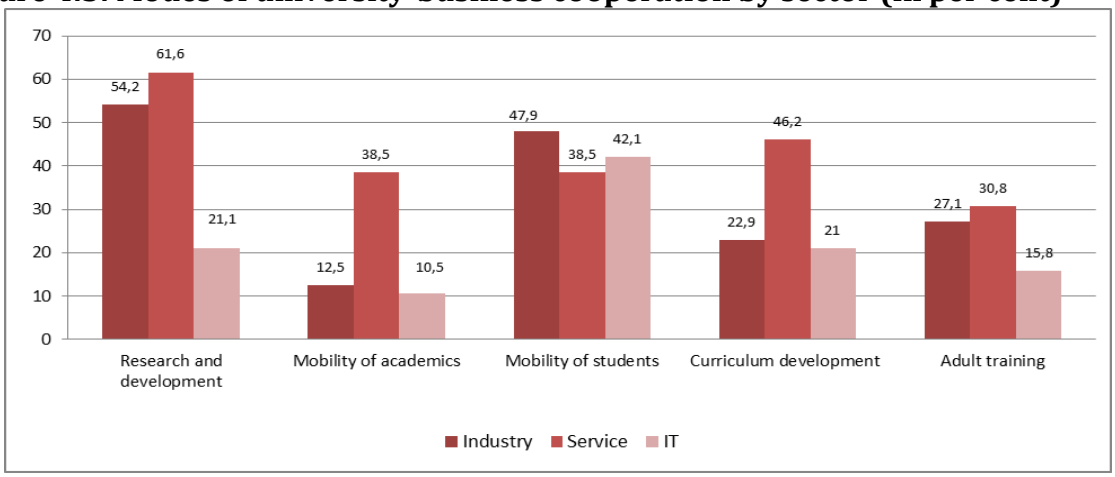


Question B1: To what extent does your organisation cooperate with HE institutions regarding the following activities? Responses 5 to 7 on a scale of answers from 1 = "Not at all" to 7="To a very high extent

However, if we take a closer look to the most common modes of cooperation among different economic sectors of interviewed companies there are quite some differences among them.

In general, the ones who are more engaged in cooperation with universities comparing to others, are companies from the service sector. Almost two out of three companies from service sector reported they cooperate in research and development to high or very high extent, almost half of the companies are engaged into the curriculum development and one out of three companies cooperate with universities to a high or very high extent in mobility of academics, mobility of students and adult training. The companies from the IT sector with an exception of student mobility have the lowest percentage of extent of their cooperation with universities, comparing to other two sectors especially in research and development. One of the important reasons is that changes (novelties, development) in IT sector are just too quick to be followed with long lasting research studies at universities.

Figure 4.5: Modes of university-business cooperation by sector (in per cent)



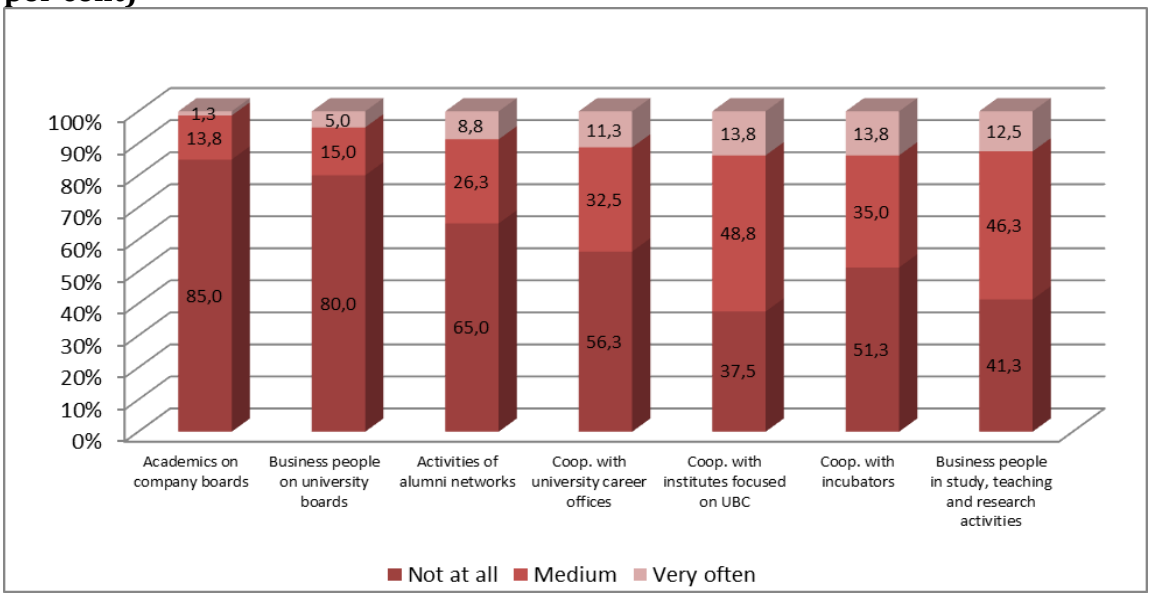
Question B1: To what extent does your organisation cooperate with HE institutions regarding the following activities? Responses 5 to 7 on a scale of answers from 1 = "Not at all" to 7="To a very high extent

In the survey we wanted to find out in what extent are **companies engaged in different activities related to higher education institutions**, such as:

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

Observed modes of collaboration could bring benefits to both sides enabling better understanding of business needs and process on one side and development of university curricula on the other side.

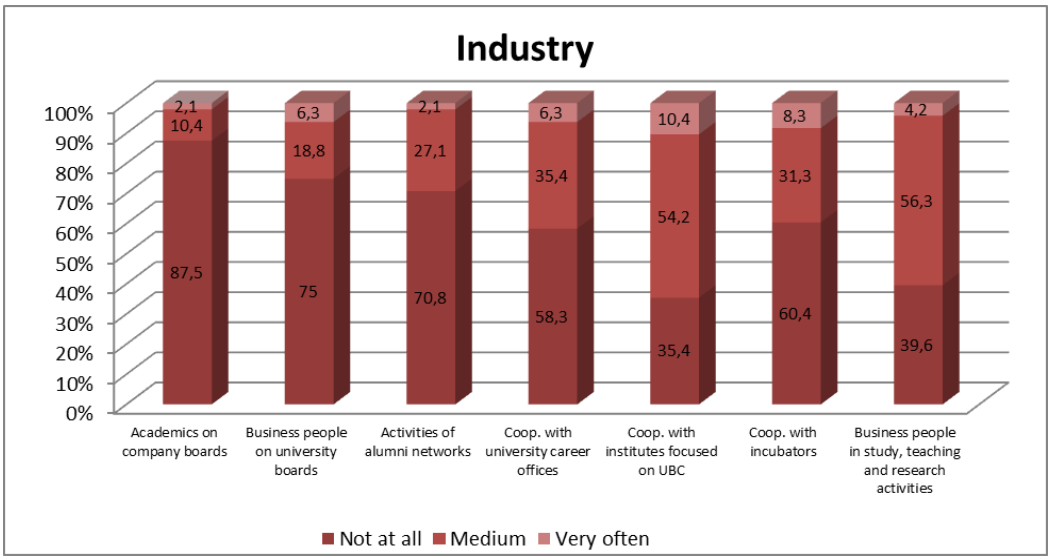
Figure 4.6: Involvement of companies in activities related to universities, total (in per cent)



Question B5: How often does your organization engage in the following activities in relation to universities? Responses 1 to 7 on a scale of answers from 1 -2 "Not at all", 3-5 "Medium" and 6-7 "often to very often".

From the collected data, it is evident that **involvement in activities carried out in cooperation with universities, is generally low or average**. Considerably small portion of all surveyed companies engages in above mentioned activities often or very often. Activities related to universities, in which the companies are involved in minimum extent or not at all are related to participation of academics on company boards and participation of business people on university boards (80% rarely or not at all!). The best results are in cooperation with institutes focused **on university-business cooperation** and cooperation with **incubators** for the development of **new business**, all leading to practical results. The participation of business people in **study, teaching and research** activities can be considered as important with positive answers (sometimes to very often) at over **half** of the respondents.

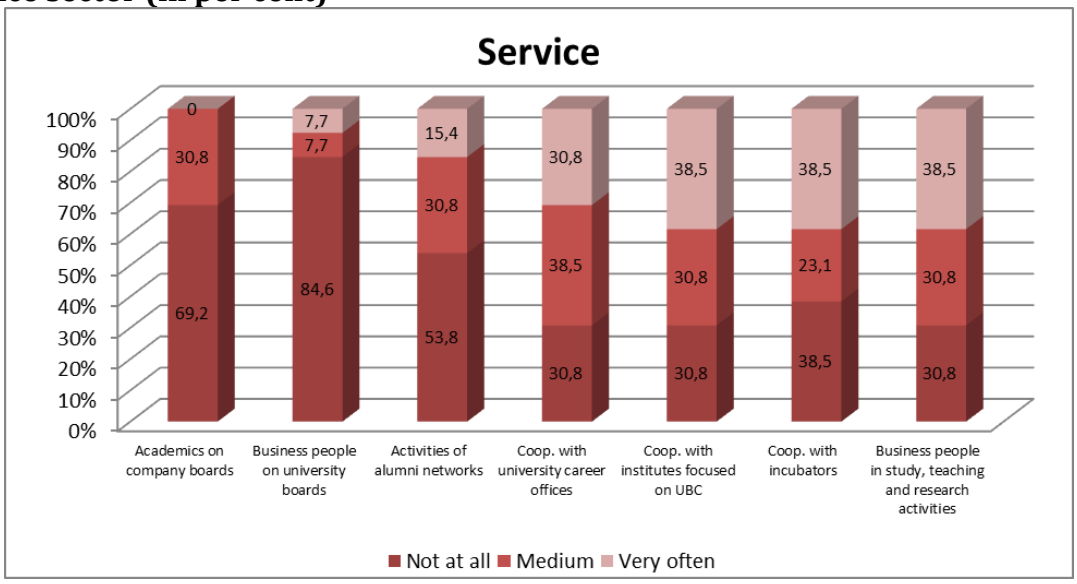
Figure 4.7: Involvement of companies in activities related to universities, by industry sector (in per cent)



Question B5: How often does your organization engage in the following activities in relation to universities? Responses 1 to 7 on a scale of answers from 1 -2 "Not at all", 3-5 "Medium" and 6-7 "often to very often".

The graph above shows responses among companies from industry sector. They are most frequently engaged in cooperation with **institutes** focused on university-business cooperation and participation as entrepreneurs in **study, teaching and research activities**. Participation of academics on company boards and participation of business people on university boards are activities that in case of industrial companies are still the least carried out.

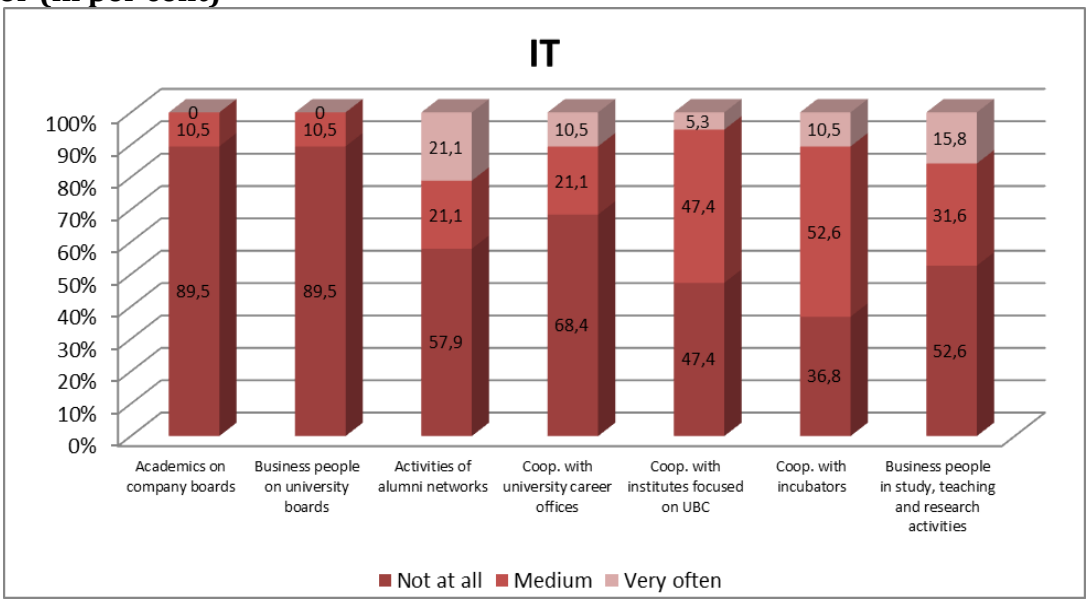
Figure 4.8: Involvement of companies in activities related to universities, by service sector (in per cent)



Question B5: How often does your organization engage in the following activities in relation to universities? Responses 1 to 7 on a scale of answers from 1 -2 "Not at all", 3-5 "Medium" and 6-7 "often to very often".

The service sector has most positive results and more often cooperate with universities. Companies are mostly engaged in activities such as cooperation with **institutes** focused on UBC and cooperation with **incubators**, as well as through business people in study, teaching and research activities. The case from Slovenian company in service sector shows an example of the implementation of activities related to higher education: "*We cooperate with career centres and organizers of the practices and education whilst working. We have established a network of mentors in all functions of company, which we have pedagogical – andragogical trained by verified programs (170 tutors for all levels of secondary vocational to higher education*)«.

Figure 4.9: Involvement of companies in activities related to universities, by IT sector (in per cent)



Question B5: How often does your organization engage in the following activities in relation to universities? Responses 1 to 7 on a scale of answers from 1 -2 "Not at all", 3-5 "Medium" and 6-7 "often to very often".

Responses from IT companies are fairly different from responses by other two sectors. IT companies, according to graph, are mostly involved with universities through activities of **alumni networks** and through business people in **study, teaching and research** activities. None of the surveyed IT companies has academics on company boards or business people on university boards.

4.6 Drivers and Barriers of University-Business Cooperation

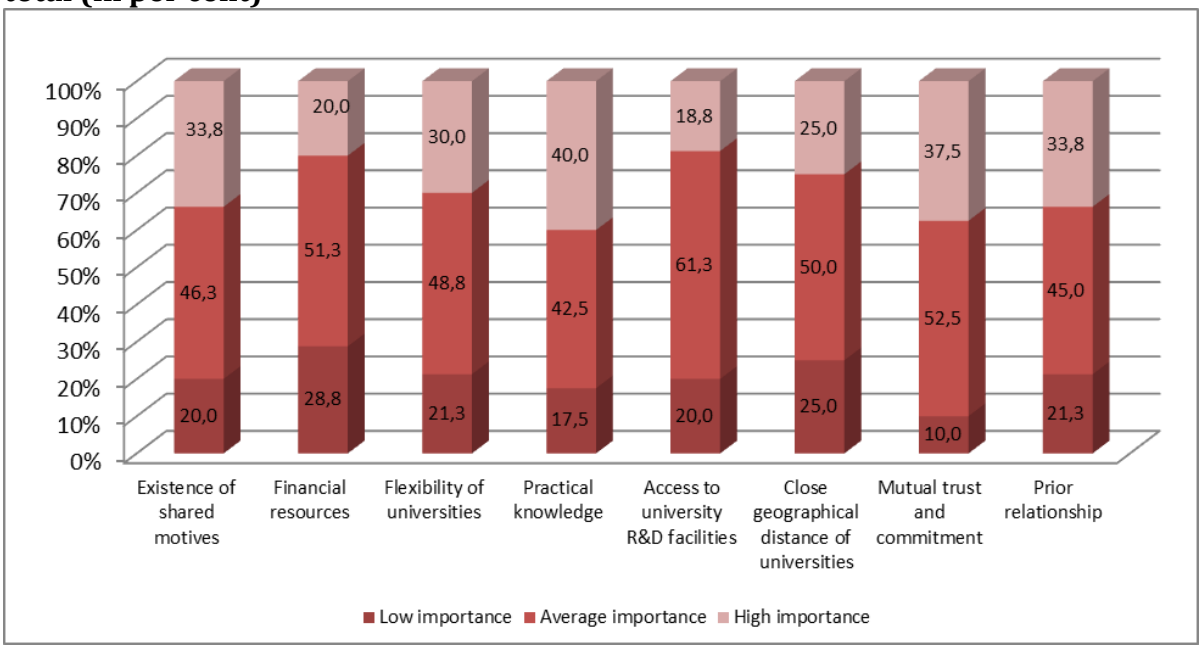
In the survey we wanted to assess the importance of different factors facilitating and encouraging university-business cooperation or hindering it.

Respondents evaluated the following arguments intended to **facilitate the cooperation** of companies with institutions of higher education:

A. Existence of shared motives
B. Financial resources for working with universities
C. Flexibility of universities
D. Interest of universities in accessing practical knowledge
E. Access to university research and development facilities
F. Close geographical distance of universities
G. Existence of mutual trust and commitment

H. Prior relationship with universities

Figure 4.10: Factors affecting cooperation between companies and HE institutions, total (in per cent)



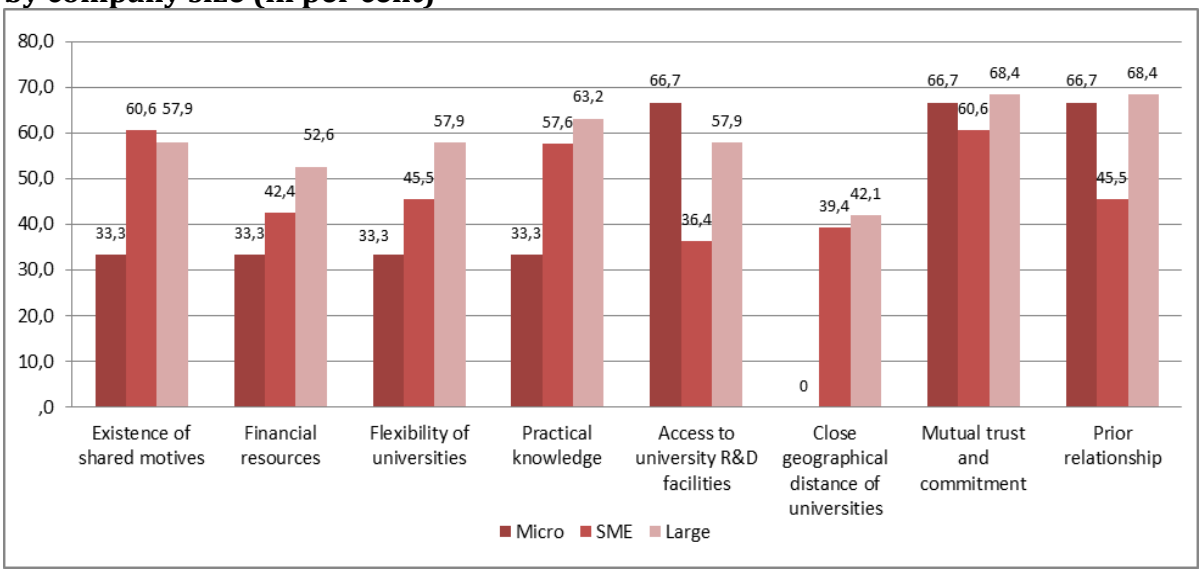
Question B6: How much do the following statements facillitate your organisation`s cooperation with universities? Responses 1 to 7 on a scale of answers from 1 -2 "Low ", 3-5 "Average" and 6-7 "high to very high importance".

Interest of universities in accessing practical knowledge and existence of **mutual trust** and commitment enables the cooperation of organizations with institutions of HE to the highest extent. Identification of **common motives** that resulted in different form of relationships is very important factor of cooperation as well. On the other hand the access to HE R&D facilities and financial resources has an average importance for over the half of the respondents. Usually, cooperation between companies and HE institutions is constant and recurrent, which is reflected in mutual trust. This statement confirms the case of Slovenian company from industrial sector with continuous collaboration with HE institutions*: "In the development of power train systems, we continuously cooperate with both Electrical Engineering Faculties, from Maribor and from Ljubljana. Project contractual relationship is always supported and so far, the collaboration is an excellent place. In addition to this defined project relationship, we also have a permanent open collaboration with the University of Ljubljana, Faculty of Mechanical Engineering, where students from faculty can develop their own solutions (which are interesting for our company) in our unit in Ljubljana, where we have a small development workshop«.*

Financial resources have the least impact to the collaboration of organizations with HEI institutions.

The graph below shows the ratio of responses from large, small and medium and micro sized companies. Although, the argument "Existence of mutual trust and commitment" still prevails, we can notice differences in relations between responses.

Figure 4.11: Factors affecting cooperation between companies and HE institutions, by company size (in per cent)



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

Prior relationship in performing joint projects resulting in existent personal contacts and mutual trust are significant factors contributing to smooth cooperation for large and micro companies as well. These factors are important for over 2/3 of these types of companies. Since Slovenia is geographically small country the distance of universities in not an important factor. For micro companies the access to R&D facilities at universities is an important cooperation driver. Micro companies mostly do not dispose with own R&D facilities, therefore the readiness to offer university R&D facilities to them is of vital importance. Since large companies dispose with their own R&D centres the cooperation with university R&D is enabling upgrading of their R&D activities and thus results as an important accelerator of mutual cooperation (over half of large companies rank this statement as very important).

Figure 4.12: Factors affecting cooperation between companies and HE institutions, by industry sector (in per cent)

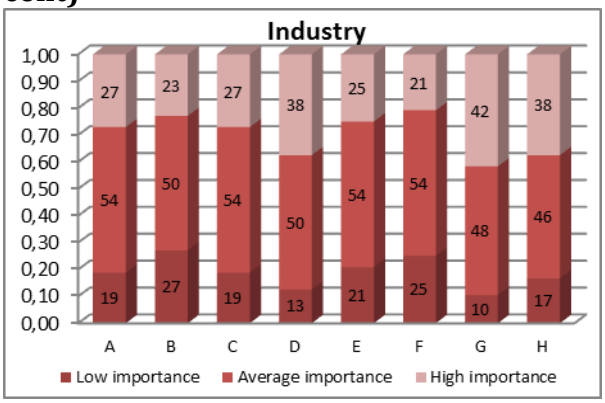


Figure 4.13: Factors affecting cooperation between companies and HE institutions, by service sector (in per cent)

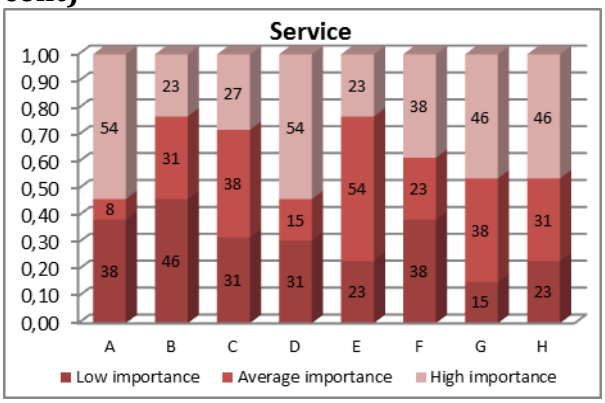
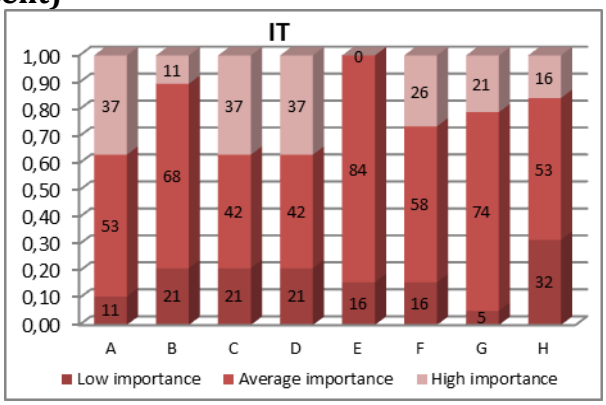


Figure 4.14: Factors affecting cooperation between companies and HE institutions, by IT sector (in per cent)



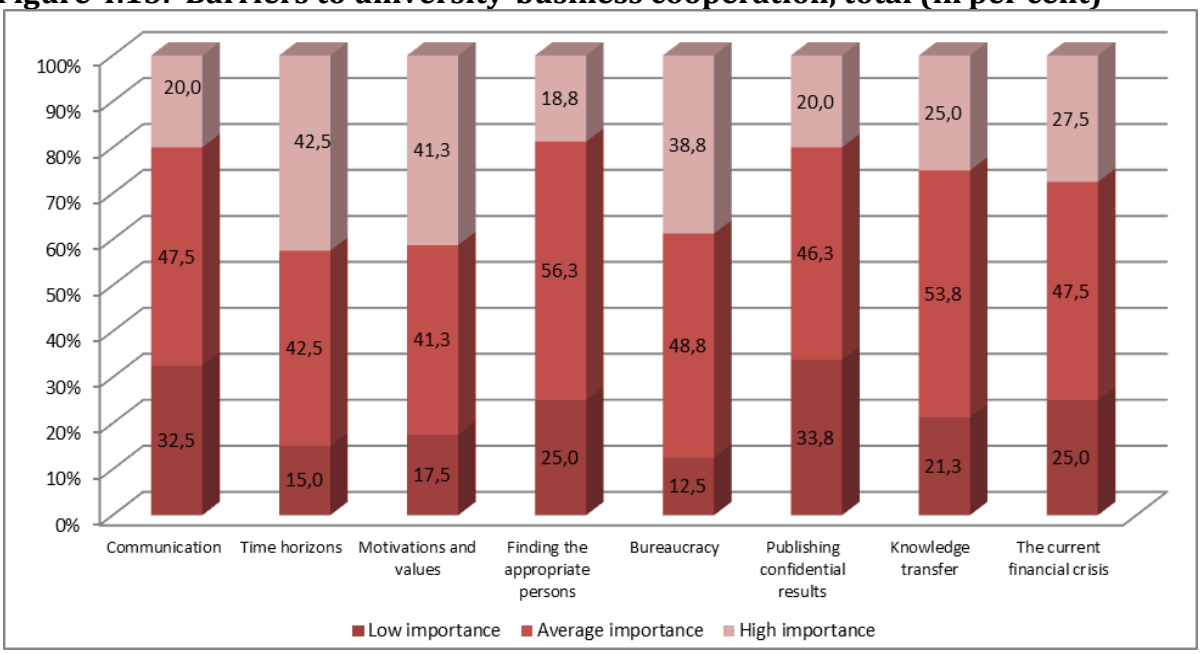
Question B6: How much do the following statements facillitate your organisation`s cooperation with universities? Responses 1 to 7 on a scale of answers from 1 -2 "Low ", 3-5 "Average" and 6-7 "high to very high importance".

Existence of mutual trust and commitment seem to be predominantly important condition for good cooperation for all sectors. In services existence of shared motives and transfer of practical knowledge to universities are very important for more than half of the respondents, in industry and IT for 37 - 38 %. Prior good contacts with universities are most important for the IT sector. One third of IT companies decided that this factor is the most important one, whereas it was important for 23% of companies in services and only 18% of industrial companies. The collected data indicates that there is a relatively small discrepancy between industry and IT in assessing the importance of factors impacting the universities-business cooperation, while services consider same factors either of high either of low importance.

Slovene respondents evaluated **which of the barriers** that are listed below are most relevant to university-business cooperation.

1. Different modes of communication and language between universities and business
2. Different time horizons between universities and business
3. Different motivations and values between universities and business
4. Difficulty in finding the appropriate persons within universities
5. Bureaucracy within or external to the university
6. Universities want to publish confidential results
7. Limited ability of knowledge transfer
8. The current financial crisis

Figure 4.15: Barriers to university-business cooperation, total (in per cent)



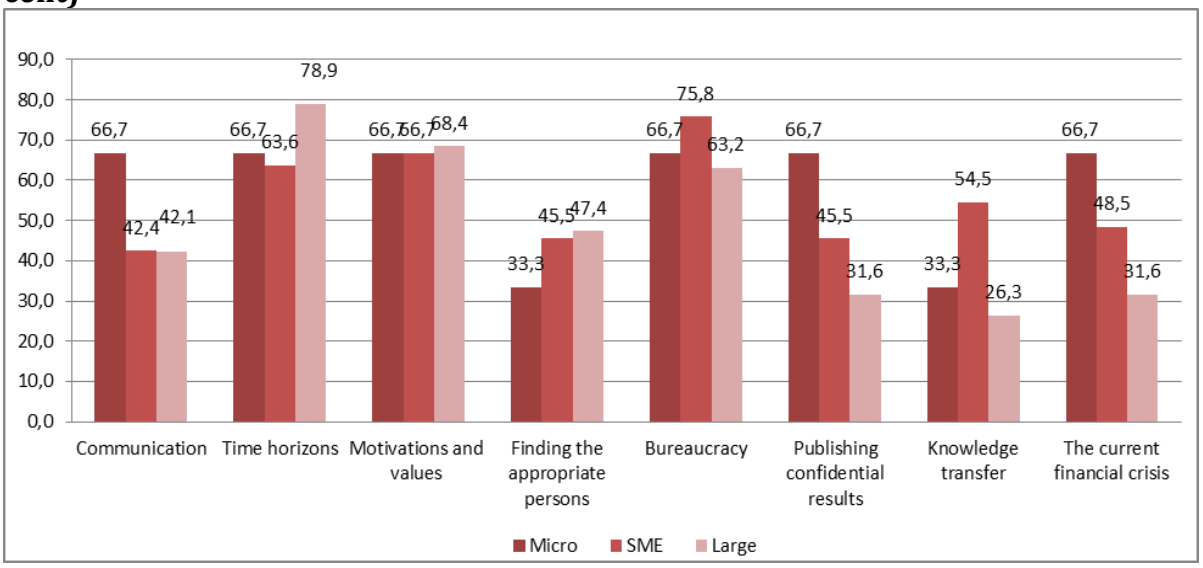
Question B7: How relevant are the following barriers to university-business cooperation? Responses 1 to 7 on a scale of answers from 1 -2 "Low", 3-5 "Average" and 6-7 "high to very high importance".

Barriers or obstacles that make cooperation between higher education and businesses difficult to the highest extent are according to the collected data, different perception of time frames, different motivations, followed by over extensive bureaucracy within or external to university. Only 15% of all respondents rate the question of different time frames as not important. For majority of companies fast solving of problems and short deadlines for practical implementation of the results is of vital importance. Researchers usually do not work under time constraints and are used to more calm research work. Another significant obstacle in Slovenia is the

discrepancy in motives and values for business and universities. University employees are in favour of scientific publications and citations while companies do not always want to reveal the results of the research quickly or not at all. The implementation of results is for companies more important than the number of publications. Nearly 90% of all respondents find the problem with bureaucracy as an important obstacle.

The least relevant barriers for university-business cooperation are to find the appropriate person and differences on modes of communication and language between universities and business.

Figure 4.16: Barriers to university-business cooperation, by company size (in per cent)



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

If we compare the results by the size of the surveyed companies we see that micro enterprises consider most of these barriers to be highly relevant to university-business cooperation (they mark them to high or very high extent). Small and medium-sized companies evaluated bureaucracy within or external to the university as an obstacle that makes cooperation between HE institutions and economy most difficult, while for the large companies – different time horizons between universities and business - represents the biggest barrier.

Figure 4.17: Barriers to UBC, by industry sector(in per cent)

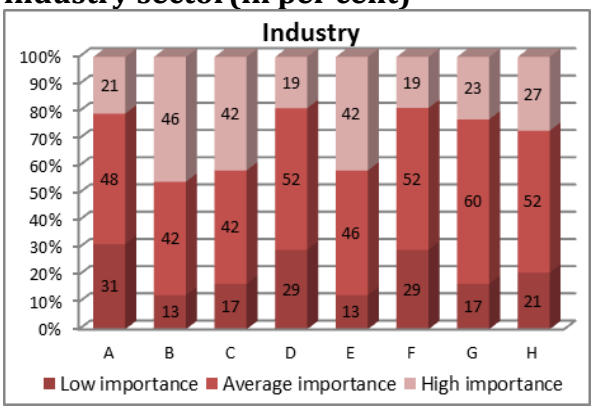


Figure 4.18: Barriers to UBC, by service sector(in per cent)

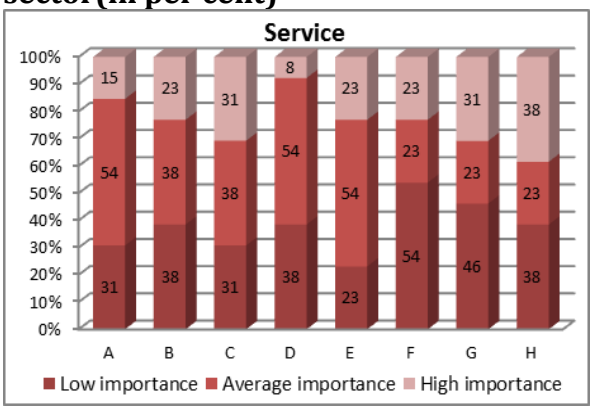
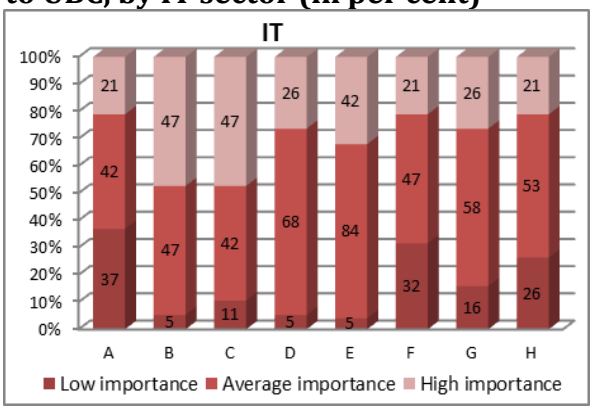


Figure 4.19: Barriers to UBC, by IT sector (in per cent)



Question B7: How relevant are the following barriers to university-business cooperation? Responses 1 to 7 on a scale of answers from 1 -2 "Low", 3-5 "Average" and 6-7 "high to very high importance".

Reponses from industry, service and IT sector are similar to responses in general. For industry and IT sector the most important, relevant barriers for university-business cooperation are different time horizons between universities and business (46%; 47%) and different motivations and values between universities and business (42%;47%), service sector however considers the current financial crisis as the biggest barrier (highest importance 38%). Barrier of lowest importance to university-business cooperation for Industry and IT sector is the different modes of communication and language between universities and business while for the service sector the least important barrier represents publishing the confidential results. That might reflect the content of their cooperation where industrial product and know-how are not involved.

The results of the survey indicate that more or less all mentioned obstacles are significant or averagely significant for entrepreneurs and business associations.

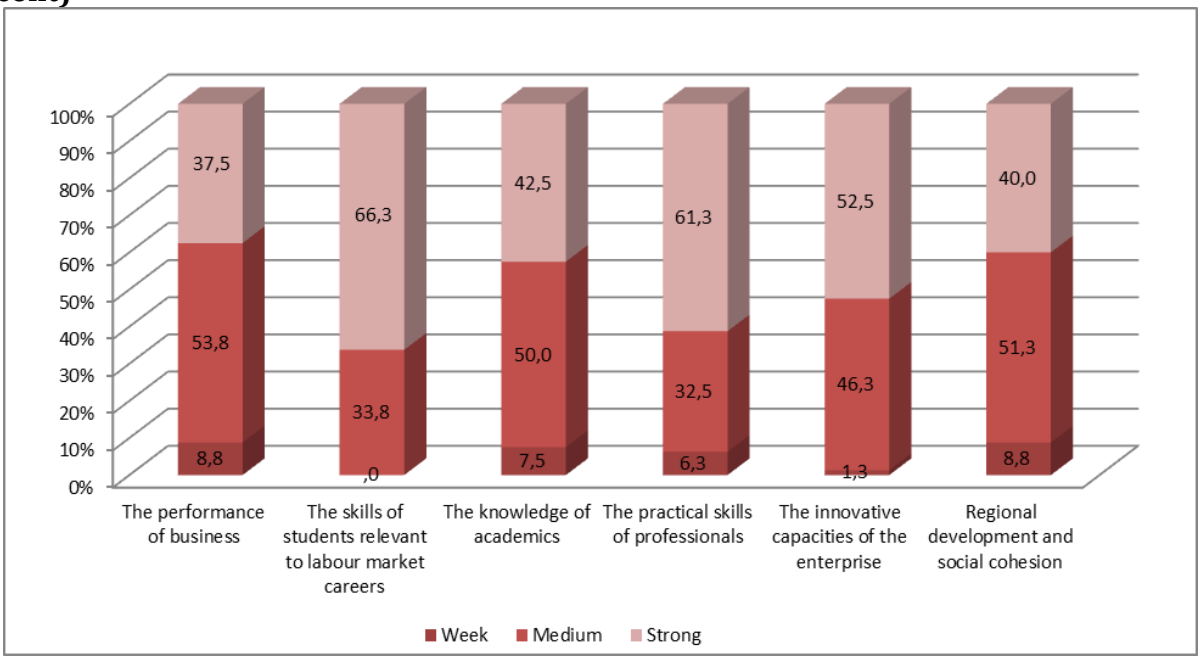
None of the obstacles was marked as of little importance by at least 34% of respondents. To foster cooperation between business and universities all obstacles observed in the survey should be taken into consideration.

4.7 University and Business Cooperation Outcomes, Impact and Lessons Learned

The companies had to indicate to what extent they agree with the following statements: University-business cooperation importantly improves:

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

Figure 4.20: Improvements due to UBC-impacts from cooperation, total (in per cent)

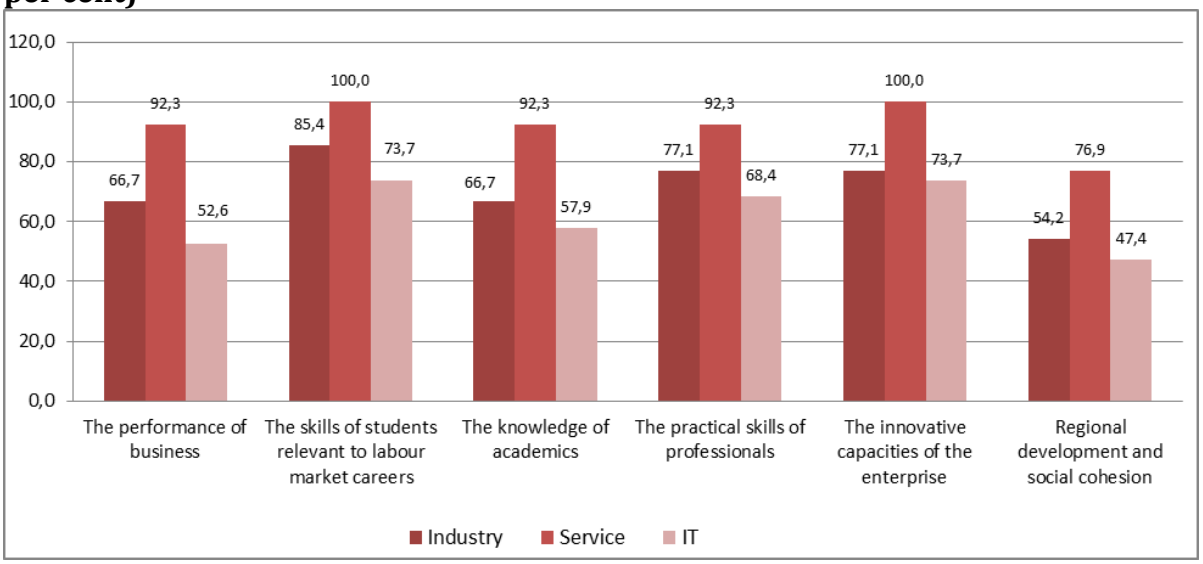


Question B9: Please indicate to what extent you agree with the following statements. Responses 1 to 7 on a scale of answers from 1 -2 "Week", 3-5 "Medium" and 6-7 "Strong".

The survey indicates that university-business cooperation has positive effects on all included spheres of activities: skills of students, innovative capacities of the enterprises,

practical skills of professionals, knowledge of academics, etc. From the graph it is evident that the **strongest impact UBC had on improving the skills of students**, which are relevant to their labour market careers. We can conclude that UBC is mostly beneficial for students. **According to the graph has UBC the weakest impact on performance of business**. Following statement is from one of the surveyed companies - on the acquisition of practical knowledge of professionals: *»Developed new skills and obtained new competences in the field of engine management«.*

Figure 4.21: Improvements due to UBC impacts from cooperation, by sector (in per cent)



Question B9: Please indicate to what extent you agree with the following statements. Responses 5 to 7 on a scale of answers from 1-2 "Week", 3-5 "Medium" and 6-7 "Strong".

If we compare the responses of the surveyed companies by sector, we can see that the service sector had the largest share of agreement with big majority of the statements to a high or very high extent. Even more, all respondents from service sector agreed with argument that **UBC improves the innovative capacities** of the enterprise and that UBC **improves the skills of students** relevant to labour market careers. Lower level of agreement with the statements to a large extent had in particular companies from the IT sector – still every second agrees with nearly all statements.

Figure 4.22: Improvements due to UBC-by micro companies (in per cent)

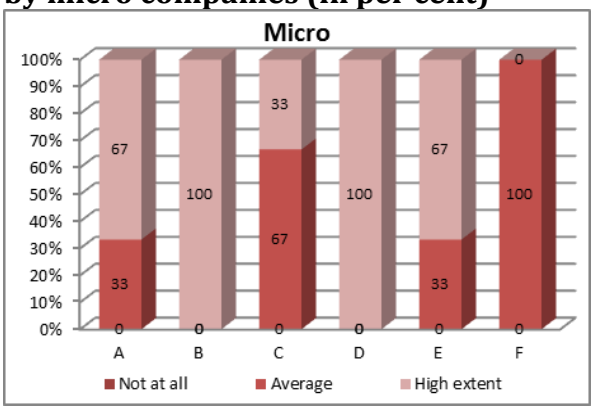


Figure 4.23: Improvements due to UBC-by SME companies (in per cent)

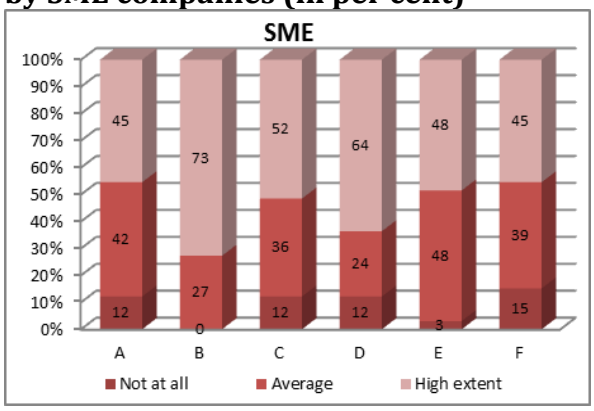
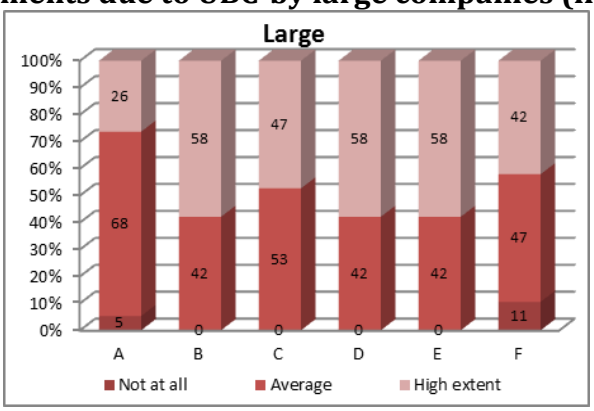


Figure 4.24: Improvements due to UBC-by large companies (in per cent)



Question B9: Please indicate to what extent you agree with the following statements Responses 1 to 7 on a scale of answers from 1 -2 "Not at all", 3-5 "Average" and 6-7 "high to very high extent".

From the graphs it is evident that responses from SME and large companies are quite similar. Micro companies stated that the most improvements due to UBC are made in the area of **student's skills**, relevant to labour market careers (100%) and **practical skills** of professionals from organizations (100%). Cooperation with universities reflects in the **innovativeness** as well. Least improvements are made in area of regional development and social cohesion, from micro companies' point of view – not at all. Opposite to observation of **only one quarter of large companies that UBC importantly increased** their business performance, 67% of micro and 45% of SMEs highly agree with this statement.

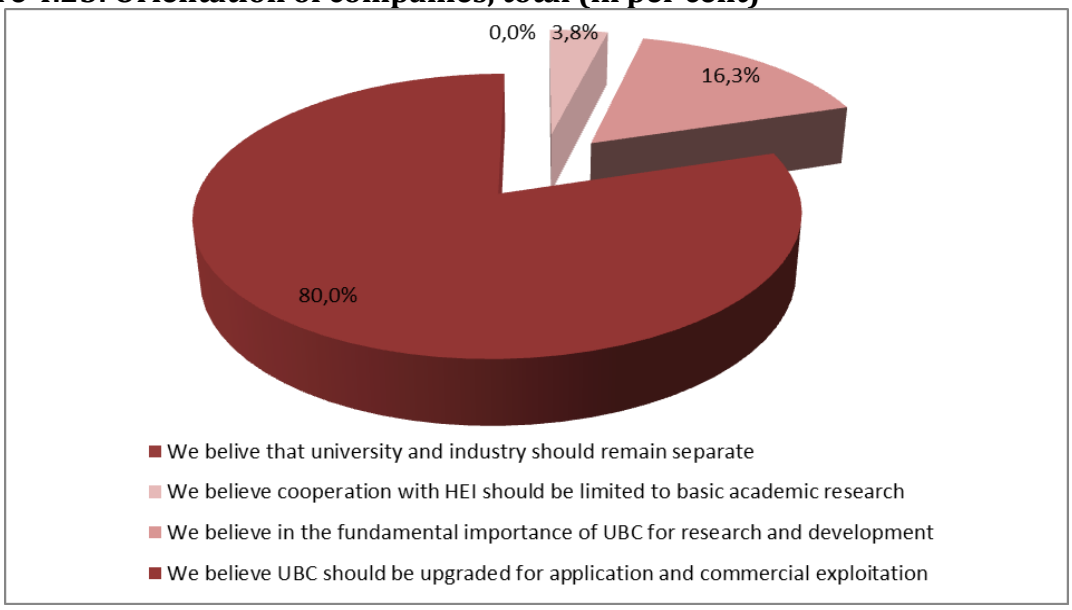
4.8 Enterprises Perceptions of Universities and University-Business Cooperation

Companies were asked to indicate which of the following statements describe the **orientation of their enterprise**.

1. We believe that university and industry should remain separate
2. We believe cooperation with HEI should be limited to basic academic research
3. We believe in the fundamental importance of UBC for research and development
4. We believe UBC should be upgraded for application and commercial exploitation

Majority of respondents (80%) believe that university-business cooperation should be **upgraded for application and commercial exploitation**, while none of the respondents claims that university and industry should remain separate. This statement reflects Slovene historical separation of academics from real business life and constant lack of business /industry oriented curriculum. Higher education should be upgraded for up-to-date application and commercial exploitation on the basis of UB cooperation.

Figure 4.25: Orientation of companies, total (in per cent)



Question B3: Please indicate which statement describes the orientation of your enterprise.

Figure 4.26: Orientation of companies, by companies' size (in per cent)

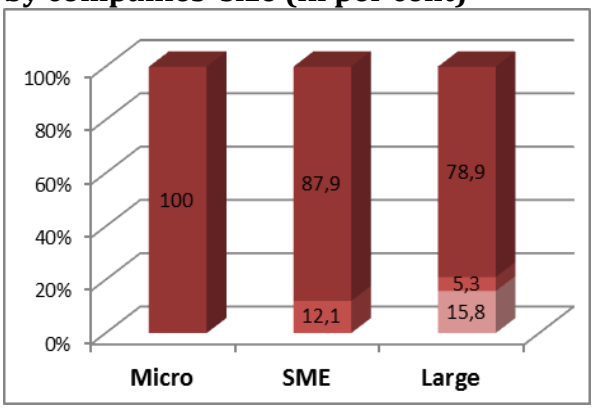
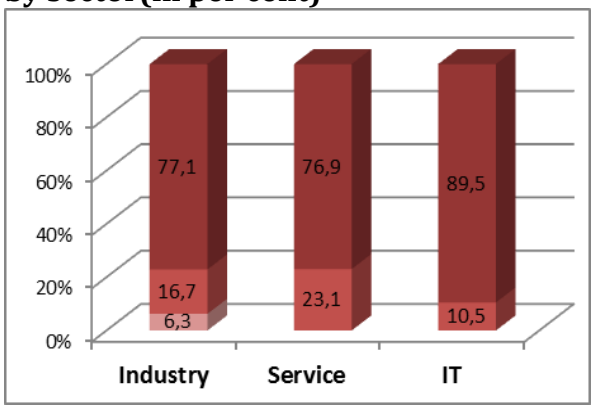
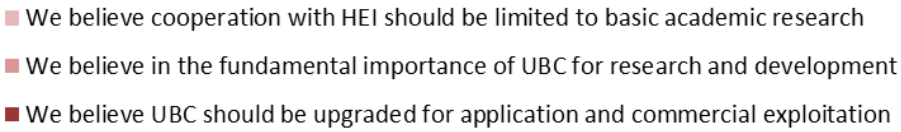


Figure 4.27: Orientation of companies, by sector(in per cent)





Question B3: Please indicate which statement describes the orientation of your enterprise.

The graphs above show companies' orientation regarding 4 statements on business – university cooperation, presented by sectors and by companies size. Statement that **UBC should be upgraded for application and commercial exploitation** prevails and leads to conclusion that no matter of the size or sector, practical aspect offering possibility of application and commercial exploration is the most important value of university - business cooperation. Companies from the IT and Service sector described the orientation of their organizations only with statements C - *We believe in the fundamental importance of UBC for research and development* and D - *We believe UBC should be upgraded for application and commercial exploitation.* The same statements were indicated by SME companies.

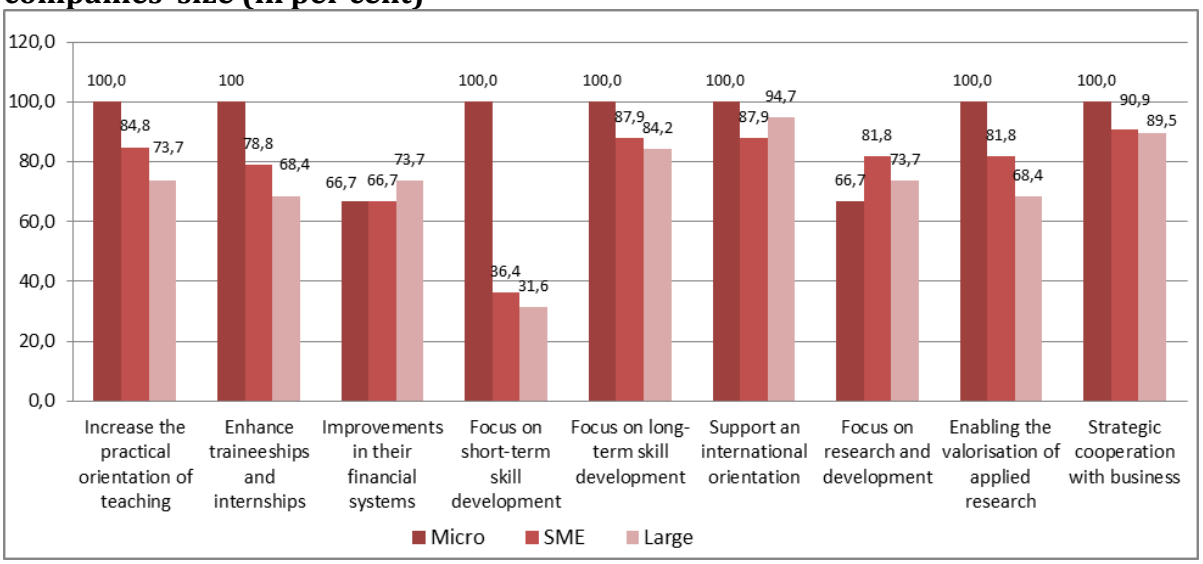
4.9 Changes at Universities in the Future?

Companies were required to report to what extent should the arguments listed in the questionnaire - related to higher education, **change in the future**. Arguments which respondents evaluated are given in the list below.

1. Increase the practical orientation of teaching
2. Enhance traineeships and internships
3. Improvements in their financial systems

4. Focus on short-term skill development
5. Focus on long-term skill development
6. Support an international orientation
7. Focus on research and development
8. Enabling the valorisation of applied research
9. Strategic cooperation with business

Figure 4.28: Perception of changes needed in higher education (universities), by companies' size (in per cent)



Question B4: In your view, to what extent should universities change in the future? Responses 5 to 7 on a scale of answers from 1 = "Not at all" to 7="To a very high extent

According to the graph, most adjustments and changes among universities should be done on development of strategic cooperation with business. Further changes of crucial importance are those related to **practical orientation of teaching**, **long-term skills development** as well as support on **international business orientation**.

Improvement of short-term skills and financial systems are of less importance to the companies.

The graphs below show the views of individual sectors on the necessary changes with universities.

Figure 4.29: Changes needed in higher education by industry sector (in per cent)

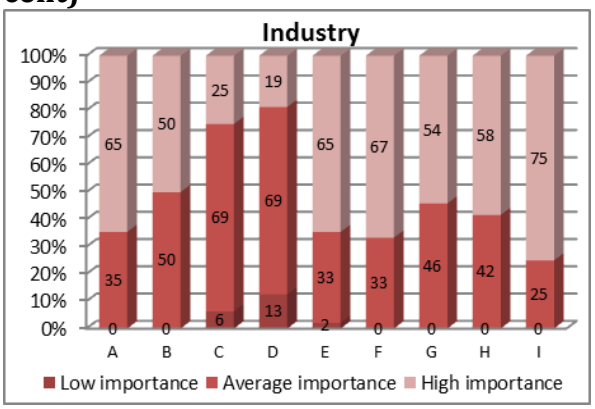


Figure 4.30: Changes needed in higher education by service sector (in per cent)

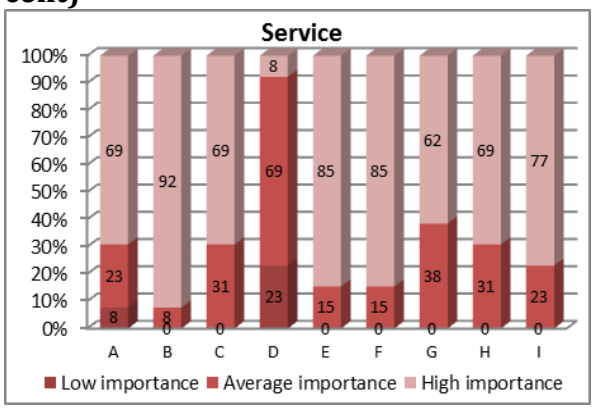
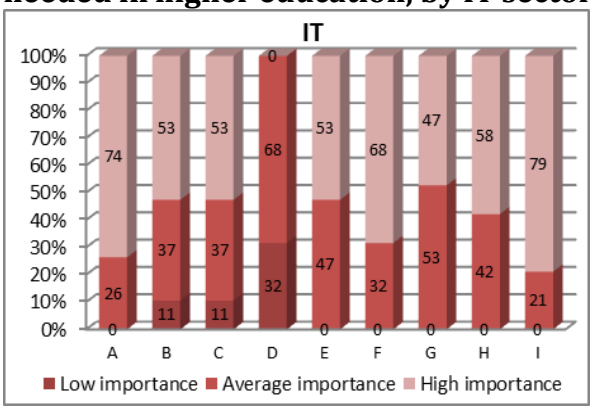


Figure 4.31: Changes needed in higher education, by IT sector (in per cent)



Question B4: In your view, to what extent should universities change in the future?". Responses 1 to 7 on a scale of answers from 1 -2 "Low", 3-5 "Average" and 6-7 "high to very high".

Answers by industry, IT and service sector don't differ much from the responses in general. For **Industry sector strategic cooperation of universities with business is still of highest importance (75%) followed by increasing the support of international orientation (67%)** and **practical orientation of teaching** (65%). Focus on short-term skill development is the less important for companies from IT and service sectors and a bit more for industry sector (19%). Slightly different are responses among companies from service sector, where in general they consider all of the above mentioned statements to be of very high importance, with the emphasis on statement B - Enhance traineeships and internships with 92% response rate for high importance.

Companies were also asked to indicate, to what extent the **university graduates have the following skills**:

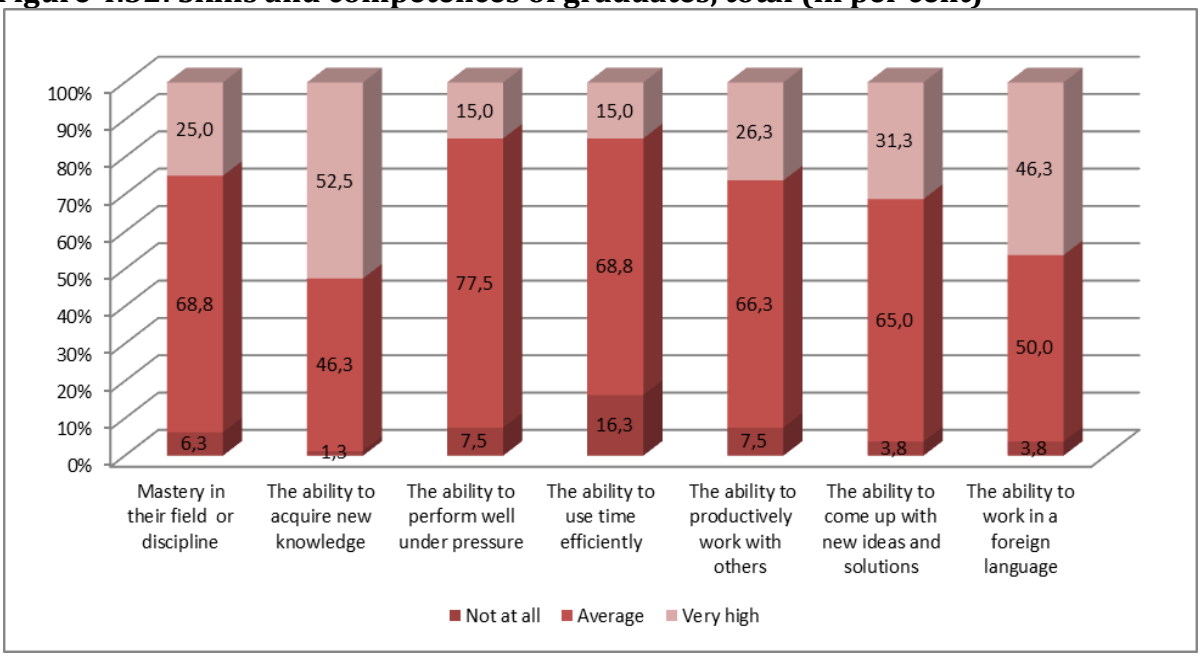
1. mastery in a field or discipline;
2. the ability to acquire new knowledge;

3. the ability to perform well under pressure;
4. the ability to use time efficiently;
5. the ability to productively work with others;
6. the ability to come up with new ideas and solutions;
7. the ability to work in a foreign language.

After giving employment to graduates, the respondents experience their **high ability to acquiring new knowledge and ability to work in a foreign language**. According to the results in the lowest extent graduates possess the skills such as the ability to perform well under pressure and the ability to use time efficiently that presumably result from the lack of experience.

Answers regarding on company size and among different economic sector of interviewed companies do not differ much. The ability to acquire new knowledge still prevails as a skill that new graduates possess to the highest extent.

Figure 4.32: Skills and competences of graduates, total (in per cent)



Question A6: Below is a list of skills. Please provide information to what extent new graduates in your experience possesss these skills? Responses 1 to 7 on a scale of answers from 1 -2 "Not at all", 3-5 "Average" and 6-7 "high to very high extent".

4.10 Country Conclusions

The most common modes of cooperation between companies and universities in Slovenia are mobility of students and research and development as it was indicated by one third of all respondents as high to very high extend. For all types of companies research and development (R&D) is the most important form of cooperation with universities, particularly for those belonging to the industrial sector. The students' mobility (direct recruitment and traineeships) is a very important form of cooperation for more than half of large companies since it facilitates the recruitment process. Large companies also cooperate with universities in adult education, training and short courses and lifelong learning activities. While they are often involved in preparing and implementing curricula, they are not in favour to cooperate with academics on the spot – company premises. On contrary the micro companies give higher importance to mobility of academics which is directly connected to importance of R&D activities.

Regarding the drivers that encourage business-university cooperation should be considered as most relevant the existence of mutual trust and commitment among companies and high education institutions. From universities point of view has the highest value the access to practical knowledge. On the other hand the access to HE R&D facilities and financial resources has an average importance for over the half of the respondents. Prior relationship in performing joint projects resulting in existent personal contacts and mutual trust are significant factors contributing to smooth cooperation for large and micro companies as well. These factors are important for over 2/3 of these types of companies.

The results of the survey indicate that more or less all mentioned obstacles (barriers) are significant or averagely significant for entrepreneurs and business associations. None of the obstacles was marked as of little importance by at least 34% of respondents. To foster cooperation between business and universities all obstacles observed in the survey should be taken into consideration. Barriers that make cooperation between higher education and businesses difficult to the highest extent are according to the collected data, different perception of time frames, different motivations, followed by over extensive bureaucracy within or external to university. Only 15% of all respondents rate the question of different time frames as not important.

The survey indicates that university-business cooperation has positive effects on all included spheres of activities: skills of students, innovative capacities of the enterprises, practical skills of professionals, knowledge of academics, etc. The strongest impact has UBC on improving the skills of students, which are relevant to their labour market careers. UBC has according to the survey the weakest impact on performance of business. Cooperation with universities reflects in the innovativeness as well. Least improvements are made in area of regional development and social cohesion.

Majority of respondents (80%) believe that university-business cooperation should be upgraded for application and commercial exploitation, while none of the respondents claims that university and industry should remain separate. According to the survey, most adjustments and changes among universities should be done on development of strategic cooperation with business. Further changes of high importance are those related to practical orientation of teaching, long-term skills development as well as support on international orientation.

4.11 Case Studies Summary

Introduction

The EMCOSU team in Slovenia elaborated 10 short case studies, basing on the answers to open questions and additional information obtained in the process of conducting UBC survey from the companies and business associations. In the questionnaire's open questions all of the companies/associations were invited to represent their best cases of UBC. From the 10 cases we gathered, 3 cases are coming from sector associations (paper, textile, food & agriculture sector), 1 is coming from regional chamber of Ljubljana, 6 cases are coming from companies (active in the sectors of: 1 - tools production, 2 - ICT, 1 - metrology, 1 - logistics and 1 - consumer goods production).

These short case studies allowed us to present most common modes of cooperation, barriers to cooperation, benefits and sources of financing. Below we are presenting the most important findings.

Most common modes of cooperation

The most common modes of cooperation among the observed Slovene companies and sector associations/regional chamber are:

1. **Student placement** (4 cases), including internship programs and the possibility of recruitment. Student placements are facilitated both from the side of the company (leadership level) and from the side of the university. Companies assign targeted problem solving projects to students; e.g. development of a new design of a product. Through these projects students – interns gain work experiences in a given area of company activities, they develop technical and business skills and become more prepared for real work environment. The companies involve/recruit students through various channels/means:
    a. Student placements and student-to-company workshop, carried out in collaboration with UNI career centres organizations;
    b. Public invitation to join the "Campus programme" aiming at assisting the young and the jobless individuals in seeking a new job;
    c. Personal contacts among companies and university professors.
2. **Project collaboration** (research and innovation – 4 cases). Companies identify their technological, technical or business related problems/needs and they find a suitable source for financing custom-made (contract) research in order to solve the known issues. One of the most used sources are EU research projects – these usually require collaboration of companies and researchers. Research activities can be conducted by the university (or public research institution) experts. Companies may co-develop new services in collaboration with specific faculties (e.g. the Maribor Faculty of Electrical Engineering and Computer Science, Faculty of Textile Technology) or new products (e.g. in collaboration with the Ljubljana Biotechnical Faculty). Companies may also use the research equipment available at University members (e.g. Faculty of Mechanical Engineering).
3. **Co-development of competences** of the companies (1 case). The initiative for the establishment of competence centres came from the Ministry of Labour, Family, Social Affairs and Equal Opportunities in the form of project collaboration between universities and companies. The aim of the initiative was to develop curricula assuring competences needed by the workers employed in the industry sector. This

mode of cooperation was identified in sector association – paper processing industry.

4. **Social responsibility actions** (1 case). Some Slovene companies are very active in the field of social responsibility. Among the observed cases, BTC d.d. is a good example of collaboration with various stakeholders – also universities – with the aim of offering Campus programme – i.e. seminars, trainings, entrepreneurial knowledge, a necessity for the young and jobless individuals, seeking a new job or starting their own company.

Barriers to cooperation

Companies and business associations identified following barriers:

- Lack of public funds for financing of development projects.
- Bureaucracy. Companies reported bureaucratic problems, mostly in the area of reporting and financing of joint projects (especially projects, financed from the Cohesion fund).
- Financial crisis implicated decrease of the involvement in research and development, also educational activities, organised in cooperation with universities. Companies do not have sufficient funding to finance cooperation and most of the joint project is financed from public sources.
- Obstacles in communication between the two sectors, different motivations and different understanding of the "timeframe" of research.

Benefits

The benefits, identified by the companies and associations, are:

- the development of necessary competences of the (future and current) employees
- networking
- development of innovative products, services, technologies
- scouting for the future employees
- transfer/exchange of knowledge and ideas between the experienced employees and young students
- monitoring the technological and economic trends

Country Conclusions and other relevant issues

From the observed cases we can conclude that the UBC gives positive results both for the company/association and also for the university (professors, students). The

indispensable condition to achieve positive results is to have the vision, the strategy and set goals of the UBC.

5 SPAIN

National report prepared by: Raúl Mínguez Fuentes and Manuel Valero Calero

5.1 Introduction and Methodological Approach

In Spain the survey was performed by the High Council of Chambers of Commerce, Industry and Shipping of Spain. The responses were collected from February to May 2014. The sample is formed by 74 companies belonging to three sectors: Industry, Services and Information Technology (IT):

Table 5.1: Companies surveyed by sector

Industry	32.4%
Services	39.2%
IT	28.4%

Most of these companies have a high percentage of college graduates on staff. Almost the 70% of them have a percentage of higher institutions graduates close to 70% or more of total workers. 20.3% have a percentage of higher graduates between 30% and 70% of the workforce. Only 11% of companies in the sample have a percentage less than 30% of the total workforce of the company.

Table 5.2: Percentage of higher education graduates in the surveyed firms

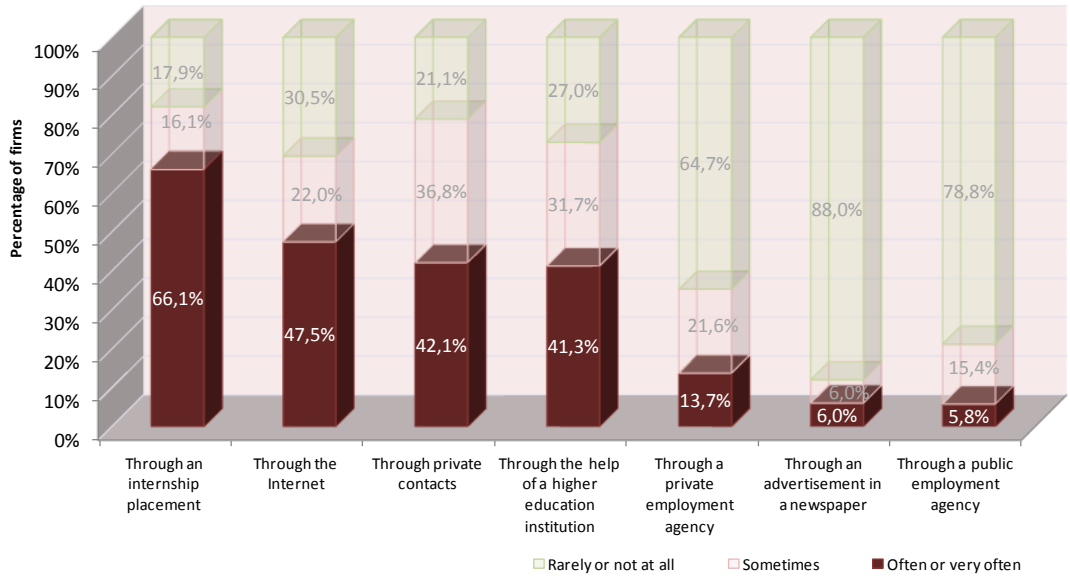
Less than 30%	10.8%
Between 30% and 69%	20.3%
70% or more	68.9%

66% of surveyed firms used frequently internship for the last 5 years as a recruitment mechanism for hiring higher education graduates.

Also, along this period of time, more than 40% of the surveyed companies often used internet for hiring university graduates, used private contacts or requested the help of the universities (e.g., through universities' career offices).

Finally, there is a small percentage of surveyed companies that, during the last 5 years, used frequently private employment agencies or advertisements in newspapers and magazines in order to hire university graduates. The percentage of companies that went frequently to public employment agencies for contacting with higher education graduates during this period of time is even smaller (5.8% of the companies surveyed).

Figure 5.1: More common recruitment mechanisms for hiring higher education graduates (in per cent)



Source: Own elaboration. Question: How often does your organisation use the following recruitment mechanisms for hiring higher education graduates in the last five years? (1- Not at all, 7- Very often). Responses grouped according to the following criteria: Rarely or not at all- 1 and 2. Sometimes- 3 and 4. Often or very often- 5 and 7.

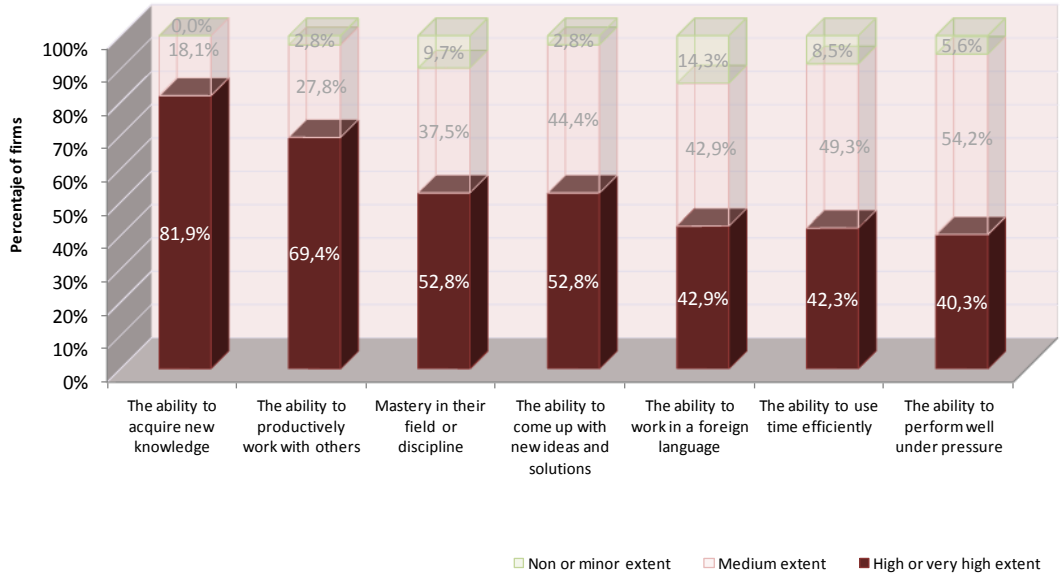
Also, the companies were consulted on the extent to which new graduates possessed certain skills necessary for the proper performance of their duties. In this regard it is noteworthy that 80% of companies surveyed considered that new graduates have the ability to acquire new knowledge in a high or very high extent.

70% of these companies believe that new graduates have the ability to make productively work with others in a high or very high extent.

Over 50% of companies surveyed believe that new graduates have, in high or very high extent, mastery in their field or discipline and ability to come up with new ideas and solutions.

Finally, around 40% of the companies surveyed said that graduates have in a high or very high extent, ability to work in a foreign language, ability to use time efficiently and ability to perform their job properly under pressure.

Figure 5.2: New graduates skills (in per cent)



Source: Own elaboration. Question: Please provide information to what extent new graduates in your experience possess these skills? (1- Not at all, 7- Very high). Responses grouped according to the following criteria: Nor or minor extent- 1 and 2. Medium extent- 3 and 4. High or very high extent- 5 and 7.

After this summary of the characteristics of companies that are part of the sample and the methods of recruitment of college graduates used by them, the following sections analyze the survey results in detail.

The first part delves into the more common ways of university-business cooperation (UBC) in companies surveyed. In the second section, the main drivers of this type of cooperation and the major barriers it has to face are identified.

Third section focuses on the results and the impact that has had UBC in the companies from the sample, and finally, the perception of these companies about high education institutions and UBC is tackled. An additional section summarizes the conclusions that can be drawn from the results described.

5.2 Activities of University-Business Cooperation

The first point of interest is to know the different modes of UBC and their importance into the activity of companies surveyed. As shown in Figure 3, the mobility of students is the most common UBC activity. Almost 58% of companies surveyed say they have had some sort of collaboration with university when recruiting students, organizing traineeships in company....

The most common practice among companies with this type of collaboration is to offer traineeships to university students and recent graduates. In general, they are assigned to specific projects and their performance is evaluated. Depending on the needs of the company, and the ability and behaviour of trainees, there is a chance for students and recent graduates to become part of the company staff at the end of their traineeship.

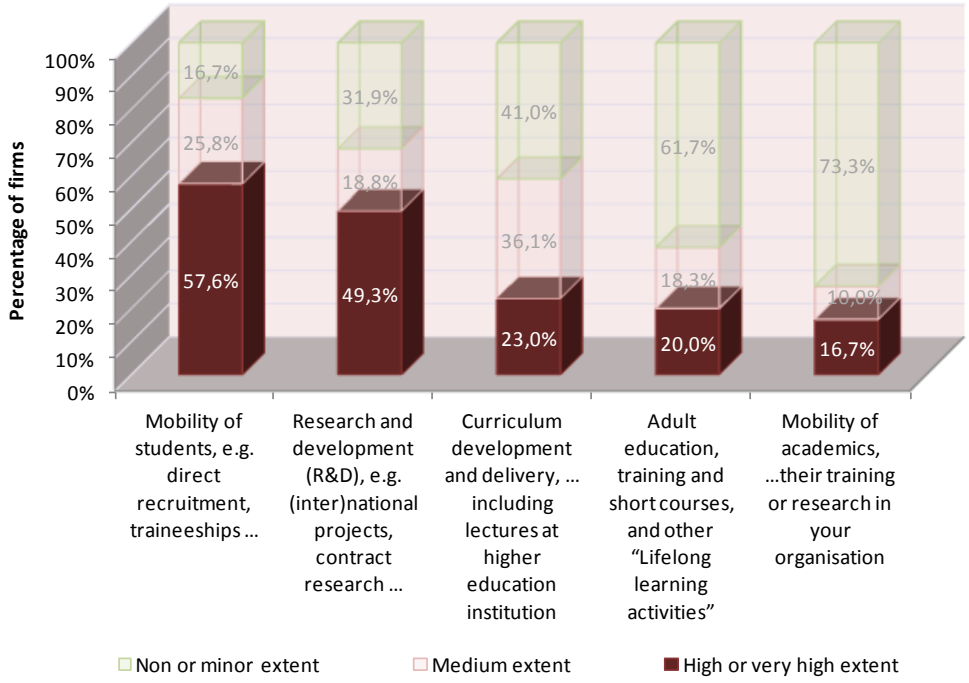
In general, companies describe positive experiences with this type of collaboration.

Cooperation related to R&D is also important among the companies surveyed. Almost half of them claim to have lines of collaboration with universities in R & D (national or international projects, research contracts for the development of certain projects ...).

As an example of cooperation in the field of R&D, it is noteworthy that one of the companies surveyed has a very close relationship with higher education institutions. There is a research group located at the university. It researches and develops the prototype, which then goes to the company for its development and transformation in the commercial version. The aim of this collaboration is to compete in the global market. It is not confined only to the local or national market.

All other ways of cooperation have minor importance. The mobility of teachers (lecturers stay in the company in order to do training or research, for example) is the less important mode of cooperation between firms surveyed (only 17% of them has a high extent of cooperation in this type of activities).

Figure 5.3: UBC Activities[1] (in per cent)



Source: Own elaboration. Question: To what extent does your organisation cooperate with higher education institutions regarding the following activities? (1- Not at all, 7- To a very high extent). Responses grouped according to the following criteria: Nor or minor extent- 1 and 2. Medium extent- 3 and 4. High or very high extent- 5 and 7.

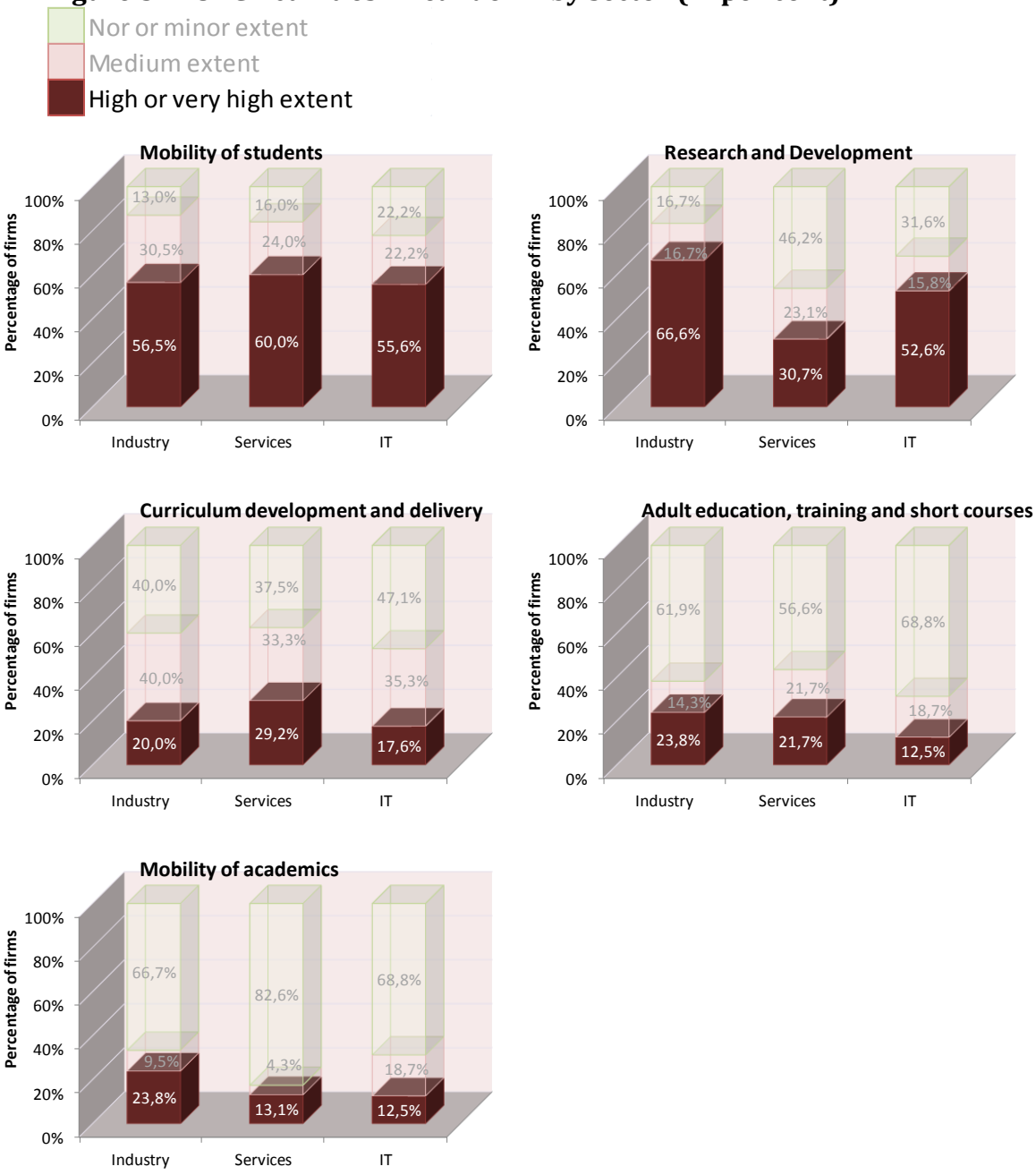
By sector, it stands out how student mobility is important in all sectors, highlighting the services sector, in which 60% of companies surveyed have a high extent of cooperation with the university in this area (also 56.5% in industry and 55.6% in new technologies). Cooperation in R&D is important in new technologies area (52.6% of the surveyed companies), and, especially in industrial sector, in which is the most common form of cooperation. 66.6% of industrial companies stated to have a high degree of cooperation with universities in R&D, well above the average (see Figure 5.3). It is remarkable how in the field of R&D, UBC is reduced to 31% of the surveyed companies within the service sector.

There is a surveyed firm in the field of IT that face collaboration in R&D from two different ways. On the one hand, they often outsource high value added services offered by the university, and on the other hand, they have also worked as partners in joint projects.

[1] 4,1% of companies surveyed indicate they do not have any form of cooperation with university

The other modes of cooperation have not enough noteworthy values. Just note that almost 30% of surveyed companies within the service sector cooperates with the university to promote employees curriculum development and delivery (conference or organization of courses in universities, for example), and about 24% of the surveyed companies from industry cooperates in the mobility of academics, well above the average, 16.7% (see Figure 5.3).

Figure 5.4: UBC Activities. Breakdown by sector (in per cent)

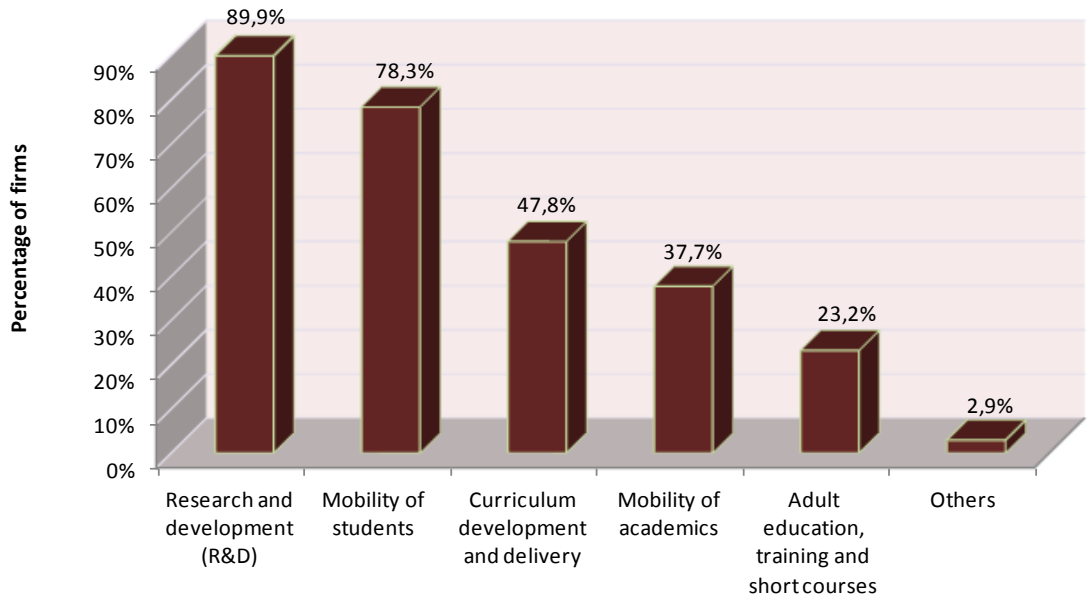


Source: Own elaboration. Question: To what extent does your organisation cooperate with higher education institutions regarding the following activities? (1- Not at all, 7- To a very high extent). Responses grouped according to the following criteria: Nor or minor extent- 1 and 2. Medium extent- 3 and 4. High or very high extent- 5 and 7.

For companies surveyed, activities related to the mobility of students and R&D will remain the most important forms of UBC in the future, although in this case, the collaboration related to R&D will have greater importance (90% of companies surveyed chose such cooperation as important in the future), contrary to what happens at present, wherein student mobility is the most significant form of cooperation, as described above (see Figure 5.1).

It is also noteworthy how almost 50% of companies, UBC related to curriculum development and delivery will be important in the future.

Figure 5.5: Degree of importance of various cooperation activities for future UBC (in per cent)



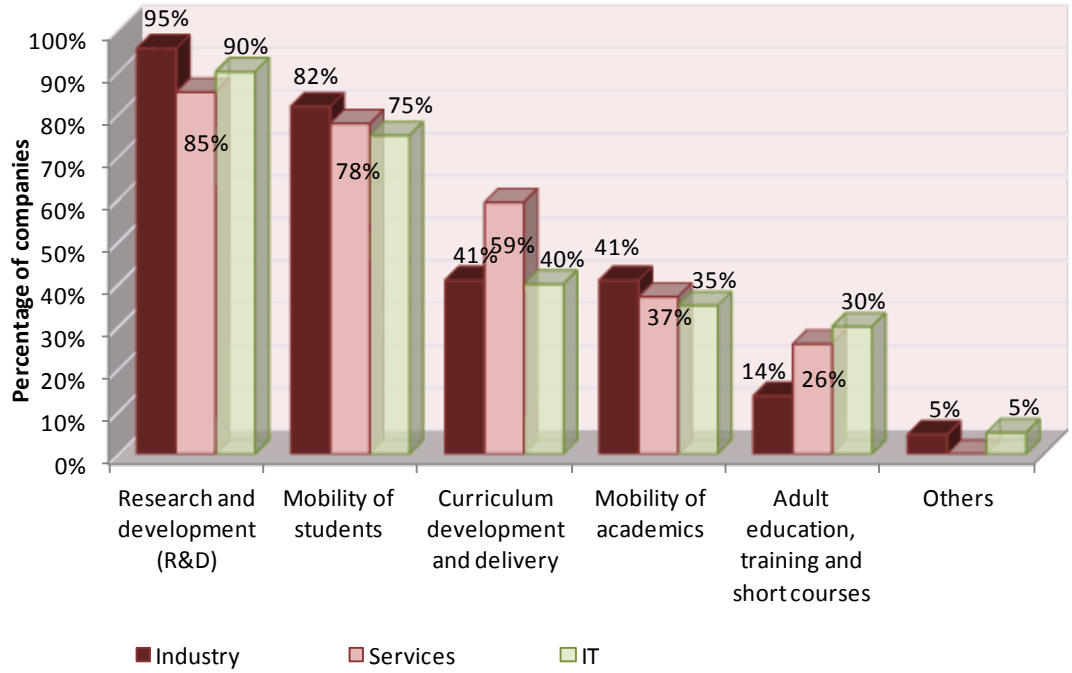
Source: Own elaboration. Question: Rank a maximum of three cooperation modes from the above list you would consider important areas for future cooperation with higher education institutions.

R&D will be the most important UBC activity in the future for all the sectors analyzed, but especially for industrial firms (95% of the sampled companies belonging to this sector chose R&D as the most important UBC activity in the future).

It is important to note how UBC related to curriculum development and delivery will take a prominent significance in the future among service sector firms (59% of surveyed companies belonging to this sector believes that such cooperation will have significance in the future).

UBC activities dealing with adult education will be important in the future, especially for the companies belonging to IT. 30% of these companies indicated that this type of UBC will be important for them.

Figure 5.6: Extent of cooperation activities for future UBC. Breakdown by sector (in per cent)



Source: Own elaboration. Question: Rank a maximum of three cooperation modes from the above list you would consider important areas for future cooperation with higher education institutions.

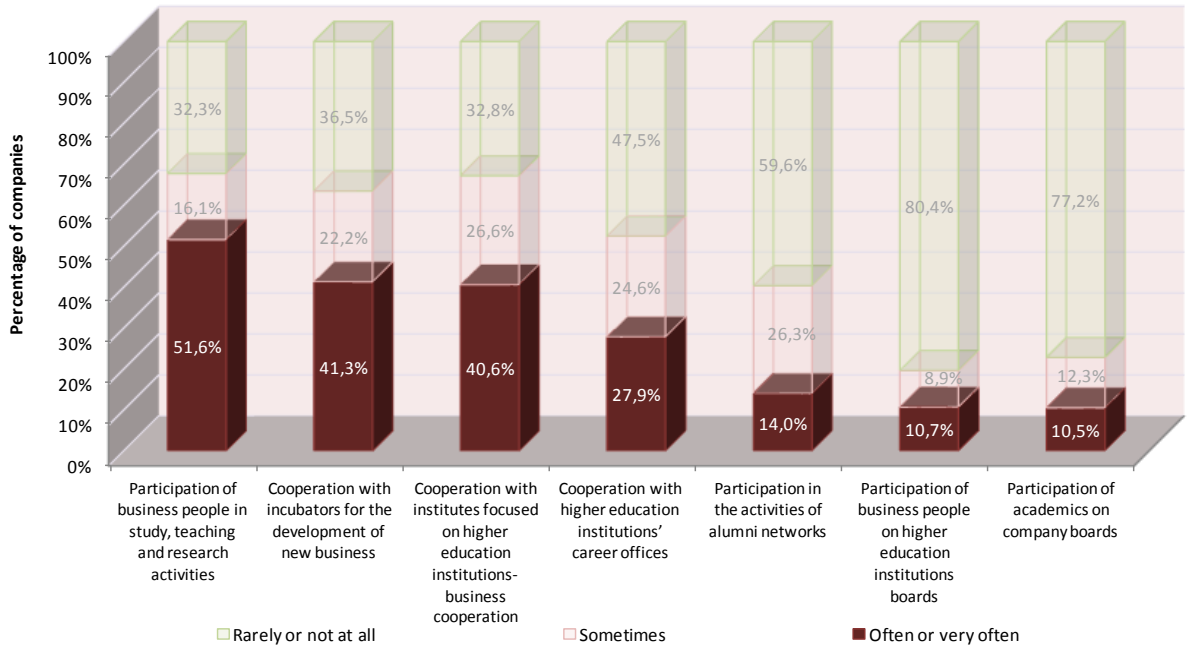
The different UBC modes analyzed enable the company to make a profit (incentive and improvement of R&D, reducing the uncertainty in accessing to labour market, improving the curriculum of technical staff and management...). However, there are also cooperative activities that can benefit universities. Collaboration of companies in tasks related to university boosts research results, provides a practical nature to usually close to business environments and, to some extent, approaches university to society.

Collaboration of companies in these activities are mainly focused on the participation of business people in study, teaching and research activities (almost 52% of companies surveyed said cooperate in this field), cooperation with business incubators (41% of surveyed firms) and collaboration with institutions that promote UBC (41% of surveyed companies).

Cooperation with higher education institutions' career offices is also important (almost 30% of surveyed companies).

The managers and academics exchange between universities and enterprises are activities with less implementation in the sample companies (around 10% of companies).

Figure 5.7: Involvement of companies in activities related to universities (in per cent)



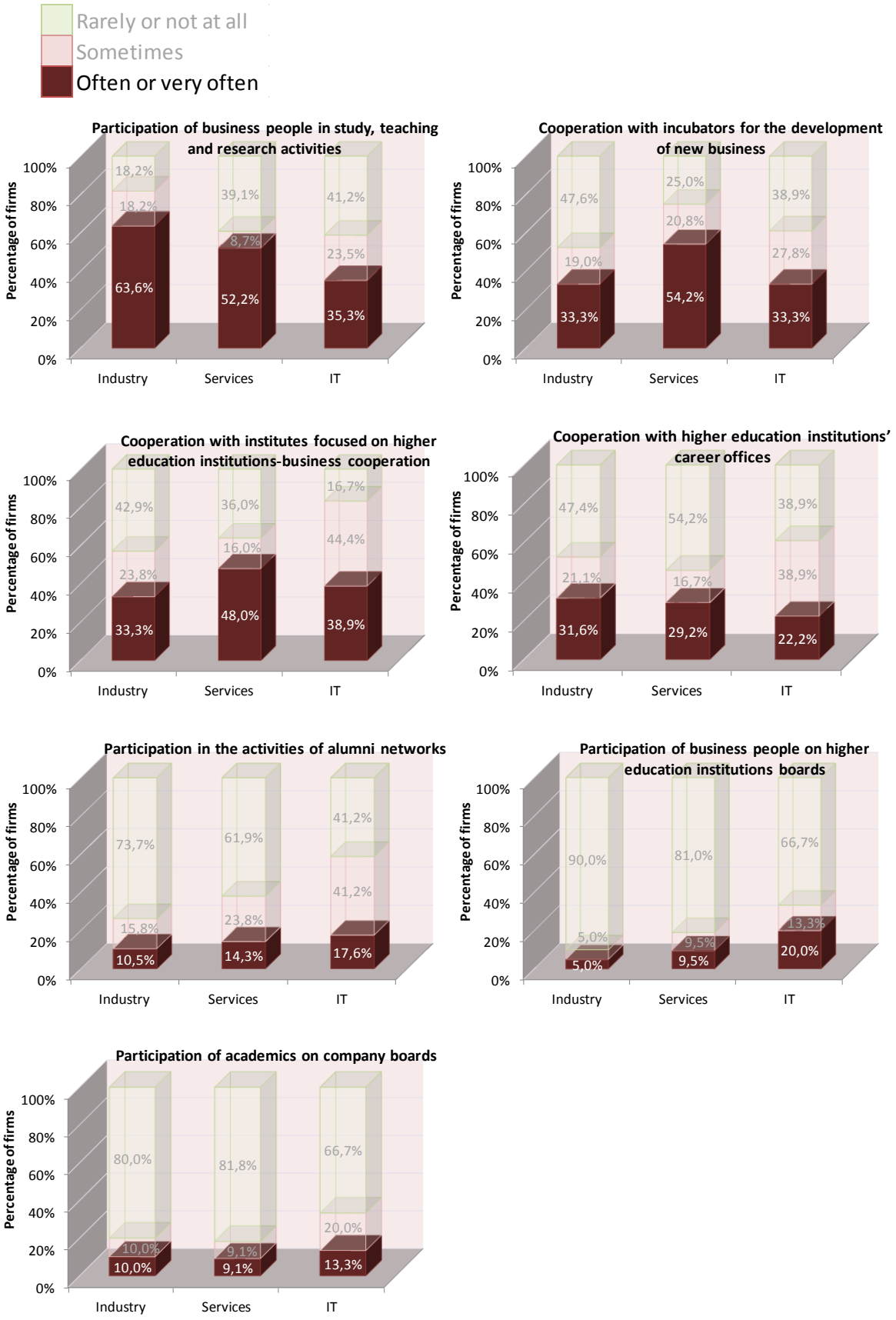
Source: Own elaboration. Question: How often does your organisation engage in the following activities in relation to higher education institutions? (1- Not at all, 7- Very often). Responses grouped according to the following criteria: Rarely or not at all- 1 and 2. Sometimes- 3 and 4. Often or very often- 5 and 7.

The participation of business people in study, teaching and research activities is important among the surveyed firms in the industry (64%) and services (52%).

However, the most common activity among the surveyed companies belonging to the tertiary sector is cooperation with incubators for the development of new business (54% of the companies in the sample belonging to the services sector). Moreover, cooperation with institutes focused on higher education institutions-business cooperation is also prevalent among service companies that have been surveyed (48%).

The surveyed companies in IT sector are less frequently involved in this type of university-related activities. The most common activity among these companies is cooperation with institutes focused on UBC (39% of surveyed companies belonging to the sector).

Figure 5.8: Involvement of companies in activities related to universities. Breakdown by sector (in per cent)



Source: Own elaboration. Question: How often does your organisation engage in the following activities in relation to higher education institutions? (1- Not at all, 7- Very often). Responses grouped according to the following criteria: Rarely or not at all- 1 and 2. Sometimes- 3 and 4. Often or very often- 5 and 7.

5.3 Drivers and Barriers of University-Business Cooperation

There are circumstances affecting UBC that in some cases may boost or encourage this type of collaboration, while in others hinder it.

Regarding the situations or the relationship between universities and companies that have been analysed in this study, which could be drivers of cooperation between the two institutions, the most important among the companies surveyed is the existence of mutual trust and commitment. 71% of them said that the trust relationship enhances UBC.

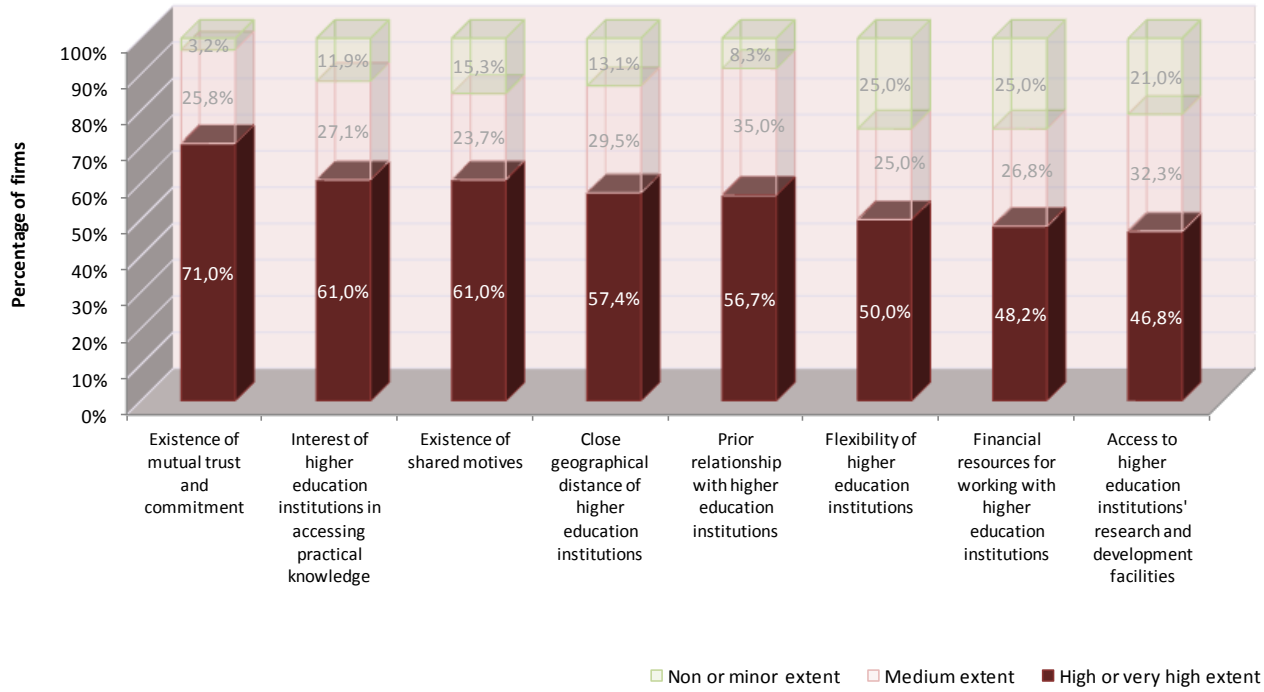
The interest of universities in the access to practical knowledge is also a fact that enhances UBC for 61% of surveyed companies.

At the same level appears the existence of shared motives. 61% of the companies surveyed said that, if there are common objectives, UBC is benefited.

Geographical proximity and the existence of prior relationships between the two institutions are also considered drivers of this type of collaboration for almost 60% of surveyed companies.

Finally, around 50% of companies surveyed considered that the flexibility of higher education institutions, the existence of financial resources for working with them or the access to their R&D facilities are drivers of UBC.

Figure 5.9: UBC drivers (in per cent)



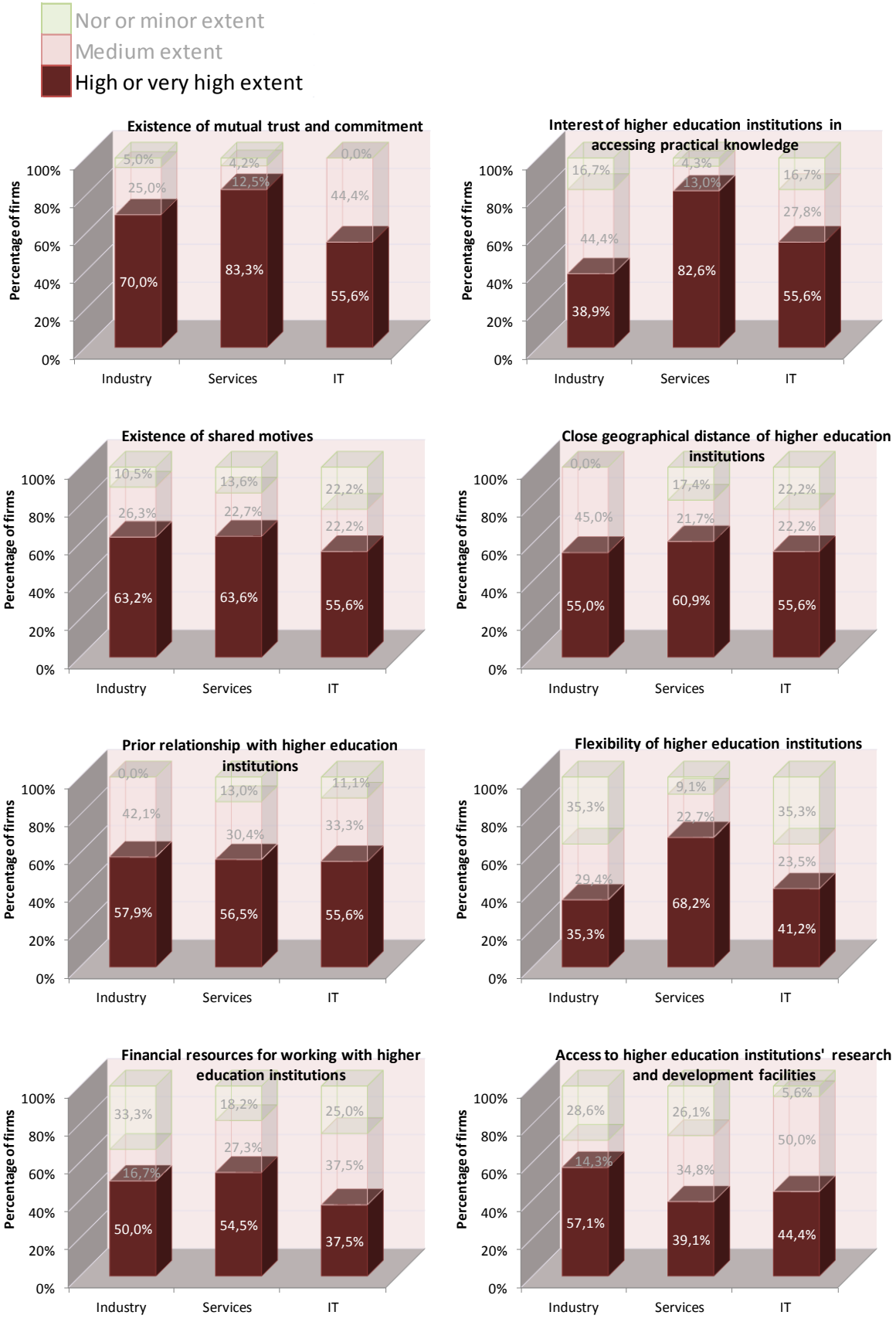
Source: Own elaboration. Question: How much do the following statements facilitate your organisation's cooperation with higher education institutions? (1- Not at all, 7- To a very high extent). Responses grouped according to the following criteria: Nor or minor extent- 1 and 2. Medium extent- 3 and 4. High or very high extent- 5 and 7.

Factors examined facilitate or boost UBC, especially among companies in the sample belonging to service sector. Over 80% of these companies think that the existence of mutual trust and commitment between university and firms, and the interest of the university in accessing practical knowledge, are factors that facilitate UBC.

The latter factor is not considered as important by the surveyed companies that belong to industrial sector. Only 39% of these companies considered that interest of the university in accessing practical knowledge enhance to a high extent UBC. On the other hand, existence of mutual trust and commitment and existence of shared motives facilitate to a high extent UBC for 70% and 63%, respectively, of these companies in the industrial sector.

55.6% of the surveyed enterprises operating in IT sector indicated that the main factors that facilitate UBC are the existence of mutual trust and commitment, interest of higher education institutions in accessing practical knowledge, existence of shared motives, close geographical distance of higher education institutions and the existence of prior relationship with them.

Figure 5.10: UBC drivers. Breakdown by sector (in per cent)



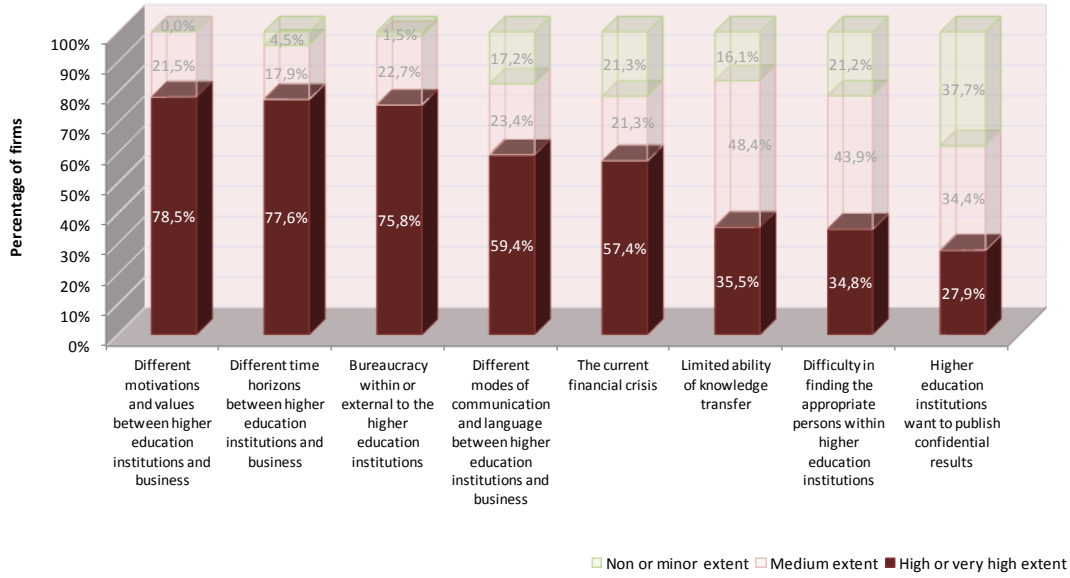
Source: Own elaboration. Question: How much do the following statements facilitate your organisation's cooperation with higher education institutions? (1- Not at all, 7- To a very high extent). Responses grouped according to the following criteria: Nor or minor extent- 1 and 2. Medium extent- 3 and 4. High or very high extent- 5 and 7.

From the point of view of the barriers faced by UBC, the three major identified by companies in the sample are different motivations and values between higher education institutions and businesses, different time horizons between them and the bureaucracy within or external to the higher education institutions. Over 75% of surveyed companies believe that each of these barriers affect to a high or very high extent to UBC.

Different modes of communication and language between academia and business, and the current financial crisis, are barriers that have a significant effect on the collaboration of both institutions for almost 60% of the companies surveyed.

The less important barriers analyzed are the limited ability of knowledge transfer, the difficulty in finding the appropriate persons within higher education institutions and the dissemination of confidential results by the higher education institutions. They are relevant or very relevant barriers to less than 40% of the companies surveyed.

Figure 5.11: UBC barriers (in per cent)



Source: Own elaboration. Question: How relevant are the following barriers to higher education institutions-business cooperation? (1- Not at all, 7- To a very high extent). Responses grouped according to the following criteria: Nor or minor extent- 1 and 2. Medium extent- 3 and 4. High or very high extent- 5 and 7.

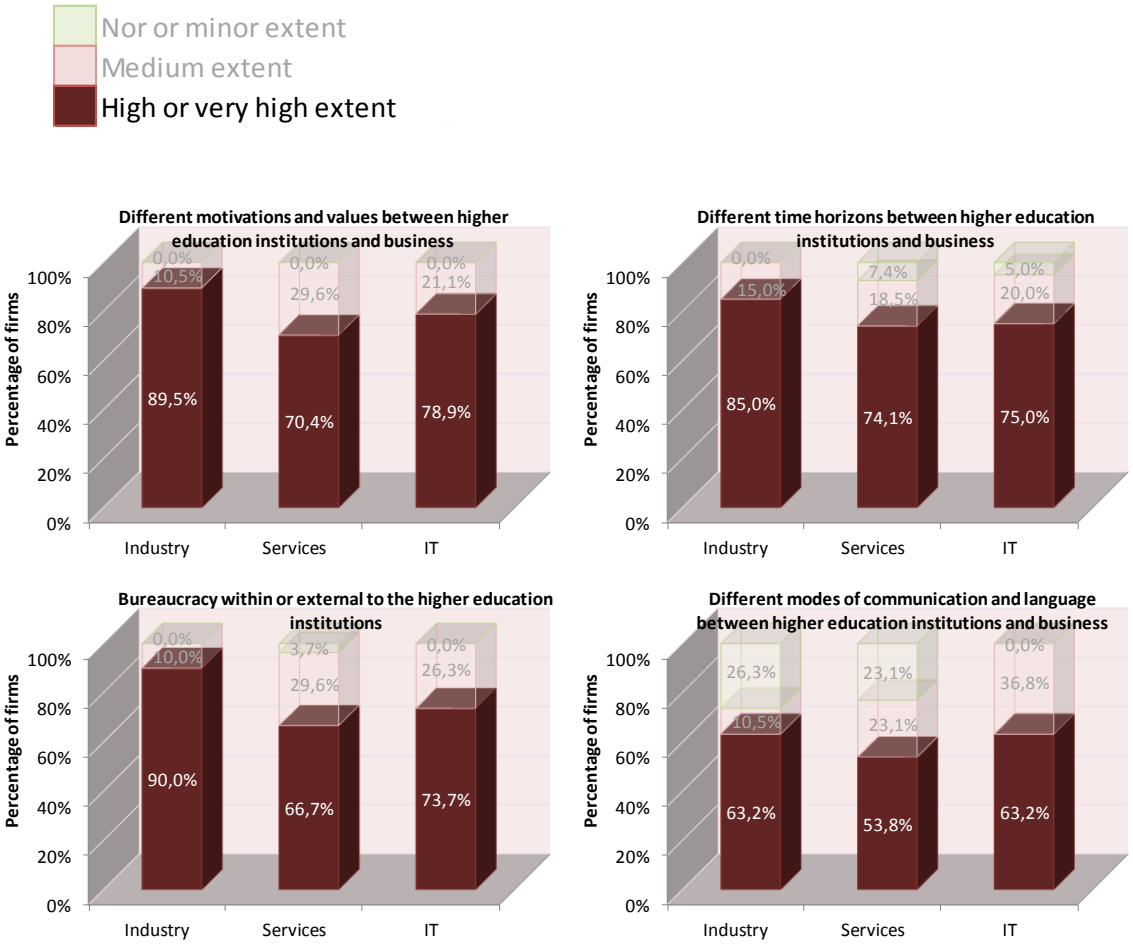
About 90% of surveyed companies within the industrial sector think that differences between academia and industry in terms of motivation and values, different time

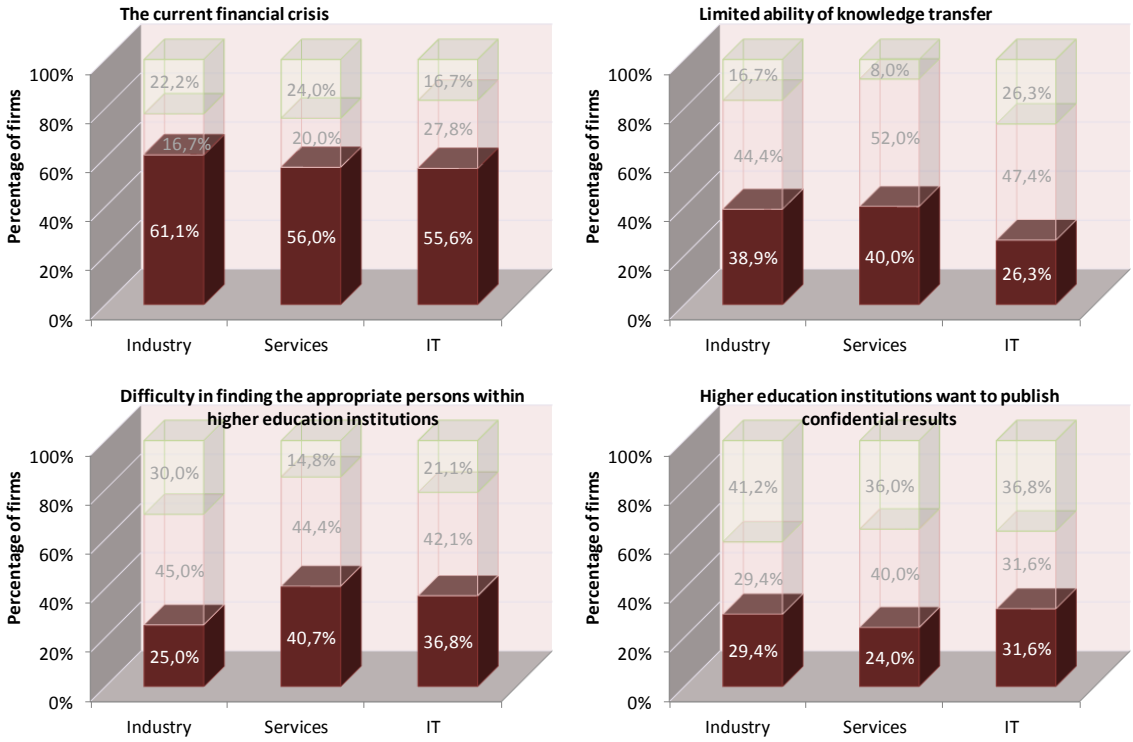
horizon between higher education institutions and business and bureaucracy, are relevant barriers for UBC to a high or very high extent.

About 75% of surveyed companies belonging to IT sector consider that bureaucracy is relevant to a high or very high extent.

Overall, the surveyed companies belonging to service sector also consider relevant or very relevant for UBC the barriers described above, although in a less percentage than in the other two sectors.

Figure 5.12: UBC barriers. Breakdown by sector (in per cent)





Source: Own elaboration. Question: How relevant are the following barriers to higher education institutions-business cooperation? (1- Not at all, 7- To a very high extent). Responses grouped according to the following criteria: Nor or minor extent- 1 and 2. Medium extent- 3 and 4. High or very high extent- 5 and 7.

5.4 Outcomes and Impacts of University-Business Cooperation

Up to this point it has been analysed the more common UBC modes in the surveyed firms and the activities that might be important for them in future cooperation with high education institutions. Also, they have been asked about their point of view on the most important factors that can promote such cooperation and the relevant barriers they face when establishing relationship with high education institutions.

But UBC, at the end, is reflected in projects that have a tangible result and have impact on the activity of the company.

As detailed in Figure 1, the most common UBC activities are those related mobility of students (traineeships, recruitment...) and R&D.

A common feature of most R&D projects that require cooperation between universities and businesses is the existence of funding from the various administrations. This funding is essential, and comes from European or national public agencies. Nearly 95% of companies surveyed that provides information on R&D related to UBC, states that these projects are financed wholly or in part through funds from public administrations.

Many of these projects have results in the business field, with the creation of patents or the commercial exploitation in the products or services developed. However, the main result of UBC, as showed Figure 3, is related to the hiring of recent graduates who have previously completed an internship at the company. In the last 5 years, the companies surveyed have offered over 2,500 practices to students and recent graduates at the end of their studies. Many of them had serious chances of being hired afterwards.

This type of UBC facilitates the management of human resources because it reduces the cost associated to the recruitment process and the uncertainty related to the ability or aptitude of new employees (the company has information about the performance of young people as they have completed their traineeship in the firm).

But cooperation also extends to other areas. As shown in Figure 7, nearly 52% of companies surveyed indicated that their technical and / or management staff often collaborates in study, teaching and research activities. In fact, in the last 5 years more than 300 technicians and managers of the surveyed companies have usually collaborated with academia.

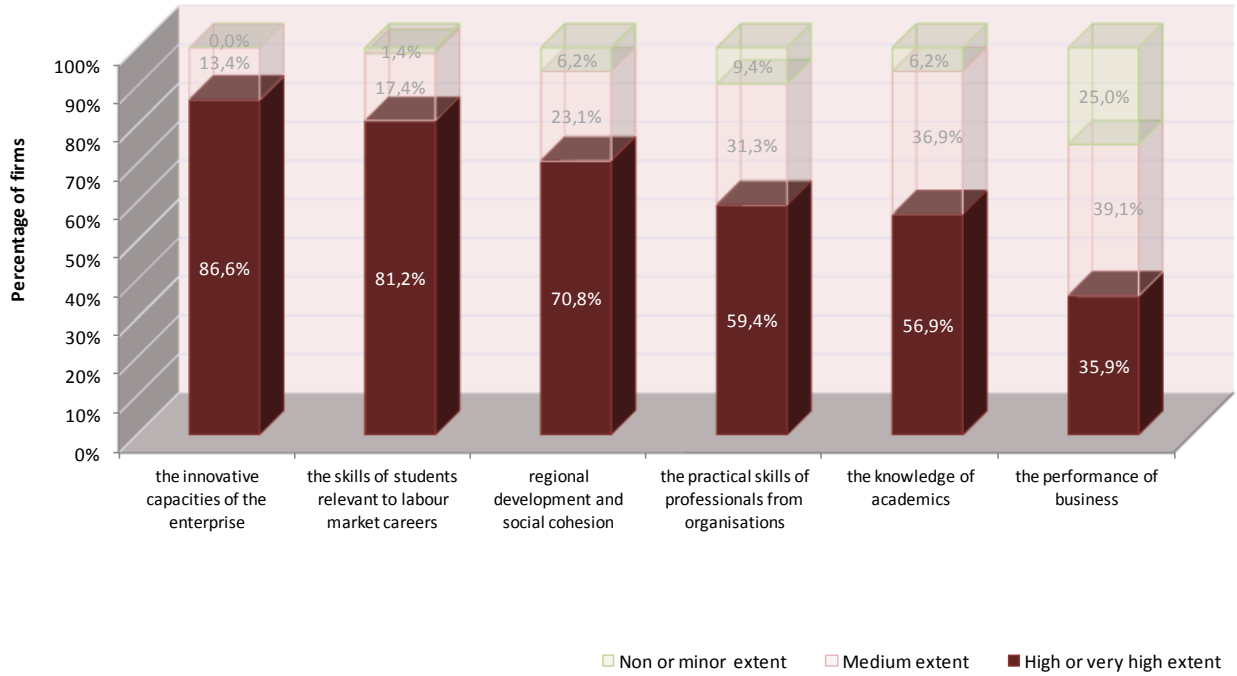
Another important result of UBC is the creation of start-ups and emerging businesses. According to the data provided by the companies surveyed, over the past 5 years, 12 of them created some start-up as a result of the collaboration with the university. Together, these companies created more than 25 of these start-ups during that period.

But the results of UBC go beyond that these merely tangible at enterprise level. The effects of this cooperation can be seen in other areas less explicit. For example, nearly 87% of companies surveyed agree or strongly agree with the idea that UBC improves significantly the innovative capacities of the enterprises, and more than 80% of them think that this type of cooperation importantly improves the skills of students relevant to labour market careers.

Meanwhile, 71% of companies surveyed agree or strongly agree that UBC importantly improves regional development and social cohesion. Regarding the practical skills of professionals from organizations and the knowledge of academic, about 60% of the companies in the sample think to a high or very high extent that this cooperation improves these areas.

However only 36% of companies surveyed agree or strongly agree that UBC importantly improves the performance of business.

Figure 5.13: Beneficial effects of UBC (in per cent)
Higher education institutions-business cooperation importantly improves…



Source: Own elaboration. Question: Please indicate to what extent you agree with the following statements... (1- Not at all, 7- To a very high extent). Responses grouped according to the following criteria: Nor or minor extent- 1 and 2. Medium extent- 3 and 4. High or very high extent- 5 and 7.

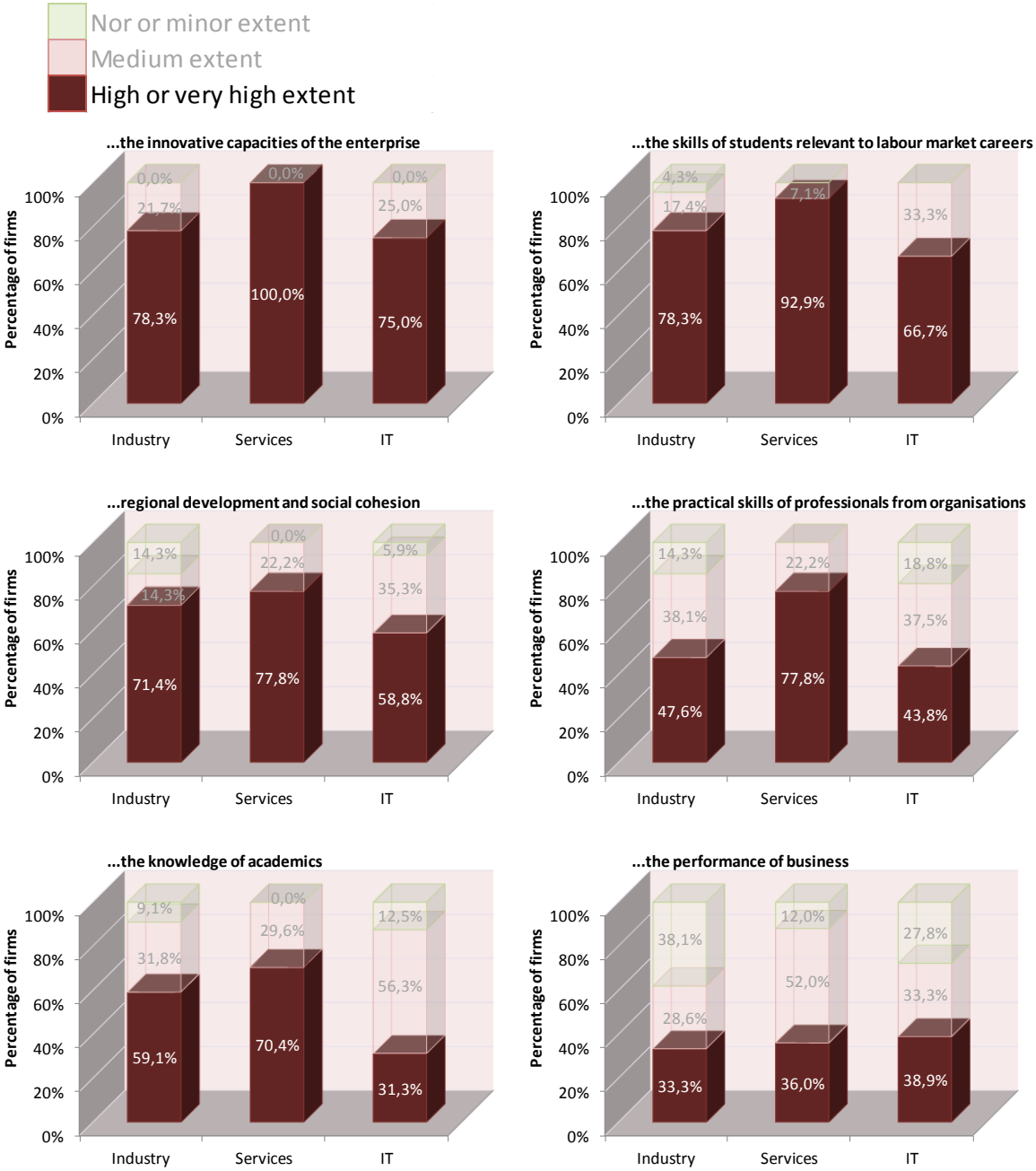
All surveyed companies belonging to the service sector considered to a high or very high extent that UBC significantly improves the innovative capacities of the enterprise. The rate stands at around 75% of industrial companies and those belonging to IT sector.

In addition, over 90% of these companies belonging to service sector indicated that UBC importantly improves the skills of students relevant to labour market careers to a high or very high extent. 78% of the surveyed industrial enterprises and 67% of those belonging to the field of new technologies also agree or strongly agree on this point.

Overall, more than 70% of companies in the service sector also agree with the ideas of the UBC importantly improves, to a high or very high extent, regional development and social cohesion, the practical skills of professionals from organizations and the knowledge of academics. That percentage drops among the surveyed companies within the industrial and IT sectors. Indeed only 44% of companies in the latter sector considered that UBC importantly improves the practical skills of professionals from organizations to a high or very high extent and only 31% agrees that this cooperation improves the knowledge of academics to that extent.

Finally, less than 40% of the surveyed companies from all sectors agree on the idea that UBC significantly improves the performance of business to a high or very high extent.

Figure 5.14: Beneficial effects of UBC. Breakdown by sector (in per cent)
Higher education institutions-business cooperation importantly improves...



Source: Own elaboration. Question: Please indicate to what extent you agree with the following statements... (1- Not at all, 7- To a very high extent). Responses grouped according to the following criteria: Nor or minor extent- 1 and 2. Medium extent- 3 and 4. High or very high extent- 5 and 7.

5.5 Enterprises Perception on Universities and University-Business Cooperation

As shown in Figure 5.11, among the barriers analysed hindering UBC, the companies surveyed identified as relevant or very relevant those related to the university and the differences between it and the business world, in terms of motivations and values, time horizons, bureaucracy, modes of communication etc.

In this regard, it is important to know the perception that companies have on the university and on the aspects that should be modified within these institutions in the field of UBC. This perception could provide guidance on how to reduce the barriers found by this type of collaboration.

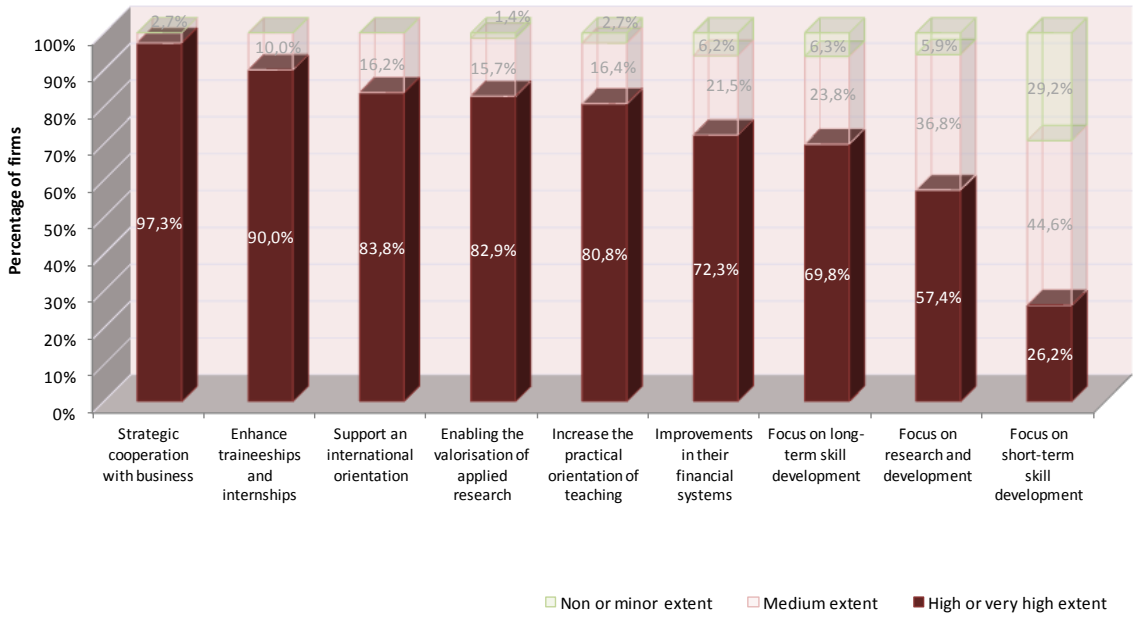
With regard to the changes that might be appropriate to implement within the university, it is noteworthy that almost 100% of the companies surveyed considered that strategic cooperation with business should be heavily modified to high or very high extent, and 90% believe it should be enhance traineeships and internships to a similar extent.

Over 80% of companies surveyed said that universities should support an international orientation, should enable the valorisation of applied research and would be wise to increase the practical orientation of teaching.

About 70% of companies surveyed consider that universities should improve their financial system and would also be necessary they to focus on long-term skill development. By contrast to the latter, only 26% of companies surveyed considered important that university focuses on short-term skill development.

Finally, almost 60% of companies surveyed indicated that it is important that university focus on R&D activities.

Figure 5.15: Perception of changes that university needs in the future (in per cent)

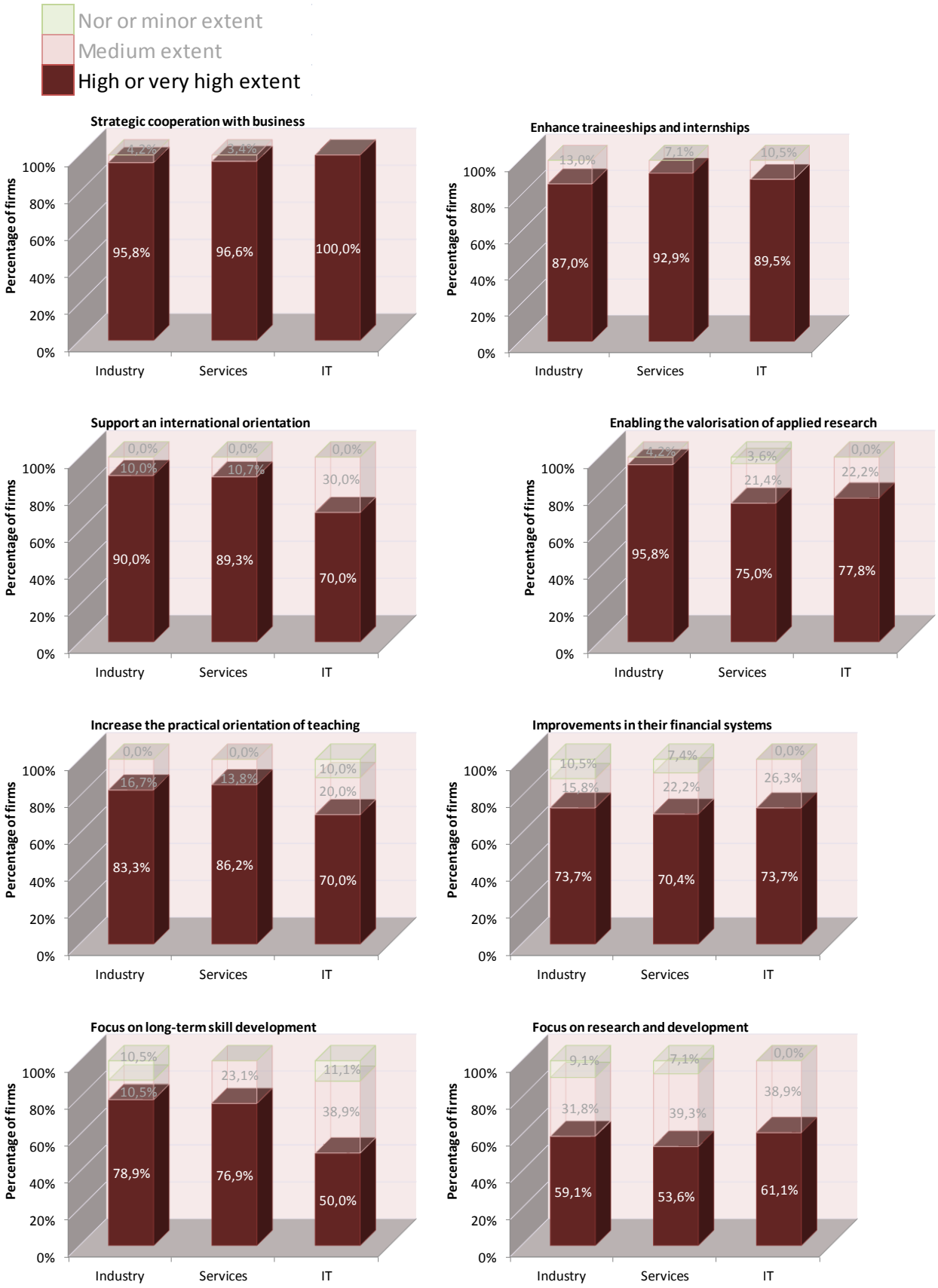


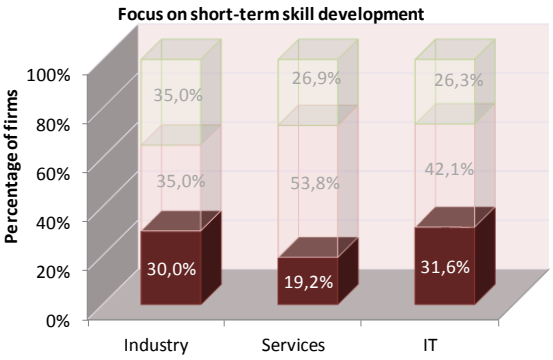
Source: Own elaboration. Question: In your view, to what extent should higher education institutions change in the future? (1- Not at all, 7- To a very high extent). Responses grouped according to the following criteria: Nor or minor extent- 1 and 2. Medium extent- 3 and 4. High or very high extent- 5 and 7.

The above results are generally applicable to each of the sectors analysed.

Just highlight that the greater interest shown by industrial companies in applied research is reflected in the high percentage of surveyed companies belonging to this sector considering that the university should enabling the valorisation of applied research. 96% of these companies, compared with 75% of companies belonging to the service sector and 78% of the surveyed companies in IT sector.

Figure 5.16: Perception of changes that university needs in the future. Breakdown by sector (in per cent)



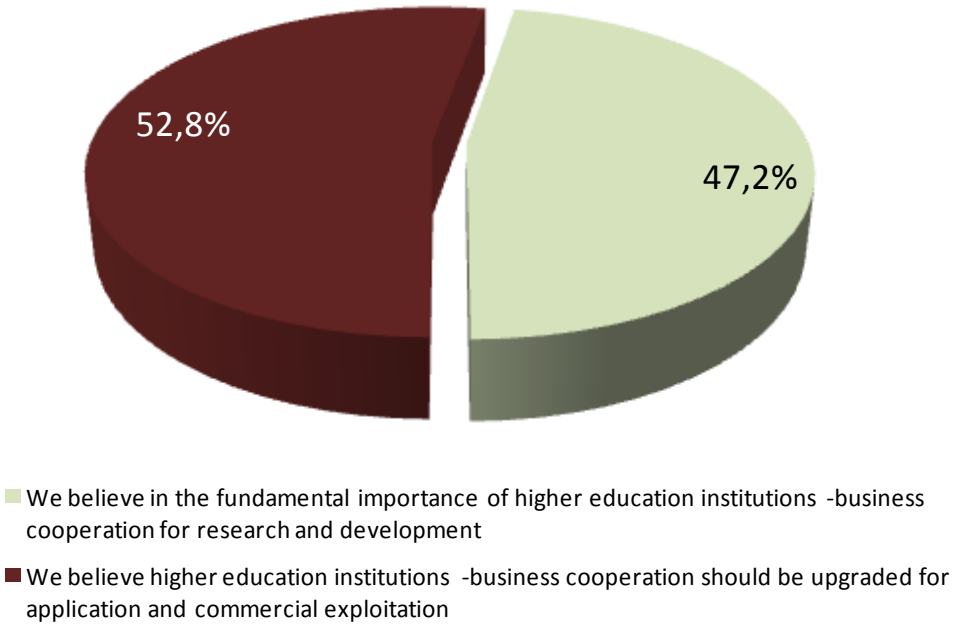


Source: Own elaboration. Question: In your view, to what extent should higher education institutions change in the future? (1- Not at all, 7- To a very high extent). Responses grouped according to the following criteria: Nor or minor extent- 1 and 2. Medium extent- 3 and 4. High or very high extent- 5 and 7.

Finally, about the opinion that companies have regarding UBC, It should be said that almost 53% of companies surveyed think that higher education institutions-business cooperation should be upgraded for application and commercial exploitation, while 47% of them believe in the fundamental importance of higher education institutions-business cooperation for R&D.

No companies consider that UBC should be limited to basic academic research, and also there are no companies that believe that higher education institutions and industry should remain separate.

Figure 5.17: Orientation of companies in terms of cooperation with university (in per cent)

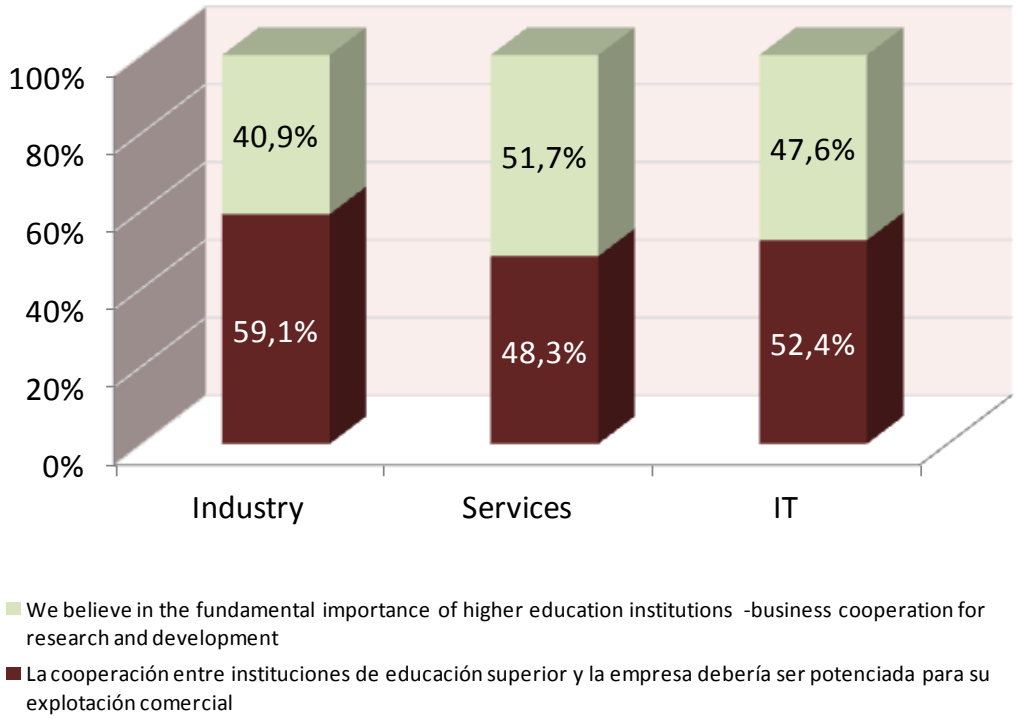


Source: Own elaboration. Question: Please indicate which statement describes the orientation of your enterprise: 1. We believe that higher education institutions and industry should remain separate; 2. We believe cooperation with higher education institutions should be limited to basic academic research; 3. We believe in the fundamental importance of higher education institutions -business cooperation for research and development; 4. We believe higher education institutions -business cooperation should be upgraded for application and commercial exploitation.

The results by sector are similar to those described in general terms. The surveyed firms in the service and IT sectors are distributed almost match, among those that believe that UBC is essential for R&D and those that believe that such cooperation should be upgraded for application and commercial exploitation.

Just point out that in the surveyed companies belonging to industry is substantially higher the percentage of companies that are more oriented to the second aspect (59% versus 41% who think that UBC is essential for R&D).

Figure 5.29: Orientation of companies in terms of cooperation with university. Breakdown by sector (in per cent)



Source: Own elaboration. Question: Please indicate which statement describes the orientation of your enterprise: 1. We believe that higher education institutions and industry should remain separate; 2. We believe cooperation with higher education institutions should be limited to basic academic research; 3. We believe in the fundamental importance of higher education institutions -business cooperation for research and development; 4. We believe higher education institutions -business cooperation should be upgraded for application and commercial exploitation.

5.6 Country Conclusions

UBC brings benefits to companies involved, which have effects in their activity and results. However there are profits affecting other areas that are difficult to measure.

Among the companies surveyed is noteworthy that the most common mode of UBC is the mobility of student, i.e., the direct hiring of final-year students or recent graduates, to offer internships in businesses... This UBC mode facilitates the management of human resources of the company because it reduces the uncertainty associated with the recruitment process.

Cooperation related to R&D is also important among companies surveyed, particularly those belonging to the industrial sector.

Going forward, however, from a global point of view, cooperation in R&D will be more important than that related to the mobility of students, contrary to what happens today.

There are UBC activities which boost research results and, to some extent, approach university to society. Collaboration of companies in these activities is mainly focused on the participation of business people in study, teaching and research activities. Over 50% of companies surveyed confirmed to work in this field. It is also important cooperation with business incubators. In this regard it is noteworthy that, overall, the surveyed companies created more than 25 start-ups over the past five years.

As previously seen, there are circumstances affecting UBC that in some cases boost this type of collaboration, while in others hinder it. Regarding the drivers that encourage UBC it should be pointed out the existence of mutual trust and commitment among companies and high education institutions, the interest of universities in the access to practical knowledge and the existence of shared motives among them.

From the point of view of the barriers faced by UBC, the most important for the companies surveyed are the following: different motivations and values between higher education institutions and business, different time horizons between them and the bureaucracy within or external to the higher education institutions.

Taking into account these barriers, in order to overcome them, surveyed companies believe that higher education institutions should, above all, modify strategic cooperation with business and they should enhance traineeships and internships. Also, high education institutions should support an international orientation and enable the valorisation of applied research. Also it is important the percentage of firms that believe

it would be wise high education institutions to increase the practical orientation of teaching.

Finally, as mentioned at the beginning of this section, the results of UBC go beyond that these merely tangible at enterprise level. For the companies surveyed, UBC improves significantly the innovative capacities of the enterprises, importantly improves the skills of students, relevant to labour market careers, and strengthens the regional development and social cohesion.

5.7 Case Studies Summary

In addition to the large scale survey, 10 case studies were conducted as an interview with some detail to a number of companies and organizations with experience in the field of UBC. This analysis has revealed several cases of success; it has allowed to identifying in detail the problems and threats that this kind of collaboration has got, it has shown how it is financed, etc.

The following entities have collaborated in this more detailed analysis:

1. Two industrial companies, one of them a world leader in its field of business.
2. Two consulting firms closely linked to R + D + i projects.
3. A service company whose activity is focused at university level.
4. A spin-off created by academics.
5. A public company that promotes the development of technology-based companies.
6. A trade association that represents companies and organism related to logistic value chain.
7. A research centre that promotes the creation and transfer of innovative business solutions.
8. An institution dedicated to promoting UBC.

Modes of UBC

The main UBC modes detailed by companies and institutions surveyed is the collaboration for R&D. Normally, theoretical research and implementation of techniques to test the validity of the product or application are made in the university. Later, once its validity is demonstrated in certain environments, the development goes to the

company, where it is implanted and tested the performance of the product or application in a commercial environment.

In some cases, university researchers can move to the company over a period of time for implementation and for working with technicians from the company. In other cases, the company is just dedicated to managing the process.

Another form of UBC very common, that companies and organizations interviewed refer to, is the offer of internships for students in their final year career and for recent graduates. Some of them become part of the staff of the company at the end of their traineeship period.

This is a beneficial policy for businesses because it minimizes the costs associated to the uncertainty involved to all recruitment process. The company reduces risks to hire a person who has already had a background for a period enough to know if he or she is suitable for the job or not.

There are also companies interviewed mentioning the involvement of technical and managerial staff of the company in university teaching. This happens, of course, in those companies interviewed with a strong link with the university (they are companies founded by university professors), but also in other companies that do not have a direct relationship with university, but in which employees have a technical profile.

Other forms of cooperation that also occur in some way are financing of business chairs in universities, creating university entrepreneurship programs or organizing employment forums at the universities.

A common feature in all these UBC modes is that they take place mainly in large and medium enterprises. Cooperation between universities and SMEs is more complicated. There are factors that make SMEs different from large companies: SMEs are atomized and they have different business model than large companies, SMEs have lower resources availability and they belong predominantly to service sector (this sector is less prone to this type of cooperation). Also, there is mutual ignorance between universities and SMEs that affects this type of cooperation.

UBC barriers

Interviewed organizations have identified different barriers:

Different time horizons between high education institutions and business. Usually the company has time expectations adapted to the business environment. Normally, these

expectations do not match those of higher education institutions when performing R & D projects. The high education institutions expectations are much extended over time.

Differences between the theoretical and practical areas. Academics carried out theoretical research in higher education institutions facilities, achieving results under certain conditions and assumptions. When moving research to the reality of the business, assumptions change and results too. In general, assumptions made in the theoretical research are not generally applicable to the reality and this is not always efficiently internalized by university researchers.

Difference of interest. Academics (higher education institutions) are interested in publishing the results of their research, while the company logically focuses on taking out a commercial profit to this research as embodied in generation of patents for commercial exploitation.

This point of view that higher education institutions have is difficult to change as researchers and academics are well-off and they are not subject to fluctuations in the economic situation (the most of them are civil servants). In fact they have no incentive to look beyond the publications and papers that provide them academic prestige. These differences are amplified when you consider that most of the academics have not worked in the business or private sector, so they ignore needs and goals of companies.

Bureaucracy. In recent years, it is observed an increase in the administrative and bureaucratic barriers that become an obstacle to UBC. New regulations that are being implemented, in many cases, are rigid and poorly adapted to reality. The bureaucracy required to the company when establishing some kind of collaboration with higher education institutions is important and, at times, compliance with the formalities has a significant cost in time (and money), which in some cases can slow or even halt the collaboration.

This red tape is multiplied when it is necessary to negotiate the distribution of intellectual property and royalties from the results of the research.

A clear example of the problems associated with bureaucracy appears when researchers are not allowed to start their work until grant is received, making difficult to comply with the deadlines set out in the project.

Different understanding of traineeships for students. The company claims that traineeships are offered to provide practical training to students, supplementing the theoretical training they receive in higher education institutions. But in some cases, in

certain university settings, such traineeships are seen as a supply of services by which the student should receive financial consideration. On this issue there is no common view within the higher education institutions themselves.

Commercial activity of higher education institutions. The majority of higher education institutions have not any commercial activity focus on the presentation of the research findings and their ability in the different areas of specialization. Because of this, sometimes the company does not find easily the appropriate department within the university when seeking advice.

Benefits from UBC

In most cases the benefits of UBC are evident for the company in the performance of its activity or when creating a patent, for instance. But in general, the results of this cooperation are essential for the technological development of the society as a whole. In this regard, in Spain, the Offices for Technology Transfer in universities (OTRIS) are a best practice that enables higher education institutions to present the results of research carried out to the whole society.

UBC enables companies to get in touch with the most advanced research through the knowledge transfer from higher education institutions to business. Also this type of cooperation helps the connection between real world of business and higher education institutions.

On the other hand, one of the most important benefits of UBC is, as described previously, the reduction of the uncertainty associated with the recruitment processes through traineeships.

Threats to UBC

Financial position of higher education institutions. It is noteworthy the financial situation in which higher education institutions are, due to the current economic crisis. Some years ago, UBC was a non- lucrative business for university. But now, higher education institutions have a difficult economic situation and they need revenues; so some type of economic profit is requested from this type of cooperation, sometimes in a very short period of time. This can hinder the establishment of collaborative agreements.

Sometimes there is mutual mistrust. Higher education institutions are sometimes reluctant to let a company to get commercial profit from their research findings.

Opposite to that, in the firm there exists the temptation to get a commercial profit from a good idea or from a research carried out in high education institutions at under-cost.

Higher education institutions are reluctant. There exists a field into the higher education institutions reluctant to implement new training systems and to open its use for businesses. At least, younger academics are more open minded, so it is expected that the renewal of higher education institutions can introduce "fresh air" into this kind of cooperation.

Resulting from the investment. Not all companies are willing to make the necessary investment to put in value the results of R&D projects. Indeed, for most of companies and organizations interviewed, the main weakness they have identified in UBC projects related to R&D is the investment needed to obtain acceptable business results.

In the field of SMEs, when the required investment is large, it can be met only through the participation of several companies in the project. If the case, SMEs will usually be competitors so they will try to put obstacles when providing information in order to prevent any company of the consortium to have a profit, although it was beneficial for the project.

UBC funding

Normally, the main source of funding for UBC comes from the company concerned, which often engages the services of the higher education institution. Obviously, the company expects to recover the investment through commercial exploitation of the research undertaken by academics.

However, there are many opportunities to present common proposals to projects funded by national and European public administrations. In this case, company and higher education institution provide a project proposal jointly. At the end, project revenues are divided among the partners according to the assigned workload.

UBC. Past, present and future

In Spain, UBC have 40 years' strong background, although it has been in recent times when it has achieved greater prominence and visibility.

In the whole country there are more than 30 organizations promoting UBC. They are institutionally linked to higher education institutions and to more than a thousand

organizations among which there are companies, chambers of commerce, business associations and public bodies belonging to local and regional governments. These institutions share a common goal: promotion and development of channels of knowledge, dialogue and collaboration between higher education institutions and firms.
The existence of these institutions ensures a bright future for the UBC in Spain, laying the foundation for a culture of collaboration that is now recognized as essential for overcoming the economic crisis and beginning a growth in the context of a more sustainable economic model.