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The Intensity of University-Business Collaboration in the EU[1]

Abstract: It seems that collaboration between academia and the private sector represents one of important sources of knowledge transfer, which is a key element for creating the knowledge-based economy. Moreover, knowledge transfer between universities and businesses is vital for innovation. The ability to create innovations is not only crucial for the development of enterprises but also for the development of a country's economy. Business is interested in having access to the latest advances in science. On the other hand, activities of university are evolving from the basic functions of teaching and research to commercialisation of research results where the partnership with the private sector is one of the most important elements. Although there are numerous advantages of such collaboration, in reality, there are also constraints that hinder university-business cooperation.

The main purpose of the article is to present selected aspects of the intensity of university-business collaboration in the Member States of the European Union (EU). In the first section of this article, advantages of and barriers to university-business cooperation are discussed. In the second part, the discussion addresses the following factors: public-private co-publications per million population and the share of enterprises cooperating with academia. The ranking of the top universities that work with the most innovative firms is also presented in the article.

The reflections will be based on the study of literature, European reports and documents. The main axis of investigation is a comparative analysis which draws its data from the Eurostat database.

It is concluded that significant differences exist among the Member States – in countries such as Denmark, Sweden or Finland science-business relations are at a good level. Furthermore, it seems that in the Member States of the EU large companies are more likely to engage in collaborations with higher education or public research institutions than small and medium-sized enterprises (SMEs).

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Keywords: university-business cooperation, higher education, European Union
JEL: I2, I25, O3

1. Introduction

Collaboration between academia and the private sector represents one of important sources of knowledge flows. Moreover, knowledge transfer between universities and businesses is crucial for innovation. In situations where products and services whose value depends to a great extent on knowledge dominate the market, companies are forced to continually innovate in all aspects of their operations. It causes business to be interested in having access to the latest advances in science. On the other hand, the role of university is changing. Nowadays, activities of university are evolving from the basic functions of teaching and research to commercialisation of research results where the partnership with the private sector is one of the most important elements. Although there are numerous advantages of such collaboration, in reality, there are also constraints that hinder university-business cooperation.

What are advantages of and barriers to university-business cooperation? Does university-business cooperation exist in the European Union (EU)? This paper endeavours to answer these questions. The main purpose of the article is to present selected aspects of the intensity of university-business collaboration in the Member States of the EU.

The reflections will be based on the study of literature, European reports and documents. The main axis of investigation is a comparative analysis which draws its data from the Eurostat and the OECD[2] databases. Due to a multifaceted nature of the subject discussed, reflections have been narrowed down to selected indicators only.

2. Discussion of advantages of and barriers to university-business cooperation

Contemporary socio-economic phenomena have permanently changed the perception of the world. The way we perceive and think about mutual relationships between science, economy and society has changed. In the context of development of the knowledge-based economy, the creation of new technologies, efforts to create socially useful innovations as well as the dynamic development of the knowl-

[2] OECD – Organisation for Economic Co-operation and Development.

edge-based industry and services have all grown in significance. It seems that closer links between business and academia can encourage the transfer and sharing of knowledge as well as drive innovation, entrepreneurship and creativity.

For a long time, the European Commission (EC) has been recommending building closer links between universities and businesses. It seems that this attitude is inspired by the American successful experience with the cooperation between academia and business. Many American universities, such as Stanford or Massachusetts Institute of Technology (MIT), have been financed by business, and thus have nowadays become global research centres. The importance of university-business cooperation has been underlined many times in European documents. For instance, more than ten years ago, in one of communications (connected with the Lisbon Strategy), the EC identified the importance of improving knowledge transfer between public research institutions and business as one of key areas for action (European Commission, 2007a). In 2008, the EC published its *Recommendation on the management of intellectual property in knowledge transfer activities and code of Practice for universities and other public research organisations*. This document recommends, in particular, that all public research bodies (including universities) should treat knowledge transfer as a strategic mission, providing free access to research results where possible, and if required, the necessary protection of intellectual property (European Commission, 2008). Another European document, *an agenda for modernising the EU's higher education systems*, stressed that: "the contribution of higher education to jobs and growth, and its international attractiveness, can be enhanced through close, effective links between education, research and business – the three sides of the 'knowledge triangle'" (European Commission, 2011: 7). Science-business cooperation is also promoted in the framework of *smart growth*, which is one of three key priorities of Europe 2020 strategy. The EC points out that successful university-business collaboration can lead to a number of advantages not only for society at large but also for the local economy. These benefits include new jobs, new products on the market and better education (European Commission, 2007b).

Nowadays, the role of university is changing, it has "evolved from a simple *knowledge factory* interested in innovative outputs to *an entrepreneurial-relational university* active in the region" (Dan, 2013: 67). With reference to that aspect, the main functions of university are not only teaching and research but also commercialisation of research results. Due to the important role of universities in society, in a country's economy and innovation system, partnerships with business are desired. The European Commission underlines also that benefits for research institutions resulting from knowledge transfer to industry should not be narrowed down to financial ones. It points out that the main benefits are indirect and should be considered in the longer term. They include for instance: the development of mutual trust between a given research institution and industry, which is beneficial

to the establishment of long-term strategic partnerships, improved understanding of market needs and industry problems; gaining status and prestige (resulting from successful partnerships); the enhancement of research institutions' teaching activities (e.g.: involvement of industry-based lecturers) or the identification of potential new clients or partners for further research (European Commission, 2007b). Further benefits for universities are as follows: enhancing the recognisability of universities among employers and candidates as well as improving the quality of education and research (Bryła, Jurczyk, Domański, 2013a). It is important to emphasise that many more advantages for universities were indicated in the literature, among which three categories of advantages may be distinguished, i.e. of economic nature (e.g.: obtaining additional funds for R&D), of organisational nature (e.g.: the possibility of mutual exchange of knowledge between partners), and of strategic nature (e.g.: protection of research results against competition) (Pleśniarska, 2016).

M.C. Dan notes that apart from benefits of the cooperation with business, there are also threats such as: the bureaucratic structure of a university, a lack of specialised staff in the marketing departments or technological transfer offices, and high administrative costs. Moreover, there is a risk that "the external financier can impose special research topics which can restrict the research freedom, or facilitate a brain drain, where professors and researchers move to the private sector because of attractive incentives" (Dan, 2013: 71).

It is generally agreed today that a company is interested in the achievement of economic success based on competitive advantages. These may be developed internally through investments in R&D or they may be obtained from external sources (e.g.: from the university). Furthermore, the most important business benefits of collaborating with universities include also: the reduction of both costs and business operation risk, using the university as a source of ideas, promoting a given company's image as an attractive partner, networking with the academic community, as well as the development of new products and services (Bryła, Jurczyk, Domański, 2013a). M.C. Dan (2013) notes that among advantages of cooperation, there are also: the speed-up of the innovation process, the reduction of stage duration (e.g.: reducing the time between a product idea and the introduction of the product into the market), as well as project-related cost and risk sharing.

In the literature, benefits coming from university-business cooperation have often been emphasised. Studies of the following researchers should be mentioned: A.N. Link, J. Rees (1990) note that productivity of business R&D increases with university participation in the R&D process, D.P. Leyden and A.N. Link (2013) observe that a business's economies of technological scope increase with university involvement.

However, this collaboration presents also some risks which concern: coordination and information problems (each party has its own hierarchy and bureaucra-

cy, hence coordination of a joint projects may be negatively influenced by internal procedures) or commercialisation of results (there is a risk that one part will use the results obtained for its own purpose). It is worth emphasising that science-business cooperation also has a positive impact on a given country's economy, especially through the increase of the country's scientific potential, the development of knowledge-intensive sectors and the creation of a modern employment structure (e.g.: *knowledge workers*) (Pleśniarska, 2016).

In spite of a number of existing benefits resulting from mutual partnership for both sides, several barriers which limit effective cooperation should also be mentioned. First of all, a discrepancy between interests and needs of both sides should be pointed out. Universities strive for the development of science as such, meanwhile business is mainly focused on the development of new products and/or services. Thus, the aim of university is not only the development of teaching or conducting research but also gaining recognition and prestige in society. In contrast, enterprises are interested in becoming successful in the market, realising their business goals as well as obtaining profit from selling new products (Santarek, 2008).

Table 1. Barriers to university-business cooperation

Barriers to university-business cooperation (selected)	Universities	Enterprises
Problems related to the management of intellectual property rights	+	+
A lack of adequate infrastructure and financial resources	+	+
A lack of interest in cooperation	+	+
Workload of scientists (their own research and/or teaching activities)	+	–
Fears of accusing the university of promoting technological solutions of a given company	+	–
Confidentiality of results	–	+
Difficulties to estimate the value of cooperation	–	+
Differing time horizons and motivation	+	+
Differing mode of communication	+	+
A lack of awareness of opportunities arising from university-business cooperation	+	+
Limited ability of business to absorb research findings	–	+
No appropriate initial contact person	+	+

Source: own elaboration based on: Bryła, Jurczyk, Domański, 2013b: 11; *Barriers and Drivers in European University-Business Cooperation*, 2012: 6

It should be emphasised that in the literature there are mentioned many types of barriers to university-business collaboration. Scientists (El Amoud, Ó'Tuama, 2014) pointed out the following types of barriers: cultural barriers, structural barriers, financial barriers, and career-oriented barriers. Apart from cultural or financial barriers, P. Bryła, T. Jurczyk, T. Domański (2013b) also mention legal barriers

and organisational behaviour barriers. It seems that one of the most important ones (apart from financial barriers) are relational barriers (barriers that relate to or affect a relationship or interactions, e.g.: no appropriate initial contact person). It is important to emphasise that there are barriers on both sides – universities and/or enterprises (Table 1).

O. Belkhodja and R. Landry (2007) note in their research on the *Triple-Helix collaboration* that the impediments to collaboration refer also to institutional and contextual barriers, for example: a lack of partnerships and networks that link researchers and users; not many firms around in the region; a lack of access to venture capital; and a lack of academic rewards for dissemination work.

However, it seems that establishing closer collaboration between universities and business requires not only the removal of the barriers but essentially the recognition of the benefits of this relationship by both partners.

3. University-business collaboration in the Member States of the EU

According to the latest CIS 2014[3], nearly half of enterprises carried out innovation activities in the EU (49.1%). The highest proportions of enterprises conducting innovation activity were recorded in Germany (67% of enterprises), Luxembourg (65.1%) and Belgium (64.2%), ahead of Ireland (61%), the United Kingdom (60.2%) and Austria (59.5%), while less than 30% of enterprises carried out innovation activities in Romania (12.8%) and Poland (21%), followed by Latvia (25.5%), Hungary (25.6%), Bulgaria (26.1%) and Estonia (26.5%). Enterprise innovation is largely based on cooperation of companies with other partners. The OECD's definition (2015) states that *collaboration* involves active participation in joint innovation projects with other organisations. It seems that cooperation is a key conduit for innovation-related knowledge flows. There is also a great synergy in cooperation because partners learn from each other. It is apparent from the figures presented (Table 2) that more than 20% of enterprises that are innovative (from each country) cooperated with universities in Finland, Slovenia, Belgium and Austria in 2014. However, in 18 Member States of the EU (including Poland), the percentage of that kind of enterprises was below the EU average (13.2%). Bulgarian firms virtually do not cooperate with universities or other higher education institutions (only 3.9%). The highest proportions of enterprises co-cooperating with research institutes was recorded in Finland (18%), Belgium (14.4%) and Slovenia (14%).

[3] The Community Innovation Survey (CIS) is a survey regarding innovation activities in enterprises. CIS 2014 was carried out in 2015 and data were released in 2017.

Table 2. The share of enterprises cooperating with academia or research institutes in the EU* (%)

	Enterprises co-operating with universities or other higher education institutions		Enterprises co-operating with government, public or private research institutes		Enterprises engaged in any type of co-operation	
Country/year	**2012**	**2014**	**2012**	**2014**	**2012**	**2014**
Austria	21.8	22.7	13.4	11.9	43.0	50.6
Belgium	18.5	20.4	13.9	14.0	52.2	56.4
Bulgaria	4.5	3.9	2.8	1.7	16.6	20.6
Croatia	14.7	8.0	10.2	4.4	34.9	28.7
Cyprus	4.6	6.0	4.6	4.3	52.8	38.2
Czech Republic	14.6	12.2	5.9	5.7	37.3	33.0
Denmark	14.9	15.4	11.1	6.8	41.5	38.2
Estonia	10.8	14.6	5.0	9.5	43.4	57.0
Finland	26.1	23.0	22.9	18.0	36.1	38.2
France	11.6	12.2	8.5	8.4	34.8	35.8
Germany	14.3	14.1	9.9	10.0	23.7	21.8
Greece	19.0	9.9	16.1	6.5	38.2	40.0
Hungary	18.1	12.3	6.8	4.5	41.1	38.5
Ireland	12.1	11.0	4.9	5.8	31.2	31.2
Italy	5.6	7.0	2.9	3.7	12.7	19.5
Latvia	7.7	7.3	7.4	5.3	25.4	24.1
Lithuania	18.9	8.0	11.7	4.8	44.5	44.6
Luxembourg	7.0	11.0	7.7	10.4	20.5	23.9
Malta	5.0	4.0	2.5	2.6	16.4	15.4
Netherlands	11.0	14.5	7.8	7.6	33.6	38.5
Poland	10.5	10.6	8.9	9.0	31.3	28.2
Portugal	9.5	9.2	6.7	5.0	18.9	19.2
Romania	4.9	12.2	7.6	7.4	24.4	30.6
Slovakia	12.7	12.8	5.3	5.9	38.3	48.5
Slovenia	25.4	19.9	19.4	14.4	50.1	44.5
Spain	10.3	10.9	11.5	13.7	29.3	32.1
Sweden	17.6	15.3	11.3	n/a	30.1	32.9
United Kingdom	19.6	18.9	11.3	11.6	66.7	61.4
EU 28	13.0	13.2	8.9	n/a	31.2	33.1

* As a percentage of product and/or process-innovating firms; n/a – not available.

Source: own elaboration based on Eurostat

It seems that collaboration with higher education or public research institutions constitutes an important source of knowledge transfer for large firms. They are more likely to engage in cooperation with those partners than small and medium sized enterprises in the EU (Table 3). According to the EU's average, one in ten small enterprises and every third of large firms that are innovative engaged in col-

laboration with universities. It is important to emphasise that differences between the Member States in the EU are significant. Among small-sized firms in Cyprus only 2% engage in collaboration with universities, while 18% in the UK. More than 30% of Finnish medium-sized enterprises and nearly 70% of large firms that innovate collaborate with a higher education institution, while accordingly 4% of medium-sized firms and only 8.5% of large enterprises in Bulgaria are involved in such cooperation. It is apparent from the figures that in 2014 in Poland among large firms every fifth cooperated with a higher education institution and every fourth with a research institution.

Table 3. Enterprises cooperating in the area of innovation with higher education or research institutions, by firm size* (%)

Firm size	Enterprises co-operating with universities or other higher education institutions						Enterprises co-operating with government, public or private research institutes					
	10–49 employees		50–249 employees		250 or more		10–49 employees		50–249 employees		250 or more	
Country/ /Year	2012	2014	2012	2014	2012	2014	2012	2014	2012	2014	2012	2014
Belgium	14.6	16.3	22.8	24.5	42.2	44.9	11.6	12.0	15.2	14.5	32.6	33.3
Bulgaria	3.6	3.0	4.6	4.0	9.8	8.5	2.3	1.7	2.4	1.7	7.2	2.1
Czech Republic	9.1	7.7	22.3	15.5	28.7	28.7	3.6	4.1	9.4	5.9	10.7	13.7
Denmark	10.1	11.1	19.3	18.7	40.0	44.0	8.5	3.7	12.7	9.6	26.7	25.0
Germany	10.3	10.4	18.4	17.4	40.1	36.2	7.0	7.6	13.4	11.2	28.2	27.8
Estonia	8.8	10.6	13.0	16.8	27.9	36.8	3.5	7.8	7.1	10.5	13.4	19.3
Ireland	9.3	8.4	14.8	13.8	31.7	28.3	3.9	4.3	6.0	6.7	11.6	18.5
Greece	16.1	6.3	28.7	22.5	49.7	39.6	13.2	4.0	25.7	14.7	44.2	29.0
Spain	7.2	8.2	13.3	13.0	28.5	27.3	8.2	10.3	15.6	17.7	28.0	29.6
France	8.0	8.4	15.1	16.2	31.9	33.8	6.1	5.7	10.3	11.3	23.0	24.2
Croatia	11.1	4.3	15.4	11.7	35.0	30.7	6.0	3.0	13.8	5.2	27.9	14.0
Italy	4.4	5.0	6.9	10.9	26.0	27.4	2.5	2.9	3.2	5.0	12.6	14.8
Cyprus	3.8	2.0	5.4	17.8	14.3	19.2	4.1	2.8	7.6	8.4	0	11.5
Latvia	5.9	4.4	9.3	8.6	19.2	18.0	5.2	3.6	10.9	5.4	14.4	13.9
Lithuania	17.2	6.5	19.0	8.7	30.9	18.5	9.4	3.6	13.0	5.8	22.0	12.3
Luxem-bourg	4.8	8.4	7.2	12.8	27.4	27.8	5.5	8.4	8.7	11.1	22.6	26.0
Hungary	11.8	9.1	21.1	13.6	40.4	29.2	4.9	4.2	6.9	4.1	15.0	7.7
Malta	1.7	3.3	12.0	4.3	8.3	9.5	1.7	2.7	5.3	1.4	0	4.8
Netherlands	9.2	11.9	13.6	18.0	27.6	31.1	6.7	6.5	9.4	8.2	19.3	18.7
Austria	15.9	15.5	26.1	29.9	51.3	56.8	9.8	8.0	15.0	14.4	33.8	34.5
Poland	4.6	6.2	12.7	11.9	26.0	23.7	4.0	5.0	10.6	11.2	22.2	18.9
Portugal	5.3	5.9	17.0	15.4	40.6	35.5	4.3	3.1	10.9	8.2	24.4	20.8
Romania	2.8	13.6	4.5	8.6	13.9	10.4	5.4	8.2	7.3	5.9	16.5	5.7

Firm size	Enterprises co-operating with universities or other higher education institutions						Enterprises co-operating with government, public or private research institutes					
	10–49 employees		50–249 employees		250 or more		10–49 employees		50–249 employees		250 or more	
Country/ /Year	2012	2014	2012	2014	2012	2014	2012	2014	2012	2014	2012	2014
Slovenia	16.2	11.5	36.4	30.7	49.8	43.7	13.5	9.8	26.5	18.6	34.9	33.3
Slovakia	9.4	7.4	14.0	15.8	25.0	33.2	3.6	2.9	6.9	8.4	9.3	15.5
Finland	19.1	16.0	32.9	32.5	68.2	68.8	15.8	11.0	29.7	27.7	64.2	63.6
Sweden	14.5	11.6	21.5	19.6	45.0	47.0	n/a	n/a	13.6	n/a	34.0	34.4
United Kingdom	19.4	18.6	19.6	19.3	22.8	22.5	11.3	11.4	10.3	11.6	15.8	14.4
EU–28	10.0	10.2	16.4	16.6	33.9	32.6	n/a	n/a	11.2	n/a	23.7	23.1

* As a percentage of product and/or process-innovating firms; n/a – not available.

Source: own elaboration based on Eurostat

The review of studies has revealed that universities are more likely to collaborate with industry if a given firm is mature and large as well as engaged in exploratory internal R&D, and if there is a lack of intellectual property issues between the business and the university (Cunningham, Link, 2015: 852).

Moreover, T. Baaken et al. (2015: 20) presented very interesting findings from their research on the development of University-Business Cooperation (UBC) both in Poland and in Germany. They note that Poland is generally lagging behind Germany in respect to the development of UBC (although German universities started carrying out UBC activities earlier in time), that both countries differ in the approach when interacting with business (German universities focus on research-related UBC, whilst Polish universities focus on education-related UBC), that Polish university managers and academics do not seem to perceive important reasons for undertaking cooperation with business, and that all UBC supporting mechanisms, UBC strategies, as well as UBC structures are more developed in Germany than in Poland.

Table 4 presents the indicator which shows public-private research linkages and active collaboration activities between business sector researchers and public sector researchers resulting in academic publications. On average, there are 33.9 public-private scientific co-publications per million population in the EU. However, there are large differences between the countries. In Denmark and Sweden, there are more than 100 co-publications per million population. At the other extreme, there are fewer than two public-private scientific co-publications per million population in Latvia and Lithuania. Moreover, the number of co-publications in 2015 was below 10 in 11 of the Member States of the EU.

Figure 1 shows that public-private scientific co-publications have been decreasing in 18 countries in the EU (–0.1%) and increasing in 10 countries. In four

countries, Ireland, Poland, Austria and Denmark, they have been growing at more than 2%. At the other extreme, strong declines (more than 10%) can be observed for Estonia, Lithuania and Latvia.

Table 4. Public-private co-publications per million population in the EU

Country/Year	Public-private scientific co-publications per million population							
	2008	2009	2010	2011	2012	2013	2014	2015
Belgium	69.0	69.0	64.0	68.2	75.6	69.0	72.5	68.5
Bulgaria	2.8	2.8	3.9	3.1	4.3	2.9	1.6	2.1
Czech Republic	23.0	23.0	25.3	25.6	27.7	19.4	16.6	13.8
Denmark	122.4	122.4	123.2	156.5	161.7	143.9	142.1	143.5
Germany	48.1	48.1	54.4	57.0	60.5	57.0	55.0	53.0
Estonia	22.4	22.4	24.0	24.8	19.6	12.8	12.1	6.8
Ireland	26.2	26.2	24.3	30.6	29.1	32.1	29.6	34.3
Greece	12.6	12.6	12.9	13.6	14.7	11.5	9.2	9.9
Spain	16.6	16.6	17.6	19.6	23.0	20.5	19.2	16.3
France	36.4	36.4	37.6	40.0	42.7	40.7	40.3	39.6
Croatia	21.1	21.1	24.4	28.6	31.0	23.2	14.3	10.6
Italy	21.7	21.7	24.8	26.7	27.6	23.0	21.8	18.0
Cyprus	6.4	6.4	17.6	28.1	21.4	18.6	12.7	7.0
Latvia	1.4	1.4	3.2	1.9	1.9	1.0	0.5	0.5
Lithuania	5.0	5.0	7.5	8.6	9.2	4.0	2.4	1.7
Luxembourg	39.3	39.3	30.4	35.9	31.3	34.3	33.5	40.0
Hungary	21.2	21.2	23.0	26.8	23.7	20.7	21.7	23.2
Malta	4.9	4.9	4.9	7.2	4.8	4.8	4.7	2.4
Netherlands	85.9	85.9	87.3	101.8	110.2	93.8	90.5	85.6
Austria	50.2	50.2	58.3	63.1	63.9	58.5	54.2	59.0
Poland	3.0	3.0	2.9	4.4	4.7	3.6	3.6	3.7
Portugal	8.6	8.6	9.0	11.3	13.5	9.5	8.1	7.1
Romania	5.1	5.1	7.0	8.4	8.3	4.8	4.2	2.6
Slovenia	58.2	58.2	68.9	74.7	93.2	63.2	68.5	66.0
Slovakia	10.8	10.8	11.1	14.3	13.0	10.5	7.4	8.1
Finland	91.9	91.9	89.4	85.6	86.5	76.8	70.6	69.9
Sweden	112.7	112.7	114.3	117.4	124.8	115.0	107.2	107.8
United Kingdom	53.3	53.3	56.2	59.3	62.2	56.9	53.2	50.2
EU	34.1	34.1	36.4	39.2	41.6	37.3	35.7	33.9

Source: *European Innovation Scoreboard* (2016) database

In 2017 The Times Higher Education published an interesting list of the top universities that work most with innovative firms (those listed by Clarivate Analytics[4]). The Netherlands' Eindhoven University of Technology has topped the list

[4] Clarivate Analytics published the 2016 edition of its annual Top 100 Global Innovators. This report lists the most innovative companies and institutions based on patents using measures such as volume, success and globalisation influence. The USA (39) and Japan (34) have the highest num-

of the universities that have co-authored the most papers with the world's most innovative organisations (Table 5). The Top 25 list includes three more Dutch institutions and one each from Belgium, France and the United Kingdom (The Times Higher Education, 2017). In the ranking, mainly universities from the USA were listed.

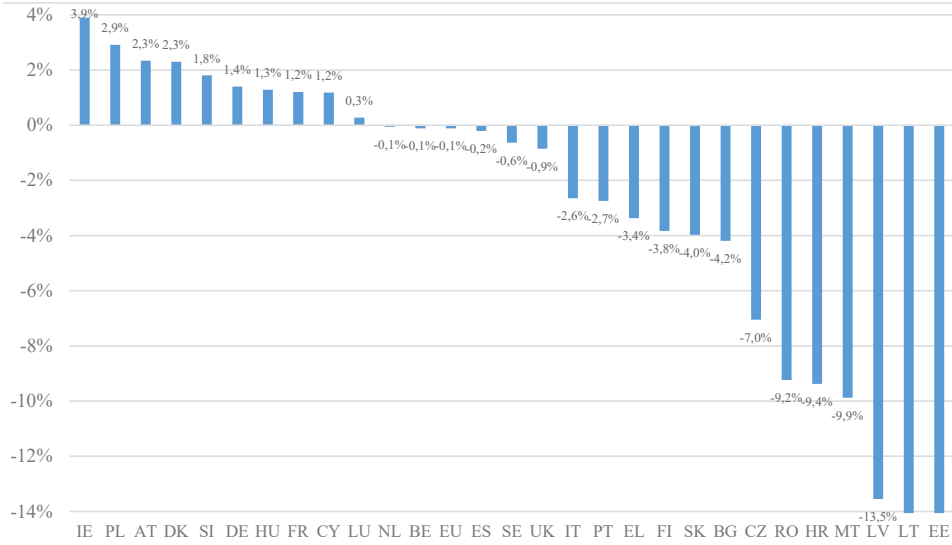

Figure 1. Average annual growth rate for public-private scientific co-publications per million population in the EU

Source: own elaboration based on: *European Innovation Scoreboard* (2016) database

Table 5. A selective ranking of universities working most with innovative firms with reference to the EU only

Rank	University	Country	Web of Science documents	Category normalised citation impact
1	Eindhoven University of Technology	Netherlands	1,316	1.55
9	Delft University of Technology	Netherlands	671	2.21
12	KU Leuven	Belgium	607	2.93
16	University Paris-Saclay (ComUE)	France	554	2.11
20	Utrecht University	Netherlands	506	1.75
21	University of Amsterdam	Netherlands	505	1.92
22	University of Cambridge	England	504	2.97

Source: own elaboration based on The Times Higher Education

ber of institutions/organisations on this list, the EU has 19. In the EU, France is the leading country with 10 companies/organisations, followed by Germany with 4 and the Netherlands with 2. Ireland, Sweden and Finland each have one company on the list.

4. Conclusions

It is commonly believed that there are measurable benefits resulting from science-business collaboration. However, it seems that barriers on the side of both universities or research institutes and enterprises are constantly being identified. For many years, the European Commission has been recommending creating closer links between the previously mentioned partners. However, it seems that the intensity of collaboration between academia and enterprises in the EU is extremely diversified among the Member States. With reference to the above, several conclusions can be drawn:

1. A significantly bigger percentage of innovative large enterprises engages in cooperation with universities or research institutes than of small and medium-sized companies. This trend refers to almost all the EU Member States.
2. On average, one in ten small innovative firms in the EU undertakes cooperation with universities. Moreover, every third large enterprise undertakes such cooperation.
3. There are significant discrepancies among the countries not only when it comes to the percentage of innovative enterprises which cooperate with universities or research institutes but also with reference to public-private scientific co-publications per million population.
4. The countries which stand out among the EU Member States in a positive way are: Finland, especially with reference to the intensity of the above-mentioned cooperation, as well as Denmark and Sweden, in terms of the number of co-publications. Bulgaria stands out in a negative way because it ranked the lowest regarding both of the previously mentioned indicators.

The intensity of university-business cooperation in the EU does not seem to be high enough. In some countries (e.g.: Bulgaria, Romania, Poland), it is downright marginal. In the context of development of the knowledge-based economy, creating permanent connections between universities and enterprises seems to be a highly desired phenomenon in the EU.

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Intensywność współpracy uniwersytetów z biznesem w Unii Europejskiej

Streszczenie: Współpraca między uczelniami a sektorem prywatnym jest jednym z istotnych źródeł transferu wiedzy. Przepływ wiedzy ma duże znaczenie zarówno w kontekście tworzenia gospodarki opartej na wiedzy, jak i rozwoju innowacyjności. Współcześnie zdolność do kreowania innowacyjnych rozwiązań jest ważna nie tylko w aspekcie rozwoju przedsiębiorstw, ale także całej gospodarki danego kraju. Wydaje się zatem, że firmy zainteresowane są posiadaniem dostępu do najnowszych wyników badań naukowych. Natomiast zmieniająca się rola uczelni powoduje, że jej działalność nie koncentruje się wyłącznie na realizacji procesu nauczania i na prowadzeniu badań, ale także na komercjalizacji wyników badań naukowych. Dla powodzenia tej ostatniej istotne jest zatem podejmowanie współpracy z biznesem. Mimo korzyści wynikających ze współpracy obu podmiotów wydaje się, że w rzeczywistości istnieją znaczne ograniczenia w tym zakresie.

Głównym celem artykułu jest próba przedstawienia intensywności współpracy między uniwersytetami a biznesem w państwach członkowskich Unii Europejskiej. Ze względu na obszerność tego zagadnienia rozważania zostaną ograniczone tylko do wybranych aspektów. W pierwszej części artykułu omówiono zagadnienie współpracy uniwersytetów z biznesem, ze szczególnym zwróceniem uwagi na jej korzyści i bariery. Natomiast w drugiej części zaprezentowano dane dotyczące liczby publikacji naukowych powstających w kooperacji uniwersytetów z sektorem prywatnym, a także udziału procentowego przedsiębiorstw podejmujących współpracę z uniwersytetami w państwach UE. Interesujące poznawczo jest również odwołanie się do międzynarodowego rankingu uniwersytetów, które podejmują współpracę z innowacyjnymi przedsiębiorstwami.

Zaprezentowane rozważania zostały poczynione w oparciu o studium literatury, a także w odwołaniu do europejskich sprawozdań i dokumentów. W artykule przeprowadzona została analiza porównawcza danych wtórnych pochodzących z bazy danych Eurostat.

Podsumowując, stwierdzono, iż istnieją znaczne różnice między państwami członkowskimi UE – w krajach takich jak Dania, Szwecja czy Finlandia współpraca między uniwersytetami a biznesem jest na stosunkowo dobrym poziomie. Dodatkowo wydaje się, że w państwach członkowskich UE duże przedsiębiorstwa są bardziej skłonne angażować się we współpracę z uniwersytetami lub instytucjami badawczymi niż MŚP.

Słowa kluczowe: współpraca uczelni z biznesem, współpraca nauka–biznes, szkolnictwo wyższe, Unia Europejska

JEL: I2, I25, O3

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