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UNIVERSITY–BUSINESS COOPERATION (UBC) – FORMS OF COOPERATION AND BARRIERS. A COMPARATIVE ANALYSIS OF POLAND AND SELECTED EUROPEAN COUNTRIES

| Abstract

- ▶ *Goal* – the purpose of this article is to show the specifics of the cooperation between science and business in Poland and the selected European countries. The literature review conducted for this purpose will allow to answer questions about, among other things, the nature of links between universities and businesses, the motives for joint action and the most important barriers to cooperation in the analyzed cases of countries.
- ▶ *Research methodology* – the article includes an analysis of the available literature and reports in the area under study.
- ▶ *Score/results* – the analysis showed that cooperation between universities and business in Poland is still at a lower level compared to the selected European countries, and enumerated other factors which affect the level of this cooperation.
- ▶ *Originality/value* – comparison of Poland against selected European countries (UK, Germany, Austria) and identification of differences in the factors determining the cooperation of universities and business and barriers that hinder it.

| **Keywords:** university–business cooperation (UBC), barriers to cooperation, benefits of university–business cooperation.

1. Introduction

Cooperation between universities and business is crucial both for the development of public and private institutions, as well as for the regional development.

Effective cooperation between universities and businesses, which is a link between two environments that differ in many aspects, although a challenge in itself, is not only feasible, but a necessity. The benefits of such a cooperation are varied and involve multiple categories. However, this cooperation also faces very serious barriers, both on the part of universities and businesses [Milczarek, 2016: 71–73].

The importance of the cooperation between universities and businesses is highlighted by both practitioners and researchers. This is because the cooperation of these entities is a mutually beneficial process. Despite the growing awareness of the importance of knowledge transfer from universities to businesses, the extent of cooperation is still insufficient, which prompts an intensive search for the reasons for this situation [Klimczuk, 2010: 149–151].

According to the studies of many economists [Salem, 2014: 1047–1049; Pietrzyk, 2015: 147–148] it is the cooperation of science and business that drives innovation and competition, and undoubtedly these elements have become a necessity as a result of the ongoing processes of globalization [Kuna-Marszałek, 2013: 439–440].

Many authors agree that the benefits of university-enterprise cooperation accrue to both parties [Matusiak, Guliński, 2010: 20–29]. The literature lists a number of benefits of this cooperation, primarily due to the entity involved (Table 1).

Table 1. The benefits of cooperation between universities and business

Universities	Business
acquisition of specialists-practitioners, exchange of knowledge and experience	use of intellectual resources of academic staff
development of the university's entrepreneurship, increase of the mobility of the staff	use of the university's infrastructure and research facilities, influence on the direction of and access to scientific research
raising funds for research, development and education	improving the qualifications of employees by co-organizing specialized courses, post-graduate studies or majors
adapting educational programs and outcomes to the expectations of the target group	recruiting trainee-trained student graduates
creation of research centers at the university, dissemination of new achievements and achievements of sciences	establishing the appropriate image and brand for the company

Source: Pukin, 2019: 99.

Thanks to the cooperation, entrepreneurs can gain, first of all, access to scientific knowledge and scientific facilities, they can improve the qualifications of their own employees, build a more professional corporate image. Universities, on the other hand, can gain primarily better access to technological resources and scientific and research facilities. In addition, such cooperation facilitates the adaptation of educational programs to the real needs of employers.

Despite the many benefits of the cooperation between science and business, a great many barriers to such a cooperation are still observed [Ankrah, Al-Tabbaa, 2015: 387–388], not only in Poland, although here they are relatively greater than in most European countries (Table 2).

Table 2. Barriers to the cooperation between universities and business

Universities	Business
differing motivation between university and business	confidentiality
bureaucracy	emphasis on generating scientific results (e.g., research papers) by academic institutions
insufficient financial support for the UBC	differing motivations between universities and our business
focus on the practicality of research results	shortage of individuals with business expertise in academic institutions
unwillingness of employees and/or students to cooperate	diverse communication styles and language between the university and our company
the workload of employees' own research and/or teaching activities	lack of knowledge of models and patterns of cooperation
lack of patterns of such a cooperation	inability to finance the high costs of research and development projects

Source: Huggin, Johnston, 2009: 1088–1106; Pawłowski, 2007: 17–33; Bryła, 2014: 95–112; Baken et al., 2015: 3–26.

The most significant barriers relate to the lack of interest in cooperation or past experiences of ineffective cooperation. The complicated procedures and

bureaucracy, as well as conflicts of interest and commitments constitute problems in establishing such a cooperation. In the case of universities, factors that destimulate the initiation of the cooperation include: lack of financial resources, business focus on practical aspects, while companies choose not to establish the cooperation also for financial and strategic reasons.

2. University–Business Cooperation (UBC) in the light of statistical data

University–business cooperation is now recognized as a key factor that drives the development of society and knowledge-based economies. The direct effects of UBC are [Bryła, 2014: 96–100]:

- strengthening the competitiveness of enterprises by generating innovation,
- raising the profile of conducting research at universities,
- improving the professional situation of students and graduates by increasing the practical accessibility of the subjects taught, which in the long run can contribute to creating and maintaining jobs, stimulating economic growth and raising living standards.

All entities have knowledge about the benefits of such a cooperation. But does this knowledge translate into practice? In the light of statistical data, it can be observed that this level of cooperation in Poland is still at a relatively novice stage (Chart 1).

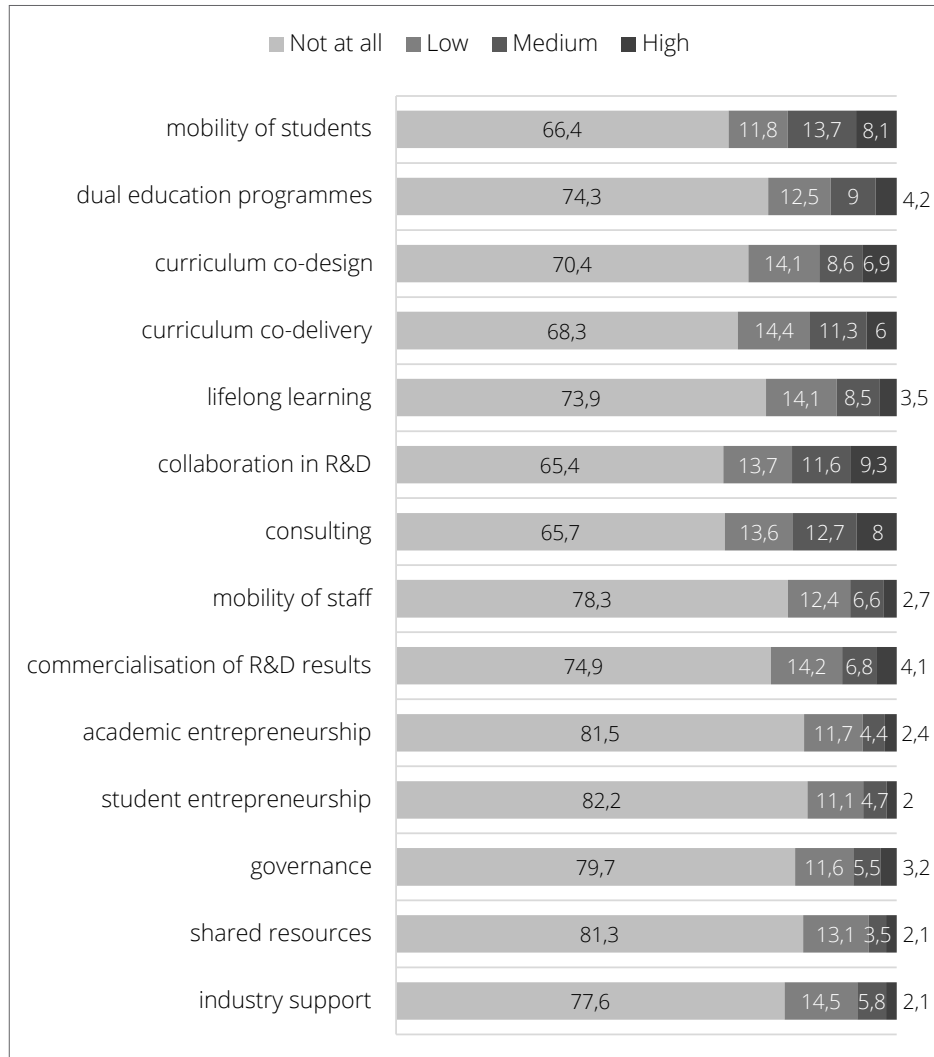
Most of Polish academics (more than 65%) do not engage in these activities at all. However, if such an activity is undertaken, it is above all else; Polish academics focus on the basic research, they also strive to conduct joint R&D and research based consulting. The third type of University–Business Cooperation undertaken in Poland is the mobility of students. Among academics, only 21.8% show a medium or high level of engagement, while as many as 66.4% remain completely unengaged. Polish academics are not eager to collaborate on activities such as: academic entrepreneurship, student entrepreneurship, shared resources, governance and mobility of staff.

The situation is slightly different from the perspective of Polish entrepreneurs (Chart 2).

Polish businesses are mainly active in educational and research activities, such as student mobility, participation in educational programs and support

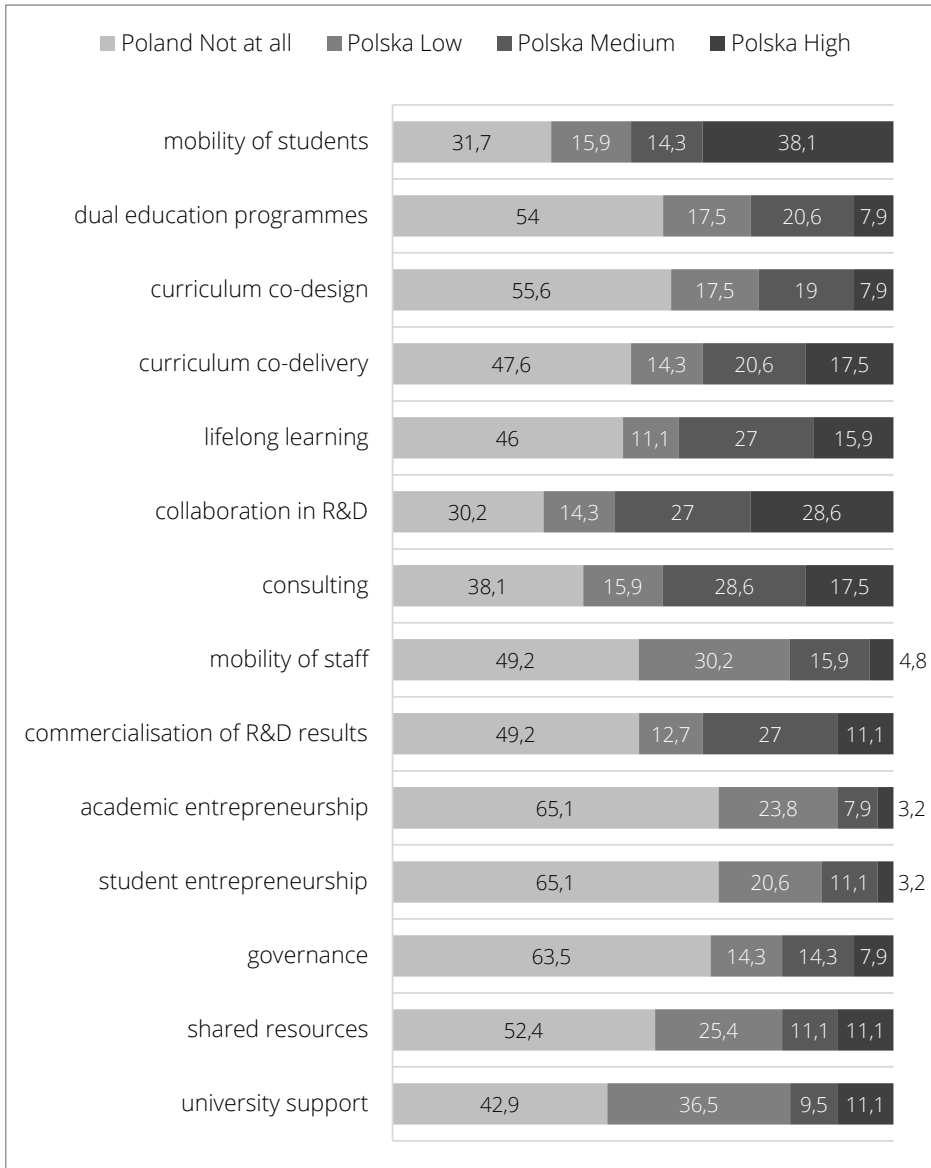
for lifelong learning, consulting and cooperation in research and development. However, about 30% of companies do not engage into these activities at all. The level of involvement is particularly low in the areas of academic entrepreneurship, cooperation with students and employee mobility.

Chart 1. Which University–Business Cooperation (UBC) activities do Polish academics collaborate with businesses in? (% of respondents)



Source: Baaken et al., 2017: 9 [date of access: 15.08.2023].

Chart 2. Which activities do Polish businesses collaborate with universities in (% of respondents)?



Source: Baaken et al., 2017: 10 [date of access: 15.08.2023].

Overall, the University–Business Cooperation activities are less frequent for Polish scientists than for European ones (table 3).

Table 3. In which UBC initiatives do academics from Poland, the United Kingdom, Germany, and Austria engage in collaboration with businesses? (% of respondents?)

Activities	Poland				UK				Germany				Austria			
	Not at all	Low	Medium	High	Not at all	Low	Medium	High	Not at all	Low	Medium	High	Not at all	Low	Medium	High
mobility of students	66,4	11,8	13,7	8,1	66,3	12,3	11,6	9,8	38,8	12,2	20,5	28,5	39,6	15,7	17,7	27
dual education programmes	74,3	12,5	9	4,2	78,4	10,2	7	4,4	60,6	11,2	12,4	15,8	56,8	15,5	11,8	16
curriculum co-design	70,4	14,1	8,6	6,9	71,6	13,7	8,4	6,3	59,9	22,7	10,5	7	57	16,7	15,5	10,8
curriculum co-delivery	68,3	14,4	11,3	6	68,8	14,7	10,5	6	51,2	17,7	17,6	13,5	51,1	16	14	18,9
lifelong learning	73,9	14,1	8,5	3,5	74,7	12,6	8,1	4,7	58,4	19,5	13,8	8,3	50,1	20,1	15,7	14
collaboration in R&D	65,4	13,7	11,6	9,3	68,8	9,8	8,8	12,6	41,6	15	15	28,5	37,8	11,3	12,5	38,3
consulting	65,7	13,6	12,7	8	67,4	14,2	10,2	8,1	45,9	15	20,5	18,6	40,8	13,3	18,7	27,3
mobility of staff	78,3	12,4	6,6	2,7	79,8	12,1	6,3	1,9	61,3	23,5	10,5	4,7	53,1	21,4	16	9,6
commercialisation of R&D results	74,9	14,2	6,8	4,1	80,2	10,5	5,3	4	56,4	20,9	16	6,7	48,4	23,1	17,7	10,8
academic entrepreneurship	81,5	11,7	4,4	2,4	77,7	12,6	6,3	3,5	59,9	20,9	12,9	6,3	51,1	22,6	17,4	8,8
student entrepreneurship	82,2	11,1	4,7	2	79,1	13,5	4,4	3	56,7	23,8	12,5	7	52,6	23,8	14,5	9,1
governance	79,7	11,6	5,5	3,2	76,3	10,9	7,9	4,9	63,2	19,2	12,6	4,9	54,3	20,9	18,4	6,4
shared resources	81,3	13,1	3,5	2,1	79,3	11,4	7	2,3	59,9	25	11,3	3,8	55,5	27,5	10,8	6,1
industry support	77,6	14,5	5,8	2,1	73,7	11,9	10	4,4	51,3	22,8	14,7	11,2	51,8	19,2	17	12

Source: Baaken et al., 2017: 9; Orazbayeva et al., 2017: 9; Davey et al., 2017: 9; Meerman et al., 2017: 9 [date of access: 28.08.2023].

The lesser differences (from the perspective of academics) in the scope of the discussed cooperation are apparently between Poland and Great Britain. A significant difference is noticeable in the cooperation in research and development, industry support and academic and student entrepreneurship. However, when comparing the activity of Polish scientists with German or Austrian scientists, clear differences are noted to the detriment of the Polish academics in almost every mentioned activity.

First of all, too large a group of Polish scientists does not take any action at all in the field of the above-mentioned university–business cooperation activities compared to German or Austrian employees. Within this group of respondents, the greatest disproportions occur in activities such as: mobility of students, collaboration in R&D, consulting, industry support and academic/student entrepreneurship. In turn, in the group of research workers who often cooperate in the above-mentioned activities, the greatest disproportions between Polish scientists and their European counterparts (approx. 3–4 times less in the case of Polish workers) are related to activities such as: mobility of students, dual education programs, collaboration in R&D, student entrepreneurship and industry support.

The situation is similar, although with some differences, from the perspective of the Polish business (Table 4).

Polish businesses are primarily involved in initiatives related to education and research, such as student mobility, R&D cooperation, consulting and lifelong learning. Nevertheless, about 30% of companies do not participate in these activities at all. The activity in the area of student and academic entrepreneurship is particularly low (more than 60% of businesses).

Despite the great interest of students and academics in starting their own companies, the development of entrepreneurship in Poland is insufficient, due to numerous barriers, i.e.: financial, legal or organizational. Nearly 50% of businesses do not have any cooperation related to the management or implementation of innovations. In general, most university–business cooperation activities are at a more advanced level in Europe than in Poland (exceptions are: co-curricular and lifelong learning and co-curricular development). When comparing Poland with selected European countries, it is noted that the greatest differences occur in activities such as: collaboration in R&D, mobility of staff, academic and student entrepreneurship.

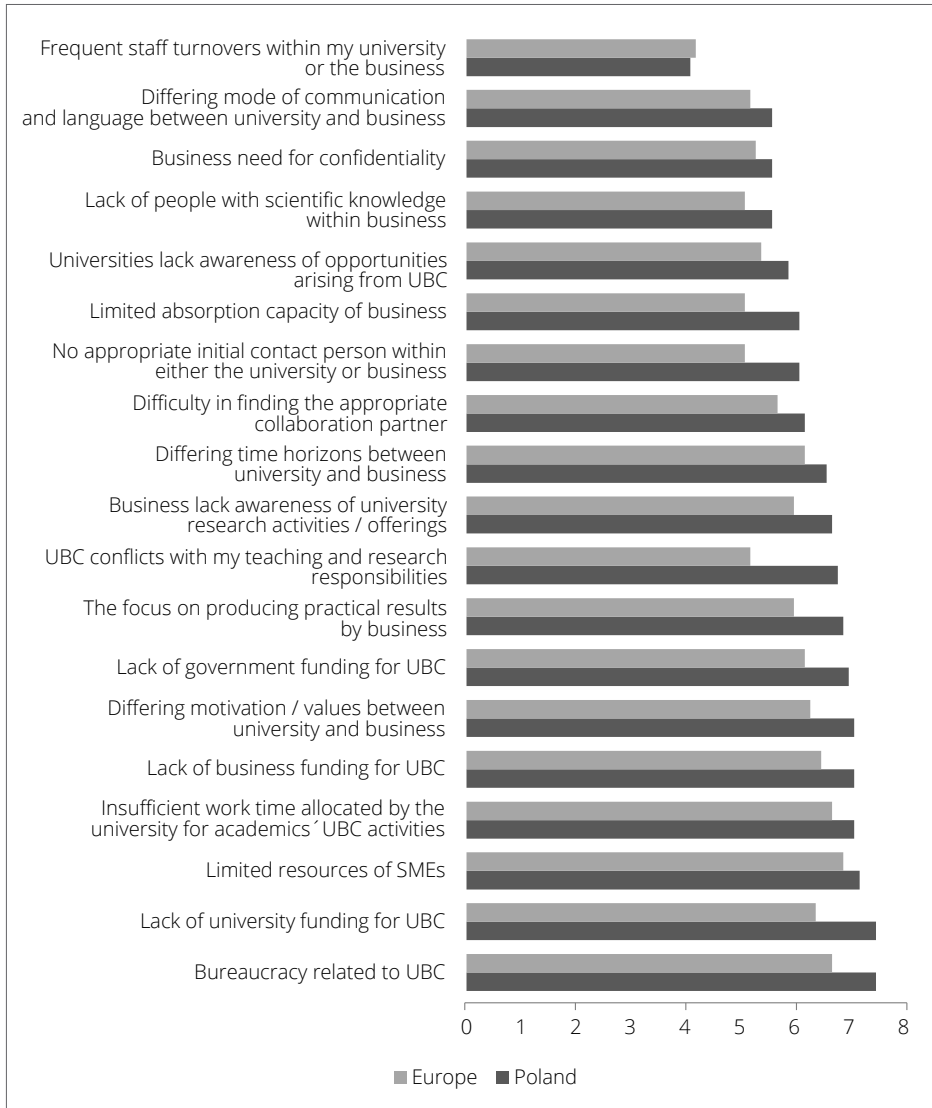
Table 4. In which UBC initiatives do academics from Poland, the UK, Germany, and Austria engage in collaboration with universities? (% of respondents)?

Activities	Poland				UK				Germany				Austria			
	Not at all	Low	Medium	High	Not at all	Low	Medium	High	Not at all	Low	Medium	High	Not at all	Low	Medium	High
mobility of students	31,7	15,9	14,3	38,1	37	24	17,1	21,9	21,8	22,8	24	31,4	20,8	28,1	30,2	20,8
dual education programmes	54	17,5	20,6	7,9	56,8	21,9	14,4	6,8	47,7	14,5	16	21,8	43,8	28,1	16,7	11,5
curriculum co-design	55,6	17,5	19	7,9	69,9	19,9	6,8	3,4	68,9	19,1	8	4	60,4	18,8	13,5	7,3
curriculum co-delivery	47,6	14,3	20,6	17,5	62,3	24	6,8	6,8	59,4	21,5	9,5	9,5	51	22,9	17,7	8,3
lifelong learning	46	11,1	27	15,9	57,5	25,3	9,6	7,5	52,6	23,7	14,8	8,9	42,7	26	15,6	15,6
collaboration in R&D	30,2	14,3	27	28,6	15,1	17,1	29,5	38,4	11,1	13,5	25,8	49,5	9,4	16,7	19,8	54,2
consulting	38,1	15,9	28,6	17,5	24,7	30,1	27,4	17,8	20	28,9	32,6	18,5	18,8	26	35,4	19,8
mobility of staff	49,2	30,2	15,9	4,8	48,6	28,1	15,8	7,5	37,8	34,5	16,9	10,8	32,3	36,5	20,8	10,4
commercialisation of R&D results	49,2	12,7	27	11,1	43,8	20,5	24,7	11	33,2	33,2	22,2	11,4	34,4	35,4	21,9	8,3
academic entrepreneurship	65,1	23,8	7,9	3,2	58,2	21,2	12,3	8,2	56,9	23,1	11,7	8,3	59,4	20,8	10,4	9,4
student entrepreneurship	65,1	20,6	11,1	3,2	68,5	17,8	10,3	3,4	62,5	22,2	8,6	6,8	62,5	19,8	7,3	10,4
governance	63,5	14,3	14,3	7,9	62,3	18,5	11	8,2	58,5	20,3	8,9	12,3	54,2	24	12,5	9,4
shared resources	52,4	25,4	11,1	11,1	52,1	26	17,1	4,8	49,5	28,3	13,2	8,9	37,5	32,3	18,8	11,5
industry support	42,9	36,5	9,5	11,1	57,5	23,3	13	6,2	60,6	19,7	11,7	8	50	27,1	13,5	9,4

Source: Baaken et al., 2017: 9; Orazbayeva et al., 2017: 9; Davey et al., 2017: 9; Meerman et al., 2017: 9 [date of access: 30.08. 2023].

It is therefore necessary to consider what barriers cause the relatively low level of cooperation between universities and business in Poland, which is noticeably lower than in other European countries. Chart 3 presents the barriers hindering cooperation between research workers and business.

Chart 3. What factors are impeding your collaboration with businesses? – as responded by academics from Poland (% of respondents)



Source: Baaken et al., 2017: 16 [date of access: 3.09.2023].

In Poland, the most serious barrier is that UBC conflicts with teaching and research responsibilities. The majority of Polish academics also point out that these teaching and research responsibilities are increasing every year. In addition, in Poland, academics are more bothered by the bureaucracy associated with university–business cooperation (UBC) than in other European countries, as well as by the lack of adequate funding for universities, which are the major barriers for them. High levels of bureaucracy and complicated administrative procedures consume much of the Polish academics' time. In terms of funding, Polish universities face more of a lack of funds to invest in R&D and innovation than is the case for European researchers. Although the performance of Polish research and innovation has improved over the past several years, it has still not reached a satisfactory level. In addition, the lack of initial contacts and limited absorptive capacity among businesses further hinder cooperation, especially compared to the European average.

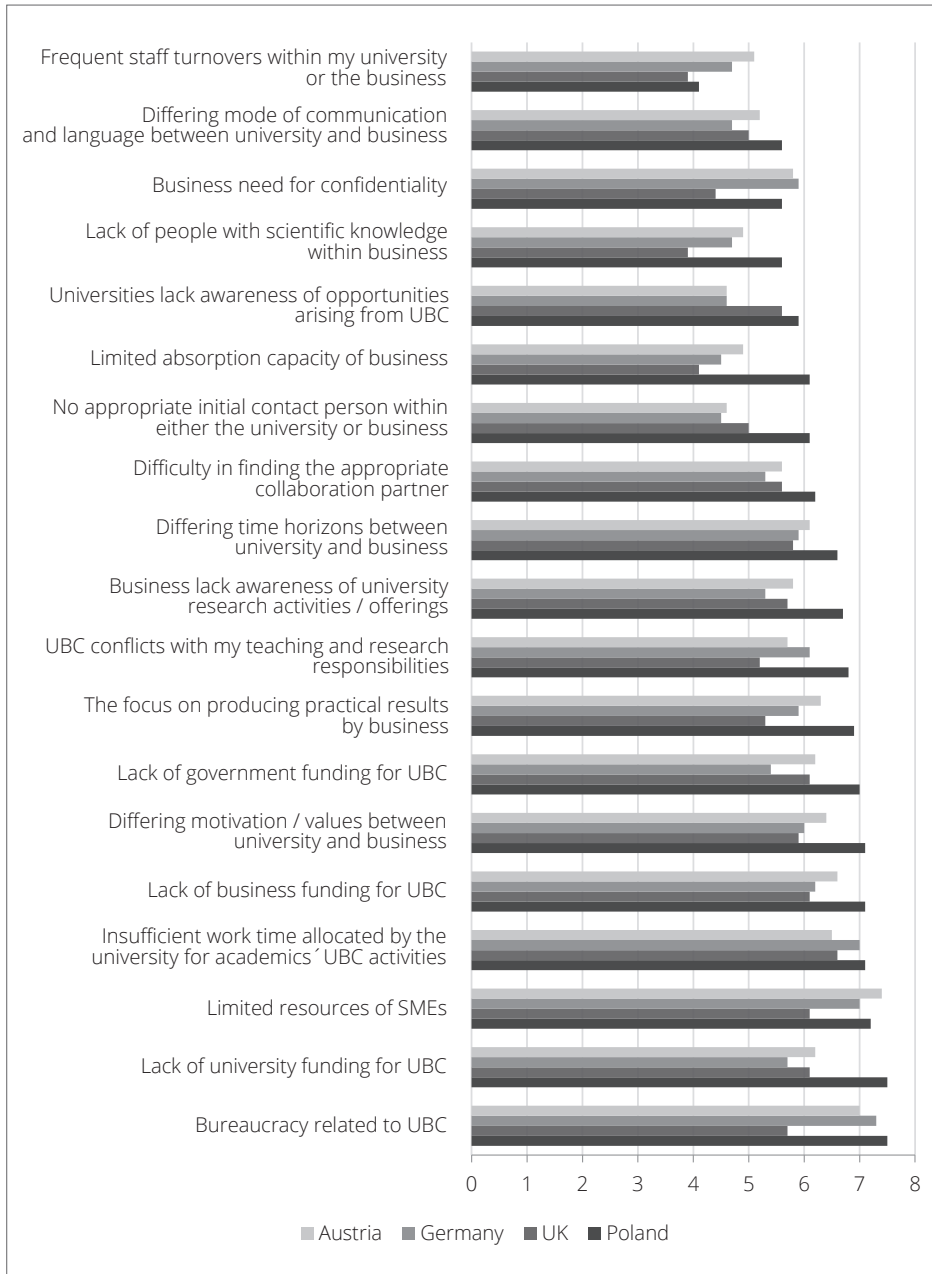
The only factor that makes UBC in Poland less difficult than in Europe is the lower level of staff turnovers within university or the business. This factor is the least significant barrier for both groups.

It is strongly noted that most of the existing barriers to cooperation between science and business are felt more by Polish than by European scientists (Chart 4).

Comparing the barriers identified by Polish and European academics, it is noticeable that the biggest differences regard: the lack of university funding for UBC, insufficient background of contacts at the beginning of cooperation at the university or company, limited ability of the company to absorb and lack of knowledge among universities of the opportunities of such a cooperation. The most important differences between Polish and European academics concern:

1. University funding for UBC – in Poland this funding is much lower and more difficult to obtain.
2. The right contact person at the university or business – in Poland this contact is described as much more difficult.
3. Absorption capacity of business – in the analyzed European countries it is noticeably higher, which creates more opportunities for cooperation.
4. Universities awareness of opportunities arising from UBC – this awareness in Poland is noticeably lower than in European countries.

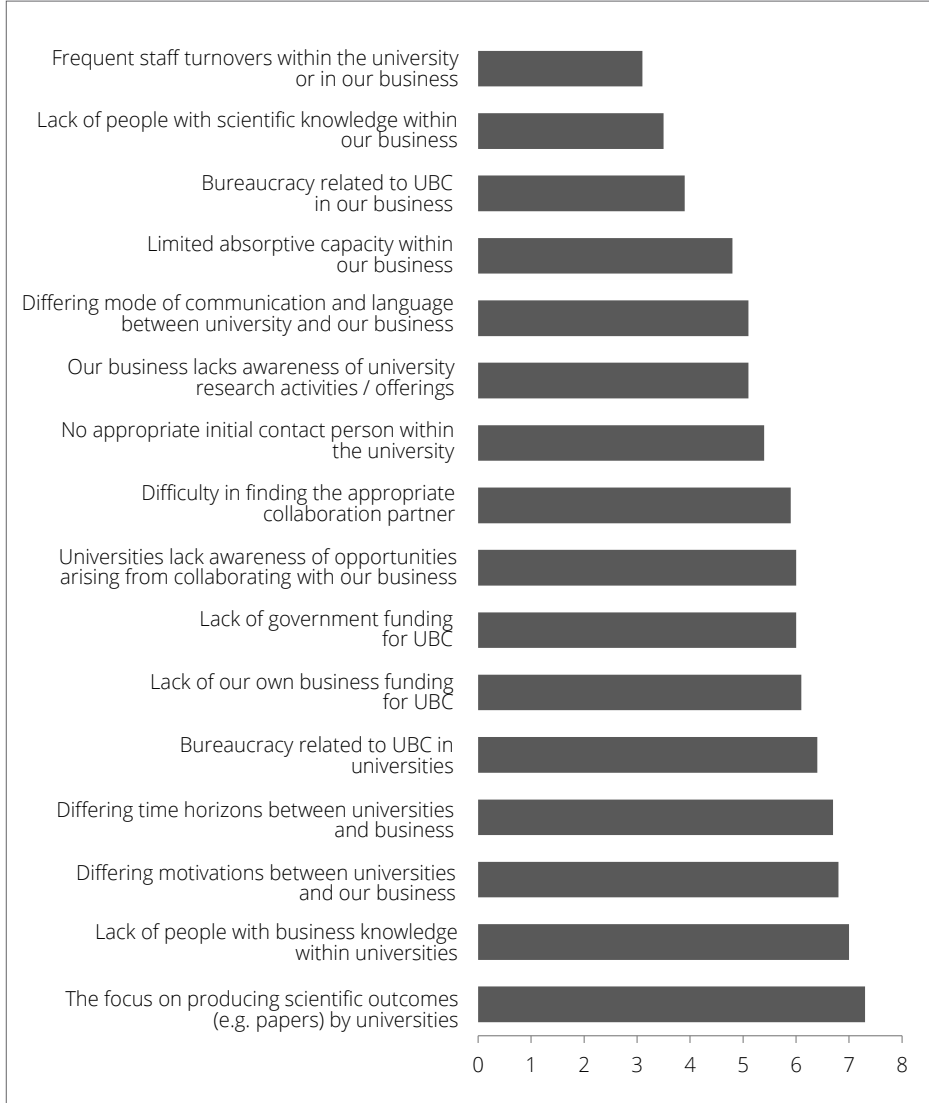
Chart 4. What is inhibiting your cooperation with business? – as answered by academics from Poland, UK, Germany and Austria (% of respondents)



Source: Baaken et al., 2017: 16; Orazbayeva et al., 2017: 15; Davey et al., 2017: 15; Meerman et al., 2017: 15 [date of access: 5.09.2023].

Analyzing the barriers on the part of business, similar factors inhibiting UBC are noted, but other frequently identified barriers are also observed (Chart 5).

Chart 5. What is inhibiting your cooperation with universities in Poland? (% of respondents)



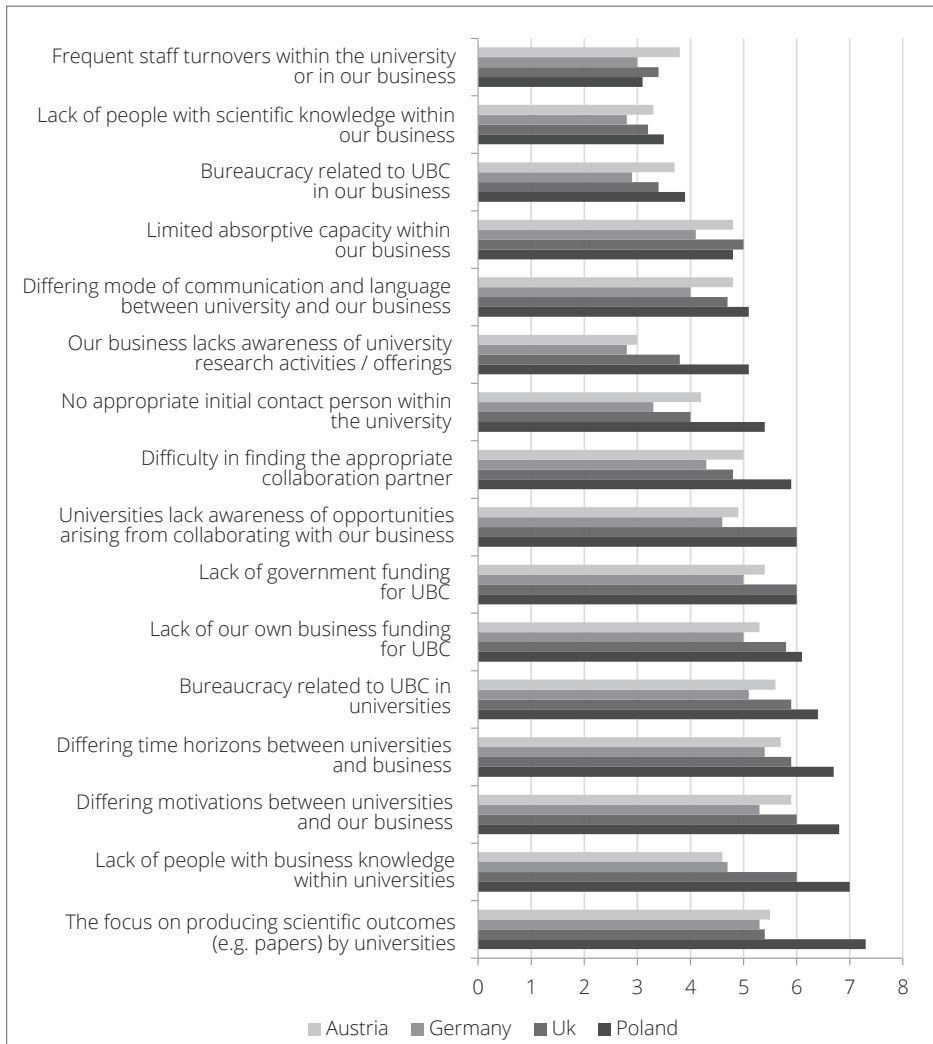
Source: Baaken et al., 2017: 14 [date of access: 7.09.2023].

Overall, Polish businesses indicate that the most significant barriers to cooperation concern: the focus on producing scientific outcomes (e.g. papers) by

universities, lack of people with business knowledge within universities, differing motivations between universities and our business and differing time horizons between universities and business.

Polish companies see most of them as more significant or much more problematic than their European counterparts (Chart 6).

Chart 6. What is inhibiting your cooperation with universities in Poland, UK, Germany and Austria? (% of respondents)



Source: Baaken et al., 2017: 14; Orzabayeva et al., 2017: 14; Davey et al., 2017: 14; Meerman et al., 2017: 14 [date of access: 10.09.2023].

All the analyzed cases of countries indicate the major obstacle which regards the focus of universities on obtaining scientific results and high-scoring scientific articles. However, in the case of Poland, this is the key and most important barrier. In the case of the UK, this factor was indicated as the seventh, in the case of Germany as the second, and in the case of Austria as the fourth. There are also significant differences between countries in the following barriers: lack of people with business knowledge within universities, no appropriate initial contact person within the university and our business lacks awareness of university research activities/offerings.

3. Conclusions

One of the most important elements of modern competition is the increased emphasis on developing university–business collaboration (UBC) and on developing science-business partnerships. Nevertheless, Polish universities, mainly in the past, but also to some extent still, rarely played and still do rarely play an important role in cooperation with industry. This is because in Poland universities have always focused more on the basic research and on theoretical education than on the practical element, both in education and cooperation. What is more, as in most emerging economies, companies in Poland have quite limited R&D expenditures, and these are usually necessary for collaboration. Therefore, the key challenge now is to build trust and engage each other into university–business cooperation.

In the case of Poland, this cooperation is at a noticeably lower level than in many other European countries. As many as 65% of Polish scientists do not participate in these initiatives at all. Large Polish entities very often have their own R&D units and employ researchers directly in them, which then limits the need for such a cooperation. Activities related to student and academic entrepreneurship are particularly underdeveloped. Despite the great interest of students and academics in starting their own companies, the development of entrepreneurship in Poland is insufficient, due to numerous barriers, i.e.: financial, legal or organizational.

Polish scientists encounter significant barriers to a much greater extent than other academic employees in European countries; they are bothered by the bureaucracy associated with university–business collaboration (UBC) and by the lack of university funding, to name the few obstacles.

For business, the key barrier to UBC is the focus on producing scientific outcomes by universities. However, in the case of Poland, this is the key and most important barrier. In addition, the other important barriers include: the low level or complete lack of employees with business knowledge conducting classes at universities, divergent motivations of universities and enterprises, difficulties in establishing the first contact at the university due to the lack of indication of a specific person for such contact and lack of awareness of the university's research offer.

Judging by the results of the conducted analysis, there is a need for further research in this area. It is necessary to thoroughly understand the causes of individual barriers in cooperation between universities and business in order to effectively eliminate or reduce them, which is what the author aims to do.

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