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Innovative entrepreneurship

Revealed and hidden potential
for innovation in Poland



Edited by
Paulina Zadura-Lichota

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PREFACE

Potential for innovation in enterprises and in socio-economic environment. Good practices, weaknesses, perspectives for the future

This year's PARP Innovation Report focuses largely on entrepreneurs, i.e. on the presentation of the level, potential, and also perspectives for the development of the private sector in the innovation area. We attempt to provide the most complete picture possible, mostly through filling the gaps in the knowledge concerning particular groups of companies. We deploy our analysis with a statistical description of the innovation of Polish enterprises compared to the other European countries based on CSO and Eurostat data. This approach allows us to tell more about whether, for example, a drop in the innovation of Polish enterprises is specific for our country only or whether it is a tendency affecting other countries of the region. On the other hand, a look at the innovation from the perspective of consecutive years informs us about the expenditure borne by the Polish companies on innovation. This is particularly interesting information, because the expenditure increases dynamically. However, is it dynamic as in the other countries that are trying to catch up with the leaders?

An analysis of Eurostat data shows that a noticeable number of entrepreneurs gave up activity in the area of innovation in most EU countries in 2010–2012, including Poland – a drop from 28% in 2009–2011 to 23% in 2010–2012. A small increase could be noticed in the most recent CSO data for 2011–2013, however, only with respect to industrial enterprises (increase in the innovators share from 17.7% to 18.4%). Again, the share of service enterprises among the innovative companies is decreasing (from 13.9% to 12.8%). When the proportion of innovative companies dwindles in developed economies with an accumulated innovative potential, it is not as dangerous as in countries such as Poland, where such a trend could be difficult to rectify. Despite a decreasing proportion of innovative companies, **an increase in expenditure per enterprise has been observed among those Polish enterprises which are innovative, up to EUR 1 million in 2012 compared to 785 thousand in 2010**, with the average innovation expenditure in Poland slightly below the average of 28 EU MS (EUR 1.15 million in 2012). Unfortunately, the recent CSO data are not optimistic in this case. In 2013, the industrial enterprises spent 2.7% less on innovation than in 2012, while service companies spent as much as 21% less¹⁾.

Overall, the data presents an interesting phenomenon, which is further described in Chapter 1. In the last couple of years, it is clearly visible that a small group of innovative companies is forming in Poland that constantly increases expenditures on activity in the area of innovation, including research and development activity. Moreover, the level of incurred expenditure is decent compared with the EU average and gives grounds for the conclusion that these companies are competitive both at home and abroad. Otherwise, they would not be motivated to increase their expenditure with only the challenge of competition at home.

¹⁾ *Innovation activities of enterprises in 2011–2013*, CSO, Warsaw, 2015.

In addition, the data presented in Chapter 4 concerning the effects of the Operational Programme Innovative Economy confirm that, when the companies deal with innovation in Poland, they manage it well. A group of OP IE beneficiaries turned out to be a well-selected group. As different evaluations show, including the ongoing PARP “The Innovation Barometer” evaluation, the companies that used innovative OP IE instruments had already dealt with innovation in their history. As a result, the outcomes they have achieved after the project was completed and in the period of its sustainability are very good – from the growing number of implemented innovations following completion of a project, through the development of R&D departments and even employment growth²⁾.

Thus, there is a strong, although small, group of innovators identified by the official statistics. This includes an even smaller group of public support beneficiaries that achieves above-average results in terms of activity in the area of innovation compared with the total population of enterprises. That group and its beneficiaries’ sub-group make our small, but very promising, potential in the area of innovation. Those companies are innovative and competitive on European or global scales, and the fundamental question concerns how to strengthen the innovation ecosystem in Poland to increase the number of these enterprises. The question obviously needs to be comprehensively discussed and analysed to find which actions are of a primary or supporting nature, which is beyond the scope of this report³⁾.

In our search of the potential for Polish innovation for the purpose of this report, we also decided to deal with the innovativeness of enterprises at the level of micro-companies. This group of enterprises is generally not covered by the official statistics measuring the level of enterprise innovativeness. However, it does not mean that there are no innovators among the smallest companies. At present, even general knowledge of the development of the start-up market allows one to truly believe that a large portion of innovations comes from the smallest companies, and a large portion of new, small enterprises is set up to implement an innovative business idea. Innovation at the level of micro-enterprises (and in fact, at the level of micro-employers, because the sample did not cover self-employed persons) is described in Chapters 2 and 3 which present analyses of a survey carried out by PARP in 2014.

In comparison to data on larger companies, the results for the smallest enterprises are surprising, since almost 60% of them report innovative activities conducted in the last three years. One may wonder how accurately the entrepreneurs assess their innovation and whether they do not overestimate it. To the question about their perceptions of the term “innovative company,” they answer that this is primarily about modernity, the future, moving with the times (23%), new technologies (22.5%), development, and improvement of the enterprise (17%). In the case of new products and service and innovative solutions, the percentages are lower (less than 10% for each). The entrepreneurs correctly associate innovation with modernity, the future, and the modern technologies, and this is how they may assess (slightly in excess) the innovativeness of their companies as well functioning on the contemporary market, developing modern products, and with perspectives for the future. Whether this is sufficient to consider a company innovative depends on whether that company itself develops or improves something. The respondents report these issues less often.

²⁾ More information can be found in Chapter 4 wrote by J. Pokorski in this volume.

³⁾ This issue will be the subject of a separate PARP report on the innovation in public administration and on the development of a national innovation system (report under preparation).

Such a hypothesis needs to be checked in subsequent studies; however, it may be assumed that a micro-entrepreneur is a specific respondent type. The entrepreneur may act on “I am the company” basis because it needs a strong involvement of the owner in the operation of an enterprise due to limited resources. Thus, the owner may transfer his/her perceptions about him/herself – that he/she is creative/innovative – to his/her company which does not need necessarily to be perceived externally as such in terms of its real operations or effects. This would explain such numerous declarations of micro-entrepreneurs concerning their own innovation. It should be noted that these were answers to a very specific question about introducing or not introducing innovation within the last three years; therefore, the answers obtained should be reliable.

Another interesting issue, which is also an important element of business and innovative activities, is the cooperation with an external environment, presented in Chapter 3 of this part. Similarly to larger enterprises (as shown in other studies, e.g. in the framework of an international research project Global Entrepreneurship Monitor in which PARP participates), the smallest companies primarily cooperate with other business partners, i.e. with enterprises from the same business group or with other companies not related in terms of capital. It applies both to the current cooperation and to a cooperation to develop an innovation. However, when it comes to the future cooperation plans, even though entrepreneurs still mostly intend to cooperate with other companies, they want to start cooperation with higher education institutions (7% already cooperate, 12% intend to) and technology incubators (2% already cooperate, 8% intend to) more frequently than now⁴⁾. Less often than now, however, they plan to start cooperation with national and foreign research units. This may indicate that entrepreneurs are increasingly aware of the relationship between the development of their company and the quality of their human resources. Those who want to develop have to invest in human resources and a number of companies in Poland has certainly already reached their limits (e.g. further cost-cutting will not bring any effects for the company, on the contrary, it will aggravate the company’s situation), and they are aware that they cannot make progress without good staff. If such awareness begins to develop in the micro-companies, as indicated by their willingness to cooperate with higher education institutions and incubators, there is a real chance for the development of this sector and expected innovation in action.

These deliberations may be summed up as follows – both quantitative data from public statistics and studies conducted by PARP identify the existence of a significant innovative potential of the small group of companies dealing with innovation (approx. 23% of companies identified by the official statistics, which translates into ca 17 thousand of small, medium-sized or large companies). Besides, companies benefitting from public support perform very well in terms of selected innovation parameters (data from the Innovation Barometer). It should also be borne in mind that this group of companies (apart from micro-companies that are also financed from public funds) also belongs to the group identified by the official statistics. Finally, there is a significant group of micro-employers among which 3 out of 5 declare introducing innovation. Micro-employers in Poland constitute a significant group of almost 700 thousand companies, the said 60% declaring innovation is almost 420 thousand enterprises.

The other side is the potential which is unused or unseen or simply not there. In a public discussion on Polish innovation, there is a constant, common element of the communication that further development will not be conducted with the use of the easiest resources, i.e. cheap labour and

⁴⁾ More information can be found in Chapter 3 wrote by D. Węclawska in this volume.

imitation of technologies, even the best ones. Another statement should be added – increasing the expenditure on research and development activity alone is not sufficient – because such activity alone will not translate into market products and services⁵⁾. The key and a great challenge for the current development policy is the re-modelling of the current development paradigm towards large civilizing projects that engage partners from many directions and most of all respond to the identified social needs. Here questions arise: How should such a system be built? Should the existing schemes be re-modelled or should totally new approaches be proposed? The limitations that we are currently subject to are described by Edwin Bendyk in the chapter *Blank spots on the map – the hidden potential of innovation*. “Us,” in the meaning of public institutions, citizens, companies and non-government institutions joining the socio-economic environment system, have to respond to these limitations by launching “the national potential of creativity and innovation on a mass scale”⁶⁾.

⁵⁾ More information can be found in Chapter 5 wrote by E. Bendyk in this volume.

⁶⁾ E. Bendyk, *Blank spots on the map – the hidden potential of innovation*, p. 91 in this volume.

Part I

**Innovation in numbers: entrepreneurs,
micro-entrepreneurs and beneficiaries
of public support**

Chapter 1

INNOVATION ACTIVITY OF ENTERPRISES IN POLAND IN COMPARISON TO OTHER EUROPEAN COUNTRIES

Introduction

In the previous edition of the Innovation Report, in the description of the statistical part covering years 2008–2010, I indicated that Europe's economy was under the influence of economic turbulence, which constituted a great economic challenge for enterprises. At that time, the results of an innovation survey were not impressive, but it seemed that it would only be a transitional stage. In the economic context, the following two years did not bring a significant improvement and a "new era" has started – the era of uncertainty and instability. The results of the newest survey devoted to the innovativeness of enterprises 2010–2012 conducted in all (28) European Union countries and some other countries are not very optimistic.

The question is *"Are innovations and new technologies no longer the motor for growth?"* It would seem that the world, including Europe, has perfect development conditions, due to new technologies, there should not be a shortage of ideas that will find a way to become commercialised and at the same time introduced into the market of innovative solutions. However, the statistics show innovation in a different light. We have been observing a lower share of innovative enterprises in most analysed countries, both in leading and trailing countries. The questions are *"Are more developed economies (where the decreases in the shares of innovative enterprises are largest) saturated with innovation? Is being innovative becoming more expensive – is this the reason for growing expenditures per an innovative enterprise?"*. The level of cooperation between enterprises is the same and even larger than in previous years; however, as it turns out, this cooperation is not always well evaluated. Enterprises create strategies and set objectives, and there are still many barriers that constitute obstacles to achieving the intended objectives.

In this part of the report, I certainly will not be able to provide a full answer to all these questions through statistical presentations; nonetheless, this material will provide detailed information about the innovation activity of enterprises in Poland in comparison to other European countries. Eurostat data was used to visualise the innovativeness of enterprises in Poland in comparison with other European countries (Community Innovation Survey 2012). The analysis of statistical data presents the results in the following areas: (1) innovativeness of enterprises, (2) research and development activity, (3) innovation activity expenditure, (4) sale of new or significantly improved goods, (5) cooperation in terms of innovation, (6) sources of information for innovation, (7) objectives of the innovation activity, (8) strategies to achieve the objectives, (9) methods to maintain or increase competitiveness, (10) barriers to achieving the objectives, and (11) public support constituting integral analytical areas of the presented analysis.

Innovation activity of enterprises

During the evaluation of the level of the innovativeness of enterprises in Poland in comparison with other European countries, a general approach was used showing the share of companies pursuing ongoing or abandoned/suspended innovation activities (product, process, marketing or organizational method innovative) compared with enterprises in total.

Table 1. The share of innovative enterprises including enterprises with abandoned/suspended innovation activities in 2006–2008, 2008–2010, and 2010–2012 period (% of all enterprises)

	2008 (%)	2010 (%)	2012 (%)	difference 2012–2010 (percentage points)	difference 2012–2008 (percentage points)
EU (28)	NDA	NDA	48,9	-4.0*	-2.7*
EU (27)	51.6	52.9	NDA	NDA	NDA
Iceland	74.8	63.8	NDA	NDA	NDA
Germany	79.9	79.3	66.9	-12.4	-13.0
Luxembourg	64.7	68.1	66.1	-2.0	1.4
Ireland	56.5	59.5	58.7	-0.8	2.2
Italy	53.2	56.3	56.1	-0.2	2.9
Sweden	53.7	59.6	55.9	-3.7	2.2
Belgium	58.1	60.9	55.6	-5.3	-2.5
Portugal	57.8	60.3	54.6	-5.7	-3.2
Austria	56.2	56.5	54.4	-2.1	-1.8
France	50.2	53.5	53.4	-0.1	3.2
Finland	52.2	56.2	52.6	-3.6	0.4
Greece	NDA	NDA	52.3	NDA	NDA
Netherlands	44.9	56.7	51.4	-5.3	6.5
Denmark	51.9	54.7	51.1	-3.6	-0.8
Malta	37.4	41.5	51.1	9.6	13.7
United Kingdom	45.6	44.2	50.3	6.1	4.7
Estonia	56.4	56.8	47.6	-9.2	-8.8
Slovenia	50.3	49.4	46.5	-2.9	-3.8
Norway	49.2	43.5	44.7	1.2	-4.5
Czech Republic	56.0	51.7	43.9	-7.8	-12.1
Cyprus	56.1	46.2	42.1	-4.1	-14.0
Croatia	44.2	42.4	37.9	-4.5	-6.3
Slovakia	36.1	35.6	34.0	-1.6	-2.1
Spain	43.5	41.4	33.6	-7.8	-9.9
Lithuania	30.3	34.5	32.9	-1.6	2.6
Hungary	28.9	31.1	32.5	1.4	3.6
Latvia	24.3	29.9	30.4	0.5	6.1
Bulgaria	30.8	27.1	27.4	0.3	-3.4
Poland	27.9	28.1	23.0	-5.1	-4.9
Romania	33.3	30.8	20.7	-10.1	-12.6

The results show that, among 29 presented countries (28 EU countries and Norway), four groups may be distinguished¹⁾ in terms of the share of innovation active enterprises: leaders, followers, moderate innovators, and modest innovators. In 2012, the leaders in terms of activity in the area of the innovation of enterprises were Germany, Luxembourg, Ireland, Italy, Sweden, and Belgium, where the share of active companies falls in the range <55.6; 66.9>. Advancing countries with a high proportion of innovation active enterprises belong to the second group: Portugal, Austria, France, Finland, Greece, Netherlands, Denmark, Malta, United Kingdom, Estonia, Slovenia, Norway, and the Czech Republic. Among the countries belonging to the second group, the percentages of enterprises pursuing innovation activity among enterprises in total fall in the range <43.8; 55.35>. The third group of countries – moderate innovators – is made up of Cyprus, Croatia, Slovakia, Spain, Lithuania, and Hungary, where the share of active enterprises in the area of innovation falls in the range <32.25; 43.8>. Among enterprises

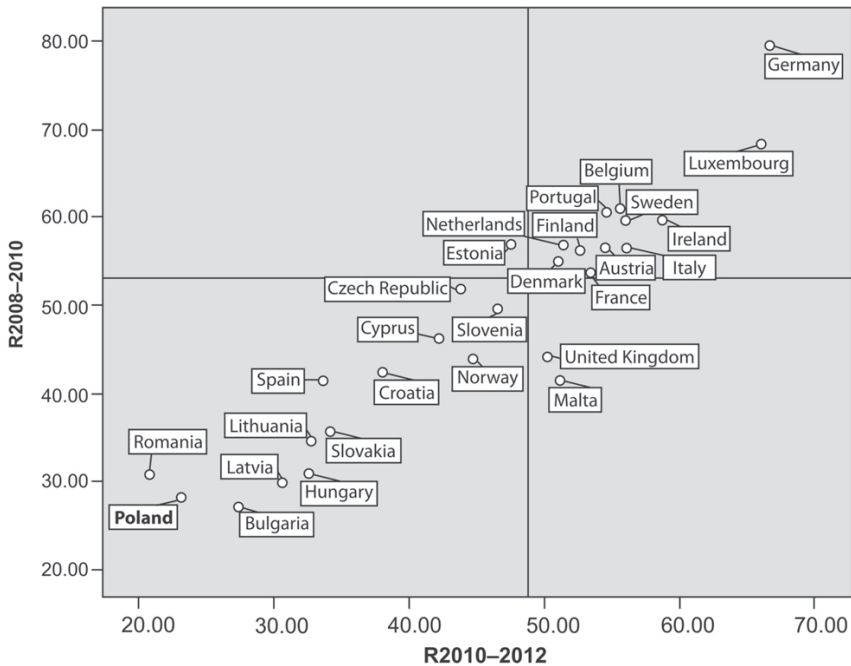
Source: Author's compilation based on the Eurostat Statistics Database [inn_cis6_type], [inn_cis7_type] and [inn_cis8_type].

¹⁾ The groups were formed by calculating equal ranges based on the minimum and maximum proportion of innovative enterprises.

in general, Poland, Latvia, Bulgaria, and Romania belong to countries with a low share of innovation activity and constitute the fourth group, in which the proportion of innovation active enterprises falls in the range <20.7; 32.25>.

The level of innovation active enterprises in Poland in general and in other presented counties has significantly changed compared with the results of the survey in the previous edition of CIS-7 2008–2010. The most negative changes concerned the innovation leader, Germany, where the companies’ innovativeness decreased by more than 12 percentage points in comparison with the previous edition of the survey. Compared with the results of the 2008–2010 survey, the lowest innovation indicators (i.e. decrease of more than 5 percentage points) could be observed in Belgium, Portugal, the Netherlands, Estonia, Spain, Poland, and Romania).

Fig. 1. Innovative enterprises including enterprises with abandoned/suspended or ongoing innovation activities (product, process, marketing or organizational method innovative) in 2008–2010 and in 2010–2012, in %

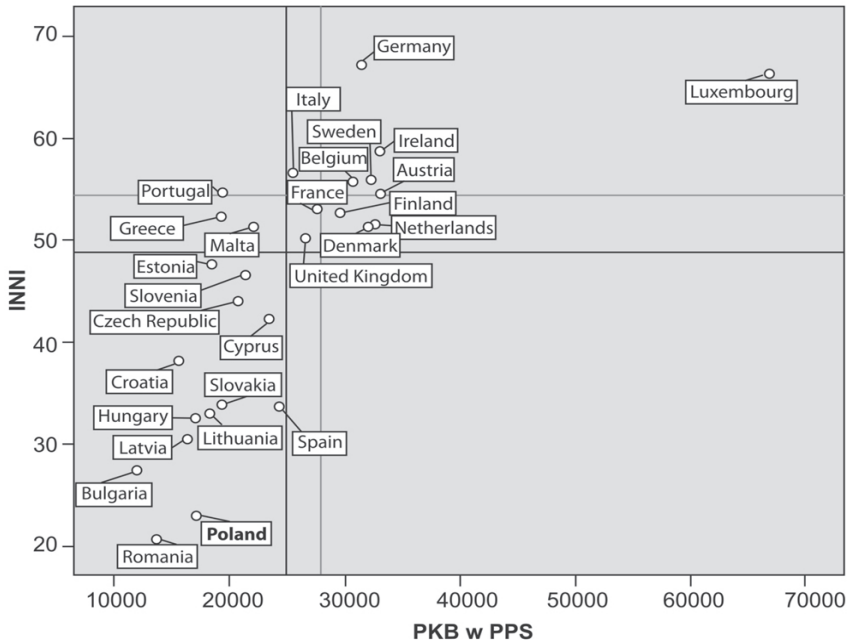


Source: Statistics Database [inn_cis7_type] and [inn_cis8_type], reference lines indicate the EU28 average.

When comparing the results for Poland with other countries, the level of development of each country should be taken into account. The results of countries such as Germany or Luxembourg are certainly impressive when it comes to the proportion of enterprises that pursue innovation activity; however, the history of the market economy of developed Germany or Luxembourg is much longer than in Poland. For these reasons, the results for Poland should be compared mostly with countries that are similar in terms of economic development. The figure below shows the results of innovation activity of enterprises in European countries with the GDP level per inhabitant calculated according to the currency Purchasing Power Parities and expressed in common pre-agreed PPS currency.

The vertical and horizontal lines indicate average levels for 28 and 15 EU countries (they are: for EU (28): 48.9; 25,500 (black line) and for EU(15): 54.3, 27,900 (grey line) respectively).

Fig. 2. Gross Domestic Product per inhabitant in PPS in 2012 and the share of enterprises pursuing innovation activity in 2010–2012



Source: Statistics Database [inn_cis8_type] and [nama_gdp_c], reference lines indicate the EU(28) average: 48.9; 25,500 black line and for EU(15): 54.3; 27,900 (grey line).

Countries that deserve attention are those where the level of economic development measured in GDP per inhabitant in PPS is below average and the proportion of companies pursuing innovation activity is above average. This is the case in Portugal, Greece, and Malta. It is interesting and very positive that none of the analysed countries fell into the quarter where innovation was below average for the EU 28 and above the average GDP level. In the 2008–2010 survey, only the United Kingdom was in such a position, and its weak position has improved in comparison with the remaining countries. In terms of economic development measured in GDP per citizen, Poland is in the first quarter of countries such as Bulgaria, Latvia, Hungary, Romania, Slovakia, Spain, Cyprus, Slovenia, the Czech Republic, and Estonia. Data analysis based on the figure shows that countries with a medium level of economic development might perform well in terms of innovation. In this regard, the sources of innovation advantages in those countries should be sought and models should be derived with regard to the specificity of a given country.

The activities of innovation active enterprises in Poland (Table 1) are more favourable in particular groups of company sizes. It can be observed that high innovation activity is the domain of large enterprises, which is determined by a larger economic potential of these enterprises. Luxembourg is the leader in the group of large enterprises, where innovative enterprises constitute 92.8% of all companies covered by the survey. Compared with European countries, the level of large Polish enterprises is average – 63.9%. A lower share of large innovative companies than in Poland can be observed in countries such as Cyprus (62.2%), Slovakia (62.1%), Bulgaria (59%), United Kingdom (56.2%), and Romania (40.1%). On the other hand, the share of innovative medium-sized enterprises in Poland is 35.8%, and we are followed only by Romania (26.6%). Among the 28 analysed countries,

the proportion of small enterprises in Poland is 17.4% of enterprises in general, which is at the very bottom of the list.

A large share of enterprises that did not pursue any innovation activity at the time covered by the survey also needs to be noted during the evaluation of the innovation activity of Polish enterprises. This value is 77% for Poland and 33% for the leader, Germany, which means that every third enterprise in Germany and over $\frac{3}{4}$ in Poland did not pursue such activity.

Table 2. The share of companies pursuing ongoing or abandoned/suspended innovation activities (product, process, marketing or organizational method innovative) by company size

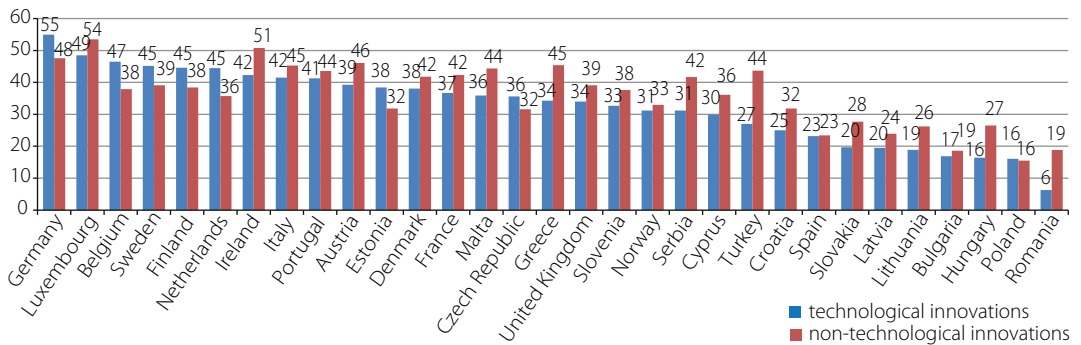
Total		10–49 (%)		50–249 (%)		>249 (%)	
EU(28)	48.9	EU(28)	45.2	EU(28)	60.5	EU(28)	76.4
EU(15)	54.3	EU(15)	50.6	EU(15)	66.8	EU(15)	80.6
Germany	66.9	Luxembourg	63.4	Ireland	74.5	Luxembourg	92.8
Luxembourg	66.1	Germany	63.3	Germany	74.3	Germany	92.2
Ireland	58.7	Ireland	54.0	Italy	71.4	Portugal	87.2
Italy	56.1	Italy	53.4	Austria	70.9	Slovenia	87.0
Sweden	55.9	Sweden	52.8	Luxembourg	69.2	Malta	86.7
Belgium	55.6	Portugal	51.3	Malta	69.2	Ireland	84.5
Portugal	54.6	Belgium	50.9	Belgium	68.8	Italy	84.4
Austria	54.4	Greece	50.7	Portugal	66.8	Austria	84.0
France	53.4	France	49.1	France	66.2	Belgium	83.5
Finland	52.6	Austria	48.7	Netherlands	65.7	Sweden	81.9
Greece	52.3	United Kingdom	48.7	Sweden	65.6	France	81.0
Netherlands	51.4	Finland	48.1	Finland	65.0	Denmark	79.4
Denmark	51.1	Denmark	47.5	Estonia	64.3	Czech Republic	78.7
Malta	51.1	Netherlands	47.4	Slovenia	62.0	Estonia	78.3
United Kingdom	50.3	Malta	45.5	Greece	60.7	Spain	78.2
Estonia	47.6	Estonia	42.6	Cyprus	59.5	Finland	77.7
Slovenia	46.5	Slovenia	40.5	Czech Republic	57.6	Croatia	77.2
Czech Republic	43.9	Cyprus	39.1	Denmark	57.5	Greece	75.6
Cyprus	42.1	Czech Republic	38.2	United Kingdom	56.7	Lithuania	72.8
Croatia	37.9	Croatia	33.1	Spain	55.7	Netherlands	68.5
Slovakia	34.0	Slovakia	29.8	Croatia	51.5	Hungary	67.2
Spain	33.6	Spain	29.0	Lithuania	45.1	Latvia	64.8
Lithuania	32.9	Hungary	28.4	Latvia	43.3	Poland	63.9
Hungary	32.5	Lithuania	28.3	Hungary	42.8	Cyprus	62.2
Latvia	30.4	Latvia	26.5	Bulgaria	40.4	Slovakia	62.1
Bulgaria	27.4	Bulgaria	22.7	Slovakia	40.0	Bulgaria	59.0
Poland	23.0	Romania	18.3	Poland	35.8	United Kingdom	56.2
Romania	20.7	Poland	17.4	Romania	26.6	Romania	40.1

Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8_type].

The analysis of the innovation activity of enterprises presented above does not provide exhaustive information concerning their innovativeness that significantly influences competitiveness. A brief analysis of innovativeness is not sufficient, because it needs to be extended with the knowledge about the processes in companies and the types in innovation that are implemented.

The proportion of innovative enterprises in the field of technological innovations²⁾ (product and process) in Poland is at the level of 16%³⁾, and in the field of non-technological innovation, it is at the level of 15.5%⁴⁾ (Fig. 3). The highest proportion of innovative enterprises in the field of new or significantly improved products or processes is recorded in Germany. In that country, 55% of enterprises pursue innovation activity in the field of technological innovations, excluding the marketing or organizational innovation activity. The leader in the field of non-technological innovations is Luxembourg, where every other enterprise implements innovation in the field of new organizational or marketing methods. Definitely the smallest percentages of innovative companies in the field of non-technological innovations operate in Poland (15.5%) and in Bulgaria (18.6%).

Fig. 3. The share of innovative enterprises in general in the field of technological and non-technological innovations



Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8_type], EU(28) average: technological innovations – 36%, non-technological innovations – 37% and for EU(15): technological innovations – 41% and non-technological innovations – 41%.

The results are very varied depending on the company size. Compared with the presented countries (Fig. 4), the innovativeness of small Polish enterprises that employ between 10 and 49 persons is almost the lowest concerning both technological (11%) and non-technological (12%) innovation.

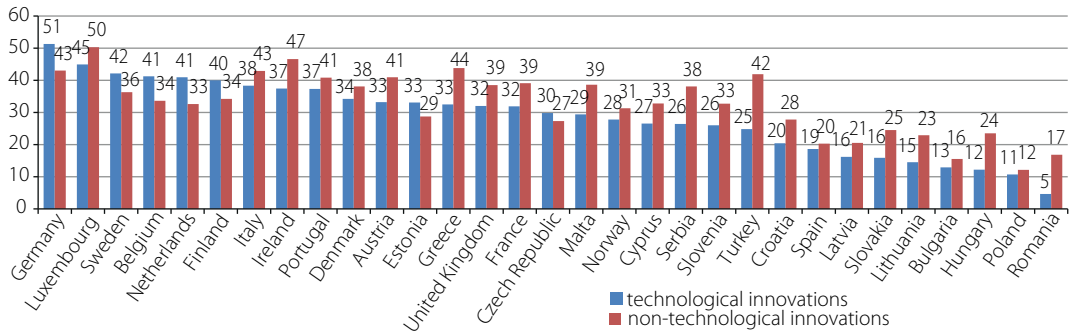
²⁾ According to Eurostat, enterprises innovative in the field of technological innovations are such enterprises that implemented, are implementing, or abandoned their innovation activity in the surveyed period. On the other hand, enterprises innovative in the field of non-technological innovations are such enterprises that implemented marketing and/or organizational innovations.

³⁾ However, these enterprises might have also pursued innovation activity in the field of non-technological innovations.

⁴⁾ This concerns the enterprises whose innovation activity was connected with non-technological innovations (marketing and organizational), and those enterprises might have also pursued innovation activity in the field of technological innovation.

Medium-sized enterprises employing between 50 and 249 persons (28%) (Fig. 5) and large enterprises employing more than 249 persons (56%) (Fig. 6) perform better in terms of technological innovations. When it comes to innovation in terms of marketing and organizational methods, 22% of medium-sized enterprises in Poland engage in this field of innovation activity.

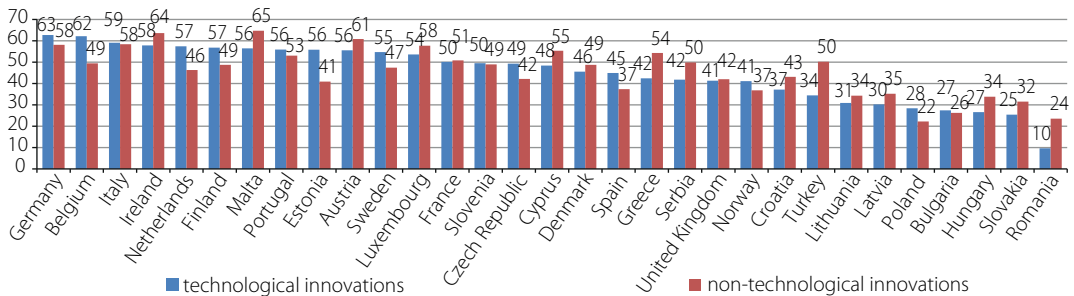
Fig. 4. The share of small innovative enterprises in the field of technological and non-technological innovations



Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8_type], EU(28) average: technological innovations – 32%, non-technological innovations – 34% and for EU(15): technological innovations – 37% and non-technological innovations – 38%.

In the case of large enterprises, the share of companies that have implemented new marketing methods or implemented organizational change was 46%.

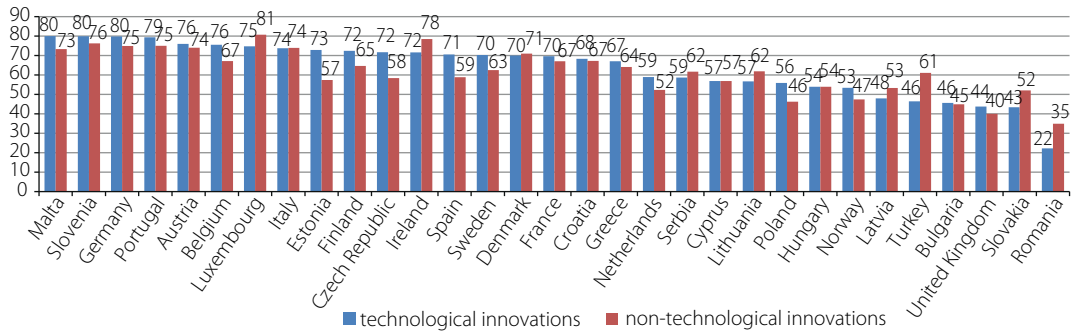
Fig. 5. The share of medium-sized innovative enterprises in the field of technological and non-technological innovations



Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8_type], EU(28) average: technological innovations – 48%, non-technological innovations – 46% and for EU(15): technological innovations – 54% and non-technological innovations – 52%

Conclusions can be drawn that non-technological innovations are usually complementary to product or process innovation activity in large enterprises.

Fig. 6. The share of large innovative enterprises in the field of technological and non-technological innovations



Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8_type], EU(28) average: technological innovations – 65%, non-technological innovations – 61% and for EU(15): technological innovations – 70% and non-technological innovations – 65%.

When evaluating the level of the innovativeness of enterprises in Poland, the analytical approach based on the basic classification of enterprises (PKD) should be used. The most innovative section in the European countries⁵⁾ is Section J – *Information and communication*. On average, 68% of enterprises in the EU-15 pursue innovation activity in this section in the field of products, processes, marketing, or organization. Germany is the leader in this industry, followed by Portugal, where 87% and 76.6% of enterprises, respectively, pursue innovation activity. Companies from Section K – *Financial and insurance activities*, Section C – *Manufacturing*, and Section D – *Electricity, gas, steam, and air conditioning supply* are highly innovative in the EU countries. The average share of innovative enterprises in Section C in the old EU countries is 58%, while, in all 28 countries, it is 52%. Germany with 71.8% and Ireland with 68% have the highest proportion of innovative enterprises in Section C. On the other hand, the leader in section K is Luxembourg with 77.6%. On average, in Section D of the old EU countries there, are 58% of innovative enterprises, with Cyprus being the leader, where each enterprise dealing with production and supply of electricity, etc. is innovative. In Poland, enterprises both in the financial and insurance industry and in the water supply industry are far ahead of other national industries in terms of innovation. However, the distance from EU(15) or EU(28) average is significant. Among the surveyed sections, the least innovative one was *Transportation and storage*. In this section, the proportion of innovative enterprises in Poland is 14%, and the average for 28 European Union countries is 33%. In this industry, Luxembourg is the leader, where 54.4% of enterprises in this section pursue innovation activity. For a comparison, Tables 2 shows the innovation performance in particular sections in the remaining countries of the Visegrad Group. Unfortunately, in comparison with the Czech Republic, Hungary, and Slovakia, the performance of Poland is not very good.

The newest survey presented by the CSO concerning innovation activity in Poland in 2010–2012 shows that the proportion of innovative enterprises increased in comparison with the results from the previous 2009–2011 edition of the survey, both among the enterprises from the industry sector – 16.5% (was 16.1%) and from the service sector – 12.4% (was 11.6%). For small companies, the share of innovative enterprises in the industry and services in 2010–2012 was at the level of 9.6% and 9.5%, respectively. There were 29.4% medium-sized innovative industrial enterprises, and

⁵⁾ Due to the absence of some average values for comparisons with the EU countries, the known values for EU(28) or EU(15) are used, depending on the section.

20.9% medium-sized innovative service enterprises. As in the previous years, large companies had the highest proportion of innovative enterprises, both among industrial enterprises with 56.2% and service enterprises with 44.7%. The highest share of innovative companies in the industry is in section *Manufacture of coke and refined petroleum products* with 52.3% and in section *Manufacture of basic pharmaceutical products and pharmaceutical preparations* with 44.8%. The highest proportion of innovative companies in the service sector is in the following sections: *Financial service activities, except insurance and pension funding* – 64.9%, and *Scientific research and development* – 43.3%.

Table 3. Innovation activity of enterprises in Poland and an average for 28 and 15 EU countries in selected sections in 2010–2012, in %

	Section C	Section D	Section E	Section G	Section H	Section J	Section K	Section M
EU (15)	58	58	46	NDA	37	68	56	NDA
EU (28)	52	49	NDA	NDA	33	NDA	54	NDA
Czech Republic	48	36	34	42	19	65	56	39
Slovakia	33	28	25	38	21	46	60	33
Hungary	32	40	30	34	18	49	43	37
Poland	24	34	19	22	14	33	39	27

Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8_type], Section C – Manufacturing, Section D – Electricity, gas, steam and air conditioning supply, Section E – Water supply; sewerage, waste management and remediation activities, Section G – Wholesale and retail trade; repair of motor vehicles and motorcycles, Section H – Transportation and storage, Section J – Information and communication, Section K – Financial and insurance activities, Section M – Professional, scientific and technical activities.

The results show that industrial enterprises more often introduce innovative processes (12.4%) than products (11.2%). On the other hand, there are fewer industrial enterprises that introduce both product and process innovations (7.1%). Enterprises from the service sector show less innovation than do the presented companies from the industrial sector. Only 9 service companies out of 100 introduced process innovations to their companies, and only 7 out of 100 introduced product innovations. Less than 4 companies out of 100 from the service sector introduced both types of innovations at the same time. When it comes to organizational and marketing innovations, enterprises from the service sector perform better, reaching shares of 10.5% and 11.1%, respectively. In the industry, 10.4% enterprises introduced organization innovations and 10.2% introduced marketing innovations. Compared with the results of the previous edition of the survey, it can be observed that the share of enterprises introducing organizational innovations was higher both in the industrial and service sectors, while it was a few percentage points lower in the case of marketing innovations.

Economic aspects of innovation activity: expenditure on innovation activity of enterprises

Activity of an enterprise, especially in the area of innovation, is connected with certain expenditure, because it is connected with research and development activity, which requires costly specialist research and equipment and qualified researchers. New innovative products require the use of modern

technologies, the purchase of knowledge from external sources, software, and external support from specialists, all of which involves high costs that are much higher at the initial implementation phase than the maintenance of technological lines that have been known and used for years. The formation of total expenditure on innovation activity per enterprise in Poland and other European countries is presented in Table 3 with a graphic and spatial presentation (Figs. 7 and 8).

According to Eurostat, the leader in the volume of expenditure on innovation activity per enterprise is Denmark, where the expenditure exceeds EUR 2.4 million. Slightly less is allotted by an average Swedish enterprise – EUR 2.2 million.

Table 4. Total expenditure per enterprise pursuing innovation activity in the area of (product and process) technological innovations per company size in 2012 (EUR thousand)

Total		10–49		50–249		>249	
Denmark	2,434	Ireland	381	Belgium	2,151	Sweden	31,366
Sweden	2,275	Belgium	379	Hungary	1,858	Denmark	24,475
France	1,825	Finland	356	Ireland	1,263	Germany	21,950
Germany	1,804	France	329	United Kingdom	1,117	France	16,565
Finland	1,620	Sweden	315	France	1,057	Netherlands	16,038
Belgium	1,558	United Kingdom	308	Denmark	1,049	Finland	15,088
Ireland	1,268	Denmark	282	Sweden	985	Belgium	11,378
Austria	1,190	Lithuania	230	Austria	877	Ireland	10,265
Hungary	1,137	Austria	217	Netherlands	876	Austria	9,021
Slovakia	1,028	Estonia	197	Finland	840	United Kingdom	7,392
Netherlands	1,010	Netherlands	178	Germany	783	Croatia	7,192
Poland	1,005	Malta	154	Italy	704	Italy	7,025
Croatia	918	Hungary	153	Spain	630	Spain	6,773
United Kingdom	800	Spain	152	Poland	627	Slovakia	5,914
Spain	752	Slovakia	150	Slovakia	611	Greece	5,600
Luxembourg	656	Germany	147	Luxembourg	588	Luxembourg	5,580
Malta	522	Italy	140	Greece	586	Poland	5,068
Czech Republic	498	Cyprus	136	Malta	577	Estonia	4,113
Italy	476	Poland	120	Latvia	450	Hungary	4,017
Lithuania	455	Czech Republic	117	Slovenia	447	Latvia	3,250
Estonia	452	Greece	111	Estonia	442	Malta	3,127
Latvia	397	Luxembourg	103	Czech Republic	433	Portugal	3,082
Greece	371	Croatia	103	Croatia	380	Czech Republic	3,009
Romania	362	Romania	92	Lithuania	371	Slovenia	2,979
Portugal	281	Latvia	89	Romania	367	Lithuania	2,248
Cyprus	230	Portugal	82	Portugal	350	Cyprus	1,651
Bulgaria	206	Bulgaria	40	Cyprus	272	Bulgaria	1,036
Slovenia	NDA	Slovenia	10	Bulgaria	NDA	Romania	NDA
EU(28)	1,150	EU(28)	181*	EU(28)	255	EU(28)	4,556
EU(15)	1,238	EU(15)	152	EU(15)	667	EU(15)	15,178
Norway	1,514	Norway	491	Norway	1,799	Norway	10,963
Serbia	66	Serbia	8	Serbia	35	Serbia	531
Turkey	1,625	Turkey	382	Turkey	4,357	Turkey	9,423

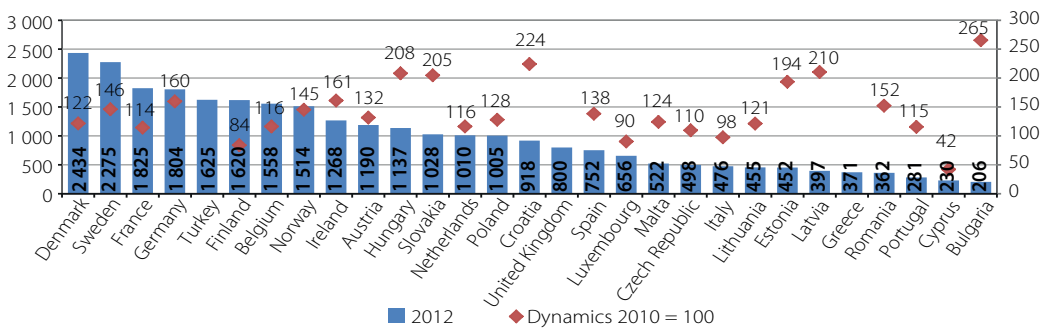
Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8_exp], *own calculations.

Poland is at the 12th position among the countries presented in terms of average innovation expenditure per company that pursue product or process innovation activity (regardless of whether the company pursued activity in the field of marketing or organization innovation). The expenditure of Polish entrepreneurs on innovation activity is similar to, yet slightly lower, than the average for EU(28) countries – EUR 1,005 thousand. The position of Polish enterprises in comparison with other countries in the group of small (position 19 out of 28), medium-sized (position 14 out of 28), and large companies (17 out of 28) is rather average.

Compared with the results of the CIS-7 (2008–2010) survey, in the CIS-8 2010–2012 survey, the expenditure on companies’ innovation activity in Poland increased by 28%, which is similar to the average in the countries presented in Fig. 8. The countries exhibited a significant growth of innovation activity expenditure are all the presented countries with the exception of Finland, Luxembourg, Italy, and Cyprus. In the group of countries that exhibited a significant decrease in expenditure on innovation activity were mostly those with a high proportion of innovative companies.

In Poland, the growing expenditure on innovation activity per company is at a similar level to the EU countries’ average, and the increase of that expenditure, despite the economic slowdown, should be considered positive. Attention needs to be drawn to the countries that almost doubled their average expenditure per company, and that group encompasses the following countries: Hungary, Slovakia, Croatia, Estonia, Latvia, and Bulgaria.

Fig. 7. Expenditure per enterprise pursuing innovation activity in the area of (product and process) technological innovations per company size in 2012 (EUR thousand) and the dynamics of that size in Poland and selected countries (2008–2010 =100)



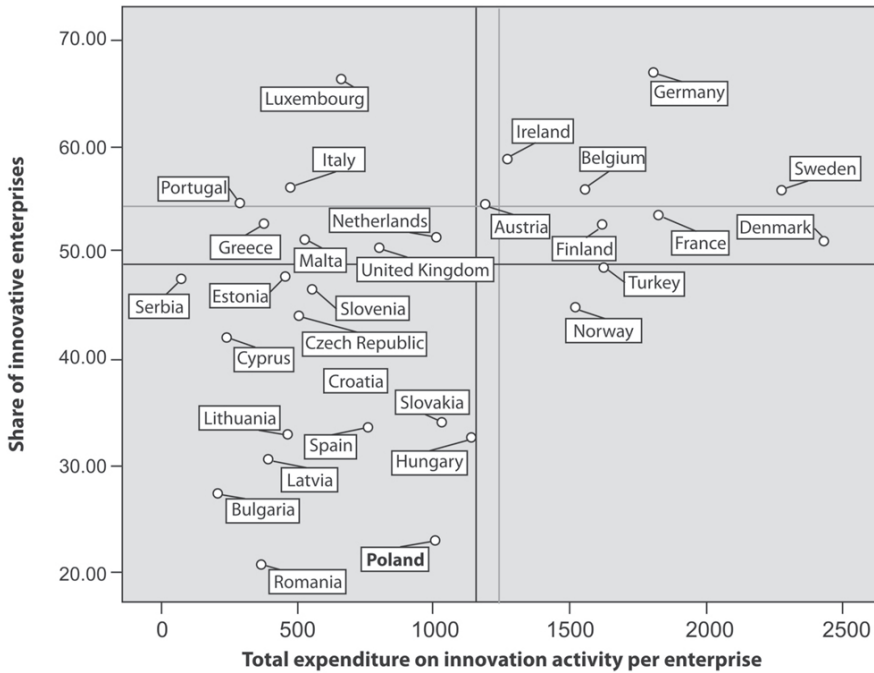
Source: Author’s compilation based on the Eurostat Statistics Database [inn_cis8_exp], [inn_cis7_exp].

The analysis of expenditure on innovation activity compared with the share of innovative companies (Fig. 9) makes us look at innovation in Poland in terms of a small group of enterprises, however well invested, at a high level. This situation is somewhat special among the presented countries and does not occur in any other country.

The first quarter includes countries where the share of innovative companies and total expenditure per company is below the EU(28) average. All countries that recently joined the EU plus Spain are in this quarter. The second quarter, with countries such as the United Kingdom, Malta, Greece, the Netherlands, Italy, Portugal, or Luxembourg, is an interesting example with a high proportion

of innovative enterprises and relatively low expenditure on innovation activity per company. Conclusions can be drawn that these countries use the funds for innovation activity very effectively. The third quarter group are countries with an above-average share of innovative companies with high expenditure per innovative company. This group is comprised of countries such as Ireland, Austria, Finland, Belgium, France, Germany, Sweden, and Denmark.

Fig. 8. Scatter diagram total expenditure on innovation activity per enterprise vs. the share of innovative companies (the share of innovative enterprises in the field of product and process innovations regardless of marketing or organizational)



Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8_exp], [inn_cis8_type].

The recent results of the CSO survey show that the expenditure of industrial enterprises in Poland was PLN 21.0 billion in 2013, i.e. 2.7% less than in 2012, while, in the service enterprise sector, the expenditure was PLN 12.0 billion, i.e. 20.9% less than a year before⁶⁾.

Medium-sized and large enterprises in the service sector conducted the largest innovation activity expenditure cuts. Compared with the expenditure of the previous year, the expenditure was reduced by 56% in medium-sized companies and by 25% in large companies. Apart from the decrease, a spectacular increase in the expenditure was noted among small companies, both in the industrial (an increase of 15.8%) and service sector (an increase of 135.6%). It is interesting that small enterprises in the service sector have been gradually spending more on innovation in the recent years compared with other enterprises; compared with 2011, the increase is already over 244%.

⁶⁾ *Innovation activities of enterprises in 2011–2013*, CSO, Warsaw, 2014.

Research and development activity of enterprises

Investments in research and development are significant for innovation processes, because they are an important element of the companies' operation due to R&D activity products, technology, and services progress. Internal and external R&D activity can be distinguished. Internal R&D activity covers the whole R&D activity of the enterprise. It covers the R&D activity with the aim to facilitate the development and the implementation of innovations in terms of products, processes, marketing, or organizational innovations, and it covers basic surveys that are not directly connected with the development of a particular innovation. On the other hand, the external R&D activity of enterprises covers mostly the purchase of research and development services available on the market.

In Poland, among the enterprises pursuing product or process innovation activity, 31% conduct internal research and development activity (Table 4). This result is almost identical with the 2008–2010 survey; however, there is a difference, namely, expenditure per an average enterprise pursuing such an activity has increased significantly from EUR 322 thousand to EUR 710 thousand. When it comes to the proportion of companies pursuing an internal R&D activity, it is one of the lowest results among the presented countries. Slovenia is the leader (78%) in terms of the share of innovative enterprises with their own research and development facilities pursuing their own R&D activity. However, the lowest share of such enterprises is in Bulgaria with 11%. The share of enterprises conducting internal R&D activity in countries such as the Czech Republic, Slovakia, and Hungary is at the level of 47%, 44%, and 51%, respectively.

The analysis of enterprises with respect to their size provides more detailed information when it comes to the proportion of companies that conduct R&D activity. It seems natural that small enterprises conduct such an activity on a smaller scale and do it less often. On the other hand, large companies, due to their organizational structure, economic potential, and thus the possibility to designate additional organizational units, use their internal R&D department more often.

The country with the highest proportion of small enterprises conducting internal R&D activity is Slovenia (74%). Comparing Polish enterprises employing 10–49 workers with the leader, the presented values are very far from the top value. The share of small enterprises in Poland that pursue an internal R&D activity is 23% of the total number of companies pursuing innovation activity. A very high share of small companies conducting internal research and development activity (apart from the mentioned Slovenia (74%)) can be also seen in Finland (75%), the Netherlands (73%), and Norway (71%).

The values presented in Table 5 concerning the proportion of enterprises pursuing internal R&D activity among medium-sized companies indicate that, in most countries, the proportion of enterprises engaged in R&D is approx. 10 percentage points higher than in the statistics for that category in comparison with small companies. The highest share of medium-sized companies pursuing R&D activity is in the Slovenia (84%). These two are followed by Finland and Norway, with the percentages of 81% and 79%, respectively. The result for Poland is 35%. The lowest share of medium-sized innovative companies conducting internal R&D activity can be noted in Bulgaria, where only every tenth enterprise conducts internal R&D activity.

Table 5. The share of companies pursuing an internal R&D activity compared with the total number of companies pursuing product and process innovation activity regardless of whether they conducted non-technological activity and average expenditure on internal R&D activity per enterprise pursuing such an activity in selected countries in 2012 (EUR thousand)

Total	EUR thousand	%	10–49	EUR thousand	%	50–249	EUR thousand	%	>249	EUR thousand	%
Denmark	3,181	45	Slovenia	NDA	74	Hungary	2,521	47	Sweden	23,481	80
Sweden	2,047	64	Norway	451	68	Belgium	1,662	67	Denmark	20,141	72
France	1,683	65	Denmark	428	40	Norway	1,357	79	Finland	13,063	92
Finland	1,603	75	Ireland	340	61	Denmark	1,193	59	France	12,895	79
Germany	1,601	48	Belgium	318	51	Sweden	1,018	70	Germany	12,771	74
Austria	1,529	51	Finland	312	72	Ireland	940	69	Netherlands	11,759	84
Belgium	1,433	57	Spain	286	36	Austria	863	60	Turkey	9,356	64
Norway	1,305	71	France	272	60	France	817	73	Austria	8,809	73
Hungary	1,120	51	Sweden	268	62	Netherlands	777	78	Norway	8,189	84
Croatia	1,102	56	Romania	212	17	Spain	702	55	Belgium	7,721	83
Turkey	1,020	41	Austria	208	44	Turkey	673	47	Croatia	7,693	72
Ireland	1,005	64	Malta	156	33	Germany	594	57	Ireland	6,495	78
Spain	889	43	Turkey	146	37	Finland	586	81	Luxembourg	6,089	69
Netherlands	851	73	Lithuania	138	45	Poland	561	35	Italy	5,410	63
Luxembourg	832	47	Italy	132	34	Greece	501	48	Spain	4,497	65
Poland	710	31	Portugal	132	29	Italy	480	50	Estonia	2,882	83
Bulgaria	553	11	Germany	126	43	Romania	465	31	Hungary	2,848	55
Italy	520	37	Netherlands	124	71	Slovakia	316	46	Slovenia	2,128	89
Romania	452	25	Bulgaria	113	10	Slovenia	267	84	Poland	2,107	46
Slovenia	411	78	Hungary	110	52	Czech Republic	264	55	Portugal	2,063	75
Portugal	364	35	Luxembourg	85	44	Portugal	259	48	Greece	1,987	70
Slovakia	300	44	Poland	81	23	Luxembourg	253	48	Czech Republic	1,045	66
Estonia	298	54	Czech Republic	78	40	Malta	229	44	Slovakia	1,017	58
Czech Republic	278	47	Estonia	75	50	Lithuania	152	40	Romania	820	41
Greece	278	34	Slovakia	64	41	Estonia	134	59	Lithuania	792	44
Malta	265	39	Croatia	49	51	Croatia	107	61	Malta	713	71
Lithuania	202	43	Greece	48	30	Latvia	75	29	Cyprus	261	52
Latvia	54	24	Latvia	18	22	Cyprus	10	32	Latvia	215	34
Cyprus	39	23	Cyprus	15	19	Bulgaria	NDA	10	Bulgaria	NDA	16
Average for EU(27)	874	X	Average for EU(27)	161	X	Average for EU(27)	605	X	Average for EU(27)	6142	X

Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8_exp], the average for EU27 excluding the United Kingdom.

Large enterprises conducting innovation activity focus mostly on the development of internal R&D activity. In Finland (92%) and Slovenia (89%) almost every company conducts an internal R&D activity.

In comparison with small enterprises, the share of large Polish enterprises is significantly higher (46%); however, it is one of the five lowest results among the analysed countries.

An analytical completion of the area of the proportion of innovative companies pursuing internal R&D activity is the average expenditure on such an activity in enterprises (Table 5). The highest expenditure on this activity is in companies in the Scandinavia: in Denmark (EUR 3,181 thousand) and in Sweden (EUR 1,471 thousand). It can be concluded that countries with a high level of expenditure on such an activity are characterised by an above-average proportion of enterprises pursuing internal R&D activity. At the same time, the leaders in terms of internal R&D expenditure spend 3.5 times more than the EU (27) average. Polish companies innovative in terms of the size of internal expenditure on R&D in general are in the middle of the number of companies, but with their expenditures being below the average.

The CIS – 8 survey shows that the proportion of enterprises pursuing external R&D activity (Table 6) is much lower than in the case of internal activity (Table 5). The highest proportion of innovative enterprises using external R&D services is in Finland (52%), Slovenia (41%), and in the Netherlands (40%). In Poland, every fifth enterprise conducts an external research and development activity, being on the 20th position out of 29 presented countries. The lowest share of innovative companies conducting external R&D activity is in Malta (5%) and Romania (3%).

In terms of average expenditure per an average enterprise conducting external R&D activity, Polish enterprises come 17th out of 29 countries, with EUR 259 thousand. The average amount for the presented countries is EUR 519 thousand, and the leader in terms of expenditure on R&D activity is Denmark (EUR 3.5 million). The expenditure of Polish companies in all size groups is much below the EU countries' average presented in Table 6.

Table 6. The share of companies pursuing an external R&D activity compared with the total number of companies pursuing product or process innovation activity and average expenditure on external R&D activity per enterprise pursuing such an activity in selected countries in 2012 (EUR thousand)

Total	EUR thousand	%	10–49	EUR thousand	%	50–249	EUR thousand	%	>249	EUR thousand	%
Denmark	3,504	20	Turkey	224	16	Denmark	840	23	Denmark	17,774	45
Sweden	1,729	27	Norway	175	30	Norway	497	42	Sweden	13,898	54
France	1,169	34	Ireland	138	29	Ireland	437	35	Netherlands	8,146	59
Slovakia	961	22	Denmark	126	16	Belgium	371	43	France	7,155	60
Germany	861	19	Malta	125	4	Netherlands	341	47	Germany	4,495	49
Spain	766	21	Belgium	121	28	Spain	318	28	Spain	4,467	39
Norway	736	35	France	115	28	France	278	43	Norway	4,326	59
Netherlands	640	40	Spain	104	16	Hungary	274	26	Ireland	4,096	42
Belgium	637	34	Finland	83	47	Italy	241	21	Belgium	3,977	56
Ireland	590	31	Netherlands	74	37	Austria	229	32	Slovakia	3,648	43
Turkey	432	18	Italy	64	10	Luxembourg	215	24	Italy	2,356	35
Austria	418	26	Austria	60	20	Turkey	201	19	Turkey	2,280	36
Hungary	391	22	Hungary	52	15	Germany	165	25	Czech Republic	1,725	43

cont. →

cont. table 6

Total	EUR thousand	%	10–49	EUR thousand	%	50–249	EUR thousand	%	>249	EUR thousand	%
Czech Republic	388	23	Lithuania	46	21	Finland	161	57	Finland	1,607	78
Italy	337	12	Estonia	46	23	Poland	152	22	Austria	1,594	57
Finland	283	52	Czech Republic	39	17	Slovakia	135	26	Hungary	1,040	45
Poland	259	19	Germany	38	14	Greece	112	24	Greece	851	45
Romania	176	3	Poland	35	12	Czech Republic	109	29	Luxembourg	695	42
Luxembourg	143	27	Romania	28	2	Slovenia	74	54	Poland	659	37
Malta	127	5	Portugal	24	17	Romania	62	3	Portugal	593	56
Slovenia	126	41	Bulgaria	18	6	Portugal	58	32	Malta	431	8
Greece	119	16	Greece	18	14	Estonia	51	37	Slovenia	383	72
Portugal	102	22	Luxembourg	15	26	Lithuania	43	20	Estonia	340	67
Estonia	80	29	Cyprus	14	19	Croatia	42	35	Croatia	232	53
Croatia	60	31	Slovakia	14	16	Cyprus	14	34	Cyprus	171	71
Lithuania	51	22	Croatia	11	26	Latvia	10	20	Latvia	133	31
Cyprus	35	24	Latvia	9	10	Malta	8	7	Lithuania	85	35
Bulgaria	33	8	Slovenia	NDA	30	Bulgaria	NDA	9	Bulgaria	NDA	15
Latvia	27	14	Sweden	NDA	24	Sweden	NDA	32	Romania	NDA	8
Average for EU(27)	519	×	Average for EU(27)	57	×	Average for EU(27)	189	×	Average for EU(27)	3222	×

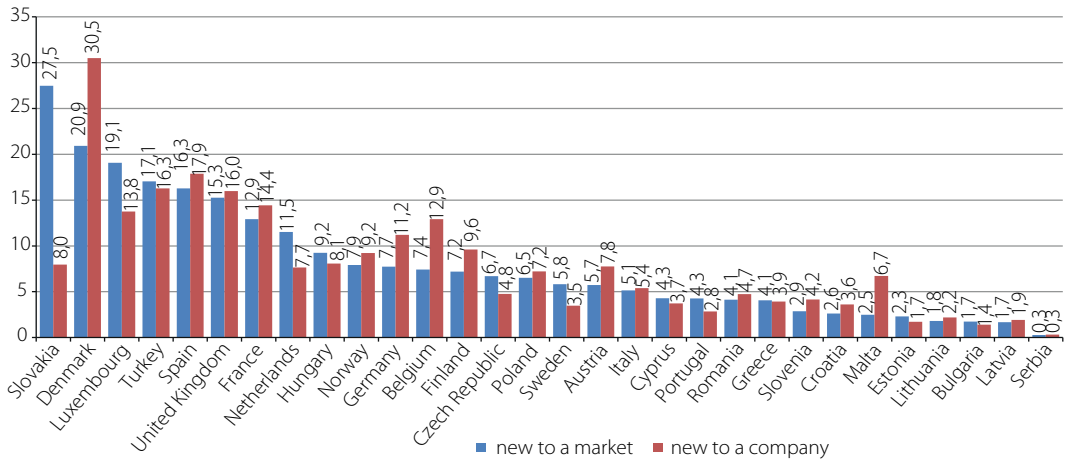
Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8_exp] Innovation activities and expenditures in 2012.

Sale of new or significantly improved goods

The marketed production of new products to a company and the market is at a relatively high level in Poland. The average sales value of products new to a company per enterprise which introduced such a product in EU(28) is at the level of EUR 10.1 million. Companies receive lower sales value from products that are new to the market – EUR 8.8 million. The enterprises in Poland which introduced a product that is new from the company's perspective achieve sales value of these products in the amount of EUR 7.2 million, which is EUR 2.9 million below the EU(28) average. On the other hand, the sales value of products new to the market is EUR 6.5 million and is EUR 2.3 million below the EU(28) average. The presented sale volumes of companies in Poland, in terms of the degree of novelty for a market or company, are different from the results of the previous edition. The sales volume of products new from the market perspective has decreased significantly – by approx. 20%, while the sales value of products new to a company has increased by 34%.

The leader in terms of the sales value of products new to a company is Denmark, with EUR 30.5 million per an average enterprise selling such innovative products. Second in this category comes Spain with EUR 17.9 million, which is nearly half of Denmark's sales value. Enterprises implementing innovations new to a market reach the highest sales values for these products in Slovakia (EUR 27.5 million) and in Denmark (EUR 20.9 million).

Fig. 9. The sales value of products new to a company or new to a market per enterprise pursuing product or process innovation activity in 2010–2012 (EUR million)



Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8_prod].

Cooperation in terms of innovation and the source of information for innovation

The innovativeness of enterprises is based mostly on the cooperation of companies with other entities. Cooperation in terms of innovation allows the enterprises to access knowledge and technology. There is also a high synergy potential, because the partners learn from one another when they cooperate with each other. Cooperation in the area of innovation may take place along the supply chain, and encompass clients and suppliers in the framework of mutual works on creating new products, processes, and may concern cooperation between the scientific community and entrepreneurs. Cooperation between enterprises might involve entities in one country as well as partners from Europe, the USA, China, or India.

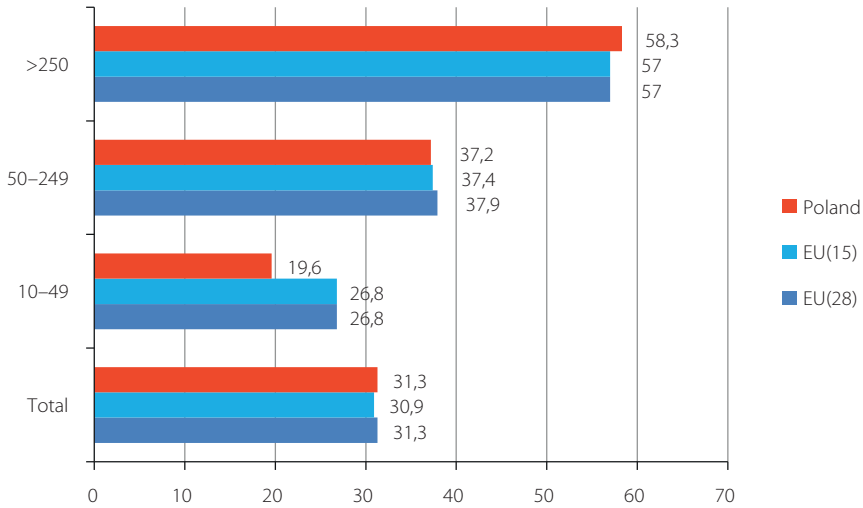
During the analysis of cooperation between enterprises in terms of innovation activity, their tendency to cooperate in the framework of a cluster initiative is also taken into account⁷⁾.

In 2010–2012, on average, 31.3% of innovative enterprises⁸⁾ cooperated with other entities in EU28 (Figure 10). The noted share of innovative enterprises in Poland cooperating in terms of innovation was at the same level. It is interesting that the average proportion of enterprises cooperating in particular categories of enterprise sizes in Poland are at the level of the EU(28) or EU(15) average. The only exception is the category of small enterprises, where the proportion of cooperating companies is visibly lower for EU(28) or EU(15) (Fig. 10).

⁷⁾ *Innovation activities of enterprises in 2010–2012*, CSO, Statistical Office in Szczecin, Warsaw, 2013, p. 92.

⁸⁾ In terms of product or process (regardless of the company pursuing innovation activity in the field of marketing or organization method).

Fig. 10. Cooperation between enterprises in terms of innovation in the breakdown by enterprise size



Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8_coop].

Detailed information on the entities cooperating with enterprises is presented in Table 7.

Polish enterprises are engaged in cooperation with all the presented groups and are generally at the average level for the EU. Comparing cooperation in EU(28) and Poland, there is a significant difference concerning equipment, materials, components, and software suppliers (EU(28)-18%, PL-21%) and the cooperation with enterprises engaged in cooperation with partners from EU, EFTA, or EU candidate countries (except for national partners) (EU(28)-13%, PL-16%). A lower proportion of innovative enterprises in Poland compared with the EU(28) average cooperates with competitors (EU(28)-9, PL-7%) and with universities (EU(28) – 13%, PL – 11%).

The analysis of data on companies cooperating with other entities in different countries provides a lot of interesting information. The United Kingdom is the leader when it comes to the level of cooperation with other entities (67%), while it is mostly conducted with national partners (51%), in cooperation with clients from the same sector (45%), and, in the third example, with enterprises belonging to the same group. The cooperation picture of the United Kingdom indicates a significant engagement of national companies (probably in the form of a cluster) and clients, which means that the implemented innovations respond to the client's needs. Another country with a high level of engagement in cooperation with other entities, measured with the proportion of companies cooperating with other entities, is Cyprus (53%). Cooperation of innovative enterprises from Cyprus is based mostly on the cooperation with enterprises from EU, EFTA, or EU candidate countries. These are mostly equipment, materials, components, and software suppliers (46%), but consulting companies (27%) and competitors (26%) also play an important role in the cooperation. Clients are an important

link in the cooperation (32%). In Cyprus, companies rarely engage in cooperation with the government (5%), universities (5%), or with other enterprises belonging to the same group.

Finland and Slovenia are examples of countries where companies largely cooperate with the government, universities, and with clients in a relatively balanced scope. Such an interdependence is probably due to the small size of these countries and a balanced and effective innovation system. The analysis of data on the cooperation of European countries indicates that innovative enterprises more often cooperate with partners from the USA than from China or India. This is more often the case in Ireland, where every tenth innovative enterprise cooperates with partners from the USA (a similar engagement can be observed in the Netherlands, Sweden, and Finland).

Comparing the proportion of companies in Poland cooperating with other entities with the proportion of companies from the Visegrad Group countries (Slovakia, Czech Republic, and Hungary), all areas of cooperation should be enforced. In the case of less-developed countries, such as Poland, it is important to develop the ability of market recognition and cooperation with the market participants as basic knowledge that is necessary for competing with other enterprises.

Innovativeness of enterprises survey for 2011–2013 indicates that 28.4% innovation active industrial enterprises in Poland cooperated with other entities in terms of innovation activity, and the results was by 5.4 percentage points lower than in the 2010–2012 survey. In the service sector, there was a reduction of cooperation by 23% (decrease by 4.3 percentage points) in 2011–2013. The analysis of data from the perspective of the enterprise size indicates that a decrease of the proportion of enterprises cooperating with other entities can be noted in all enterprise groups in the industry sector. In the service sector, an increase in the number of enterprises cooperating with other entities can be observed only among small companies (an increase from 16% to 20.2%).

Taking into consideration the tendency to cooperate in terms of cluster initiatives, the noted share of enterprises cooperating in clusters in the total number of entities cooperating in terms of innovation activity in 2011–2013 was at the level similar to the 2010–2012 survey. Among the enterprises from the service sector, the level was 13.2% (compared with 13.1% in 2010–2012), and among industrial enterprises, the level was 16.1% (compared with 18.3%). Cooperation in the framework of a cluster initiative is taken up mostly in entities with more than 250 workers. In this size class, more than every fifth enterprise both from the industrial and service sector declared cooperation in the framework of clusters⁹⁾.

⁹⁾ *Innovation activities of enterprises in 2011–2013*, CSO, Statistical Office in Szczecin, Warsaw, 2015, p. 96–97.

Table 7. The share of enterprises that cooperated with the following groups of entities in selected countries in 2012

Enterprises cooperating with other entities in general (%)	Enterprises from the same group (%)	Competitors and other companies from the same sector (%)	Clients from the private sector (%)	Equipment, materials, components, and software suppliers (%)	Universities or other higher education institutions (%)	Government or public or private research institutes (%)	Consulting companies (consultants), private laboratories, private R&D institutions (%)	Enterprises cooperating with China and India (%)	Enterprises engaged in cooperation with partners from EU, EFTA or EU candidate countries (except for national partners) (%)	Enterprises engaged in any cooperation with national partners (%)	Enterprises engaged in cooperation with partners from EU, EFTA or EU candidate countries (including national partners) (%)	Enterprises cooperating with partners from the USA (%)							
EU(28)	31	EU(28)	9	EU(28)	13	EU(28)	9	EU(28)	11	EU(28)	13	EU(28)	27	EU(28)	NDA	EU(28)	NDA		
EU(15)	31	EU(15)	9	EU(15)	13	EU(15)	9	EU(15)	11	EU(15)	12	EU(15)	27	EU(15)	NDA	EU(15)	NDA		
United Kingdom	67	United Kingdom	26	United Kingdom	46	Finland	23	Cyprus	27	Denmark	6	Slovenia	39	United Kingdom	51	Cyprus	53	Ireland	11
Cyprus	53	Estonia	26	Slovenia	39	Slovenia	19	Denmark	25	Sweden	6	Cyprus	34	Cyprus	49	Slovenia	50	Netherlands	10
Belgium	52	Belgium	26	Cyprus	38	Austria	22	Finland	23	Slovenia	5	Estonia	31	Slovenia	44	Belgium	48	Sweden	10
Slovenia	50	Slovakia	19	Finland	36	United Kingdom	20	Norway	14	United Kingdom	5	Slovakia	31	Belgium	42	Lithuania	44	Finland	10
Lithuania	45	Slovenia	18	Sweden	32	Greece	19	Belgium	14	Greece	21	Netherlands	5	Belgium	40	Lithuania	43	Denmark	9
Estonia	43	Finland	16	Greece	32	Lithuania	19	Austria	13	Hungary	20	Lithuania	5	Austria	39	Hungary	43	Belgium	8
Austria	43	Austria	15	Lithuania	32	Lithuania	19	Lithuania	12	Slovenia	19	Belgium	4	Lithuania	38	Denmark	41	Slovenia	8
Denmark	43	Denmark	15	Croatia	31	Hungary	18	Spain	12	Belgium	19	Croatia	4	Finland	25	Austria	41	Austria	7
Hungary	41	Serbia	15	Slovakia	30	Sweden	18	Denmark	11	Sweden	18	Ireland	4	Denmark	25	Finland	38	Lithuania	7
Slovakia	38	Lithuania	14	Croatia	29	Denmark	16	Sweden	11	Lithuania	18	Austria	4	United Kingdom	25	Greece	38	Slovakia	7
Greece	38	Sweden	13	Hungary	28	Croatia	15	Norway	11	Norway	16	Latvia	4	Croatia	24	Czech Republic	37	Norway	6
Czech Republic	37	Greece	13	Austria	26	Czech Republic	15	Austria	10	Austria	15	Greece	4	Greece	21	Estonia	36	Greece	6
Finland	36	Hungary	13	Belgium	26	Germany	14	Croatia	10	Croatia	15	Czech Republic	3	France	32	Croatia	35	Croatia	5
Croatia	35	Ireland	13	Estonia	25	Norway	13	Slovakia	9	Slovakia	13	Slovakia	3	Sweden	21	Croatia	34	Latvia	5
France	35	Netherlands	12	Norway	24	Slovakia	13	France	9	France	12	Hungary	3	Ireland	20	Slovakia	32	France	5
Netherlands	34	France	11	Denmark	24	Ireland	12	Netherlands	8	Ireland	12	Norway	3	Hungary	19	Netherlands	31	Netherlands	5
Poland	31	Norway	10	Netherlands	21	France	12	Luxembourg	8	Netherlands	12	France	2	Luxembourg	18	Sweden	30	Cyprus	5
Ireland	31	Latvia	9	Luxembourg	14	Netherlands	11	Romania	8	Estonia	12	Latvia	2	Spain	16	Spain	29	Czech Republic	4
				Poland	21														

cont. ↓

cont. table 7

Enterprises cooperating with other entities in general (%)	Enterprises from the same group (%)		Competitors and other companies from the same sector (%)		Clients from the private sector (%)		Equipment, materials, components and software suppliers (%)		Universities or other higher education institutions (%)		Government or public or private research institutes (%)		Consulting companies (consultants), private laboratories, private R&D institutions (%)		Enterprises cooperating with partners from China and India (%)		Enterprises engaged in cooperation with partners from EU, EFTA or EU candidate countries (except for national partners) (%)		Enterprises engaged in cooperation with national partners (%)		Enterprises engaged in cooperation with partners from EU, EFTA or EU candidate countries (including national partners) (%)		Enterprises cooperating with partners from the USA (%)	
Sweden	30	Czech Republic 14	Czech Republic 8	Ireland 14	Latvia 20	Estonia 11	Latvia 7	Czech Republic 11	Cypr 2	Poland 16	Poland 27	Ireland 29	Hungary 4											
Spain	29	Croatia 13	France 7	France 12	Ireland 18	Poland 11	Hungary 7	Latvia 11	Poland 2	Norway 16	Norway 26	Norway 28	Poland 4											
Norway	28	Luxembourg 12	Poland 7	Romania 12	Romania 18	Spain 10	Portugal 7	Luxembourg 11	Bulgaria 2	France 14	Ireland 23	Latvia 24	Estonia 4											
Serbia	27	Poland 12	Turkey 7	Latvia 11	Norway 17	Portugal 10	Czech Republic 6	Poland 9	Estonia 2	Malta 12	Germany 21	Romania 24	Bulgaria 3											
Latvia	25	Turkey 11	Spain 7	Portugal 10	Luxembourg 15	Latvia 8	Turkey 5	Romania 9	Germany 2	Romania 12	Romania 20	Germany 24	Portugal 3											
Romania	24	Cyprus 9	Bulgaria 6	Spain 9	Spain 13	Luxembourg 7	Slovakia 5	Spain 8	Turkey 2	Netherlands 11	Latvia 20	Luxembourg 21	Romania 2											
Germany	24	Spain 9	Portugal 6	Turkey 9	Portugal 13	Turkey 7	Estonia 5	Turkey 8	Portugal 1	Bulgaria 10	Luxembourg 18	Portugal 19	Germany 2											
Luxembourg	21	Germany 7	Germany 5	Bulgaria 9	Bulgaria 11	Italy 6	Ireland 5	Portugal 7	Spain 1	Portugal 9	Portugal 18	Serbia 18	Spain 2											
Portugal	19	Portugal 7	Ireland 5	Germany 9	Turkey 11	Malta 5	Cyprus 5	Germany 6	Romania 1	Serbia 9	Turkey 16	Turkey 17	Malta 2											
Turkey	17	Malta 7	Italy 4	Malta 6	Germany 10	Romania 5	Italy 3	Italy 6	Italy 1	Spain 8	Serbia 15	Malta 16	Turkey 2											
Bulgaria	17	Romania 7	Malta 4	Italy 4	Malta 9	Cyprus 5	Bulgaria 3	Bulgaria 5	Malta 0	Germany 7	Bulgaria 13	Bulgaria 16	Italy 1											
Malta	16	Bulgaria 6	Romania 3	Serbia 0	Italy 7	Bulgaria 5	Malta 3	Malta 5	Serbia 0	Turkey 5	Italy 12	Italy 13	Serbia 0											
Italy	13	Italy 3	Serbia 0	Poland 0	Serbia 0	Serbia 0	Serbia 0	Serbia 0	United Kingdom NDA	Italy 4	Malta 12	United Kingdom NDA	United Kingdom NDA											

Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8].

Information sources for innovation

Analysing the sources of information for the innovation activity, the basic areas of importance for an innovative enterprise can be listed, containing information which

- is within a given enterprise or another enterprise belonging to the group of enterprises;
- may be received from suppliers, clients, competitors, or consulting companies;
- has its institutional sources, i.e. higher education institutions, research institutes, foreign public research institutes; and,
- coming from an engagement in fairs, exhibitions, conferences, industry societies, and associations, as well as from periodicals, and scientific or industrial publications.

The meaning of particular information sources for enterprises varies in particular countries (Table 8). Enterprises from Cyprus come first in terms of the share of companies (97.7%) that evaluated their own facilities (in terms of both infrastructure and human resources) as an information source for innovation of major importance. In Poland, this source of information is evaluated as high by 48% of innovative enterprises. It needs to be underlined that, among the possible answers in the questionnaire, "enterprise" is indicated most often as a source of information. In the evaluation of an enterprise, market sources such as equipment, materials, components and software suppliers, clients, consumers, and competitors are the most important sources of information for innovation activity besides the enterprise's internal sources. Enterprises in countries such as Cyprus, Slovenia, Malta, and Romania mostly appreciate this source of information. In Poland, among external information sources, the following sources are most often evaluated as of high importance: equipment suppliers 22.3%, then clients and consumers from the private sector – 11.2%, and competitors – 10.1%. The countries that highly evaluate institutional sources for innovation, such as research institutes or higher education institutions are mostly Slovenia (53.1%, 8%), Romania (18.2%, 20%), Poland (8.9%, 8%), but also Hungary and Austria. On the other hand, the countries that appreciate sources of information related to fairs, exhibitions, associations with societies, as well as from gaining information from periodicals, and scientific or industrial publications are Cyprus, Austria, and Romania.

The identification of important information sources for innovation activity helps one to understand a structure of the knowledge transfer within the enterprise and indicates important cooperation relations in terms of innovation. It can be observed that the proportion of enterprises that indicated a given information source for innovation as "high" also indicated cooperation with that entity in terms of innovation.

Table 8. Enterprises pursuing innovation activity in the field of product or process innovations that evaluated the relevance of a given source as “high” in the European countries

Clients or customers from the private sector	Clients or customers from the public sector		Competitors or other enterprises from the same sector		Conferences, trade fairs, exhibitions		Enterprises or enterprise group		Research institutes		Consulting companies, private laboratories, private R&D institutions		Scientific/technical/trade periodicals and publications		Scientific and technical, specialist and professional societies and associations		Equipment, materials, components and software suppliers		Higher education institutions and universities		
Cyprus	483	Romania	32.9	Cyprus	31.9	Cyprus	36.7	Cyprus	97.7	Slovenia	53.1	Slovenia	38.8	Cyprus	27.5	Romania	29.6	Cyprus	71.6	Romania	20.0
Norway	40.2	Malta	19.6	Slovenia	25.9	Austria	23.1	Slovenia	67.1	Romania	18.2	Cyprus	31.9	Malta	23.2	Malta	12.2	Malta	37.1	Hungary	12.5
Slovenia	396	Cyprus	18.1	Romania	23.5	Romania	20.4	Finland	65.0	Poland	8.9	Romania	22.7	Austria	14.0	Norway	10.8	Slovenia	32.6	Austria	10.3
Austria	350	Norway	16.3	Malta	21.8	Slovenia	20.2	Austria	62.9	Spain	8.5	Hungary	14.3	Poland	12.4	Slovenia	9.7	Norway	29.3	Poland	8.0
Hungary	349	Slovenia	13.4	Austria	19.9	Norway	18.7	Norway	62.4	Norway	8.4	Malta	11.1	Slovenia	12.1	Hungary	9.2	Belgium	28.6	Slovenia	8.0
Germany	344	Portugal	12.4	Hungary	19.6	Malta	17.1	Slovakia	58.2	Austria	5.8	Italy	11.0	Bulgaria	11.4	Austria	8.7	Hungary	27.9	Norway	7.5
Malta	343	Austria	11.4	Norway	18.8	Turkey	16.3	Belgium	54.7	Lithuania	5.0	Norway	10.9	Hungary	11.4	Portugal	8.1	Netherlands	27.6	Lithuania	7.4
Turkey	303	Turkey	10.2	Germany	16.6	Bulgaria	16.1	Croatia	54.4	Portugal	4.9	Spain	9.3	Norway	10.7	Serbia	7.9	Austria	26.7	Germany	7.3
Netherlands	300	Serbia	8.9	Slovakia	16.4	Hungary	15.8	Spain	53.2	Finland	4.7	Greece	8.3	Slovakia	10.2	Luxembourg	7.8	Slovakia	26.6	Portugal	6.8
Portugal	281	Croatia	8.4	Turkey	14.0	Greece	15.7	Lithuania	53.0	Malta	4.6	Slovakia	8.2	Serbia	9.7	Poland	6.9	Turkey	26.0	Spain	6.6
Slovakia	274	Lithuania	8.4	Croatia	13.9	Slovakia	15.4	Germany	52.4	Cyprus	4.5	Poland	8.1	Luxembourg	9.1	Turkey	6.9	Portugal	25.7	Malta	6.1
Sweden	266	Poland	8.1	Greece	12.8	Luxembourg	15.1	Malta	52.1	Slovakia	4.5	Serbia	8.1	Croatia	8.8	Netherlands	6.6	Spain	25.5	Finland	5.6
Belgium	25.5	Hungary	7.8	Bulgaria	12.7	Poland	14.6	Netherlands	51.7	Serbia	4.1	Lithuania	7.5	Lithuania	8.8	Belgium	6.5	Lithuania	24.2	Belgium	5.5
Croatia	24.5	Slovakia	7.6	Portugal	12.7	Portugal	14.4	Hungary	48.9	Hungary	3.9	Bulgaria	7.1	Portugal	8.6	Bulgaria	6.4	Croatia	23.5	Slovakia	5.5
Finland	23.6	Sweden	7.5	Spain	10.9	Croatia	13.9	Poland	48.6	Belgium	3.5	Portugal	7.0	Belgium	8.4	Malta	6.4	Bulgaria	23.2	Greece	5.2
Bulgaria	22.8	Belgium	7.2	Belgium	10.8	Germany	13.4	Portugal	46.3	Greece	3.0	Turkey	6.2	Turkey	8.2	Germany	5.3	Greece	23.2	Serbia	5.1
Spain	22.8	Germany	6.9	Netherlands	10.7	Lithuania	12.7	Luxembourg	44.1	Turkey	2.7	Germany	6.0	Germany	7.9	Slovakia	4.7	Estonia	22.9	Cyprus	4.8
Greece	21.9	Finland	6.9	Lithuania	10.6	Serbia	12.1	Sweden	41.2	Germany	2.5	Belgium	5.9	Greece	7.8	Greece	4.7	Poland	22.3	Estonia	4.4
Serbia	18.6	Bulgaria	6.2	Luxembourg	10.5	Belgium	11.6	Serbia	35.4	Netherlands	2.5	Luxembourg	5.9	Malta	7.1	Spain	4.6	Italy	21.6	Turkey	4.3
Lithuania	16.4	Luxembourg	5.7	Poland	10.1	Estonia	10.2	Estonia	33.8	Bulgaria	2.2	Estonia	5.6	Spain	5.5	Italy	3.9	Sweden	19.7	Bulgaria	3.9
Luxembourg	15.6	Estonia	4.3	Finland	9.4	Finland	9.4	Bulgaria	32.7	Italy	2.2	Netherlands	5.6	Netherlands	4.2	Croatia	3.5	Finland	16.8	Netherlands	3.9
Italy	14.5	Greece	3.7	Serbia	8.5	Italy	9.3	Greece	32.7	Luxembourg	2.2	Croatia	4.5	Finland	4.0	Lithuania	3.1	Luxembourg	16.7	Croatia	3.5
Romania	13.6	Italy	2.1	Estonia	8.4	Netherlands	8.5	Turkey	28.8	Estonia	1.9	Austria	4.5	Italy	3.3	Finland	3.1	Serbia	15.3	Italy	2.9
Poland	11.2	Spain	0	Sweden	8.4	Spain	8.4	Italy	20.5	Croatia	1.5	Finland	3.5	Estonia	3.2	Estonia	2.4	Germany	14.1	Luxembourg	1.9
Estonia	11.1	Netherlands	NDA	Italy	6.0	Sweden	8.4	Romania	5.3	Sweden	NDA	Sweden	NDA	Sweden	NDA	Sweden	NDA	Romania	10.3	Sweden	NDA

Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8].

Important goals in innovative and non-innovative enterprises

Companies aiming at developing their activity set specific objectives, and the most common, and simultaneously the most general, are to decrease costs, increase market share, increase profit margins, or increase turnover. The list presented below (Table 9) includes answers from innovative and non-innovative companies that indicated particular objectives as highly relevant. The results are very interesting. The country where the priority of 8 out of 10 enterprises is to decrease costs is Hungary. It is interesting that there is not much difference in the share of companies that are innovative (79.8%) and non-innovative (78.3%). Thus, it seems likely that building a competitive advantage, regardless of the nature of the enterprise, is closely linked to efforts to decrease costs as much as possible. In more detail, with the example of innovative companies from Table 10, the developments of general objectives with more detailed strategies of the companies are presented. Not only in mentioned

Table 9. The share of innovative and non-innovative enterprises for which the following objectives were highly important in 2010–2012

Decrease in costs			Increase in market share			Increase in profit margins			Increase in turnover		
	Innovative	Non-innovative		Innovative	Non-innovative		Innovative	Non-innovative		Innovative	Non-innovative
Hungary	79.8	78.3	Cyprus	70.5	49.9	Hungary	83.1	79.0	Hungary	86.5	83.0
Cyprus	77.1	60.8	Hungary	69.4	55.6	Malta	66.8	39.1	Cyprus	80.1	63.1
Portugal	75.7	64.2	Malta	64.8	30.4	Estonia	61.4	51.8	Malta	78.6	45.4
Slovenia	72.0	68.3	Lithuania	62.2	41.6	Latvia	61.3	52.9	Slovenia	77.0	67.1
Malta	71.1	42.8	Turkey	56.5	43.9	Croatia	59.0	52.1	Croatia	74.7	68.5
Croatia	70.4	64.0	Latvia	55.8	35.6	Cyprus	58.9	45.4	Slovakia	74.0	67.4
Greece	64.6	55.1	Portugal	55.8	39.7	Germany	58.8	52.2	Portugal	72.9	61.4
Slovakia	61.0	56.9	Croatia	53.9	37.6	Lithuania	58.6	40.4	Latvia	71.7	51.9
Lithuania	60.2	49.2	Slovenia	53.9	47.3	Austria	58.0	51.4	Lithuania	70.1	59.3
Italy	60.0	59.0	Bulgaria	53.2	33.1	Slovenia	53.5	44.9	Estonia	66.6	55.5
Austria	59.6	57.6	Slovakia	53.0	41.8	Portugal	53.0	41.2	Poland	66.5	55.1
Latvia	56.8	47.8	Greece	52.7	46.0	Belgium	52.9	42.1	Serbia	65.2	49.2
Serbia	55.2	44.7	Austria	48.6	30.4	Netherlands	51.4	40.4	Bulgaria	65.1	44.9
Poland	54.8	44.9	Estonia	47.2	32.6	Turkey	50.3	47.7	Netherlands	64.3	44.4
Netherlands	53.0	48.8	Poland	47.1	34.1	Greece	47.0	38.2	Greece	62.1	56.6
Belgium	52.9	48.4	Serbia	46.2	34.0	Serbia	45.3	34.4	Austria	60.8	48.9
Germany	52.8	51.9	Netherlands	45.4	27.9	Italy	44.5	35.5	Germany	60.0	52.1
Turkey	50.6	47.2	Belgium	43.3	26.6	Sweden	44.1	37.5	Turkey	59.8	51.6
Bulgaria	48.3	33.8	Italy	40.5	26.3	Slovakia	41.5	33.8	Italy	57.8	48.1
Estonia	44.8	43.9	Sweden	38.1	25.8	Bulgaria	35.7	24.1	Belgium	57.3	44.0
Sweden	36.1	34.4	Germany	35.0	24.5	Poland	32.9	25.0	Sweden	50.3	33.2
Romania	4.4	5.0	Romania	3.0	6.5	Romania	5.4	6.9	Romania	0.9	2.3

Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8_obj].

Table 10. How important were each of the following strategies for reaching your enterprise's goals during 2010 to 2012?

	Building alliances with other enterprises or institutions		Reducing costs of purchased materials, components or services		Increasing flexibility / responsiveness of your organisation		Reducing in-house costs of operation		Introducing new or significantly improved goods or services		Developing new markets within Europe		Developing new markets outside Europe		Intensifying or improving the marketing of goods or services								
	highly important	not relevant	highly important	not relevant	highly important	not relevant	highly important	not relevant	highly important	not relevant	highly important	not relevant	highly important	not relevant	highly important	not relevant							
Hungary	47.6	7.4	Hungary	65.6	6.0	Slovenia	60.8	1.4	Hungary	77.1	1.4	Germany	57.4	5.9	Hungary	45.9	18.0	Lithuania	31.1	32.7	Slovenia	48.4	4.0
Serbia	41.8	11.9	Slovenia	65.2	1.9	Hungary	57.6	3.6	Cyprus	70.7	4.4	Slovenia	48.8	2.3	Slovenia	44.6	18.3	Portugal	31.1	31.8	Bulgaria	46.4	12.9
Germany	33.3	8.9	Portugal	61.4	3.2	Cyprus	57.1	6.8	Portugal	66.8	1.7	Croatia	44.9	9.2	Lithuania	38.6	25.3	Latvia	25.4	31.4	Cyprus	42.2	13.3
Lithuania	31.4	10.5	Cyprus	52.8	7.1	Malta	50.5	10.8	Slovenia	62.2	1.5	Malta	42.2	16.6	Latvia	33.5	23.2	Slovenia	23.5	28.7	Germany	38.4	10.0
Cyprus	21.8	46.4	Slovakia	52.3	3.3	Croatia	49.5	7.6	Malta	58.8	8.5	Portugal	40.9	5.7	Portugal	30.2	27.0	Hungary	20.3	30.2	Slovakia	36.5	10.7
Romania	20.1	41.1	Croatia	52.0	6.5	Slovakia	49.2	7.9	Greece	55.4	1.7	Cyprus	39.4	52.4	Netherlands	29.4	25.8	Turkey	20.2	47.8	Malta	35.4	18.1
Malta	18.1	32.9	Malta	46.7	16.6	Estonia	45.3	4.0	Lithuania	53.5	1.8	Latvia	36.8	11.2	Croatia	28.2	36.2	France	19.9	50.0	Lithuania	33.4	9.6
Greece	16.2	23.2	Lithuania	46.6	5.6	Netherlands	44.8	6.2	Croatia	53.3	7.1	Hungary	36.7	9.0	France	28.1	38.2	Italy	19.9	53.6	Turkey	32.1	18.6
Portugal	15.9	24.7	Greece	44.8	3.7	Lithuania	44.6	5.4	Slovakia	53.3	2.7	Lithuania	36.2	8.9	Estonia	26.5	27.9	Malta	19.8	47.7	Hungary	29.7	7.6
Slovenia	15.6	14.3	Latvia	44.5	8.4	France	43.8	9.4	France	50.3	7.5	France	34.1	16.7	Slovakia	25.8	34.6	Greece	18.2	46.3	Serbia	27.8	13.2
Netherlands	15.2	24.4	Serbia	44.4	9.1	Greece	42.4	1.7	Italy	48.4	6.4	Poland	33.3	12.7	Bulgaria	25.4	35.5	Netherlands	17.6	43.8	Greece	27.7	7.5
Turkey	14.0	42.3	Italy	43.9	8.2	Bulgaria	41.8	12.3	Latvia	46.7	5.4	Serbia	33.3	12.2	Belgium	25.0	33.9	Belgium	17.5	49.9	Portugal	27.7	9.6
Belgium	12.0	29.0	Estonia	41.9	5.5	Serbia	41.7	6.9	Germany	45.9	5.0	Slovakia	32.8	8.7	Malta	24.1	43.7	Cyprus	17.5	76.0	Latvia	27.6	9.6
France	11.3	39.9	Germany	41.5	7.5	Belgium	39.3	7.2	Belgium	44.5	5.3	Belgium	32.5	13.3	Poland	23.5	37.8	Bulgaria	17.1	43.6	Estonia	26.9	14.0
Poland	10.2	40.2	France	40.4	14.8	Portugal	37.3	4.7	Netherlands	42.0	5.9	Netherlands	32.5	11.4	Serbia	21.9	38.1	Croatia	15.9	48.5	Croatia	26.2	17.3
Sweden	8.0	23.8	Turkey	37.2	17.8	Latvia	36.0	10.8	Serbia	39.6	7.6	Turkey	29.3	23.5	Greece	20.8	37.9	Poland	14.3	51.7	Netherlands	25.4	10.7
Italy	7.5	7.5	Poland	36.6	11.5	Italy	33.1	10.3	Bulgaria	39.2	9.8	Bulgaria	29.1	19.4	Italy	20.4	44.3	Germany	14.2	53.7	France	24.0	19.9
Croatia	7.4	47.7	Belgium	36.1	9.0	Poland	31.4	10.4	Estonia	38.3	2.8	Greece	28.8	8.5	Germany	20.1	38.0	Estonia	14.0	45.2	Poland	22.8	17.2
Bulgaria	6.6	47.7	Bulgaria	34.1	12.2	Germany	23.1	13.2	Poland	37.4	8.7	Sweden	26.3	7.8	Cyprus	17.6	70.5	Romania	14.0	56.5	Sweden	19.8	9.4
Slovakia	5.1	52.4	Netherlands	30.3	9.1	Sweden	20.7	6.5	Turkey	30.9	22.1	Italy	26.2	16.0	Turkey	17.3	50.7	Serbia	13.4	49.5	Belgium	19.3	17.3
Estonia	4.5	38.9	Sweden	24.8	8.3	Turkey	18.4	27.3	Sweden	24.1	7.1	Estonia	23.6	12.8	Romania	11.5	48.1	Slovakia	10.7	55.3	Italy	16.1	23.1
Latvia	2.8	48.8	Romania	7.1	4.8	Romania	17.9	12.2	Romania	7.8	7.8	Romania	15.0	6.5	Sweden	9.5	38.9	Sweden	10.1	47.6	Romania	8.9	5.0

35 Source: Author's compilation based on the Eurostat Statistics Database[inn_cis8_strat].

Hungary, but also in other countries the most important attitude of companies is related to cost cutting. It might also be noticed that, for a larger share of companies, the costs-decreasing strategy relates first to decreasing internal operation costs and then there is the strategy connected with decreasing the costs of materials, components, or services. Larger differences in the attitude to set objectives are between innovative and non-innovative companies in relation to increased market share, increased profit margins, and increased turnover. In Poland, the objective to increase the turnover is indicated by 66% of innovative companies. The next objective, according to relevance, i.e. to decrease costs, is declared by 55% of companies. Increased market share is highly relevant for less than half of innovative enterprises. In Poland, the increase in profit margins is relevant only for 1/3 of companies. If countries with a high pressure on achieving the objectives presented in the table were compared with the chart of most innovative countries (measured with the proportion of innovative enterprises), it would turn out that there are no countries who are leaders in terms of innovative companies, but the countries who are aspiring to become innovation leaders.

Methods for maintaining or increasing competitiveness in enterprises

For the first time, the CIS-8 survey for 2010–2012 was extended by questions concerning the methods for maintaining or increasing competitiveness. The results below show the share of companies in particular countries for which particular methods were highly relevant. The range of available answers included basic advantages such as copyrights, the complexity of goods and services, trademarks, patents, design registration, secrecy (including non-disclosure agreement), and lead time advantages. Due to the acceleration of economic processes and the decrease in the durability of basic advantages, the last advantage connected with time turned out to be the most relevant. The position of an enterprise that is the first to introduce a new product or a method of selling it to the market becomes stronger even in the situation where it is neither cheaper nor better than substitute products¹⁰⁾. These are the conclusions of enterprises from Austria (45.2%), Finland (45%), and Germany (40.1%). Only every fifth innovative enterprise in Poland considers this method effective for maintaining or improving competitiveness.

According to enterprises, the complexity of goods and services came second in terms of the proportion of companies that consider a given method effective to maintain or improve the competitiveness of their products. In Austria, almost 40% of innovative companies are of the opinion that it is a highly relevant and effective method for maintaining or increasing competitiveness. A slightly smaller proportion from Slovakia (36.7%) or Slovenia (34.3%) agrees with this. In Poland, 19% of innovative companies indicated this method as relevant and effective. It is interesting that trademarks gained more recognition than patents, design registrations, or copyrights. In some countries, also in Poland (19%), secrecy (including non-disclosure agreement) was considered as relatively important.

¹⁰⁾ M. Romanowska, *Planowanie strategiczne w przedsiębiorstwie* [Strategic planning in enterprise], PWE, Warsaw 2004, p. 289.

Table 11. Enterprises that evaluated the following methods for maintaining or increasing the competitiveness of their innovation as highly important and effective

Copyright	Complexity of goods and services	Trademarks	Lead time advantages	Patents	Design registration	Secrecy (including non-disclosure agreement)
Serbia	15.7	Turkey	Austria	Turkey	Serbia	Hungary
Romania	12.2	Slovenia	Finland	Germany	Malta	Serbia
Turkey	11.8	Sweden	Germany	Serbia	Turkey	Germany
Malta	10.7	Austria	Norway	Austria	Romania	Austria
Germany	9.8	Serbia	Turkey	Finland	Slovakia	Poland
Poland	9.4	Hungary	Serbia	Slovenia	Netherlands	Finland
Austria	7.9	Lithuania	Slovenia	Poland	Poland	Bulgaria
Norway	7.9	Netherlands	Sweden	Sweden	Bulgaria	Luxembourg
Cyprus	7.8	Greece	Portugal	Romania	Germany	Netherlands
Bulgaria	7.7	Croatia	Malta	Portugal	Portugal	Slovenia
Hungary	6.9	Finland	Netherlands	Bulgaria	Austria	Malta
Finland	6.9	Norway	Greece	Norway	Norway	Lithuania
Luxembourg	6.6	Poland	Slovakia	Malta	Cyprus	Norway
Slovakia	6.1	Belgium	Cyprus	Belgium	Croatia	Turkey
Greece	5.9	Portugal	Croatia	Slovakia	Slovenia	Portugal
Slovenia	5.8	Romania	Poland	Luxembourg	Finland	Sweden
Sweden	5.6	Turkey	Hungary	Netherlands	Italy	Greece
Lithuania	4.9	Malta	Luxembourg	Hungary	Hungary	Romania
Portugal	4.9	Sweden	Lithuania	Greece	Estonia	Croatia
Estonia	4.3	Estonia	Italy	Lithuania	Lithuania	Cyprus
Croatia	3.7	Cyprus	Romania	Italy	Belgium	Slovakia
Netherlands	3.6	Luxembourg	Belgium	Cyprus	Luxembourg	Belgium
Belgium	1.8	Italy	Italy	Croatia	Greece	Italy
Italy	1.3	Bulgaria	Bulgaria	Estonia	Sweden	Estonia

Source: Author's compilation based on the Eurostat Statistics Database [inn_cis8_comp].

Important obstacles to meeting the goals of enterprises

Obstacles to meeting the goals of enterprises vary depending on the objectives and type of the introduced innovation. Some obstacles concern all types of innovation, while others relate to particular innovation types. There might be reasons for not taking up any innovation activity, and reasons for hampering such an activity, or stopping it from achieving the expected results.

According to the surveyed enterprises in particular countries, the biggest obstacle to meeting goals among innovative enterprises in the analysed period was strong price competition. It was the biggest obstacle for innovative enterprises from Cyprus – 65.4%, Austria – 65.3%, Portugal – 63.1%, Malta – 62.3%, Estonia – 61.3%, Germany – 61.2%, and Slovenia – 60.7%. In Poland, almost half of innovative enterprises (48.6%) considered that price competition is an important obstacle to meeting goals.

Strong competition on product quality, reputation, or brand came second in terms of the proportion of companies that considered a given obstacle important and evaluated its degree of importance as “high.” Companies from Malta – 43%, Lithuania – 36.8%, and Hungary – 34.5% feel most that these factors have a significant influence on and hamper meeting the intended objectives. In Poland, every fourth innovative company indicates this factor as an important obstacle.

The high cost of meeting government regulations or legal requirements is also important for enterprises. This obstacle is most often indicated by companies from Serbia – 42.6%, Italy – 39.9%, and Turkey – 34.4%. In Poland, this is an important obstacle to meeting intended goals for 20% of companies.

The high costs of access to new markets are factors connected with the lack of sufficient financial resources. In comparison with other countries, Polish companies are in the middle of the ranking. A more important obstacle for Polish companies is a lack of demand (23.5%), even though companies from Greece and Italy indicate this problem even more often (42% and 41.5%, respectively).

Compared with the presented countries, the results in terms of the obstacle “lack of qualified personnel” are relatively positive in Poland (9.7%). In countries such as Romania, Estonia, Turkey, but also Austria and Germany, this is the factor that significantly hampers meeting the goals of the enterprise.

Analysing the results of the survey, the factor of innovations by competitors is not an exceptional obstacle, as long as the competitor’s share in the market is not dominant. For example, a significant obstacle for 17% innovative enterprises in Poland is the dominant market share held by competitors, but innovations by competitors are obstacles for only 13%.

Table 12. The share of enterprises that considered the degree of influence of particular factors hampering innovation activity as “high”

High cost of access to new markets ⁵		Innovations by competitors ⁸		Dominant market share held by competitors ⁹		Lack of adequate finance ⁶		Lack of demand ⁴		Strong price competition ¹		Lack of qualified personnel ⁷		Strong competition on product quality, reputation or brand ²		High cost of meeting government regulations or legal requirements ³	
Serbia	41.4	Romania	31.3	Lithuania	28.5	Serbia	39.4	Greece	41.9	Cyprus	65.4	Romania	33.4	Malta	43.0	Serbia	42.6
Portugal	33.9	Lithuania	19.5	Hungary	27.3	Greece	37.7	Italy	41.5	Austria	65.3	Estonia	28.1	Lithuania	36.8	Italy	39.9
Turkey	32.6	Turkey	14.9	Malta	23.6	Cyprus	34.1	Serbia	39.3	Portugal	63.1	Turkey	26.2	Hungary	34.5	Turkey	34.4
Slovenia	27.5	Malta	13.3	Turkey	23.5	Slovenia	31.5	Portugal	37.2	Malta	62.3	Lithuania	22.4	Portugal	31.9	Portugal	32.9
Estonia	26.9	Poland	13.0	Serbia	22.9	Croatia	29.5	Cyprus	34.7	Estonia	61.3	Austria	19.0	Turkey	29.8	Slovenia	30.9
Bulgaria	26.7	Estonia	11.6	Estonia	21.2	Turkey	29.1	Slovenia	34.4	Germany	61.2	Germany	18.8	Estonia	29.5	Austria	27.9
Cyprus	26.6	Serbia	11.6	Romania	19.9	Portugal	28.7	Hungary	32.3	Slovenia	60.7	Serbia	16.5	Germany	27.4	Hungary	27.8
Greece	25.7	Hungary	10.5	Bulgaria	18.8	Lithuania	27.5	Slovakia	31.5	Hungary	59.7	Bulgaria	15.2	Serbia	26.6	Cyprus	26.3
Hungary	25.7	Slovakia	10.2	Cyprus	18.4	Romania	24.5	Croatia	30.8	Slovakia	56.5	Slovenia	12.3	Poland	26.1	Croatia	26.2
Croatia	25.3	Bulgaria	8.4	Poland	17.3	Italy	22.7	Netherlands	25.5	Italy	55.1	Malta	12.1	Austria	26.0	Greece	25.5
Lithuania	23.9	Portugal	8.2	Austria	17.2	Hungary	22.6	Turkey	24.3	Lithuania	53.2	Portugal	11.5	Croatia	25.5	Romania	24.5
Malta	23.6	Austria	7.1	Slovakia	17.0	Estonia	22.2	Bulgaria	24.2	Croatia	50.5	Poland	9.7	Slovenia	25.2	Malta	22.6
Romania	20.5	Germany	6.0	Croatia	17.0	Bulgaria	20.3	Poland	23.5	Turkey	49.5	Croatia	9.5	Slovakia	24.8	Bulgaria	22.4
Poland	17.8	Greece	6.0	Portugal	15.6	Poland	20.2	Malta	21.4	Poland	48.6	Hungary	9.3	Bulgaria	23.3	Germany	19.5
Slovakia	17.7	Cyprus	5.9	Germany	15.5	Slovakia	17.9	Lithuania	19.6	Greece	47.8	Sweden	8.9	Cyprus	22.6	Poland	19.5
Italy	17.3	Croatia	5.7	Italy	14.1	Malta	15.1	Germany	15.6	Bulgaria	46.0	Netherlands	8.6	Netherlands	20.6	Slovakia	18.8
Austria	17.0	Slovenia	5.0	Sweden	13.2	Netherlands	13.6	Romania	15.2	Serbia	43.4	Cyprus	7.9	Greece	20.5	Estonia	17.4
Germany	14.6	Netherlands	4.3	Slovenia	13.2	Austria	10.2	Sweden	14.9	Netherlands	42.6	Greece	6.2	Sweden	17.4	Lithuania	17.2
Netherlands	7.8	Italy	3.8	Greece	12.3	Germany	10.0	Estonia	13.0	Sweden	33.2	Slovakia	5.4	Romania	13.6	Netherlands	11.9
Sweden	6.9	Sweden	3.8	Netherlands	11.4	Sweden	7.3	Austria	12.3	Romania	8.0	Italy	5.1	Italy	12.7	Sweden	6.0

Public support for the innovation activity of entrepreneurs

Public support involves a number of tools addressed to enterprises, including various innovation activity support mechanisms to create better conditions for introducing innovation for enterprises. Public support for innovation activity may come from local or regional authorities, from central authorities, from the European Union, or from the Framework Programs, like the 7th Framework Programme or Horizon 2020. In Poland, the relevance of this financing source for innovation activity is not very high compared with other European countries. In 2010–2012, 25.9% of innovation active industrial enterprises (compared with 25.5% in 2009–2011) and 18.7% of enterprises from the service sector (compared with 17.6%), received public financial support for innovation activity¹¹⁾. A total of 23.2% of innovative enterprises in Poland benefitted from public support.

Table 13. The share of innovative enterprises that were granted public support in selected countries in 2012

Total		From local or regional authorities		From central government (including central government ministries and agencies)		From the European Union		From the 7 th Framework Programme	
France	49.4	Austria	21.0	Netherlands	44.3	Hungary	33.8	Slovenia	5.2
Netherlands	46.9	Italy	15.8	Austria	33.2	Poland	19.5	Slovakia	4.3
Hungary	45.6	Belgium	15.4	Finland	28.4	Lithuania	19.2	Estonia	3.9
Austria	39.7	Spain	14.7	Cyprus	27.1	Czech Republic	17.1	Poland	3.8
Cyprus	36.8	Cyprus	13.2	Slovenia	24.3	Bulgaria	14.4	Germany	3.7
Finland	34.9	France	11.8	Hungary	23.3	Estonia	14.3	Hungary	3.5
Estonia	31.4	Luxembourg	10.7	Estonia	22.3	Slovakia	13.3	Czech Republic	3.2
Serbia	28.6	Finland	9.3	Turkey	22.0	Slovenia	12.8	Greece	3.2
Portugal	28.5	Serbia	8.4	Portugal	21.9	Malta	12.5	Austria	3.1
Slovenia	28.3	Netherlands	8.2	Serbia	21.6	Romania	11.1	Belgium	3.0
Spain	28.0	Germany	7.4	Croatia	21.2	Portugal	10.5	Finland	2.9
Belgium	26.4	Croatia	5.1	France	19.1	Austria	8.5	Lithuania	2.4
Malta	25.4	Poland	4.6	Spain	17.5	Cyprus	7.7	Spain	2.2
Croatia	24.9	Portugal	3.9	Germany	17.1	France	7.2	France	2.2
Czech Republic	24.8	Turkey	3.6	Malta	16.8	Finland	5.9	Portugal	2.2
Turkey	24.0	Romania	3.5	Greece	15.2	Greece	5.8	Romania	2.1
Germany	23.7	Czech Republic	2.8	Belgium	13.8	Sweden	5.8	Netherlands	1.6
Poland	23.2	Greece	2.5	Czech Republic	13.0	Netherlands	5.5	Bulgaria	1.5
Italy	22.0	Hungary	2.1	Bulgaria	11.0	Germany	5.2	Luxembourg	1.5
Lithuania	21.1	Slovenia	2.1	Luxembourg	10.2	Belgium	5.1	Croatia	0.9
Bulgaria	20.3	Lithuania	1.9	Sweden	8.8	Spain	4.1	Italy	0.8
Luxembourg	19.5	Estonia	1.6	Poland	8.4	Italy	3.6	Serbia	0.8
Greece	18.2	Bulgaria	1.5	Romania	7.0	Serbia	3.4	Turkey	0.6
Romania	17.5	Slovakia	1.4	Italy	6.6	Croatia	3.1	Cyprus	0.4
Slovakia	16.0	Malta	NDA	Lithuania	6.6	Luxembourg	1.9	Malta	0.4
Sweden	13.0	Sweden	NDA	Slovakia	3.8	Turkey	1.8	Sweden	NDA

Source: Public funding for innovation activities [inn_cis8_pub].

¹¹⁾ *Innovation activities of enterprises in 2010–2012*, Warsaw 2013, p. 79.

In countries such as the Netherlands, Austria, Cyprus, and Finland, where over 35% of enterprises benefitted from public support, this assistance came mostly from central authorities. Moreover, enterprises from countries such as Cyprus (13.2%) or Austria (21%) significantly benefitted from the local government support. The situation is different in Poland, where every fifth innovative enterprise benefitted from public support for innovation activities, enterprises most often used EU funds (19.5%) and government support (8.4%). Poland came second in terms of the share of enterprises using public assistance from the EU, preceded only by enterprises from Hungary (33.8%). It needs to be noted that public support from local authorities was used by 4.6% of innovative enterprises in Poland, which showed an increase compared with the results of the previous edition. Support for enterprises from the framework programme's resources was granted to 3.8% of innovative enterprises. Such a high position of Polish companies indicates that they are able to successfully compete for the Framework Programmes' resources with companies from other EU countries.

Summary

In order to try to identify certain regularities in terms of innovation activity, a dozen or so variables were used simultaneously from the following areas to compare the countries with different concentrations of innovative companies: (1) innovativeness of enterprises, (2) research and development activity, (3) innovation activity expenditure, (4) sale of new or significantly improved goods, (5) cooperation in terms of innovation, (6) sources of information for innovation, (7) objectives of the innovation activity, and (8) methods to maintain or increase competitiveness.

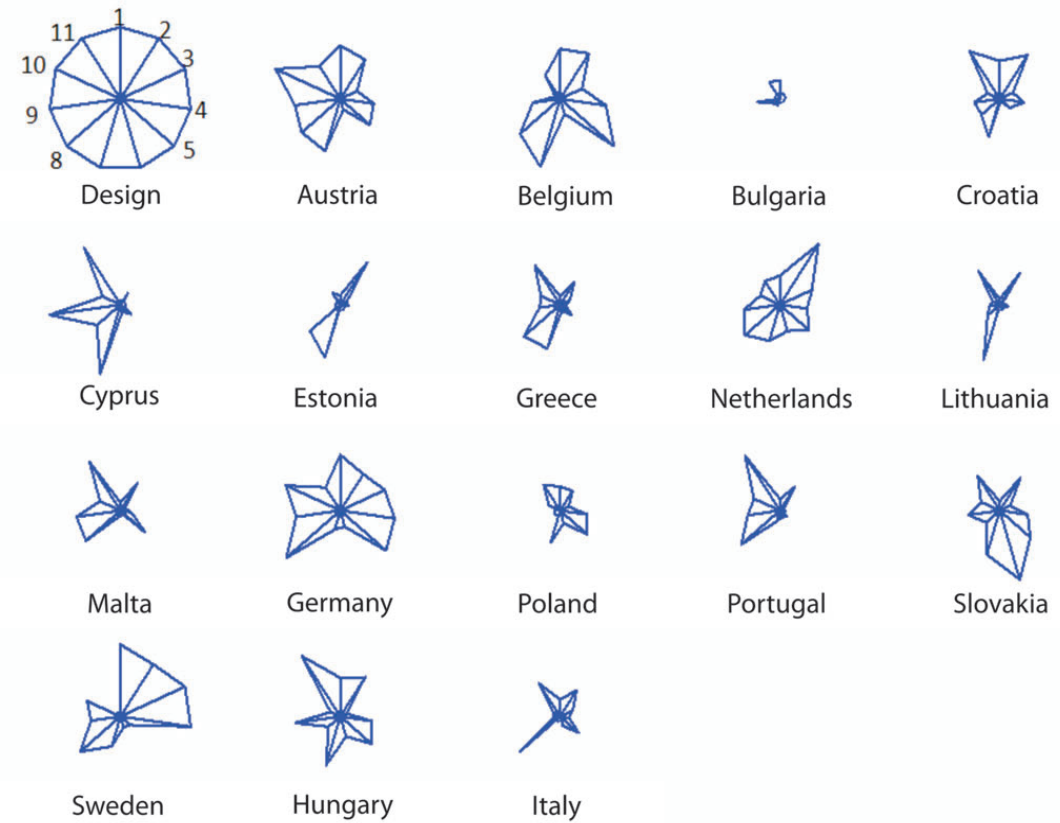
In order to depict numerous dimensions that compound the innovation activity of enterprises, the data was presented in the form of star plots. The graphical illustrations show cases (observations) in the form of multidimensional symbols and are an interesting, although not easy to use, exploration technique. The basic idea behind this method is the use of the human ability to "automatically" notice complex links between multiple features (variables).

The graph presents a separate star-shaped illustration for each country¹²⁾ (Fig. 11). Relative values of 11 selected variables for each case are presented by the length of spokes (clockwise, beginning with 12:00). A line is drawn connecting the data values for each spoke. In the presented example, the variable at 12:00 is marked in the legend as 1.

A graphic analysis of star plots allows noticing a significant diversity of countries, and thus the enterprises analysed in terms of innovation activity. A simple observation of objects allows one to clearly indicate that some objects are "somewhat" similar. During an in-depth analysis, the observer is able to state which variables are responsible for the observed heterogeneity, and a further analysis of the intuitively noticed structure may lead to detecting the nature of important interrelations between the variables. The presented example determines the maximum values of particular variables (it needs to be highlighted that the most innovative country does not have to resemble the presented example – innovation is often a combination of a number of variables and not all areas have to achieve maximum values).

¹²⁾ 17 countries for which there was data in each of the analysed areas were chosen for the analysis.

Fig. 11. Star plot enabling to analyse multidimensional data. The presented area concerns innovation activity of enterprises in selected European countries



Legend: clockwise:

- 1 – Average in-house R&D expenditure.
- 2 – The share of companies pursuing an internal R&D activity.
- 3 – Total expenditure per large enterprise pursuing innovation activity in the area of (product and process) technological innovations (regardless of marketing or organizational innovation) in the breakdown by company size in 2012.
- 4 – Total innovation activity expenditure per company in general.
- 5 – Sales value of goods new to a company.
- 6 – Sales value of goods new to a market.
- 7 – Enterprises cooperating with other entities in general.
- 8 – The share of companies pursuing innovation activity in general (%).**
- 9 – The share of enterprises that evaluated the relevance of the information source: clients and consumers as high (%).
- 10 – Enterprises that evaluated lead time advantages as a highly effective method for maintaining and improving competitiveness (%).
- 11 – The share of enterprises for which the decrease costs objective was highly relevant (%).

Source: Author's compilation based on CIS8 survey.

Thus, the objects are visual representations of configurations of the variables' values that can be easily recognized by the observer. The analysis of such illustrations may be helpful in detecting **groups of countries** that are characterised by simple interrelations and also interaction between the variables.

A country that is most similar to the defined example is Germany. This country, together with Sweden, Belgium, the Netherlands, and Austria, represents the group of countries **with a high proportion of innovative enterprises**, and the areas of innovation activity develop rather evenly in these countries. A characteristic feature of innovative companies in this group is the high engagement in cooperation with other entities. By appreciating market information sources for innovation in the form of clients and consumers, many companies pursue internal R&D activity and innovative companies in those countries primarily allocate considerable resources in innovation activity. A complement of this group's characteristic (excluding Belgium) is the companies' attitude to the effective method leading to maintaining or improving the competitiveness of their products in the form of time-lead advantage. In this way, the position of an enterprise who is first to introduce a new product or a method of selling it to the market becomes stronger, even in the situation where it is neither cheaper nor better than substitute products.

The second group encompasses countries such as Malta, Cyprus, Portugal, and Greece and is characterised by a **medium level of innovativeness of companies** with a low average expenditure on innovation both in general and in large companies. This group is mostly characterised by a high proportion of innovative companies whose aim is to decrease costs. It is interesting that there is not much difference between the proportion of innovative and non-innovative companies in terms of the set objectives, which may mean that the impulse among non-innovative companies to "become" an innovative company is the pressure of decreasing costs; therefore they are searching for new, cheaper solutions in production, products, organization methods, or marketing. On the other hand, for innovative companies, it is connected with maintaining their competitive position. A characteristic feature of this group, even though to a smaller degree than in the previous one, is the relevance of the time-lead advantage for maintaining competitiveness and the relevance of an information source for innovation in the form of clients and customers. The area of innovation activity that is not visibly disseminated is R&D activity. Because this group is not characterised by significant expenditure on internal development activity, it can be expected that the specificity of research and development is limited to searching for innovation at low cost.

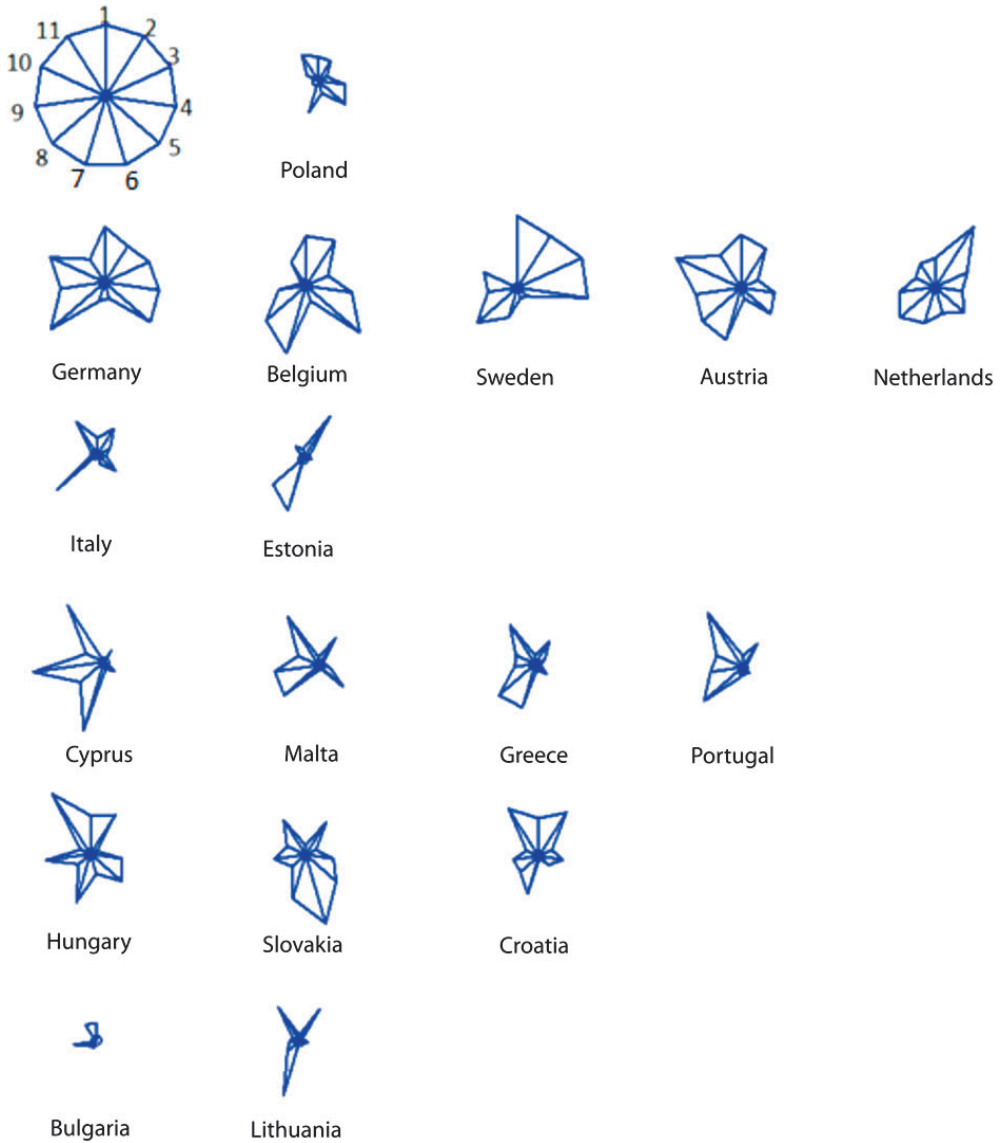
An interesting example is Italy or Estonia, where high innovation is accompanied by innovation activity developed only in 2–3 dimensions. In the case of Italy, innovative companies find decreasing costs an important objective, with a medium share of companies conducting internal R&D activity, based on a medium level of expenditure on this activity. In Estonia, a country classified as a follower of innovation leaders, innovative activities are practically based on in-house R&D activity.

Another group of countries, somewhat similar to the first group where the areas of innovation activity develop in a diversified way but with a low share of innovative enterprise, are countries such as Croatia, Hungary, and Slovakia.

Bulgaria and Lithuania are difficult to classify, because their only common feature is a low share of innovative companies.

In comparison with other countries and created groups, Poland is far from performing exceptionally well. Thus, it could probably be described in advance as a "rising star." In the star plot for Poland,

Fig. 12. Star plot – groups of countries



Source: Author's compilation based on CIS8 survey.

7 spokes can be distinguished which reflect (1) the level of average expenditure on internal R&D activity, (2) the proportion of companies pursuing internal R&D activity, (3) the total expenditure per large enterprise pursuing innovation activity in the area of (product and process) technological innovations (regardless of marketing or organizational innovation), (4) the sales value of products new to a company, (5) the sales value of products new to a market, (6) enterprises cooperating with other entities in general (%), and (7) the proportion of enterprises for which the decrease costs objective was highly relevant. The innovation activity of Polish companies is developed in numerous areas but on a small scale, so far, there have not been any effects in the form of a higher proportion of innovative

companies. Innovative companies cooperate, but they might lack links with the large companies that could lead other smaller companies towards innovation.

There is a great similarity between the star plot for Poland and the plots for Croatia, Slovakia, and Hungary, due to the development in numerous areas that must result in the emergence of a greater number of innovative companies. On the other hand, if the areas that are being developed in Poland were to be analysed in detail, it turns out that the star is very similar to the star representing Belgium – only its size is smaller!

Poland has a potential for the companies' innovation activity to perform better than it has so far. From the observation of statistical data, it can be noticed that Hungary is a good example, also due to a similar level of economic development, where the proportion of innovative companies has been gradually growing since the 2006–2008 survey. It seems that clients and consumers are very relevant for the response to the market demand; therefore, companies in Hungary find this information source highly relevant for pursuing innovation activity. The proportion of companies cooperating with enterprises from the same group has been increasing year by year. The direction in which Polish companies should develop is, among others, greater openness to clients and consumers, which means that companies should take into account the comments from potential clients, and there might be more innovative ideas resulting from consumers' needs. Research and development works within a company are also important. For the whole economy, an important element of the development of innovation activity is the innovativeness of large companies and their cooperation with smaller entities.

Chapter 2

(UN)EXPECTED MICRO-INNOVATION

Introduction

In most cases, micro-enterprises are self-employed persons and family businesses dealing with crafts or different activities and companies or associations conducting a regular business activity. Depending on the definition, they employ up to 9 persons¹⁾ or fewer than 10 persons, and their annual turnover and/or annual balance sheet total does not exceed EUR 2 million²⁾. According to recent available data, there are 1.75 million entities of this type in Poland (95.6% of all enterprises). Most of them (93.7% – 1.64 million companies) are units owned by natural persons. Micro-enterprises employ 3.4 million persons (37.9% of persons working in enterprises) living in Poland³⁾. They account for 29.7% of gross value added of enterprises⁴⁾ 27.6% of the production of enterprises⁵⁾. Their capital expenditure accounts for 16.3% of the expenditure of all enterprises.

The relevance of micro-enterprises for the economy is dependent on the figures mentioned above, which, in turn, depend of the human factor, i.e. the founder-owner and employees. According to F. Heunks, the person who decides to start his/her own business is assumed to be an entrepreneur and an innovator. In the initial phase of business development, innovativeness is identical with the enterprise as such, and a combination of its products/services and market which will be created for them. At this stage, surviving on the market is the most important. Company development is the challenge of the subsequent development phase, and it is then that the founder faces the need to create new ideas⁶⁾. In 2010, four out of five micro-enterprise's owners (83.4%) who participated in the PARP's survey claimed that the current company model is the target model of operation⁷⁾. At that time, the entrepreneurs did not seem ready to accept the need to introduce significant changes to the company operation. Even in the cases of a crisis situation, activities from the scope of passive strategy were preferred, while the largest group of respondents (25.4%) claimed that no actions are taken⁸⁾. Given such an attitude, the fact that over half (54.4%) of micro-companies' owners still declared the introduction of an innovative solution in their companies in 2007–2009⁹⁾ is positively surprising.

¹⁾ Definition used by the CSO and most often used in surveys on entrepreneurs.

²⁾ Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty.

³⁾ *Activity of enterprises with up to 9 persons employed in 2013*, CSO, Warsaw 2015 and *Activity of non-financial enterprises in 2013*, CSO, Warsaw 2014.

⁴⁾ *Report on the condition of small and medium-sized enterprise sector in Poland in 2012–2013*, PARP, 2014, p. 15.

⁵⁾ *Activity of non-financial enterprises in Poland in 2013*, CSO, Warsaw 2014.

⁶⁾ F.J. Heunks, *Innovation, creativity and success*, Small Business Economics 10, p. 263–272, 1998.

⁷⁾ P. Raźniewski, M. Juchniewicz, U. Tomczyk, J. Byczkowska-Ślęzak, *Raport końcowy z badania: Strategia niszy rynkowej jako specyficzny element potencjału rozwojowego mikroprzedsiębiorstw* [The strategy of a market niche as a specific element of the potential for the development of micro - enterprises], PARP, 2010.

⁸⁾ *Ibidem*, p. 6.

⁹⁾ Among the persons declaring the introduction of changes, indications to improve a product or service (36.8%), to introduce a new product or service (18.8%), and to improve the production process and the provision of services (16.0%) prevailed.

How should, therefore, the above results be interpreted – do they mean that the nature of the introduced changes was not developmental or rather that entrepreneurs focusing on the current company's activities do not notice the changes to which they contribute or have the pro-innovation attitudes of micro-companies changed in the recent years? We, i.e. PARP tried to answer this in a research project on the innovativeness of micro-enterprises in Poland that was realised in 2014. This chapter presents the key results concerning this area of activity of the smallest and most numerous entities in our country¹⁰⁾.

Associations of “innovative company” ...and innovativeness of micro-enterprises

What do almost 96%¹¹⁾ of enterprises operating in Poland associate the term “innovative company” with? Most micro-entrepreneurs' answers are connected with the word **novelty**, perceived as new technologies/products/services/ideas and with the terms associated with them – modernity, development, and improvement. Most, **almost 23% of respondents identify the innovation of their company with modernity, moving with the times and prospective thinking**. A similar group¹²⁾ connects this term with new technologies, a bit less (approx. 17%) with actions to develop and improve the enterprise. Every tenth entrepreneur associates the innovativeness of a company mostly with new products and services or innovative solutions. Other associations appear much less often. For instance, innovation understood as a company's competitiveness or following the customers' needs is indicated by one out of hundred surveyed micro-companies' owners. Surprisingly, in the consideration of the fact that the term innovation entered colloquial speech along with the emergence of pre-and post-accession measures, the associations connected with the European Union and Union funds are relatively rare among the respondents (0.6%). Other rarely occurring answers are good equipment, and an efficient and successful enterprise that stands out and is balanced in terms of technology and human resources, as well as a better quality of products, the improvement of working conditions, and enterprise investing in research, or taking a pro-ecological approach.

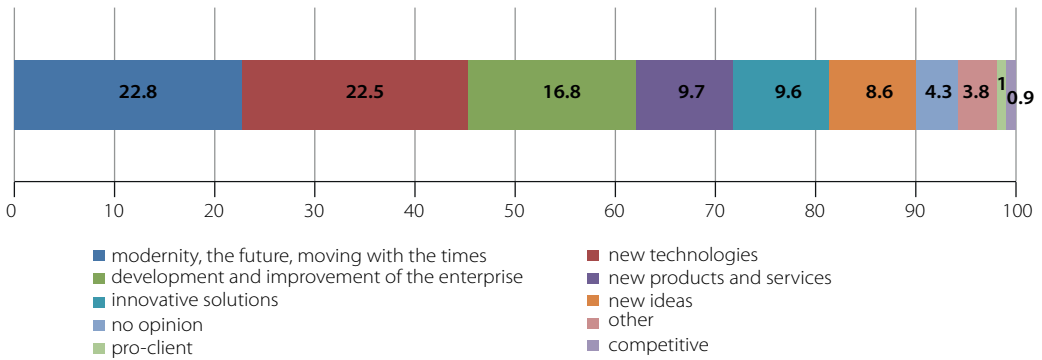
The above results may be considered good for two reasons. Firstly, they mean that innovation is not only a term typical for the language used in documents associated with European measures. However, more importantly, it confirms the proper understanding of the essence of innovation, which is to create new solutions and gives a certain basis to expect the development of micro-entrepreneurs' activity in this area.

¹⁰⁾ A survey of the part concerning micro-enterprises was carried out on a nationwide sample of 1,277 Polish micro-enterprises (excluding the self-employed). 1277 micro-enterprises, i.e. micro-employers were effectively surveyed. The general population for surveying the innovativeness were enterprises registered in Poland from those NACE sections in accordance with the Eurostat methodology and guidelines. The respondents were owners/co-owners of companies, reasonably managing enterprises – under the condition of actual participation in the company's affairs and making key decisions in it. The field study was conducted in November and December 2014 by Centrum Badań Marketingowych INDICATOR Sp. z o.o. with the use of the CAPI technique.

¹¹⁾ The data concerning the number of micro-enterprises in realization compared with the total number of enterprises in Poland come from a CSO publication *Activity of non-financial enterprises in 2013*, Warsaw 2014.

¹²⁾ 22.5%.

Fig.1. Micro-entrepreneurs' associations with the term "innovative company" (%)



N = 1277

Source: Author's study and compilation based on the survey on the innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Let us have a closer look at the activity in the area of innovation of the most numerous group of economic entities operating in Poland. **Within the last three years, almost 60% of micro-enterprises have introduced innovations in the company**¹³⁾. With almost every third entity, they were product innovations relying on the development of products or services that were new or significantly improved in terms of their features or applications. Also many, over a fifth (21%), micro-companies undertook process innovations at that time that were based on the introduction of new or significantly improved production methods or provision of a service. Over 17% of respondents engaged in marketing innovations that were the introduction of new marketing methods, changes to products or packaging, distribution, promotion, or price. The smallest group (13.6%) are micro-entrepreneurs who have introduced organizational innovations to their companies that ensure new organizational methods for the company's operating principles.

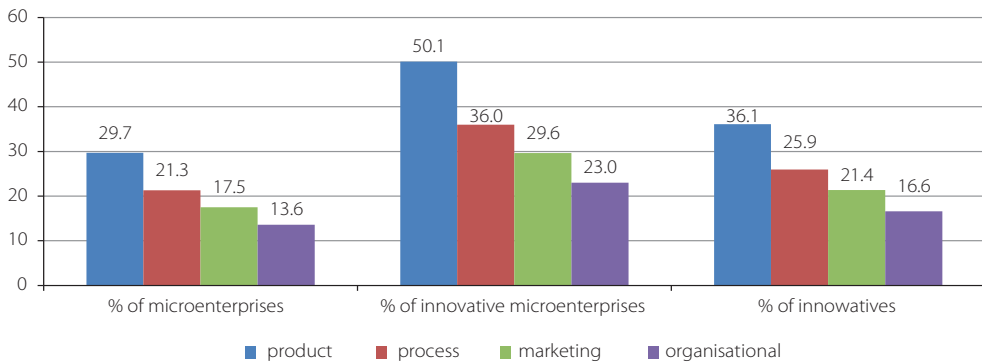
The above data were illustrated in Fig. 2, which also presents the results of the activity in the area of innovation of micro-enterprises in relation to the group of innovative respondents (who have introduced innovations to their companies within the last three years, i.e. as it can be assumed considering the time when the survey was conducted – in 2012–2014) as well as the structure of the whole of introduced innovations¹⁴⁾. When it comes to innovative enterprises, with a maintained innovation structure by type, the proportion of innovations in particular type categories are, of course, much higher than for the total of micro-enterprises.

Innovations at the company level are dominant in terms of the scale of introduced innovations – **38% of micro-enterprises have implemented projects of this kind within the last three years**. Over half as many (**16.6%**) **micro-entrepreneurs introduced innovation at the national level at that time**, while approx. 8% – on a global scale. The results for innovative micro-enterprises are correspondingly higher: almost 65% of them have introduced innovation at their company level,

¹³⁾ Exactly 59.2% of respondents introduced innovations to their companies. 40.8% entities participating in the survey did not introduce any innovations.

¹⁴⁾ The whole of innovations in the sample is a sum of micro-entrepreneurs' indications for particular types of innovations (product, process, marketing, and organizational) introduced by them within the last 3 years, while PARP's survey was conducted at the end of November and at the beginning of December 2014.

Fig. 2. Activity in the area of innovation of micro-enterprises according to the innovation type (innovations implemented in a company within the last three years i.e. 2012–2014)



N = 1277 for micro-enterprises, N = 756 for micro innovative enterprises, N = 1049 for all innovations

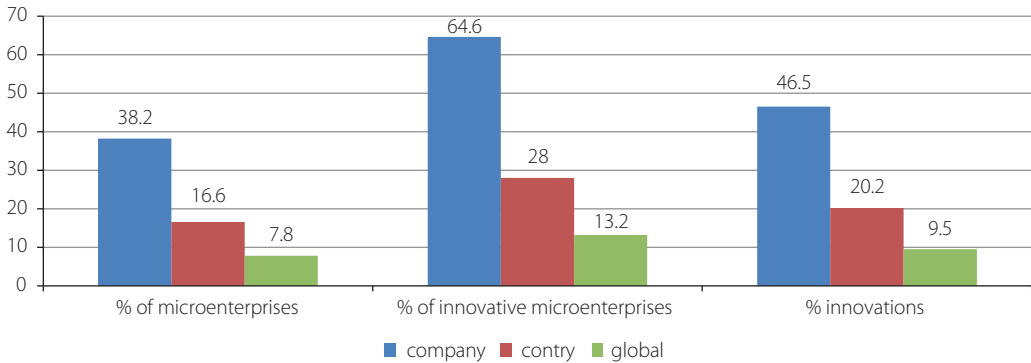
The data come from multiple-response questions – the percentages do not add up to 100.

Source: Author's study and compilation based on the survey on the innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

28% – at national level and 13% – at global level. When it comes to the total number of innovations, almost half (45%) are innovations at enterprise level, a fifth – at national level, and almost very tenth – at global level. It can be noticed that the prevalence of innovations at the lowest level of advancement is significant. If we also consider the fact that a fifth (20.8%) of respondents are entities that have introduced innovations only at company level and did not engage in any projects at a higher innovation scale within the last three years, it turns out that the result of 60% of innovative micro-enterprises should be considered a starting point for further discussion. Undoubtedly, this result is very good considering the possibilities and the potential of micro-entities to undertake activity in the area of innovation. It proves a high activity of micro-companies. There are 1.4 introduced innovations per one innovative micro-company in the surveyed sample. Additionally, the choice of relatively less-risky projects (at company level) seems to be an action indicating certain caution in terms of inducing changes to an enterprise, which partly results from uncertainties concerning the situation in the euro area or in the east of Europe in the recent years.

Research and development activity (R&D) of micro-enterprises, seen as systematic creative work undertaken to increase the knowledge and to find applications for that knowledge, e.g. in the form of new or improved products, services or solutions, is less favourable compared with activity in the area of innovation. **Most micro-companies (72.1%) do not conduct or did not conduct research and development activity within the last three years.** Among those who were, or have been, engaged in this type of activity, almost **16% implement R&D projects on their own, and 8.4% in cooperation with other entities.**

Fig. 3. Innovative activity of micro-enterprises according to the innovation scale (innovations implemented in a company within the last three years i.e. 2012–2014)

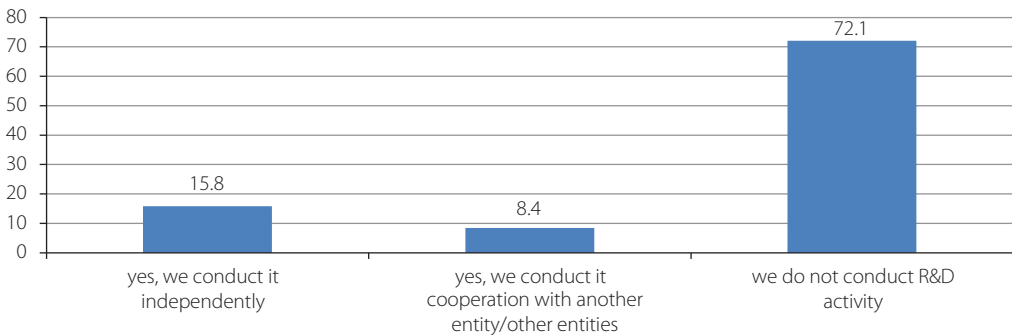


N = 1277 for micro-enterprises, N = 756 for micro innovative enterprises, N = 1049 for all innovations

The data come from multiple-response questions – the percentages do not add up to 100.

Source: Author's study and compilation based on the survey on the innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Fig. 4. Research and development activity of micro-enterprises (%)



N = 1277

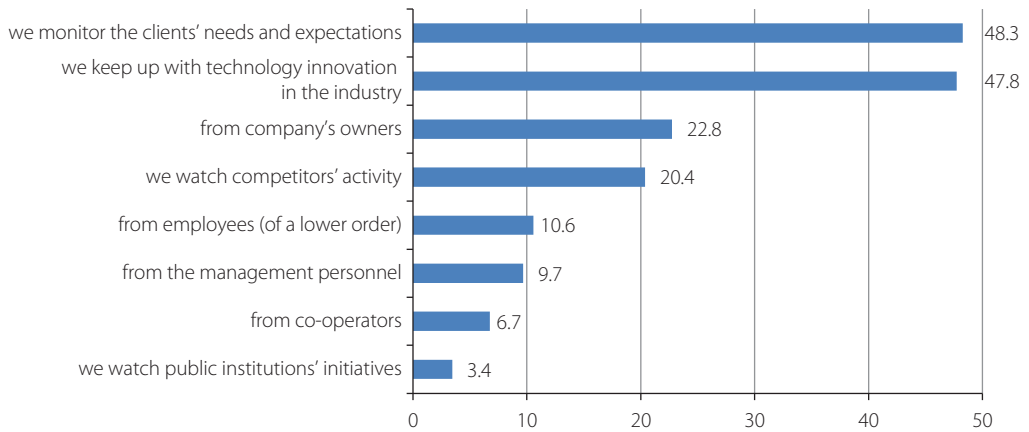
Source: Author's compilation based on the survey of micro-companies in Poland carried out by PARP in 2014.

Where to go hunting – the sources of innovation ideas, how to finance them and is it worth it all?

The data concerning the sources of micro-entrepreneurs' innovation ideas provide interesting information. As it turns out, **over 48% of entities that implemented innovation within the last three years monitor the customers' needs and expectations**. A similar group (47.8%) **follows the new technological solutions emerging in the industry**. Another important source of innovation ideas are persons working in a given company – from owners (almost 23%), through employees of a lower order (10.6%), to management personnel (9.7%). Much less often

micro-entrepreneurs get their ideas from co-operators (6.7%) or from watching public institutions' initiatives (3.4%).

Fig. 5. Sources of innovation ideas' in innovative micro-enterprises (% of innovative micro-enterprises)



N = 756

The data come from multiple-response questions – the percentages do not add up to 100.

Source: Author's study and compilation based on the survey on the innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

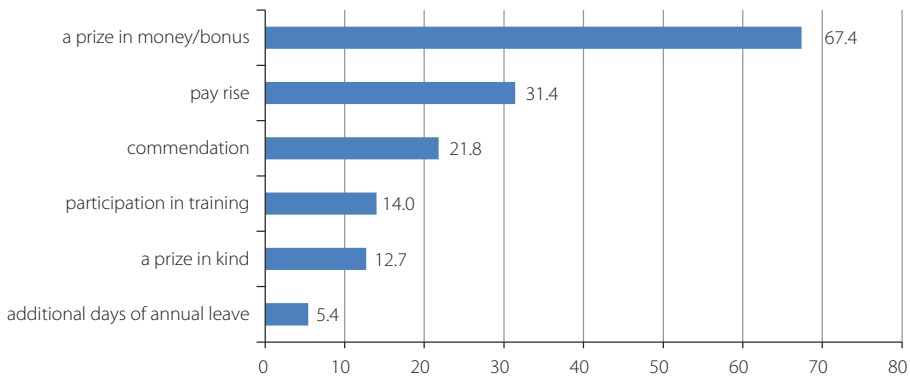
Among the sources of innovation ideas described above, the results for workers draw attention. With the domination of owners resulting from the specific nature of managing micro-enterprises and with a low results for management personnel (which often is not present in micro-companies), a relatively high score for regular employees (they are a source of ideas in one out of ten innovative micro-enterprises participating in the survey) can be noted. It contradicts the current belief concerning the lack of bottom-up attitude in terms of innovations in smaller enterprises, which are dominated by the owners' belief that they have sufficient driving force, and for that reason, they rarely engage employees in the company's innovative projects¹⁵⁾. PARP's survey also indicated the occurrence of additional encouragement in a company. **A type of system encouraging the workers to propose their ideas concerning improvements in the company, its products, and services provided is present in almost two out of five surveyed entities (over 39%)**. Employees reporting their ideas for improvements in the company can count on a prize in money (67% of enterprises with an incentive system), a pay rise (31.4%), or official praise (approx. 22%). Only in about 12 percent of innovation micro-enterprises with a motivation system, it includes the possibility of a training or a prize in kind, and even less (5%) – additional days of annual leave.

The above data, confirming the appreciation of employees' creativity by a large part of micro-entrepreneurs allow one to hope for better results of this group of companies. The results of a survey conducted by P. Andries and D. Czarnitzki also give rise to such expectations, according to which, the

¹⁵⁾ P. Andries, D. Czarnitzki, *Small firm innovation performance and employee involvement*, *Small Business Economics* (2014) 43:21–38.

use of managerial personnel and employees of a lower order has a good influence on the results of activity in the area of innovation of enterprises¹⁶⁾.

Fig. 6. Incentive systems for imaginative employees according to the types of available prizes (% of micro-enterprises that have an incentive system encouraging the employees to submit their ideas for improvements in the company and its offer)



N = 370

The data come from multiple-response questions – the percentages do not add up to 100.

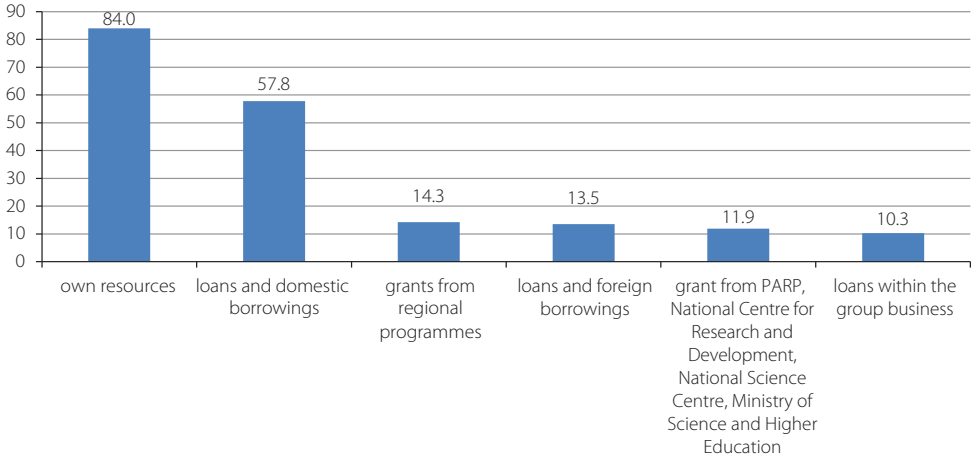
Source: Author's study and compilation based on the survey on the innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

The structure of financing sources for the activity in the area of innovation of micro-enterprises is not much different from the structure of financing for investments in the small and medium-sized enterprises sector or the whole population of enterprises. **A vast majority (84%) of micro-enterprises cover all the expenditure connected with innovative projects from their own resources, and many micro-companies use loans or national borrowings (approx. 58%).** Significantly less respondents use grants: 14.3% achieved support from regional programmes, almost 12% from resources at disposal of PARP, the National Centre for Research and Development, National Science Centre, or the Ministry of Science and Higher Education. Loans and foreign borrowings are the innovation projects' source of financing for 13.5% of innovative micro-companies, while borrowings within the group business – for every tenth entity. It is worth mentioning that 22.1% of respondents finance innovation only from their own resources.

Almost half (47.6%) of micro-companies' owners who introduced innovation to their enterprise within the last three years believe it was profitable. Over a fifth of owners claim that it is too early to determine that. Only eight out of hundred micro-entrepreneurs believe that expenditure on introducing innovation to a company would not bring any benefits, and slightly more than 18% do not know, because they are unable to measure the possible effect of the introduced change's visibility.

¹⁶⁾ Ibid.

Fig. 7. Sources of financing innovation in micro-enterprises (% of innovative micro-companies)

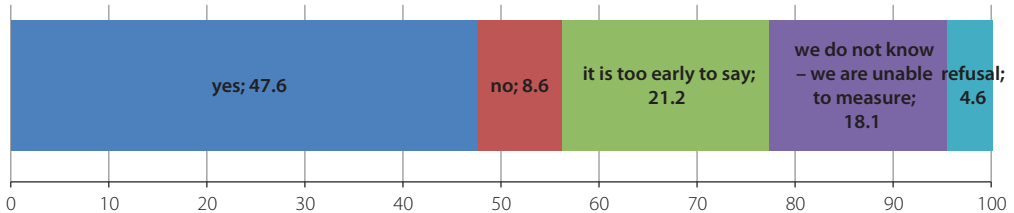


N = 756

The data come from multiple-response questions – the percentages do not add up to 100.

Source: Author’s study and compilation based on the survey on the innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Fig. 8. Has innovation expenditure incurred by your enterprise been profitable? (% of innovative micro-companies)



N = 756

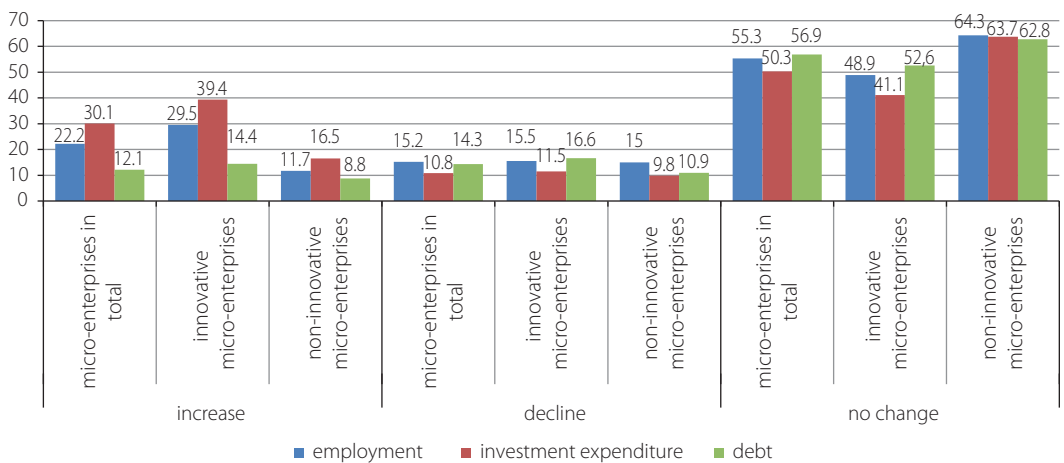
Source: Author’s study and compilation based on the survey on the innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Data on selected parameters illustrating the enterprise’s situation shed more light on the issue of the profitability of innovative activity. Those parameters include employment, investment expenditure, and debt, as well as their changes over the last three years. In this case, innovative micro-entrepreneurs were compared with micro-entrepreneurs who did not introduce any innovation within the last three years and with micro-enterprises in total. It turns out that, compared with micro-entrepreneurs in total and in particular with non-innovative companies, within the period 2012–2014, more respondents who were innovators recorded an increase in employment, investment expenditure and, slightly, in debt (employment: 2.5-fold more innovative companies compared with non-innovative companies, expenditure: 2.4-fold, debt: 1.6).

As regards to declines in those parameters, in innovative companies, they were very similar to those in the whole group of respondents and in non-innovative ones (apart from debt, the decline of which

was recorded in a larger number of companies which did not introduce innovation, i.e. 10.9%, than in innovative ones – 16.6%). On the other hand, the three indicators have not changed mainly among non-innovative respondents (proportions exceeding 62%), while, among micro-enterprises in total and the innovative ones, approximately one in two recorded no change in employment, investment expenditure, and debt in the years 2012–2014. In terms of specific values, an increase in employment occurred in almost 30% of innovative micro-enterprises, while investment expenditure increased in almost 40% of those companies. During this period, debt increased in 14.4% of innovative micro-enterprises. A decrease in employment was recorded in 15.5% of innovative respondents, 11.5% experienced a decline in investment expenditure, and 16.6% in debt. One in two innovative micro-enterprises did not report any changes in terms of employment and debt, while expenditure remained the same for 41% entities in this group. **Even though an analysis of these three parameters is not sufficient for a comprehensive assessment of the profitability of engaging in activity in the area of innovation, however, combined with the general assessment of effects, performed by owners of micro-enterprises, it allows to state that innovation is profitable.**

Fig. 9. Selected parameters concerning the activity of micro-enterprises that introduced or did not introduce innovation in 2012–2014



N = 1277 for micro-enterprises, N = 756 for innovative micro-enterprises, N = 521 for non-innovative enterprises.

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

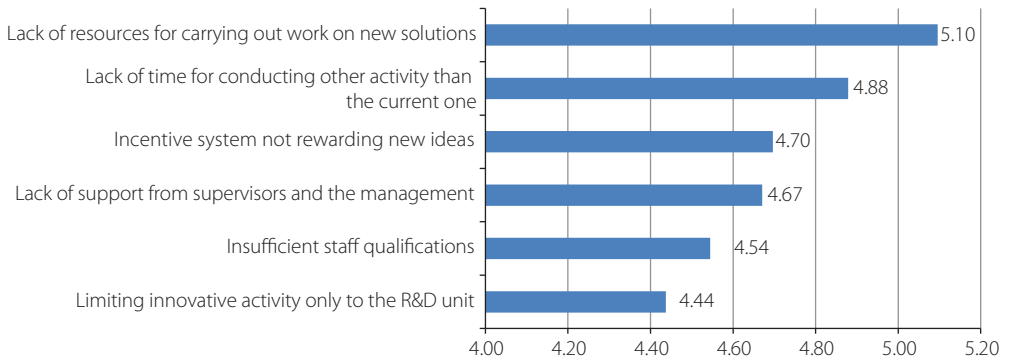
Barriers, incentives, and plans for the immediate future

Now, let us take a look at factors that might constitute a barrier to taking up and conducting activity in the area of innovation by the smallest entities. According to owners of micro-enterprises, **the major barrier to innovativeness of enterprises is the lack of resources for carrying out work on new solutions and the lack of time for conducting other activity than the current one**¹⁷⁾. Other problems include the issues connected with the organization of a company, such as using

¹⁷⁾ The average for micro-enterprises: 5.09 and 4.88 on a scale of 1–7, where 1 means “this is not a barrier to the innovativeness of enterprises,” and 7 – “a very significant barrier to the innovativeness of enterprises”.

incentive systems that do not reward the originators of new ideas. Another group of barriers to activity in the area of innovation are issues related to the human factor, i.e. **the lack of support from supervisors and the management and low qualifications of employees** in general. According to the surveyed entrepreneurs, limiting activity in the area of innovation only to the R&D unit received the lowest score, although still above 4 as “a relatively important barrier”.

Fig. 10. Barriers to the innovativeness of enterprises according to micro-entrepreneurs (the average of responses on a scale of 1–7, where 1 – this is not a barrier, 7 – a very significant barrier)



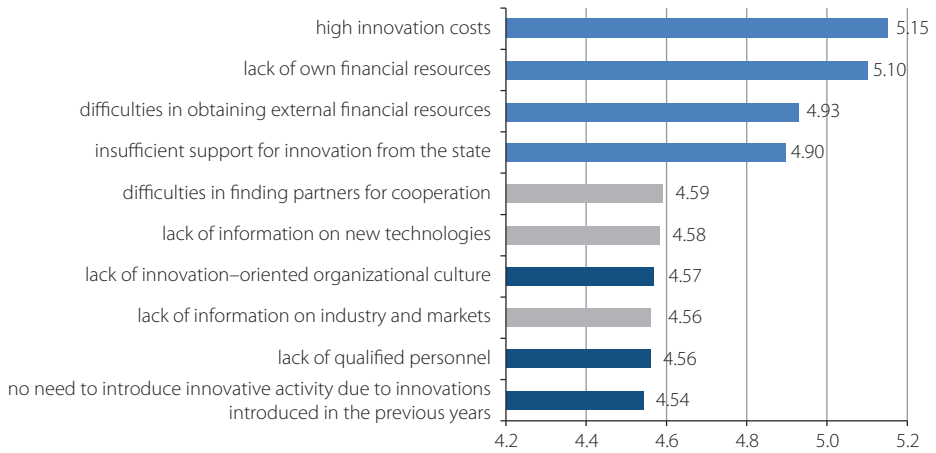
N = 1277

Source: Author’s compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Evaluation conducted by micro-entrepreneurs experienced in this field provides additional information on difficulties connected with conducting activity in the area of innovation. Apart from financial issues such as high innovation costs, the lack of their own resources, difficulties in obtaining external financing, or insufficiently developed innovation support from the state, they point to two additional groups of factors. The first group is related to the need to find a partner for cooperation or extending knowledge on new technologies, industries, and the market. The second one is linked with internal aspects of the operation of a company, i.e. the lack of innovation-oriented organizational culture, of sufficiently qualified personnel, and finally, quite simply, no need to conduct activity in the area of innovation due to innovation introduced in the previous years.

So, what **induces micro-entrepreneurs to introduce innovation?** It is mostly **the increasing costs** (indicated by 28% of respondents who introduced innovation to their companies within the last three years) and **the fact of entering new markets to gain new clients** (approx. 25%). One in five micro-entrepreneurs introduces innovation to gain recognition or due to the need to extend their offer of products and services. A similar number decides on such activity in response to the actions of competitive companies that have already introduced innovation or in response to more intense competition on the public procurement market. 15% of innovative micro-enterprises want to use innovation to meet their contractors’ requirements, which often constitute conditions for further cooperation. Slightly fewer respondents are motivated by new technological solutions emerging in the country and in the world (12–13%). A similar proportion of owners of micro-enterprises decide to implement innovative projects due to the possibility of receiving support from public funds or re-organization within the company.

Fig. 11. Factors hindering activity in the area of innovation according to innovative micro-entrepreneurs (the average of responses in a 1–7 scale, where 1 – this is not a barrier, 7 – a very significant barrier)



N = 756

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Fig. 12. Incentives, i.e. factors inducing the introduction of innovation in a company (% of answers of innovative micro-enterprises)



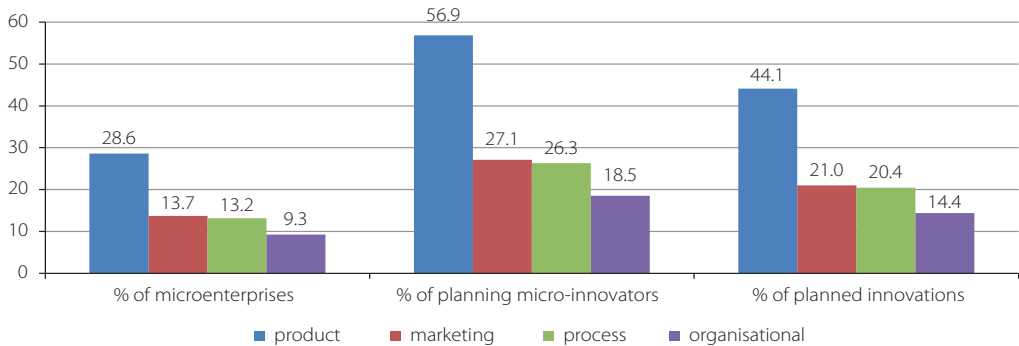
N = 756

The data come from multiple-response questions – the percentages do not add up to 100.

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Slightly **more than half of micro-entrepreneurs who participated in the PARP's survey (50.3%) plan to introduce innovation in their company within the next 12 months**. 49.7% of respondents have no such plans. In terms of the structure of the planned innovations by type, as in the case of the already implemented ones, it is dominated by product innovations (over 28% of respondents want them to be the projects aimed at introducing new or significantly improved products or services). The interest of micro-entrepreneurs in the two subsequent groups of innovative solutions, i.e. process and marketing innovations, is twice lower (their implementation is planned by 14% and 13% of respondents, respectively). Organizational innovations are planned by 9.3% of micro-enterprises. Relating the planned innovations by type to micro-entrepreneurs planning to introduce these innovations translates into relatively higher proportions of enterprises interested in product (56.9%), marketing (27.1%), process (26.3%), and organizational (18.5%) innovative activity. The structure of all planned innovations by type is as follows: product – 44%, marketing – 21%, process – 20.4%, organizational – 14.4% innovations.

Fig. 13. Plans of micro-enterprises concerning the introduction of innovation within the next 12 months (%)



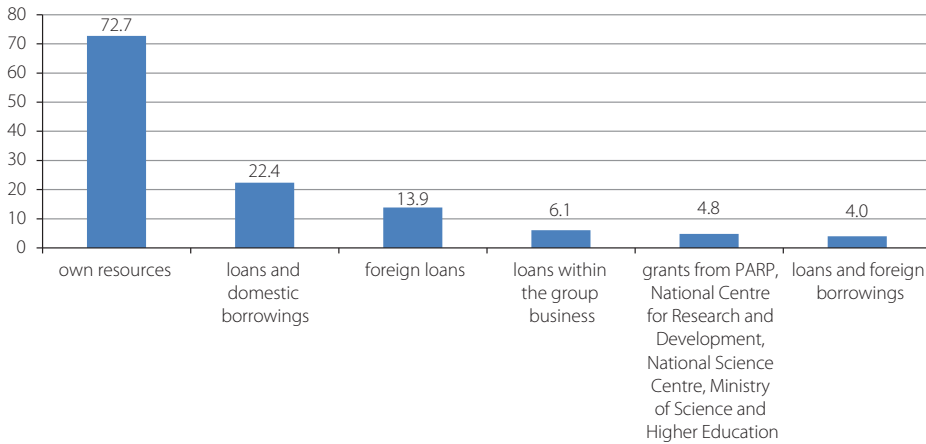
N = 1277 for micro-enterprises, N = 642 for micro-enterprises planning innovations (planning micro-innovators), N = 827 for all planned innovations.

The data come from multiple-response questions – the percentages do not add up to 100.

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

The majority, i.e. seven out of ten, micro-entrepreneurs who plan to introduce innovations in their companies within the next 12 months intend to finance the related expenditure using their own resources. In terms of external sources of financing, most micro-entrepreneurs want to use domestic credits and loans (22.4%), EU funds (approx. 14%), and public funds at the disposal of i.e. PARP, National Centre for Research and Development, National Science Centre, or the Ministry of Science and Higher Education. It is evident that the structure of financing sources for the planned innovative implementations is similar to the structure of sources of funds for innovative projects implemented by micro-entrepreneurs in the last three years, namely in the period 2012–2014. Domestic and foreign credits and loans attract relatively less interest compared with the current situation, which is undoubtedly due to the uncertain situation of the euro area and in Eastern Europe in the recent years. A decline in the number of respondents wanting to finance innovation from PARP, National Centre for Research and Development, National Science Centre, or the Ministry of Science and Higher Education grants is probably also the effect of waiting for the shape of new instruments available in the framework of 2014–2020 perspective at the time the survey was conducted.

Fig. 14. Sources of financing for innovation planned in micro-enterprises (% of micro-enterprises planning to introduce innovation)



N = 642

The data come from multiple-response questions – the percentages do not add up to 100.

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

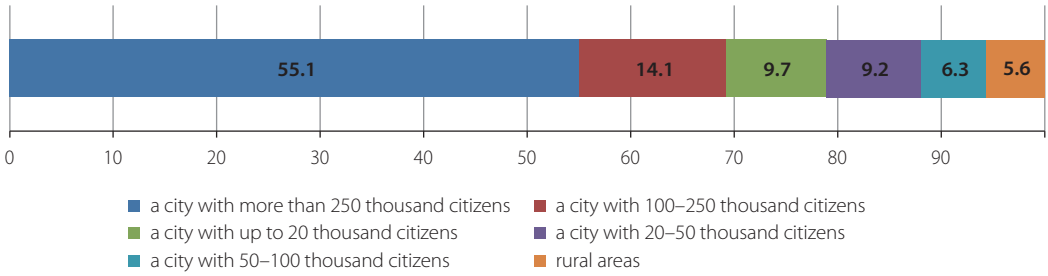
Outline of innovative micro-enterprises

To sum up the activity in the area of innovation of micro-enterprises in Poland, it is worth presenting some information on the profile of these entities. **More than half of micro-entrepreneurs (55.1%) are based in big cities (with more than 250 thousand citizens)**. 14% of micro-enterprises are located in cities with 100–250 thousand inhabitants. However, it is interesting that **slightly more entrepreneurs choose cities with up to 20 thousand citizens (9.7%) over those relatively bigger – with 20–50 thousand citizens (9.2%) and with 50–100 thousand (6.3%) citizens for their principal place of business**. Only approximately six out of hundred micro-entrepreneurs are based in rural areas. Similarly to the total of micro-entrepreneurs in the sample, the companies that introduced innovation within the last three years are located (53.6%) in cities with more than 250 thousand citizens and 46.4% in smaller cities.

The tendency to engage in activity in the area of innovation is significantly greater among micro-enterprises located in cities with more than 250 thousand inhabitants, and 53.2% of micro-enterprises from big cities plan to introduce innovations to their companies in 2015, compared with 46.8% of those located in rural areas and in cities with up to 250 thousand inhabitants.

The location of the enterprise turns out to be an important success factor for the development decisions made. The results of PARP's survey show that, **among micro-entrepreneurs based in smaller areas (in rural areas and cities with up to 250 thousand citizens), there are more who believe that the innovation expenditure has been profitable compared with the respondents from big cities (with more than 250 thousand inhabitants) – (53.1% compared with 42.7%, which is a difference of 10.4%pp)**. However, the difference might change, since many enterprises, which include more entities based in big rather than smaller cities (25.2% vs. 16.5%, respectively), believe that it is too early to estimate the effects of the implemented innovation activities.

Fig. 15. Location of micro-enterprises (%)

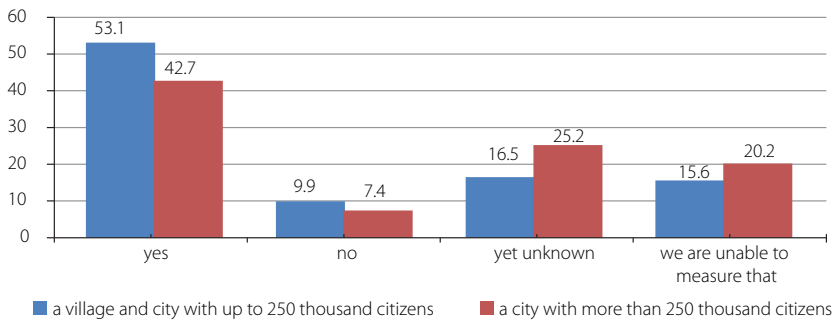


N = 1277

The data come from multiple-response questions – the percentages do not add up to 100.

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Fig. 16. Assessment of the profitability of implemented innovations by the micro-entrepreneurs who introduced the innovations by location of the company



N = 756

The data come from multiple-response questions – the percentages do not add up to 100.

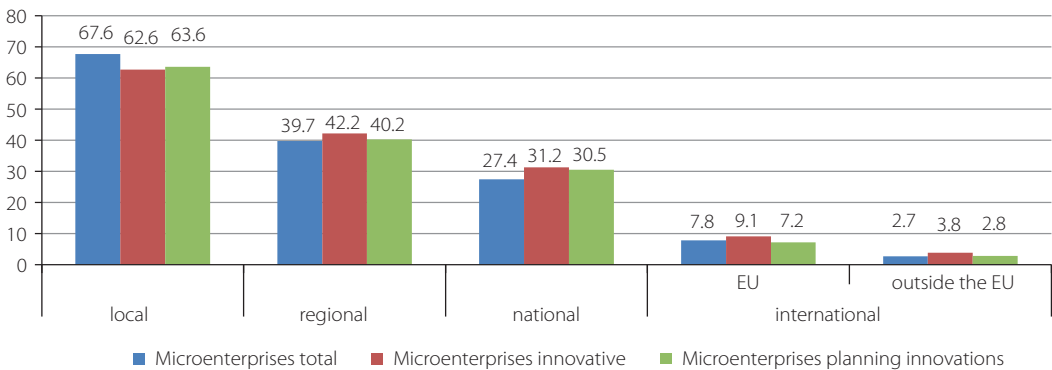
Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Slightly more than a third of micro-entrepreneurs in the survey are sub-suppliers (35.8%), approx. 31% are producers of final goods, and slightly more than 21% are both sub-suppliers and producers of final goods. **The structure of micro-enterprises that implemented innovation in their companies within the last three years and those planning innovations within the next 12 months is similar: a third of them are sub-suppliers (33.7% and 33.2%, respectively), a similar percentage are producers of final goods (30.7% and 31.8%), and a quarter are companies are both sub-suppliers and producers of final goods (25.7% and 26.9%).** In which group is the proportion of entities planning innovations the largest? One can easily guess that it is the largest among those who are both sub-suppliers and producers of final goods (63.4%), followed by producers (51.8%), while it is the lowest among sub-suppliers (46.5%), which is still high.

More than six out of ten innovative micro-enterprises or those planning to introduce innovation are entrepreneurs operating on a local market, more than four out of ten operate on a regional market, and

approximately one in three is a company operate on the entire national market. **As many as 91.5% of micro-enterprises focus only on the Polish market**, 9% of innovative micro-enterprises and 7% of those planning to introduce innovation are present on the EU market, while 3.8% of innovative micro-enterprises and 2.8% of those planning to introduce innovation are present on non-UE markets. **Export activity¹⁸⁾ is conducted by 8.5% of micro-enterprises and 10.3% of micro-enterprises that introduced innovation within the last three years as well as by 7.9% of those planning to introduce innovation. Among 8.5% of exporting micro-entities, 6.5% (over six out of hundred) conduct international activity only within the EU or only outside the EU, while 2% of micro-entrepreneurs are present both in the EU and outside the EU. Among those micro-entrepreneurs who operate outside Poland, 71.6% of respondents introduced innovation within the last three years.**

Fig. 17. Innovative activity of micro-enterprises and their scope of operation



N = 1277 for micro-enterprises in total, N = 756 for innovative micro-enterprises, N = 642 for micro-enterprises planning innovations.

The data come from multiple-response questions – the percentages do not add up to 100.

Source: Author’s compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Summary

Upon closing this chapter, we would like to draw attention to some changes occurring in the attitudes of micro-entrepreneurs. A comparison of their planned innovation activity with the one actually implemented within the last three years in terms of structure by type indicates the following:

- A similar proportion of micro-enterprises still plan to introduce product innovations (approx. 29% of companies).
- Fewer micro-enterprises than before plan to introduce other types of innovation (the difference is approx. 7%–4% p.p. depending on the type of innovation).
- The above changes indicate a slight decline in the innovation tendency from approx. 1.4 innovations per micro-enterprise to approximately 1.3.
- The micro-entrepreneur’s interest in individual types of innovation is slightly changing, since more micro-enterprises plan to implement marketing than process innovations. Up to the present, more entrepreneurs introduced process innovations than marketing innovations.

¹⁸⁾ Export activity refers to the entities conducting business activity on the EU market or outside the EU and those which are present both on the EU market and outside the EU.

- Regarding the innovation structure, more product innovations and less process innovations than before are planned.

It is also clear that the tendency to undertake activity in the area of innovation is linked to experience in this field. More than 71% (seven in ten) respondents who introduced innovations to their companies within the last three years plan to implement another innovative project within the next 12 months. For a comparison, among those who did not introduce any innovations in the 2012–2014 period, significantly fewer, although still many, i.e. a fifth (20%), plan to undertake activity in the area of innovation. If we look at experience in terms of the entities planning to introduce innovation, it turns out that only 16% of them are companies that implement innovation for the first time, while the remaining 84% gained experience in this field within the last three years.

The CSO's innovation survey of enterprises having 10 or more employees shows that more than 18.4% of industrial enterprises and 12.8% of enterprises in the service sector carried out activity in the area of innovation in the years 2011–2013¹⁹. Undoubtedly, the result of 60% of entities implementing innovations among micro-enterprises is surprisingly, and even astonishingly good.

Now, let us take a closer look at the positive and negative aspects of the innovativeness of micro-enterprises, i.e. micro-employers, identified during the PARP's survey. One of the positives is the fact that innovativeness is definitely profitable and results in employment growth. The ideas for innovation originate from customers and their needs, as well as employees, with numerous micro-enterprises having incentive systems rewarding inventive employees. The willingness to enter new markets is a motivation for engaging in innovation. 16% of micro-enterprises conduct R&D activity on their own, while more than 8% in conduct R&D in cooperation with other entities. However, the fact that micro-entrepreneurs lack resources and time to engage in activity in the area of innovation is negative, or maybe rational in many aspects, due to external conditions and internal limitations. One in five respondents are innovative, but only at the company level. Micro-enterprises focus on the Polish market (over 90%), few of them operate outside the country, they relatively seldom use external sources of financing, and they lack knowledge on markets and industries.

We certainly know more about the innovativeness of micro-enterprises, its good aspects, and those that need improvement. As for the question asked in the introduction, it seems that the current activity in the area of innovation of micro-enterprises has a much greater potential for further development than four years ago. Whether, as already noted by *The Economist* in 2011²⁰, we will provide micro-enterprises with conditions for growth and make more entities than now take more risk and engage in innovative projects at the national level, or even globally, depends on us, i.e. the institutions that will support entrepreneurs in this process.

¹⁹ Based on signal information *Innovative activity in Poland*, CSO, Warsaw 2014. The CSO's survey covers enterprises with the exception of micro-enterprises. The 2007 PKD sections covered by PARP's and CSO's surveys are the same.

An innovation active enterprise, according to the CSO, is an enterprise which introduced at least one product or process innovation in the survey period or implemented at least one innovation project, which was interrupted or abandoned during the survey period (unsuccessful) or was not completed by the end of that period (i.e. is pending).

²⁰ *Schumpeter. Big and clever. Why large firms are often more inventive than small ones*, *The Economist*, 17 December 2011.

Chapter 3

TOO SMALL TO COOPERATE? – AN ANALYSIS OF COOPERATION IN MICRO-ENTERPRISES

In the conflict-solving theory (TKI Thomas-Kilmann Conflict Mode Instrument¹⁾), cooperation seems to be one of the most effective conflict-handling modes. The essence of this attitude is to consider each party to be equally important and to take into account the needs of each of them. To compare, compromising assumes that each party has to resign from something in order to reach an agreement.

However, cooperation is taken into consideration not only in conflict situations. Opportunities for widely understood cooperation can be found everywhere, and its main assumptions remain the same: The point is to take into consideration the needs of all parties involved, which leads to the synergy of actions, i.e. to generation of added value.

This is why the issue of cooperation between enterprises is discussed relatively often in numerous publications, also those by PARP. This article is another piece of the jigsaw, which makes the image of entrepreneurship more complete. In this presentation of the topic, we focus on the issue of cooperation in micro-enterprises, taking a closer look at their activity in the area of innovation.

This article is based mostly on the data collected during the survey of the innovativeness of micro-enterprises, carried out by PARP in 2014. A random sample of 1277 micro-enterprises (employing between 1 and 9 employees) was surveyed with the use of a CATI technique.

Cooperation of companies

The level of cooperation of enterprises in Poland turns out to be satisfactory compared with other countries; however, it is not as good in terms of cooperation in the area of activity in the area of innovation. In 2012, almost 64% of entrepreneurs cooperated in the area of production, and as many as 66% cooperated in the field of purchases. At the same time, approx. 27% of enterprises entered into cooperation in creating new products or services²⁾. The recent PARP's survey on micro-enterprises shows that 22% of companies were not engaged in cooperation, which means that as many as 78% cooperated at the time of the survey. A vast majority are engaged in cooperation with other national enterprises (42%) or enterprises from the same capital group (23%). Cooperation with the research sector and business eco-systems is relatively rare; micro-enterprises most often cooperated with national R&D centres (4%) (Fig. 1). In most cases, the current cooperation is continuous (58%). Additionally, 13% of companies claim that their cooperation is continuous and its intensity is increasing. For 29%, it was a "one-off" cooperation (Fig. 2).

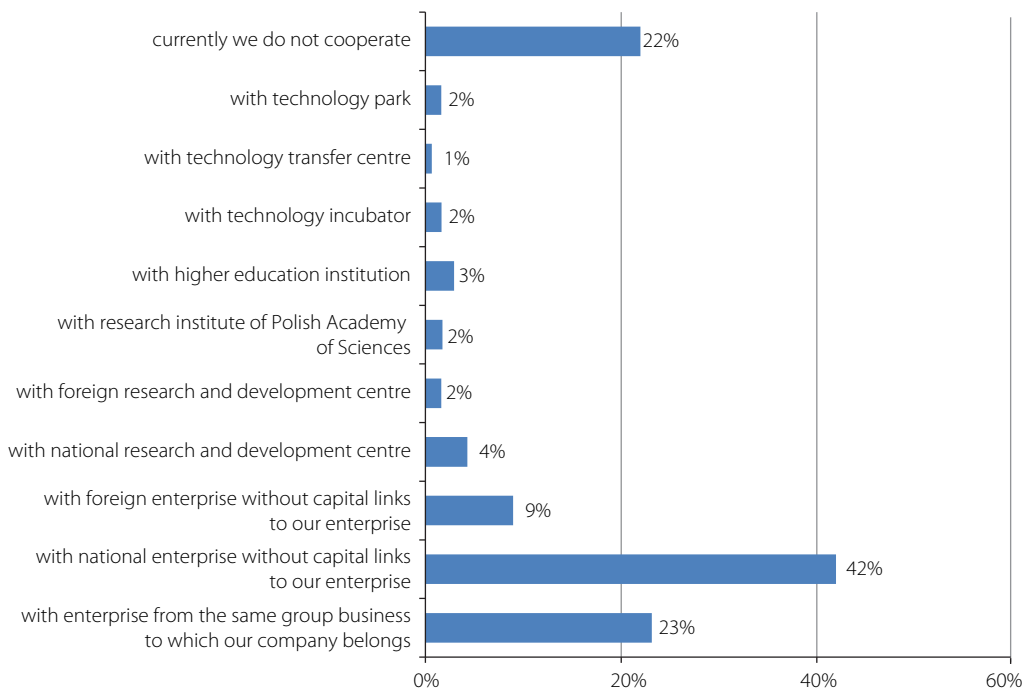
¹⁾ <https://www.cp.p.com/Pdfs/smp248248.pdf> (accessed on 10.03.2015).

²⁾ D. Węclawska, P. Zbierowski, A. Tarnawa, M. Bratnicki, *Global Entrepreneurship Monitor. Poland*, PARP 2013, p. 53.

Trust

Therefore, there can be no doubt that entrepreneurs do cooperate and that their cooperation is intensive. It may seem surprising in the context of findings of the social capital surveys, and in particular, of one of its components, to have the concept of trust, which usually translates into the willingness to cooperate. In the periodically conducted Social Diagnosis, Professor Czapiński estimates that the level of trust in Poland has remained at approx. 12% for many years^{3,4}. However, entrepreneurs, who account for about 12% of the population, differ significantly from the rest of the society. Professor Gardawski's survey shows that entrepreneurs' trust for other people is at the level of approx. 40%⁵.

Fig. 1. Partners in the current cooperation between micro-enterprises



N = 1277

A multiple-response question – the percentages do not add up to 100.

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

The survey of micro-companies attempted to measure the level of trust as well. The respondents were asked to evaluate whether trust in partners is profitable (1) or ends badly (7). On average, the entrepreneurs evaluated trust at the level of 3.35 (the higher the value, the lower the trust), which is slightly above the median. Significant differences between the companies were found, depending on whether they are (or used to be) engaged in cooperation with other enterprises. In the group of

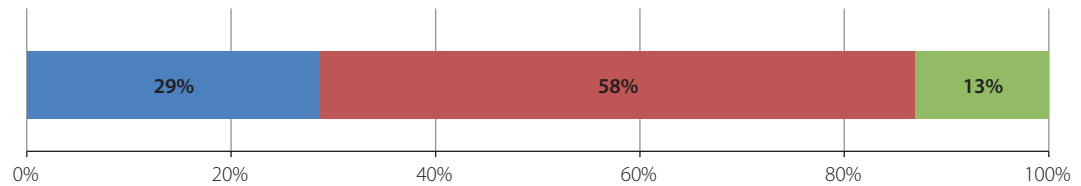
³ In the European Social Survey, whose scale is more sensitive, the level of trust is estimated at approx. 16%.

⁴ J. Czapiński (ed.), T. Panek, *Social diagnosis 2013*, Warsaw, The Council for Social Monitoring 2014.

⁵ J. Gardawski (ed.), *Rzemieślnicy i biznesmeni. Właściciele małych i średnich przedsiębiorstw prywatnych* [Craftsmen and businessmen. The owners of small and medium-sized enterprises in Poland] Wydawnictwo Naukowe SCHOLAR, Warsaw 2013, p. 192.

companies which did not cooperate, trust was, on average, at the level of 3.55 (i.e. above the average value for all companies) and among the companies that attempted to enter into such a cooperation, the average was 2.94. This confirms that the level of trust has a positive impact on the level of cooperation in micro-enterprises. It is consistent with the findings of Professor Gardawski.

Fig. 2. Nature of current cooperation



N = 971

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Cooperation in implementing innovation

As emphasized at the beginning, cooperation between companies results in the generation of added value, which can be beneficial to all partners. We will now analyse what such a cooperation may be and where it may prove particularly valuable for an enterprise.

The issue of cooperation in introducing innovation is becoming more valid in the recent years. Statistically, with an increase in the number of innovation ideas, there is an increase in the quality of the best ideas⁶⁾. In the modern world, it is not enough to introduce as many innovations as possible, because they might turn out to be too expensive, risky and, as a result, might not have a positive impact on the operations of the company. The point is to introduce innovation more effectively⁷⁾. Since the value of the best idea increases with the diversity of the ideas received, access to the most comprehensive database of ideas is particularly important⁸⁾.

So where to look for ideas? According to Joy's law, most of the smartest people work for someone else⁹⁾. For this reason, it is worth looking for the ideas outside one's own company. This is the foundation of the "open innovation" concept. It is also the vital argument in favour of the fact that it is worth cooperating in introducing innovations. Additional arguments in favour of cooperation are key in the case of SMEs, including micro-enterprises. Due to their size (and thus limited financial and human resources), these companies are unable to undertake all the measures that are necessary to

⁶⁾ A. King, K.R. Lakhani, *Using Open Innovation to Identify the Best Ideas in: MIT Sloan Management Review*, Fall 2013, p. 42.

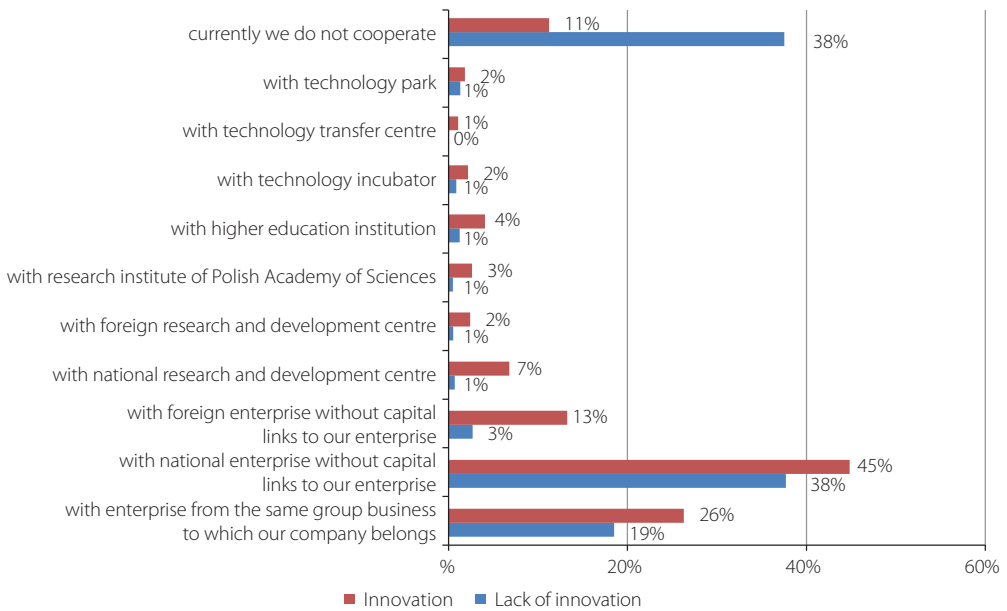
⁷⁾ D. Irvine, J. Wilson, *Lessons from water and lemons: Open Innovation*, http://www.huffingtonpost.co.uk/dominic-irvine/open-innovation_b_6553108.html, accessed on: 29.01.2015

⁸⁾ A. King, op.cit.

⁹⁾ The statement "No matter who you are, most of the smartest people work for someone else" is attributed to Bill Joy – the founder of Sun Microsystems. This statement is in line with the conclusions to which F. Hayek came in 1954, i.e. that at the macro-level knowledge is unevenly distributed in the economy (F. Hayek, *The Use of Knowledge in Society*, in: *The American Economic Review*. 1945) according to: K.R. Lakhani, J.A. Panetta, *The Principles of Distributed Innovation*, The Berkman Center For Internet & Society At Harvard Law School, Research Publication No. 2007-7, p. 2.

successfully introduce innovation¹⁰). Moreover, SMEs are more closely linked with a network of informal contacts that they can use while introducing innovation¹¹). Entrepreneurs more often cooperate with their closer network (i.e. spouses, family members, friends, etc.) than with the more distant network¹²). The close network provides emotional support, sensitive market information, or access to financial resources. Research shows that SMEs that belong to the network are also more innovative¹³). PARP’s survey on micro-enterprises supports this claim. The analysis of the survey results by companies that introduced or did not introduce innovation within the last three years reveals that the level of cooperation is significantly higher among the companies that introduced innovation (89% compared to 62%). Another important difference applies to cooperation with foreign enterprises (10 percentage points more among the companies that introduced innovation) (Fig. 3). Thus, innovative companies not only have a higher level of cooperation, but this cooperation is also more advanced. The above deliberations show that cooperation gives micro-enterprises better opportunities to introduce more effective innovation, which, in turn, allows them to achieve a market advantage.

Fig. 3. Current cooperation between micro-enterprises that introduced or did not introduce innovation within the last 3 years



N = 1277

The difference between groups is statistically significant (the statistics for p-value in Chi-squared test was 0,000).

A multiple-response question – the percentages do not add up to 100.

Source: Author’s compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

¹⁰ S. Brunswicker, V. Van de Vrande, *Exploring Open Innovation in Small and Medium-Sized Enterprises*, in: *New Frontiers in Open Innovation*, ed.: Chesbrough H., Vanhaverbeke W., West J., Oxford University Press 2014, p. 136.

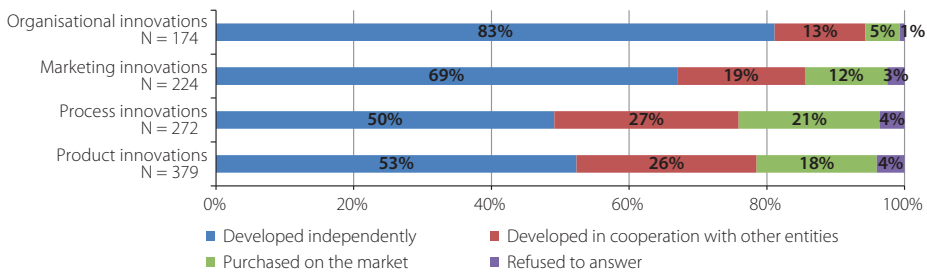
¹¹ A. Macpherson, R. Holt, *Knowledge, learning and small firm growth: A systematic review of the evidence*, in: *Research policy* 36(2), 2007, pp. 172–192.

¹² D. Węclawska et al....op.cit., p.38.

¹³ F. Ceci, D. Iubatti, *Personal relationships and innovation diffusion in SME networks: A content analysis approach*, in: *Research policy* 41(3), 2012, pp. 565–579.

Do micro-enterprises take advantage of the benefits of cooperation in this regard? As PARP's survey shows, depending on the type of innovation, 13%–26% of companies cooperated with other entities, and 5–21% of micro-enterprises purchased innovations. Micro-enterprises were significantly less open to cooperation in terms of organizational innovations and most open in terms of process and product innovations (Fig. 4). While introducing innovation, companies most often cooperated with other enterprises. 45% of micro-enterprises cooperated with unrelated national companies, 30% with companies from the same capital group, and 14% with foreign enterprises. Science institutions were micro-enterprises' partners in introducing innovation significantly less often (Fig. 5).

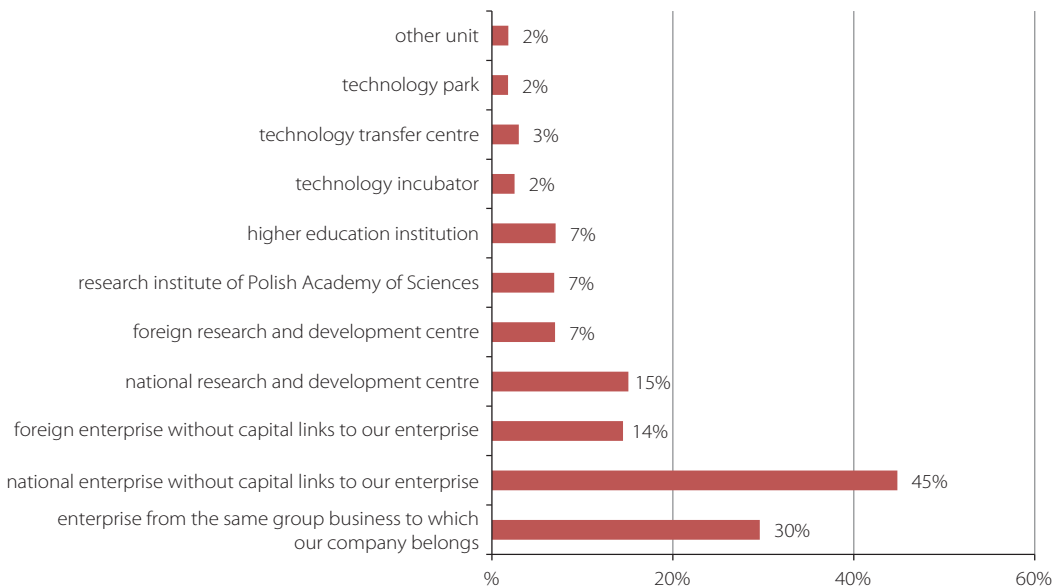
Fig. 4. Cooperation of micro-enterprises in introducing individual types of innovation (innovations implemented within the last 3 years)



A multiple-response question – the percentages do not add up to 100.

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Fig. 5. Micro-enterprises' partners in introducing innovation (innovations implemented within the last 3 years)



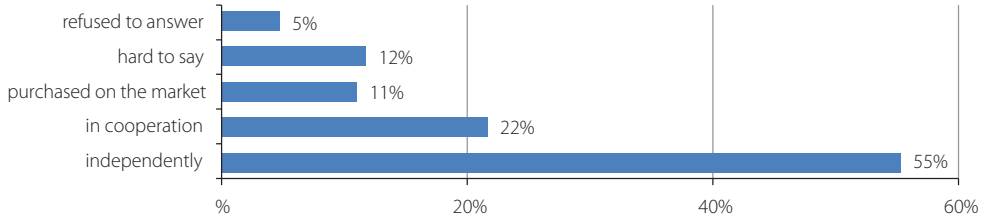
N = 195

A multiple-response question – the percentages do not add up to 100.

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Among the micro-enterprises planning to introduce innovations in the following year, more than half want to implement them on their own and less than a quarter in cooperation with others (Fig. 6). They are most willing to cooperate with other national enterprises (50%), with an enterprise from the same capital group (27%), or with a foreign enterprise (19%) (Fig. 7). It is also interesting to note that, in comparison with the partners that have already cooperated with micro-enterprises in implementing innovations within the last three years (see Fig. 5), there were more (by 5 pp) higher education institutions, technology incubators, and foreign companies, and less national R&D centres.

Fig. 6. Micro-enterprises' plans concerning cooperation in introducing innovations

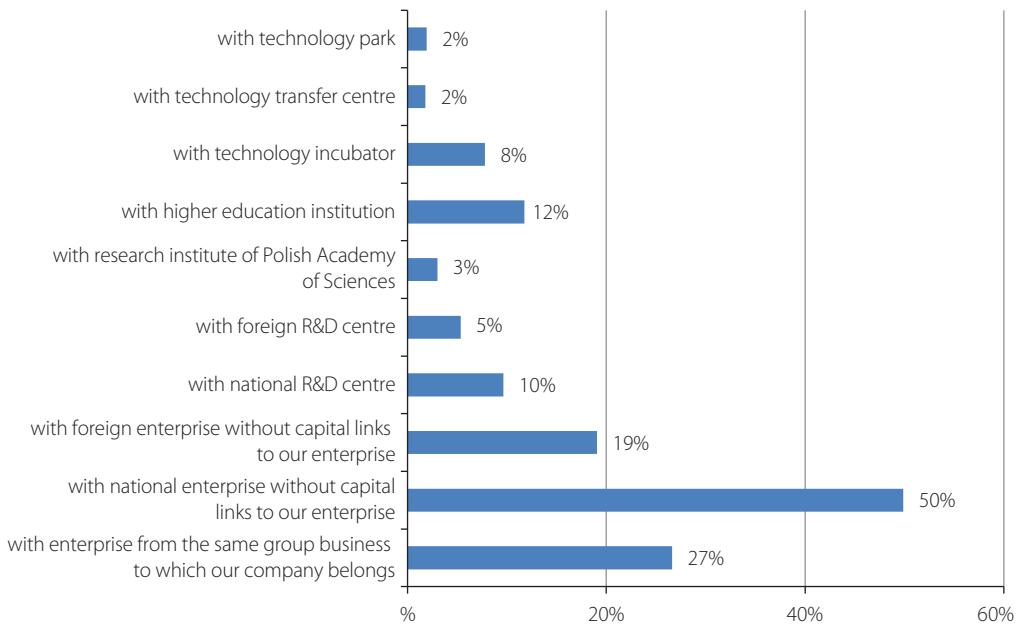


N = 124

A multiple-response question – the percentages do not add up to 100.

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Fig. 7. Planned partners for cooperation in introducing innovations in micro-enterprises



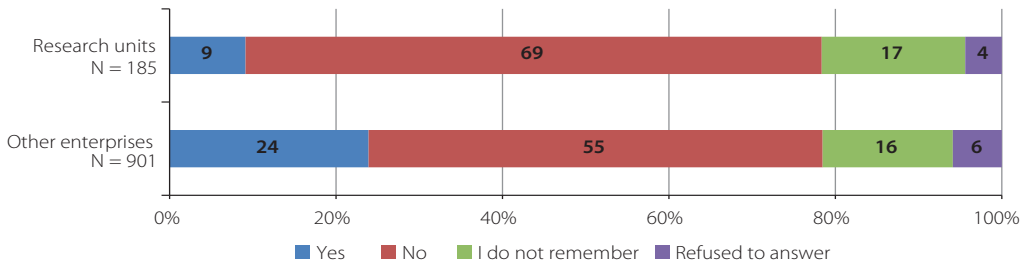
N = 124

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Evaluation of cooperation

We already know that micro-enterprises should cooperate and why they should. We also know that some of them are aware of this and do cooperate. We also know that companies cooperate mostly with other enterprises and much less often with science institutions. Now, let us investigate the performance of this cooperation. It turns out that as much as one fourth of micro-enterprises have experienced barriers to establishing and maintaining cooperation with other enterprises. For comparison, only 9% of companies experienced barriers in cooperation with science institutions (Fig. 8). The main barriers include difficulties in finding an appropriate partner (52%), difficulties in coordinating the cooperation (46%), and the dishonesty of the partner (40%) (Fig. 9). Thus, the level of cooperation between micro-enterprises is still influenced by the deficit of social capital that can take the form of failing to notice the mutual benefits of cooperation, the lack of mutual trust, or even dishonesty.

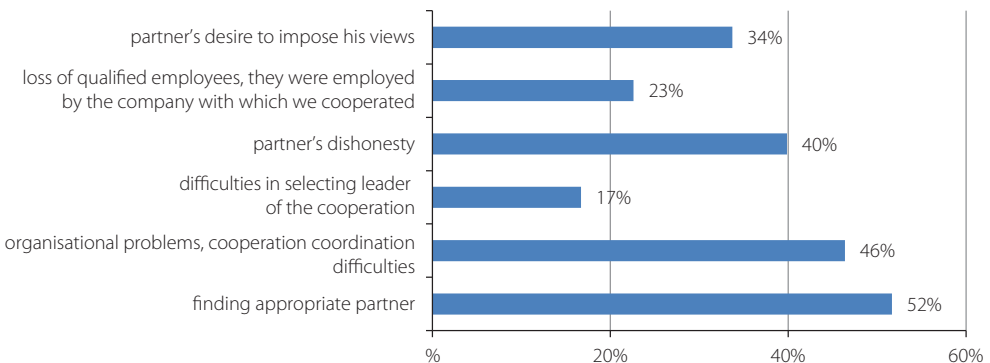
Fig. 8. Barriers to entering into and maintaining cooperation faced by micro-enterprises (%)



A multiple-response question – the percentages do not add up to 100.

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Fig. 9. Types of barriers to cooperation with other enterprises¹⁴⁾



N = 215

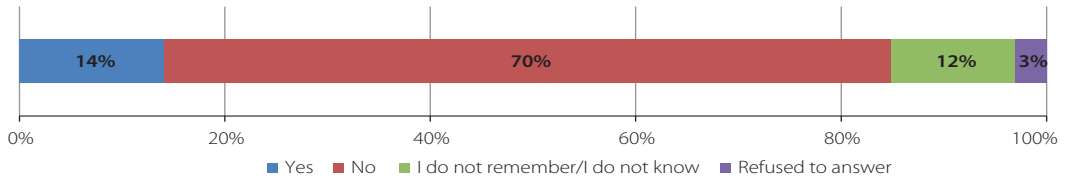
A multiple-response question – the percentages do not add up to 100.

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

¹⁴⁾ The number of companies (N) which answered the question concerning the type of encountered barriers to cooperation with research units is too small.

Among the companies which had not cooperated with other companies, as much as 70% did not attempt to enter into such cooperation at all, mostly because there was no need (80%), and secondly due to the fact that they considered themselves to be too small (Fig. 10 and 11). Therefore, it is not only social capital deficiencies, but also the lack of the awareness of the benefits such a cooperation may bring that contribute to the decrease in the level of cooperation in micro-enterprises.

Fig. 10. Attempts to enter into cooperation with other enterprises

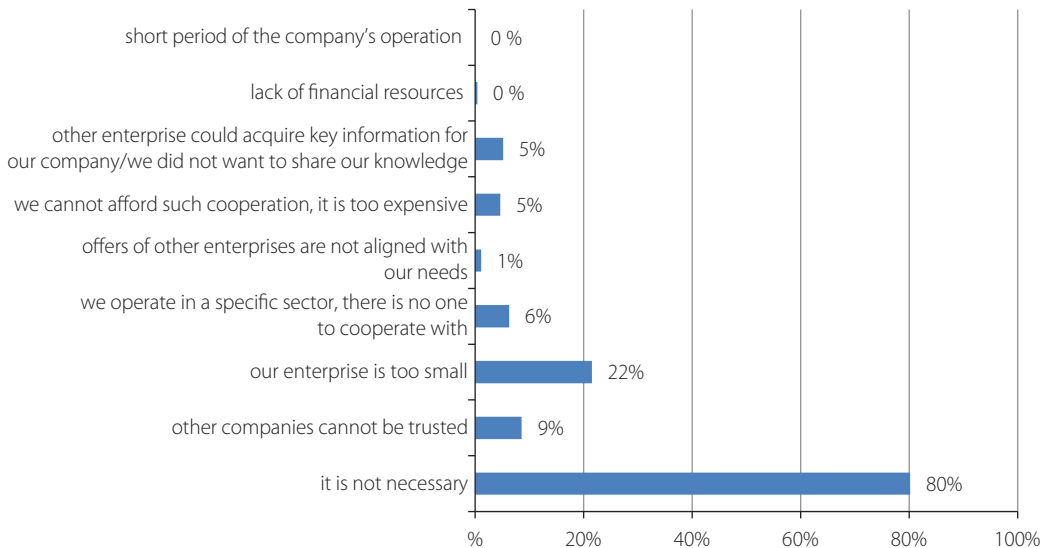


N = 412

A question asked to companies that have not entered into cooperation with other enterprises yet.

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Fig. 11. Reasons for the lack of interest in cooperating with other enterprises



N = 290

A multiple-response question – the percentages do not add up to 100.

Source: Author's compilation based on the survey on innovativeness of micro-enterprises in Poland carried out by PARP in 2014.

Summary

Firstly, it must be noted and emphasized that Polish entrepreneurs stand out from the society in terms of their high level of trust, which translates into a high level of cooperation.

Secondly, enterprises (also micro) cooperate in activity in the area of innovation to a lesser extent. In the case of micro-enterprises, 13-26% (depending on type of innovation) entered into cooperation with regard to innovation, while almost 80% of them declared entering into cooperation in general.

Thirdly, micro-enterprises cooperate mostly with other enterprises and much less often with research units, although they evaluate their cooperation with the latter significantly better.

More importantly, micro-enterprises do not cooperate, because they fail to see a need for cooperation or consider themselves to be too small. This way of thinking seems a paradox, since it is their small size and limited resources that should motivate the smallest entities to enter into cooperation for the sake of their own development. The basic advantage of cooperation is that it creates more than the partners would have created independently. The paradox also results from a low awareness of the benefits of cooperation and shows that it is still a pressing issue for institutions supporting entrepreneurship in the country. It is all the more pertinent, since there are many indicators that future innovation models will increasingly rely on resources from the company's environment rather than those within the company itself.

On the other hand, among the companies which had been involved in cooperation, the most significant problems include organizational and communication issues, followed by partner's dishonesty.

The following real-life example illustrates problems faced by micro-enterprises. A one-person company called A cooperates on an ongoing basis with micro-enterprise B (which employs 5 people) in carrying out joint projects. One day, a contest for the implementation of project X was announced. Company B decided to participate in the contest. At the same time, company A arranged with company C (which is owned by a close friend of A's owner) to participate in the contest together. However, they must do it under the A brand name, because it has the experience necessary for the contest. Companies A and C agree that company A provides its name and experience, and company C prepares a project for the contest. Independently, companies A and C would not have participated in the contest (A did not have the time to prepare the contest project, and C lacked sufficient experience). At the same time, A agrees with B that they do not mind being each other's competitors in this case.

A and C win the contest. This is where, instead of joy from receiving the order, the complications arise. It turns out that companies A and C did not discuss what would happen when they win and how they would divide the work. The companies also have contradictory expectations. C believes it should be a party to the agreement with the investor and not only a subcontractor. Company A disagrees with it. The issues of the distribution of remuneration also arise. How does this story end? At present, it is still unknown, and the dispute is ongoing.

What is the conclusion of it for discussions on cooperation of micro-enterprises? Firstly, it is evident that micro-enterprises can cooperate and compete at the same time (like A and B). Secondly, it is proven that micro-enterprises can achieve more when they work together (like A and C). It is finally clear that micro-enterprises cooperate, within a closer network in this case; however, they lack knowledge and tools to organize and manage such cooperation.

Chapter 4

BUILDING THE INNOVATION POTENTIAL OF ENTERPRISES IN POLAND – THE OUTCOMES OF THE INNOVATIVE ECONOMY OPERATIONAL PROGRAMME

Innovation grants

In the period 2005–2007, when “new perspective: 2007–2013” for EU funds was programmed in Poland, institutions of the new system of the EU funds implementation for 2007–2013 faced, as it might have seemed, an unimaginably difficult task of correctly and effectively allocating, enormous as it seemed at that time, the financial envelope granted for the implementation of the EU cohesion policy in Poland¹⁾. The appropriate planning of innovation-oriented instruments and an effective transfer of over EUR 10 million to research and economy sectors and their environment under the Innovative Economy Operational Programme 2007–2013 (OP IE) was to be a particularly demanding task. The designed instrument portfolio constituted an entirely new offer of external financing for enterprises in Poland. It was an opportunity to obtain relatively cheap capital (mainly in the form of non-repayable grants), both for those planning to enter the path of innovative development and for companies which had been introducing innovations for years. On the one hand, this offer reflects a full life cycle of innovation²⁾ and, on the other hand, it was adjusted to the potential of individual target groups and to the current development needs of the Polish economy.

Many of the support instruments had not been tested in Poland before. They were often adapted solutions successfully functioning in the “old” EU-15 countries for many years (e.g. passport to export, support under a business angel network or transregional cooperation networks) or totally new innovations – experiments in the national innovation system, difficult to evaluate *ex ante* to see how they will work in Poland. The ambitious goals and targets lacked adequate measuring tools in Poland, on the one hand, and required a precise operationalisation in the context of the more extensive theory of the Programme, on the other hand³⁾. The Polish Agency for Enterprise Development, which acted as the implementing institution with regard to support for enterprises also under the previous EU perspective⁴⁾, was entrusted with the implementation of the highest number of OP IE innovation-oriented instruments and aid measures, addressed directly to companies and business environment

¹⁾ The allocation of funds under the 2007–2013 national strategic reference framework exceeded EUR 100 billion, of which 85% were resources from the EU funds.

²⁾ The concept of innovation ecosystem (cf. Research and innovation as sources of renewed growth – Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of The Regions, Brussels, 2014, p. 10 – <http://ec.europa.eu/research/innovation-union/pdf/state-of-the-union/2013/research-and-innovation-as-sources-of-renewed-growth-com-2014-339-final.pdf> of 18 February 2015).

³⁾ See: Theory-Based Impact Evaluation: Principles and Practice, Howard White, International Initiative for Impact Evaluation, June 2009 (http://www.3ieimpact.org/media/filer_public/2012/05/07/Working_Paper_3.pdf of 18 February 2015).

⁴⁾ See: Implementation system of the Sectoral Operational Programme Improvement of the Competitiveness of Enterprises, 2004–2006.

institutions⁵⁾. Having developed detailed rules for granting co-financing and after launching the first contests, PARP also designed an appropriate ongoing evaluation system, i.e. "Innovation Barometer"⁶⁾. Its aim was to provide, on an ongoing basis (also as the Programme progressed), the feedback on the outcomes of projects implemented by enterprises and the efficiency of innovation-oriented OP IE Measures in achieving the set goals.

The main objective of the Programme was defined as "Development of the Polish economy on the basis of innovative enterprises." The implementation of measures supporting the enterprises was to contribute to building the knowledge-base by means of enhancing the R&D sector working for the development of the economy and enterprises introducing innovative solutions. The specific objectives of the OP IE include "to improve the innovativeness of enterprises, to increase the role of science in economic development, increase the share of innovative products of the Polish economy in the international market, to create permanent and better workplaces"⁷⁾. The implementing strategy for specific objectives of the Programme focused on investments in R&D and innovations; however, it was implemented in the framework of a broader system of support for the competitiveness of the Polish economy⁸⁾ (by means of improving the innovativeness of enterprises and their environment; an increase in competitiveness of the whole economy was expected).

The operational definition of innovation in the framework of the OP IE was borrowed from the Oslo Manual, where innovation is defined as: "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations"⁹⁾. The OP IE highlighted the crucial role of investments due to which new or significantly improved products are developed. Thus, the focus shifted to product and process innovations. It needs to be underlined that in the mentioned publication (Oslo Manual), the minimum requirement for innovation to occur is the situation where the introduced product, process, marketing method, or organizational method is new to the firm. Thus,

⁵⁾ See http://www.poig.2007-2013.gov.pl/OrganizacjaFunduszyEuropejskich/Documents/wykres_02012014.pdf accessed on 12 March 2015.

⁶⁾ Project "Barometr Innowacyjności – ewaluacja ongoing Działań PO IG skierowanych do przedsiębiorstw" ["The Innovation Barometer – ongoing evaluation of the OP IE Measures addressed to enterprises"] is being implemented by PARP in 2011–2015 on the basis of Computer Assisted Web Interviewing technique. The project covers Programme Measures introduced by PARP which are targeted directly at enterprises (1.4–4.1, 3.3.2, 4.2, 4.4, 5.4.1, 6.1, 8.1 and 8.2). Generally, all beneficiaries of the Programme are invited to participate in the survey twice: during the implementation (the initial measurement after approximately one third of the project implementation period) and 2 years after completion of the project (final measurement in the period of the project's durability). The survey is conducted in six-month cycles on the basis of the adopted sampling scheme. Seven six-month editions of evaluation have been completed so far (from September 2011 to December 2014). 1,861 interviews have been conducted so far in the framework of the final measurement survey and 6,089 in the initial measurement. The survey is carried out by a consortium of companies ARC Rynek i Opinia and Exacto. The methodology was developed by PARP in cooperation with The Gallup Organization Poland Sp. z o.o. and CASE-Doradcy Sp. z o.o. More information about the project can be found on PARP's website www.parp.gov.pl in the section "Research and evaluation/PARP evaluations/Innovation Barometer" (cf. J. Pokorski, *Innowacyjne przedsiębiorstwa Innowacyjnej Gospodarki. Wnioski z Barometru Innowacyjności PARP* [Innovative enterprises of the innovative economy. The conclusions from PARP's Innovation Barometer] in: P. Zadura-Lichota [ed.], *Świt innowacyjnego społeczeństwa. Trendy na najbliższe lata* [Dawn of Innovative Society. Trends for the nearest future], PARP 2013).

⁷⁾ Cf. Operational Programme Innovative Economy 2007–2013, October 2013.

⁸⁾ 2013 Cf. Strategic objective of the national strategic reference framework 2007–2013 – "the creation of the conditions for the growth of competitiveness of knowledge based economy and entrepreneurship which are to assure an increase in the employment and in the level of social, economic and territorial cohesion" (National strategic reference framework 2007–2013 in support of growth and jobs, MRD, Warsaw, 2007)

⁹⁾ Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, OECD&EUROSTAT 2006.

it is not only the solutions that a given company was the first to develop which may be considered innovative, but also those acquired from other companies or entities. The provisions of the OP IE are in line with this statement, because they stipulate that innovation 'is not the objective but relative in its nature, in relation to a given enterprise which, by introducing innovation, becomes, in a given period, an innovative enterprise.' (...) At the same time, the OP IE states that both radical and incremental innovations would be supported. (...) One may think that the authors of OP IE wanted to highlight the intention to support the solutions which are the most innovative on a broader scale (at least national). On the other hand, due to the state of development of Polish innovativeness, the door was left open to the absorption of innovation, namely to the implementation of the imitation strategy¹⁰⁾. It was indicated that it was necessary to improve the innovativeness of enterprises (especially SMEs) "in all its aspects"¹¹⁾.

At the beginning of 2015¹²⁾, which was the last year of incurring expenditure co-financed under the Programme and in the year where at least every fifth co-financed OP IE project implemented by entrepreneurs exceeded half of the durability period of its effects, the first summary of the effectiveness of the granted innovation grants could be formulated. This study focused on the following 3 dimensions of the OP IE's effectiveness: (1) the activity of enterprises in the field of innovation, (2) the state of the innovation-oriented potential of the OP IE beneficiaries, and (3) the economic development of co-financed companies in the long time-horizon concerning the strategic objectives and the expected impact of the support (impact on the competitiveness of enterprises implementing innovation).

The data analysed below refer to the results of the ongoing evaluation of OP IE Measures addressed to enterprises, and implemented by PARP under "the Innovation Barometer" project. The study was conducted from 2011 in the framework of seven consecutive half-yearly editions (measurements) on the population of enterprises using co-financing in the framework of Measures 1.4–4.1, 3.3.2, 4.2, 4.4, 5.4.1, 6.1 8.1 and 8.2 of the OP IE¹³⁾, each edition providing a broader picture, illustrating the results of the granted support. Generally, this chapter presents summary results concerning all the OP IE Measures implemented by PARP that were directly used by the entrepreneurs. However, a special emphasis in this analysis was placed on investment measures (with the dominant implementing investment component)¹⁴⁾ implemented by PARP under axis IV of the OP IE (title of the axis – *Investments in innovative undertakings*):

- Measure 4.4. *New investment of a high innovation potential* which envisages intense support for investments in crucial technological innovations (on a global scale, with a low dispersion in the industry, with a good impact on the environment);
- Measure 4.2 *Stimulating R&D activities of enterprises and support in the area of industrial design* envisages the co-financing of companies' investments in research and development laboratories' infrastructure (including future Research and Development Centres) and in adjusting the manufacturing processes for the needs of introducing innovative design for a product;

¹⁰⁾ Ocena wpływu Programu Operacyjnego Innowacyjna Gospodarka na zwiększenie innowacyjności przedsiębiorstw. Raport końcowy [Assessment of the impact of the Operational Programme Innovative Economy on the increase of innovativeness of enterprises. Final report], the Ministry of Infrastructure and Development 2014, p. 38–39 (<http://www.poig.20072013.gov.pl/AnalizyRaportyPodsumowania/Strony/default.aspx#strona=1&zakladka=2> of 18 February 2015).

¹¹⁾ Operational Programme Innovative Economy 2007–2013, October 2013, p. 35.

¹²⁾ This study was made in the first quarter of 2015.

¹³⁾ Cf. footnote No 6.

¹⁴⁾ Apart from the important investment part (e.g. purchase of fixed assets or intangible assets), the subject of co-financing included specialist consultancy or training services, closely linked to the subject of the investment. However, in the case of Measure 1.4 it was mostly industrial research and development work preceding the implementations financed under Measure 4.1.

- Measure(-s) 1.4–4.1 are in fact a group of two instruments¹⁵⁾: *Support for goal-oriented projects* and *Support for the implementation of the outcome of R&D work* at stage II (4.1.) financing implementation investments concerning innovation being a result of R&D works conducted by companies at stage I (1.4 OP IE or Technology Initiative I).

The scope of possible financing¹⁶⁾, the target group which could benefit from the support (high growth enterprises¹⁷⁾ – SMEs as well as large ones), and common objectives at the priority axis level coincided for the three presented Measures. Moreover, the budget of the above-mentioned instruments constituted the main part of OP IE resources, which PARP had for innovative enterprises in the 2007–2013 perspective. The total budget of the above Measures under axis IV of the OP IE accounted for 61% of total allocations of the OP IE Measures entrusted for implementation to PARP (including also the budget of system and pilot projects, support for the construction of the infrastructure of science and technology parks, development of innovative clusters or other innovation centres). However, compared with the total budget of the Programme Measures addressed directly at enterprises (in the framework of contests organized by PARP under Measures 1.4–4.1, 3.3.2, 4.2, 4.4, 5.4.1, 6.1 8.1 and 8.2) – the budget of “fours” (Measures 1.4–4.1, 4.2 and 4.4) accounted for more than 3/4 of these resources (almost PLN 11 billion).

Activity in the area of innovation

In order to formulate conclusions concerning the development of activity in the area of innovation of enterprises benefitting from the OP IE co-financing, their activity in the area of innovation from two periods, i.e. before and after receiving the co-financing, was compared. Among the entities which used innovation grants¹⁸⁾, the increase in the number of innovators was the highest in the area of business processes (companies introducing process innovations), while participation in the OP IE was less conducive to the initiation of activity in the area of innovation in enterprises in terms of products (introducing innovative products or services). It was mostly because three fifths of companies that joined the Programme earlier (within 3 years prior to submission of application for co-financing) introduced product innovations. The activity in the area of process innovation (i.e. introducing new or significantly improved manufacturing methods, logistics, or methods supporting the remaining processes within the enterprise) was recorded in a significantly smaller number of beneficiaries before receiving the co-financing (51%). Therefore, opportunities for increasing the number of new innovative entities were, to a greater extent, connected with the area of process rather than product innovations. This conclusion also corresponds with the findings from other studies on the OP IE’s impact on innovativeness conducted in Poland – most companies which joined the Programme were innovative (in different dimensions), and the Programme contributed mainly to increasing the intensity and quality of innovation processes in the supported enterprises¹⁹⁾.

¹⁵⁾ The beneficiaries received support for R&D works and implementation of their results in the framework of one project – cf. Detailed description of the priorities of Operational Programme Innovative Economy, 2007–2013, version from 11 September 2014, p. 89).

¹⁶⁾ Based mostly on the General Block Exemption Regulation, i.e. Commission Regulation (EC) No 800/2008 of 6 August 2008 declaring certain categories of aid compatible with the common market in application of Articles 87 and 88 of the Treaty (OJ L 214, 9.8.2008, as amended).

¹⁷⁾ Unlike the support under Priority III of the OP IE which is directed to enterprises at initial development stages.

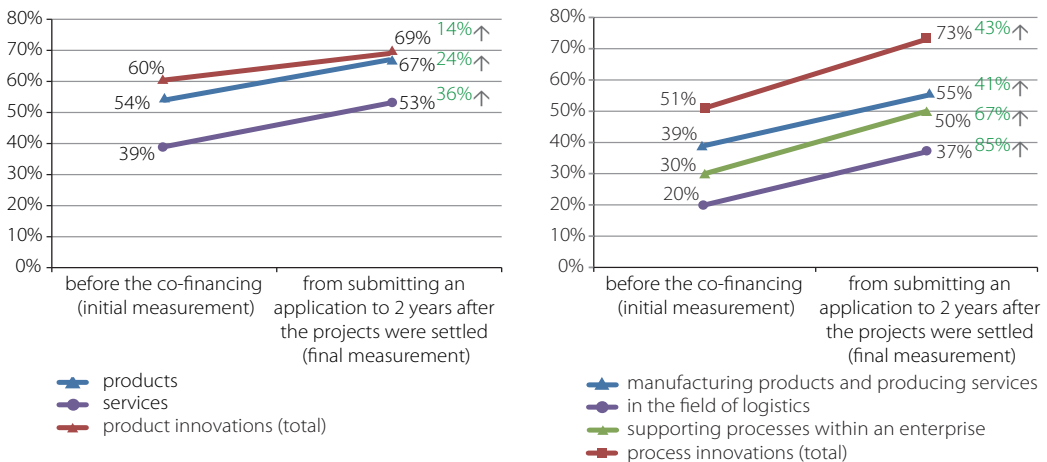
¹⁸⁾ Refers to Measures 1.4–4.1, 4.2, 4.4, 5.4.1, 6.1 and 8.2.

¹⁹⁾ Cf. “Assessment of the impact of the Operational Programme Innovative Economy on the increase of innovativeness of enterprises” report, Ministry of Infrastructure and Development, 2014.

In the case of process innovations, 2 years after the projects were settled, (compared with the pre-financing period) the number of companies introducing this type of innovations had increased by 43 p.p. from 51% of all beneficiaries introducing process innovations before receiving the co-financing to 73% after receiving the co-financing. In the analysed period, the highest increase in the number of innovative companies was recorded with regard to introducing new or significantly improved logistics methods (an increase of 85 p.p. from 20% before to 37% after receiving the co-financing). A slightly smaller growth was recorded in terms of innovations (systems) supporting other processes within an enterprise (by 67 p.p. from 30% to 50%) and innovations in manufacturing processes of products and services (before the co-financing, this type of process innovations was introduced by the highest proportion of the OP IE beneficiaries, i.e. 39%, and the increase recorded after the co-financing was granted amounted to 41 p.p., to 55%).

According to the entrepreneurs who declared conducting activity in the area of innovation in terms of processes, before the co-financing was granted, they were less often new or significantly improved processes for the market where an enterprise operates (43% of companies introduced process innovations on the scale of a market in which they operated before the OP IE) than after the co-financing (54%). The recorded increase in the number of companies introducing process innovations, which are new to the market on which they operate in that period, amounted to 26 percentage points.

Fig. 1. OP IE beneficiaries implementing product and process innovations



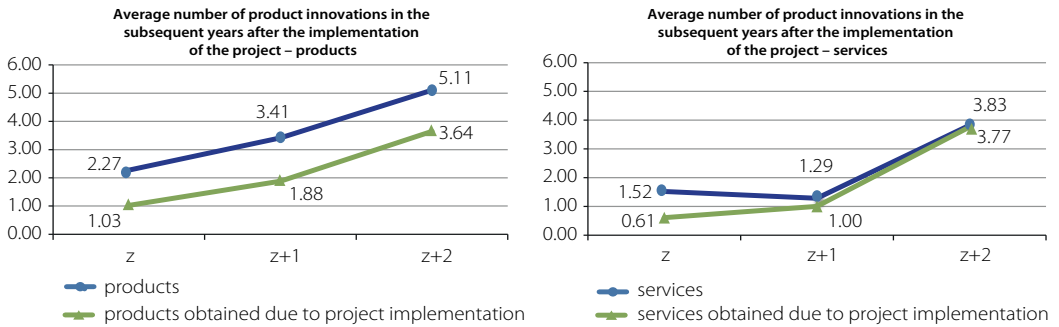
Source: THE INNOVATION BAROMETER – ongoing evaluation of the OP IE Measures addressed to enterprises (outcomes of the final measurement following 7 editions of the survey, 2011–2014; the presented data concern Measures 1.4–4.1, 4.2, 4.4, 5.4.1, 6.1 and 8.2 of the OPIE, n = 1347).

When it comes to the number of companies introducing new or significantly improved products (product innovations), as mentioned before, the increase in the analysed period was significantly lower than for process innovations and amounted to 15 p.p. (from 60% before the financing to 69% after). At the same time, the increase in the number of innovative enterprises was higher in terms of services (36 p.p.) than products (24 p.p.), which was also connected with a higher “critical mass upon joining the Programme” in the case of companies introducing innovations in the area of products (54%) than services (39%). To sum up, the increase in the number of companies introducing product innovations after the co-financing was granted was to a greater extent due to the group of companies

introducing new or significantly improved services rather than innovative products, among others, due to the fact that the proportion of entities which introduced innovative products was high both before and after their participation in the Programme.

The above findings largely correspond with the data on the number of introduced innovations in the subsequent years after completion of the OP IE project. The number of new services introduced due to the implementation of the project and the dynamics of their growth in the following years fully reflect these values for innovative services in general (cf. figure below).

Fig. 2. The average number of introduced product innovations (in the post-financing period)



Source: THE INNOVATION BAROMETER – ongoing evaluation of the OP IE Measures addressed to enterprises (outcomes of the final measurement following 7 editions of the survey, 2011–2014; the presented data concern Measures 1.4–4.1, 4.2, 4.4, 5.4.1 and 8.2 of the OP IE, n = 775).

The highest increase was noted in the second year after the project was settled (from the level of approx. one innovative service introduced to a company in the previous year to almost four innovations of this type). According to the information from beneficiaries, the effects in the innovative services area in that period were almost (77–98%), due to the implementation of the project. This was not the case when it comes to innovative products obtained due to the implementation of the project, where their share in the total number of innovative products introduced during this period by companies was relatively lower and stable (55%–71%, cf. Fig. above). The recorded increase in the number of innovations introduced due to the OP IE in the second year after the project had been settled was less than 2 (from the level of 1.88 in the previous year to 3.64).

On the other hand, no increase was noted in the number of process innovations introduced by companies in the period of two years after the projects were settled, being at the stable level of 0.25–0.5 per year in the case of processes that were modified due to project implementation and 0.70–0.78 of process innovations in total.

Following their participation in the Programme, the entities that introduced new or significantly improved products (product innovations) more often (71%) declared that they were innovations for the market in which an enterprise operates rather than only at the company level (59%). It should be noted that, in the analysed period (before and after the co-financing), the share of companies introducing innovations at the enterprise level changed slightly (an increase of only 5 p.p. from the level of 56% before to 59% after the co-financing), while the proportion of entities declaring the introduction of innovations at the market level increased significantly (an increase of 29 p.p., from 55% before the participation in the Programme up to the level of 71% after the co-financing).

“Soft” innovations in marketing and organization of enterprises could also be introduced under the Programme as supplementary solutions to the leading “hard” product and process innovations. During the period of project implementation and within two years after their completion, 3/4 of beneficiaries introduced organizational innovations and 2/3 of entities introduced marketing innovations. Companies introducing organizational innovations most often changed their adopted operating procedures (business models) – 57%, and their relationships with the environment – 55%. Slightly less often (49%), organizational innovations concerned the division of tasks and decision-making powers between the employees. On the other hand, marketing innovations involved new product distribution methods (43%), new media or product promotion techniques (41%), significant changes concerning production, construction or packaging (31%), and new price-shaping methods for products and services (29%).

According to more than 1/3 of beneficiaries, marketing innovations introduced in companies in the analysed period were a direct effect of the implementation of the co-financed project. The proportion of beneficiaries combining the effects of project implementation with the introduced organizational innovations was even higher (49%).

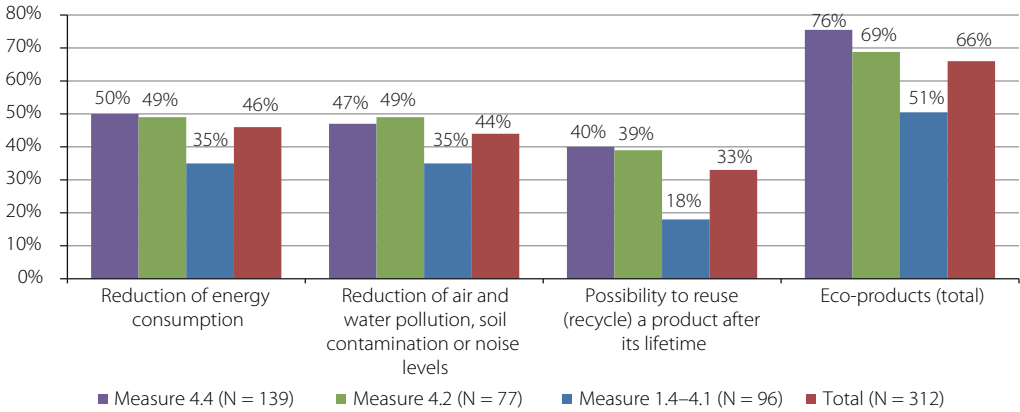
The main objectives of introduced organizational innovations were to improve product quality (29%), to improve the capability to develop new products or processes (15%), to improve communication or access to information within an enterprise (or in a relationship with another enterprise or other institutions) (14%), to reduce costs per product unit (13%), and to shorten the time needed for response to customers’ or suppliers’ needs (12%). The first 3 objectives were most common among the beneficiaries of Measures 1.4–4.1 (indicated by 33%, 18%, and 22% of the beneficiaries of this Measure, respectively).

On the other hand, the most often indicated objectives of the introduced marketing innovations were to increase or maintain market share (35%), to increase the company’s prestige, to build a brand (30%), to introduce products for a new group of customers (30%) and to a new geographical market (20%). In all cases, in the group of Measures (1.4–4.1, 4.2 and 4.4 of the OP IE) analysed in that respect, the most visible definitely were the indications of the beneficiaries of Measure 4.2 (65%, 62%, 60% and 47%, respectively), whose subject of co-financing – in the area of industrial design and development of R&D potential for newly-created products – had a direct impact on the marketing innovativeness of enterprises.

Apart from classical types of innovation, in the area of investment activities (1.4–4.1, 4.2, and 4.4), “The Innovation Barometer” also evaluated the impact of the implemented undertakings on the natural environment, asking the beneficiaries about the introduced eco-innovations (eco-products and environmental technologies). According to 66% of the surveyed entrepreneurs, their company introduced innovation in the form of environmentally beneficial eco-products as a result of the implementation of the project (gathered in the lifetime of the purchased product or period of utilization of a service by end users). For 46% beneficiaries, the specificities of the introduced eco-products involved a reduced energy consumption, 44% – a reduction of air and water pollution, soil contamination or noise levels, and 33% – the possibility to reuse (recycle) a product after its lifetime.

Eco-products were implemented to the greatest extent (i.e. above the proportion for all respondents mentioned above) as a result of implementation of Measures 4.4 and 4.2 (their introduction was indicated by 76% and 69% of beneficiaries, respectively) and to a lesser extent – in the case of research and development works and implementation undertaken in the framework of Measures 1.4–4.1 of the OP IE (51%).

Fig. 3. Beneficiaries introducing eco-products



Source: THE INNOVATION BAROMETER – ongoing evaluation of the OP IE Measures addressed to enterprises (outcomes of the final measurement following 7 editions of the survey, 2011–2014; the presented data concern Measures 1.4–4.1, 4.2 and 4.4 of the OP IE, n = 312).

On the other hand, environmental technologies (i.e. environmentally beneficial technological innovations obtained in the course of product manufacturing) introduced due to project implementation concerned an even greater number (78%) of the beneficiaries of Measures 1.4–4.1, 4.2, and 4.4 of the OP IE than in the case of eco-products. Environmental technologies occurred in the vast majority of projects under Measure 4.4 (93%), and in almost four out of five (79%) projects under Measure 4.2. As in the case of eco-products, beneficiaries of Measures 1.4–4.1 introduced environmental technologies visibly less often (54%). The introduced environmentally beneficial technological innovations most often involved a reduction of energy intensity per product unit (58%), a reduction of material intensity per product unit (56%), and a reduction of air and water pollution or soil contamination or noise levels (52%). Slightly less often environmental technologies involved the use of materials which were less pollutant or dangerous to the environment (41%) and the reduction of carbon dioxide emissions per enterprise (33%). Distribution of the above-mentioned types of environmental technology introduced by individual beneficiaries of Measures under axis IV of the OP IE reflected the overall results. Generally, entities co-financed under Measures 4.4 and 4.2 were leading in terms of every type of environmental technologies (the share of projects introducing such technology was almost equal for both Measures only in terms of the reduction of material intensity per product unit), and there was a significantly smaller share of beneficiaries of Measures 1.4–4.1 in this area.

The main reasons for companies to introduce environmentally beneficial innovations were current or expected demand from customers for environmentally beneficial innovations (65%) and environmental regulations already in force (or environmental pollution taxes) (55%). However, voluntary codes or agreements of the industry concerning good environmental practice (36%), environmental regulations (or environmental pollution taxes, the introduction of which beneficiaries are expecting in the future) (35%), and the availability of government grants, subsidies or other financial incentives to introduce environmentally beneficial innovations (31%) were less meaningful.

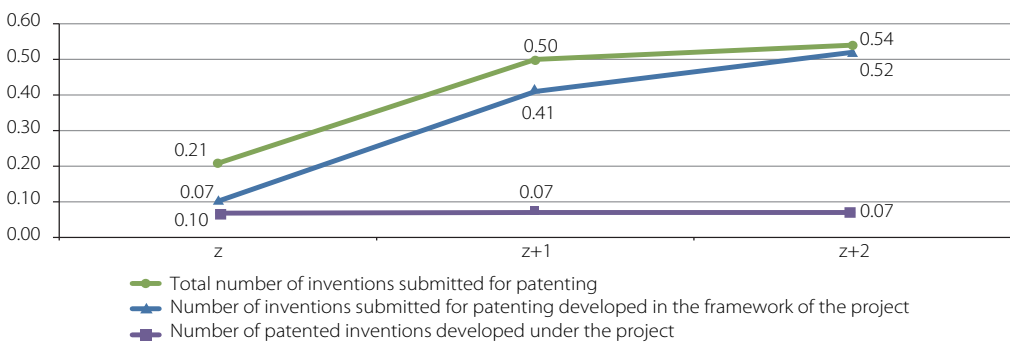
It should be noted that, despite the increasing trends in the number of introduced product innovations and a relatively stable level of the number of process innovations introduced in the subsequent years following completion of the projects, the increase in the expenditure per activity

in the area of innovation in beneficiaries' companies visibly halted at the same time (for beneficiaries of investment Measures – 1.4–4.1, 4.2 and 4.4. of the OP IE). Even though two years after the projects were settled, the value of that expenditure is 62 p.p. higher than in the year when the projects were settled, and the dynamics of the year-over-year indicator amounted to only 14%, while in the previous years of their implementation, it was 73%, 34%, and 46%, respectively. It can be assumed that, without maintaining the growing trend of the indicator for the dynamics of expenditure on activity in the area of innovation, the number of introduced innovations in the subsequent years might experience a halt too (especially in the area of new products or processes).

It should be noted that in the case of beneficiaries of Measures 1.4–4.1, 4.2 and 4.4, the expenditure on innovative activity amounts to almost 1/3 of the value of overall product sales revenue, which shows that these companies strongly focused on investing in innovations (in the first and second year following the projects' completion, the share increased by additional percentage points from the level of 25% in the year the co-financing was settled). Therefore, further development of innovativeness in this group of beneficiaries does not seem to be at risk. A relatively high share of fixed assets expenditure (such investments were between 11% and 17% of the share of revenues in the years directly following completion of the project) and relatively high internal expenditure on research and development (5–7% of annual revenues) will surely be in favour of that development.

The observed increase in innovative activity in the period following the participation in the Programme goes hand in hand with activity in the area of the protection of industrial property of the beneficiaries implementing innovative projects under Measures 1.4–4.1, 4.2, and 4.4 of the OP IE. Here, a visible upward trend can also be noticed over the two years from settling the projects. Among the beneficiaries of the analysed Measures under priority axis IV of the OP IE, the average number of inventions submitted for patenting in total increased from 0.21 (average per company) in the year the project was settled to 0.50 in the first year following the settlement of the project and was increasing in the following year (to 0.54). The increase of the overall patent application indicator coincided with the results of the OP IE in this area. According to beneficiaries' declarations, the vast majority of inventions submitted for patenting (especially in the first and second year after the project was settled) had been developed in the framework of the project.

Fig. 4. Average number of patent applications and patents (per company) in the subsequent years after the year the projects were settled (z)



Source: THE INNOVATION BAROMETER – ongoing evaluation of the OP IE Measures addressed to enterprises (outcomes of the final measurement following 7 editions of the survey, 2011–2014; the presented data concern Measures 1.4–4.1, 4.2, 4.4 and 5.4.1 of the OP IE, n = 313).

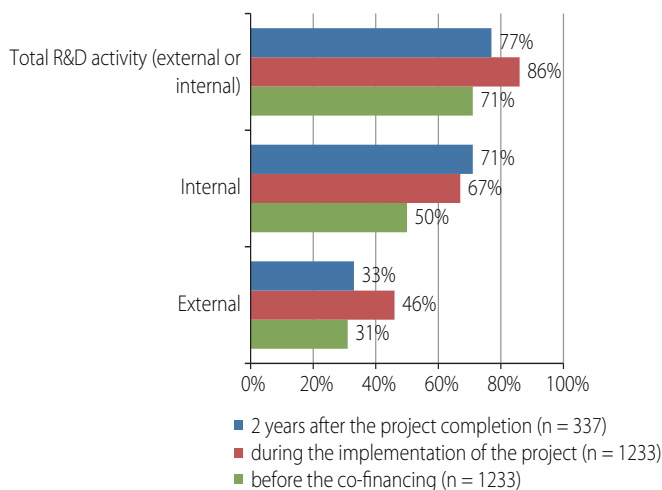
It seems that not enough time has passed since the completion of projects and the submission of beneficiaries' first patent applications to be able to clearly state the results of the OP IE projects (or lack of them) in the form of granted patents for inventions developed due to the co-financing. In the period directly following completion of project, the level of this indicator has been stable and relatively low (on average 0.07 patents per company).

In the period following the implementation of projects, a slightly smaller growth dynamics was noted for indicators concerning industrial design. Just as for patent applications, the highest increase (double) in terms of industrial design concerned the first year after the completion of the projects (from the level of 0.11 – on average per company – to the level of 0.22, and in the following year – to the level of 0.29). Progress concerning the number of industrial designs in the same period was visibly smaller; however, its values were generally higher (from 0.38 in the year the projects were settled to 0.43 and 0.44 in the two years following the participation in the OP IE).

Building potential for future innovations

An important factor strengthening the innovation-oriented attitude of the enterprises that have contributed from the Programme support is their potential in the area of research and development. Development of this potential in the framework of PARP's "Innovation Barometer" was observed especially in beneficiaries of Measures 1.4–4.1, 4.2, 4.4, and 5.4.1 of the OP IE. Two years after completion of projects (compared with the pre-financing period), the number of companies conducting research and development activity increased by 6 percentage points. At the time of the survey, 77% of the beneficiaries of Measures 1.4–4.1, 4.2, 4.4, 5.4.1 conducted R&D activity (internal or external), while 71% of these entities had conducted this activity prior to their participation in the Programme. A visible increase in this indicator was noted mostly in the project implementation period – 86% of beneficiaries of the analysed Measures declared conducting R&D activity at that time.

Fig. 5. R&D activity of beneficiaries

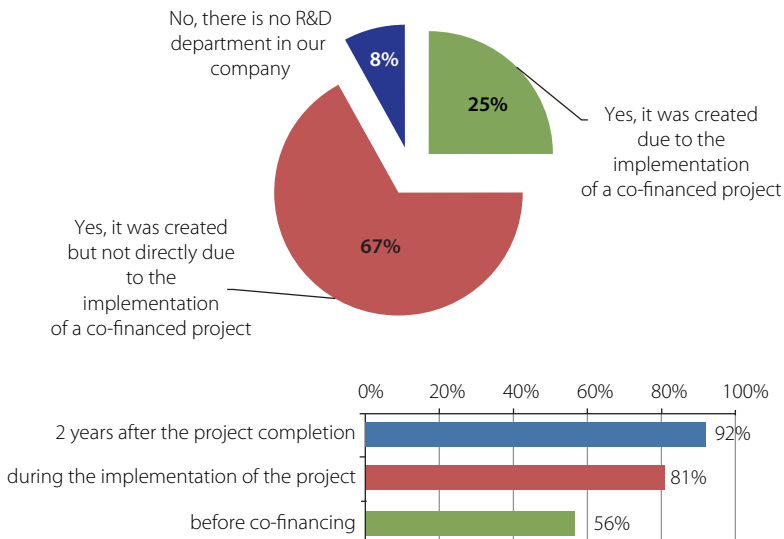


Source: THE INNOVATION BAROMETER – ongoing evaluation of the OP IE Measures addressed to enterprises (outcomes of the final measurement following 7 editions of the survey, 2011–2014; the presented data concern Measures 1.4–4.1, 4.2, 4.4 and 5.4.1 of the OP IE, n = 337).

The highest increase (by 21 p.p.) was noted in the area of internal R&D activity of enterprises. Half of the beneficiaries had conducted internal research and development works before using the OP IE support, their share increased to 67% in the period of the project implementation, and it reached the level of 92% two years following its implementation.

In the analysed period, a slight increase was also noted in terms of external research and development activity (2 p.p.). However, the period of project implementation was the peak in this case (almost half of co-financed companies contracted R&D works in that period, while approximately 1/3 did it before and after the co-financing). The lack of increase in the number of entities contracting R&D works following completion of the project is partly because the internal research and development potential of those enterprises strengthened as a result of the OP IE project implementation. Before the co-financing was granted, only 56% of the beneficiaries of Measures 1.4–4.1, 4.2, 4.4, and 5.4.1 of the OP IE conducting internal R&D activity had their own research and developments department or laboratories conducting R&D works²⁰. During the implementation of the project and within two years after its completion, the proportion increased by 36 p.p. to the level of 92%. Two years after completion of the project, only 8% of beneficiaries of the analysed OP IE Measures declared that their companies did not have an appropriate R&D department. However, 1/4 of the remaining companies stated that their R&D department was created directly in connection with the co-finances project implementation.

Fig. 6. R&D department in beneficiaries' companies



Source: THE INNOVATION BAROMETER – ongoing evaluation of the OP IE Measures addressed to enterprises (outcomes of the final measurement following 7 editions of the survey, 2011–2014; the presented data concern Measures 1.4–4.1, 4.2, 4.4 and 5.4.1 of the OP IE, n = 337).

The creation and maintenance of R&D departments even two years after the projects had been settlement should undoubtedly be considered a result confirming the innovation-oriented direction of the development of co-financed companies taken in the OP IE. Another indicator pointing to this

²⁰ A separate organizational unit within a company whose employees deal with research and development activity.

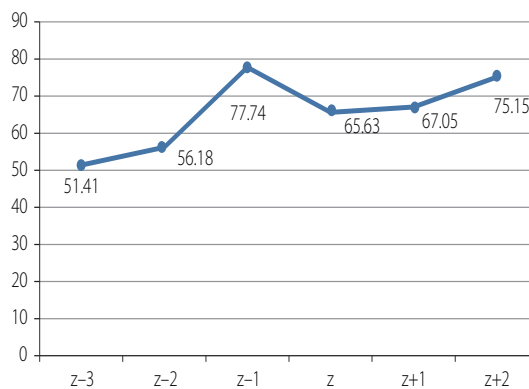
is the level of employment in beneficiaries' R&D departments. While less than 6 persons worked there at the time of submission of the co-financing application, the level of employment increased to 11 (growth by 85%) two years after the project was settled. It should also be underlined that the highest increase in this case was not noted during project implementation (from 5.96 to 6.79) but within the two years following the termination of participation in the Programme (from 6.79 to 11.00). Thus, it is another outcome for enterprises benefitting from the support under the Programme that shows a significant growth of the potential for future innovation.

Competitiveness of innovative entities

The companies that received OP IE innovation grants have not only increased their innovative activity and potential for future innovation, but most of all have permanently strengthened their competitive position, according to the results of evaluation studies of "the Innovation Barometer." This is indicated by the outcomes of the most important economic parameters observed over the period of two years directly following the termination of participation in the Programme. Given the long-term impacts of the intervention, the financial and employment results look the most promising in this regard.

Two years after the projects were settled, the level of employment in beneficiaries' companies increased by 14 p.p. (compared with the level in the year of completion of the project). Despite the fact that the highest average level of employment was noted by companies in the period of project implementation (77.74 jobs in the year preceding completion of projects), two years after the participation in the Programme, the level of employment was 75.15 jobs, which was, on average, 25 jobs more than 5 years before. In the group of enterprises surveyed two years after the completion of the project, the highest growth in employment was in 2013, which, apart from the impact of the effects of intervention, also coincides with the economic recovery observed in the private sectors since 2012. The average growth in the second year after completion of the project was 12% (on average 8 jobs more per company), visibly making up for the 9% decrease in the years the project was completed and for the employment stagnation in the first years after the termination of participation in the Programme (cf. Fig. below).

Fig. 7. Average employment in beneficiaries' companies (compared with the year of completion – z)



Source: THE INNOVATION BAROMETER – ongoing evaluation of the OP IE Measures addressed to enterprises (outcomes of the final measurement following 7 editions of the survey, 2011–2014; the presented data concern Measures 1.4–4.1, 3.3.2, 4.2, 4.4, 5.4.1, 6.1, 8.1 and 8.2 of the OP IE, n = 1861).

Over the two years following the settlement of projects, Measure 4.4 noted the highest employment growth in the group of Measures under axis IV of the OP IE (24 p.p.). For the remaining Measures (4.2 and 1.4–4.1), employment growth in beneficiaries' enterprises was between 10–12 p.p. in the analysed period. In the group of OP IE Measures addressed to enterprises implemented by PARP, Measure 4.4 had the highest share in generating the employment effect. Given that 1/3 of entities co-financed under Measure 4.4 were large and over 40% were medium-sized enterprises, the increase of 20% over two years following the completion of projects in practice meant the creation of almost 12 thousand new jobs by the beneficiaries of Measure 4.4. (on average, 54 jobs per company more, only in the second year following the termination of participation in the Programme). It accounts for approximately one third of all jobs created in that period in the group of the analysed OP IE Measures (1.4–4.1, 3.3.2, 4.2, 5.4.1, 6.1, 8.1, and 8.2) (cf. below – 36,000 new jobs in total).

Analysing the cumulated employment value of PARP beneficiaries (FTE) in the case of which two years passed since their participation in the OP IE, a total of almost 36 thousand new jobs appeared in these companies since the year the co-financing was settled²¹⁾. In the second year after completion of projects, the share of employed women in the total of persons employed increased to 33% from 22%–27% before the co-financing and during project implementation. According to the beneficiaries, the implementation of a co-financed project had a direct impact on the level of employment. According to 44% of entrepreneurs surveyed two years after their participation in the Programme, the level of employment would have been lower if it had not been for the project.

According to beneficiaries' declarations, the average number of jobs created due to the implementation of the OP IE project was 6.86 jobs per company. Apart from that, 1.7 new jobs were created in the research and development department due to the implementation of the OP IE project in the case of Measures 1.4–4.1, 4.2, and 4.4. The beneficiaries are planning to keep all the jobs created as a result of the co-financing in the period of the project's durability and even after its expiry.

The growing average level of employment (FTE) in beneficiaries' companies is a tendency that is contrary to the observed decrease in the number of persons employed based on a civil contract. While the highest average number of persons signing at least 1 civil contract with the beneficiaries was in the year the project was settled (more than 22 persons per company). In the second year after the project was settled, the indicator for this form of employment of co-workers was 17.4 (a decrease of 22%). One of the interpretations of the decreasing values of the employment indicator in terms of civil contracts and a simultaneous increase in the number of employment contracts is that they point to a better economic condition of companies, a higher potential for further growth, and stabilization two years after participating in the Programme. The development of internal R&D activity increase in the number of introduced innovations and the level of capital expenditure observed at the same time also point to this.

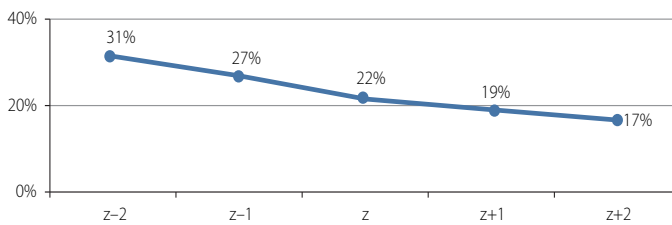
When it comes to financial results, their analysis seems to be much more complex and varied in different OP IE Measures. Overall, it is slightly less optimistic than the results for employment. Compared with the year of project completion, net revenue from the sales of products, goods, and materials in beneficiaries' companies increased by 39 p.p. over the period of two years after the projects were settled. The highest average increase was recorded by the beneficiaries of Measure 8.1 (119%)

²¹⁾ Value estimated based on Computer Assisted Web Interviewing under "the Innovation Barometer" conducted in 2011–2014. It covered companies 2 years after completion of projects (RR = 49%, n = 1861 following 7 editions of the survey).

developing their businesses based on newly created internet services. For investment activities (1.4–4.1, 4.2, and 4.4 of the OP IE), whose beneficiaries represented mostly the industrial sectors and much larger enterprises, the increase was between 10% and 20%.

The analysis of the dynamics of the total revenue indicator shows a visible halt in the year-on-year increase. However, the decline of the growth dynamics seems to be independent of the OP IE project implementation. It is because it is present in the entire analysed period – from two years before to two years after the project completion. The recorded increase was lower with each year, amounting to 31%, 27%, and 22% in the year the project was settled and 19% and 17% in the two subsequent years following the project completion²²⁾.

Fig. 8. Year-on-year dynamics of revenue from sales in beneficiaries' companies (compared with the year of completion – z)



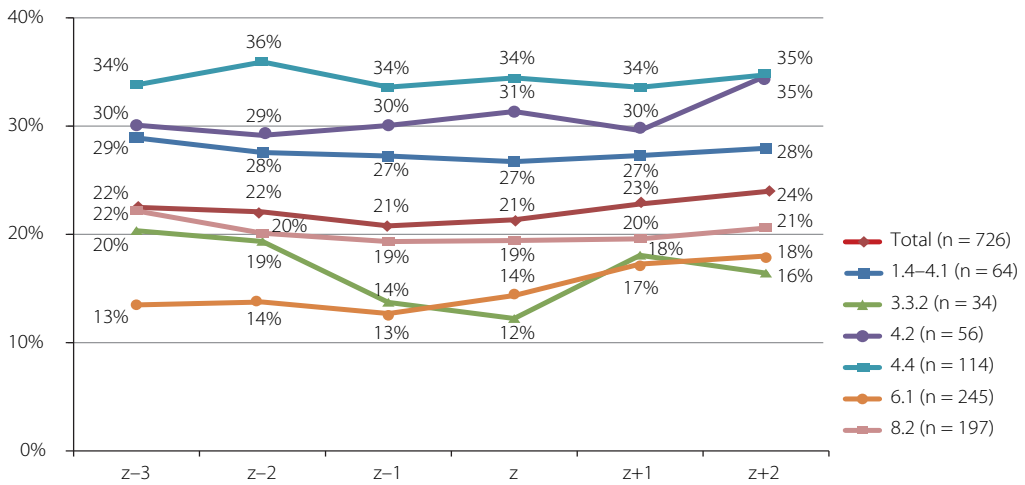
Source: THE INNOVATION BAROMETER – ongoing evaluation of the OP IE Measures addressed to enterprises (outcomes of the final measurement following 7 editions of the survey, 2011–2014; the presented data concern Measures 1.4–4.1, 3.3.2, 4.2, 4.4, 5.4.1, 6.1, and 8.2 of the OP IE, n = 1347).

The indicator for the share of revenue from sales of products, goods, and materials for export (including sales to EU countries) in total revenue in the project implementation period and two years after their completion is characterised by a relatively high stability. For the total of beneficiaries of the analysed Measures (1.4–4.1, 4.2, 4.4, 3.3.2, 6.1, 8.1, and 8.2), its average value was 11%; however, taking into account only the companies which conduct export activity (excluding those entities for which the value of export revenue was PLN 0) in the entire analysed period, its average value falls in the range 21%–24%. At the same time, it needs to be underlined that the highest share of export revenue in total revenue was noted in the second year after the completion of projects (increase by 3 p.p. from the year the participation in the Programme was terminated).

It also needs to be highlighted that the indicator of the share of export in revenue exceeds the average (compared with the indicator for exporting beneficiaries in total) for enterprises which have benefitted from investment support under Measures 1.4–4.1 (27%–29%), 4.2 (29%–35%), and 4.4 (34%–36%). On the other hand, the highest increase in the share of export in revenue in the period of two years after completion of the project was noted for the beneficiaries of Measure 4.2 (an increase of 4 p.p. from 31% to 35%) and the beneficiaries of Measure 6.1 – the instrument geared directly to promote export from enterprises (an increase of 4 p.p. from 14% to 18%).

²²⁾ The mentioned values of the revenue dynamics do not cover Measure 8.1 used by ICT start-ups, which were characterised by a completely different dynamics of economic growth indicators at the initial development phase. Nevertheless, even taking these entities into account, the general trend remains the same (a decline of the growth dynamics of the revenue indicator in the entire analysed period by approx. 10 p.p.).

Fig. 9. Share of revenue from export sales in total revenue in beneficiaries' companies (compared with the year of completion – z)



Source: THE INNOVATION BAROMETER – ongoing evaluation of the OP IE Measures addressed to enterprises (outcomes of the final measurement following 7 editions of the survey, 2011–2014; the presented data concern Measures 1.4–4.1, 3.3.2, 4.2, 4.4, 5.4.1, 6.1, 8.1 and 8.2 of the OP IE, only companies conducting export sales were taken into account, n = 734).

According to the entrepreneurs' declarations, the implementation of the co-financed project had a direct impact on the level of total annual net revenue from sales of products, goods, and materials, and from export sales. According to more than half of beneficiaries (52%), total revenue from sales in a company would be lower than it is now (2 years after participation on the Programme), if it had not been for the project. Almost a quarter (23%) of beneficiaries claimed that the level of annual revenue from export sales would be lower without the project. Interestingly, for both indicators, between the project implementation period and the final measurement (2 years later), an increase in beneficiaries' opinions indicating the positive influence of the Programme was noted. Compared with the project implementation period, more respondents identified the effects of the Programme in this regard two years after participating in the Programme – 10 p.p. for total revenue from sales and 3 p.p. for revenue from export sales. This is confirmed by a strong feeling among this group of beneficiaries regarding the impact of co-financing on the current financial condition of their companies.

Conclusion

There is no doubt that the OP IE support received by enterprises was a strong impulse for development on the path leading to further innovations. It also had a visible impact on the economic condition of enterprises, expressed in the observed upward trends in employment or revenue in the long term. On the basis of the available data, it is difficult to clearly state to what extent the development of the OP IE beneficiaries had a wider impact on the innovativeness and competitiveness of the Polish economy (e.g. internationalisation of the enterprise sector based on the export of innovative products or growth of competitiveness of Polish science and its strong focus on providing the economy with

the needed know-how). However, it can definitely be stated that innovation capacity in the form of research and development facilities and behavioural additionality, thanks to OP IE, will pay off in the future (and influence further areas) in the form of new, ground-breaking projects of high importance for the economy. This type of project can be implemented in cooperation with specialized innovation centres, as well as with the research sector units, which have boosted their professionalization and broadened the range of their innovation-oriented services (research, counselling, financial, training, or widely understood technical support) as a result of support under OP IE. Future development will probably bridge the gap in national innovation capacity to a lesser extent and will mostly focus on already visible Polish advantages and specializations on the global scale (smart specialisation strategy)²³⁾. This will be supported by the new Operational Programme for 2014–2020 “Smart Growth,” financing scientific research, the development of new innovative technologies, and activities to improve the competitiveness of small and medium-sized enterprises²⁴⁾. The innovation-oriented direction for the economic development of Poland, set forth at the stage of OP IE programming, will retain its strategic character at least until 2020.

²³⁾ Cf. Krajowa Inteligentna Specjalizacja w ramach Programu Rozwoju Przedsiębiorstw [National Smart Specialisation under the Enterprise Development Programme], adopted by the Council of Ministers on 8 April 2014 (<http://www.mg.gov.pl/Wspieranie+przedsiębiorczosci/Polityki+przedsiębiorczosci+i+innowacyjnosci/Krajowe+inteligentne+specjalizacje> of 18 February 2015).

²⁴⁾ The main objective of the Programme is to stimulate the innovativeness of the Polish economy by increasing private R&D expenditure and creating the demand of enterprises for innovations and research and development works (cf. Operational Programme Smart Growth 2014-2020 [version approved by the European Commission] in force since 21 January 2015).

Part II

New areas of innovation – observations and uncertainties

Chapter 5

BLANK SPOTS ON THE MAP – THE HIDDEN POTENTIAL OF INNOVATION

The terms “development drift” and “middle income trap” have permanently entered the vocabulary of the Polish development debate. The debate became particularly fierce after the publication of two strategic documents in 2009. The first of them is the summary of the National Programme Foresight “Poland 2020”¹⁾. The second is a report “Poland 2030 – Development Challenges”²⁾ drawn up by the Board of Strategic Advisers to the Prime Minister of Poland chaired by Michał Boni.

Even though these studies were prepared with the use of different methodologies, they clearly stated that the period of socio–economic transformation was over and that Poland needed a new development model to avoid technological gap and development drift. One of the ways to avoid these unfavourable phenomena is to improve the innovativeness of the economy. However, this objective cannot be achieved by focusing only on the modernization of the National Innovation System. Measures such as increased research and development expenditure, institutional reforms facilitating the transfer of knowledge from academic circles to the economy, and providing incentives for business to invest in scientific research are necessary; however, these measures are insufficient for improving the situation.

Beginning of the development drift

The conclusions from the two reports were confirmed two years later by subsequent studies, whose authors could take into account the financial crisis that started in 2008 and the growing crisis in the euro area, as well as its implications for Poland, in their analyses. The report “Heading for innovation”³⁾ states the following: We are at the stage of development drift at the time when a longstanding crisis of unknown nature and unpredictable consequences is spreading in the world. We protect ourselves against its consequences relatively effectively, but almost exclusively with the use of measures relating to the business cycle dimension of the functioning of the economy, neglecting structural measures. As a result, we have significantly increased the budget deficit and state debt to the level that must be considered dangerous. What protected us on a short-term basis will be harmful in the medium-term perspective, especially if the global economic recovery and the world crisis are not overcome. Which does not seem to be the case in the future. On the contrary, we may expect a longer period of global economic stagnation.

¹⁾ M. Kleiber, E. Bendyk, J. Kuciński, *Wyniki Narodowego Programu Foresight Polska 2020* [Results of the National Programme Foresight “Poland 2020”], Ministry of Science and Higher Education, Warsaw, 2009.

²⁾ M. Boni (ed.), *Polska 2030: wyzwania rozwojowe* [Poland 2030 – Development Challenges], Chancellery of the Prime Minister, Board of Strategic Advisers to the Prime Minister of Poland, Warsaw 2009.

³⁾ J. Hausner (ed.), *Kurs na innowacje: jak wyprowadzić Polskę z rozwojowego dryfu?* [Heading for innovation. How to lead Poland out of a development drift?], Foundation of Economy and Public Administration, Kraków, 2011.

The expected persistence of the global economic slowdown is a symptom of the crisis of the system and not only a crisis in the system resulting from factors connected to the economic situation⁴⁾. Consequently, conventional crisis management instruments turn out to be ineffective. This thesis is confirmed in foreign publications. The most radical authors state that the 1970s already ended the age of “easy growth” in developed economies⁵⁾. Despite the conviction of the “roaring 90s,” when, following the disintegration of the system of genuine socialism, the world simultaneously entered the phase of accelerated globalization and digital revolution related to the emergence of the Internet and mobile telecommunications, it is difficult to talk about real development. The 2008 downturn marks the erosion process that has been continuing for years. According to Galbraith, the solution to the current crisis is neither “belttightening” nor stimulating with the use of quantitative easing.

The lost dynamism

Edmund Phelps, the winner of the Nobel Prize in Economics, expresses a similar opinion in his book “Mass Flourishing”⁶⁾. He demonstrates that the economies of developed countries have lost their dynamism, which needs to be separated from the ability to create growth. Economies on the brisk growth path do not have to be dynamic. Dynamism means the ability to develop based on the creation of new solutions: products and services creating new markets. Thus, dynamism means entrepreneurship and innovativeness, which, in turn, draw their strength from the values and institutions rooted in the society. Fast growing “catching up” economies are usually not dynamic, because their growth is based on using easily accessible resources of relatively cheap labour force and on imitative filling of the technological gap. This strategy enables to shorten the distance from better-developed societies in the framework of convergence process⁷⁾; however, there is a limitation – the smaller the distance, the slower the pace of the pursuit. The above-mentioned middle-income trap appears, and the only way to avoid it is to increase the dynamism, which means to focus on endogenous development based on innovations. Increasing the intensity and expenditure on research and development is not sufficient to change the strategy; structural and institutional changes supporting the development of entrepreneurship are also necessary. It is these changes that are the most difficult, which is confirmed by numerous examples of unsuccessful modernisations⁸⁾.

An additional obstacle for developing countries’ development policy is the premature deindustrialization phenomenon^{9), 10)}. It means the lack of possibility to reach the same level of the share of industry in the employment structure and GDP as was reached by developed countries that

⁴⁾ J. Hausner, *Globalny kryzys: potrzeba nowej polityki gospodarczej* [The global crisis, the need for a new economic policy], report prepared for the 9th Congress of Polish Economists, 19 November 2013.

⁵⁾ J.K. Galbraith, *The end of normal: the great crisis and the future of growth*, 2014.

⁶⁾ E.S. Phelps, *Mass flourishing: how grassroots innovation created jobs, challenge, and change*, Princeton University Press, Princeton 2013.

⁷⁾ M. Spence, *The next convergence: the future of economic growth in a multispeed world*, Farrar, Straus and Giroux, New York 2011.

⁸⁾ D. Acemoglu, J.A. Robinson, *Why nations fail: the origins of power, prosperity, and poverty*, Crown Publishers, New York 2012.

⁹⁾ S. Dasgupta, A. Singh, *Manufacturing, services and premature deindustrialization in developing countries: a Kaldorian analysis*, UNU-WIDER, Helsinki 2006. Downloaded from: <http://www.wider.unu.edu/publications/rps/rps2006/rp200649.pdf>

¹⁰⁾ R.H. Wade, *Rethinking Industrial Policy for Low Income Countries*, AFDR African Development Review 2009, 21(2), 352–366.

went through industrialization earlier. Germany reached their highest share of employment in the industry (peak industrialization) – 40%, around 1970, and Sweden – 33%, in the mid-1960s. China reached its maximum saturation of employment in the industry, at the level of 15%, in the mid-1990s, for India the saturation reached 12%, for Brazil – 13%. The moment when the deindustrialization process began, measured by the indicator of GDP per capita, is relevant. In developed countries, it reached the level of USD 10 thousand, in Brazil – 5 thousand, in India – 2 thousand¹¹⁾.

Consequences of premature deindustrialization

The phenomenon of premature deindustrialization has numerous consequences. The most important one is dispelling the illusion of the conviction that there is a possibility for the real convergence of developing countries with developed countries¹²⁾. The fact that they will never reach the level of industrial saturation comparable with developed countries means that their economies will be deprived of the most important growth factors: It is the industry which notes the highest productivity growth, which, in turn, results from the highest concentration of expenditure on research and development (approx. 80% of R&D expenditure is related to manufacturing industry)¹³⁾.

The innovation potential of appropriate intensity cannot develop without industry. However, according to Dani Rodrik, the consequences of premature deindustrialization are much more far-reaching. A lower maximum employment saturation in the industry also means a less in-depth social modernization based on the lack of economic structures supporting the forms of modern organizing into associations and trade unions, which were the basis for the structuration of developed societies. Associations and trade unions enabled the growth and stabilization of democratic governance¹⁴⁾.

Joseph Stiglitz also draws attention to the direct connection between manufacturing industry and the ability to build the “learning society.” For this reason, he believes that developing countries and catching-up countries should adopt an active industrial policy based also on the protection of national production from the open competition trap under conditions of globalisation¹⁵⁾. It should be the case, especially because developed countries experienced the consequences of the deindustrialization for their economies themselves, and they increasingly mention the issue of reindustrialization as a remedy for the existing crisis¹⁶⁾.

However, will bringing manufacturing industry back be enough to regain the lost economic dynamism? Will new factories revive the spirit of entrepreneurship and innovativeness? Bruce Nussbaum reminds us that, in the USA, only 9% of enterprises engaged in developing an innovative product or service in the period 2006–2008, which was the period of the dynamic pre-crisis development of the American

¹¹⁾ D. Rodrik, *The Perils of Premature Deindustrialization*, 11 October 2013. Downloaded on 22 December 2014 from: <http://www.project-syndicate.org/commentary/dani-rodrik-developing-economies-missing-manufacturing>

¹²⁾ *The third great wave*, The Economist, October 2014. Downloaded from: <http://www.economist.com/news/special-report/21621156-first-two-industrial-revolutions-inflicted-plenty-pain-ultimately-benefited>.

¹³⁾ J. Manyika, *Manufacturing the future the next era of global growth and innovation*, McKinsey Global Institute, Washington D.C. 2012. Downloaded from: http://www.mckinsey.com/insights/mgi/research/productivity_competitiveness_and_growth/the_future_of_manufacturing

¹⁴⁾ D. Rodrik, op.cit.

¹⁵⁾ J.E. Stiglitz, B.C. Greenwald, *Creating a learning society: a new approach to growth, development, and social progress*, 2014.

¹⁶⁾ *Mission Growth: Europe at the Lead of the New Industrial Revolution – Enterprise and Industry*, n.a. Downloaded on 22 December 2014 from: http://ec.europa.eu/enterprise/initiatives/mission-growth/index_en.htm

economy¹⁷⁾. On the other hand, based on his research, Robert Litan shows that the share of start-ups in the structure of American companies has been gradually decreasing since 1977. In 1977, 15% of enterprises could be called start-ups, in 2012 – only 8%. The decrease is visible in both proportions and absolute values. In the area of life science, 2,600 new companies were established in 1990 and only 1,995 in 2011. However, the share of so-called “mature companies,” which have been operating for more than 16 years, increased (from 23% in 1992 to 33% in 2011)¹⁸⁾.

Structural crack

There is a lot of evidence for structural misadjustment – enterprises in developed countries amass unprecedented amounts of cash (in countries such as the USA, France, and the United Kingdom, the amount of collected resources exceeds 10% of the GDP)¹⁹⁾. At the same time, unemployment among young and well-educated people reaches unprecedented levels – approx. 25% in Sweden. This means that two capitals, human and financial, are not productively involved.

How is it possible to regain the lost dynamism of developed countries? Michael Spence warns that there are no easy returns. The existing development model, which led to the 2008 downturn, has brought costs on future generations which might turn out to be difficult to bear and for a long time and might constitute a barrier to sustainable development, namely, development based on the ability to fulfil people’s diverse needs without losing the ability to reproduce the development resources, both human and natural²⁰⁾.

As stressed by Mariana Mazzucato, the return to countries’ active development policy based on grand civilization projects is needed. It is the state that should be innovative, engaging in creating new markets and supporting techno-economic paradigms, as it was in the previous periods of prosperity²¹⁾. Most ground-breaking innovations originated from the activity of a state financing both fundamental and strategic research. The belief that private actors operating on the free market are able to fulfil this role turned out to be futile²²⁾.

Entrepreneur Peter Thiel, who, despite his libertarian beliefs, destroys the myth about the advantages of free competition, holds a similar belief to Mazzucato. He argues that the condition that enables the creation of ground-breaking innovations are monopolies who are able to turn often long-term investments into new ones, which may change the reality and open new technology markets²³⁾.

Nowadays, there are numerous arguments demonstrating the complexity of the existing crisis. The tools to stimulate the developmental dynamism necessarily have to be adequately complex, engaging both the state and individual resources of particular enterprising individuals. Edmund Phelps asks the question: “How can the ‘modernist spirit’ based on the tendency to take up challenges be restored?” This spirit was based on a bottom-up initiative and natural innovativeness, which was part of the

¹⁷⁾ B. Nussbaum, *Creative Intelligence: Harnessing the Power to Create, Connect and Inspire*, 2013.

¹⁸⁾ R. Litan, *Start-up Slowdown. How the United States Can Regain Its Entrepreneurial Edge*, Foreign Affairs 2015, 94(1), 47–60.

¹⁹⁾ *Companies must reinvest their cash hoard*, FT.com, 27 November 2013. Downloaded on 30 November 2014 from: <http://www.ft.com/intl/cms/s/0/8653e66e-4de9-11e3-8fa5-00144feabdc0.html#axzz3KXhG6CuB>.

²⁰⁾ M. Spence, op.cit.

²¹⁾ M. Mazzucato, *The entrepreneurial state: debunking public vs. private sector myths*, 2014.

²²⁾ M. Mazzucato, *The Innovative State*, Foreign Affairs 2015, 94(1), 61–68.

²³⁾ P.A. Thiel, B. Masters, *Zero to one: notes on startups, or how to build the future*, 2014.

outlook on life and culture of modern people, inhabitants of the United States, the United Kingdom, France and Germany, who conducted industrial revolution, taking the world out of widespread poverty²⁴⁾.

Innovations and culture

Phelps' question reminds us that developmental dynamism is not a matter of appropriately advanced technological infrastructure and research potential, but it also results from the state of mind. For this reason, according to the American economist, caring for the state of the humanities, which guarantee an adequate quality of critical thinking, is no less important than educating engineers. Without them, it would be difficult to imagine the capacity to create innovations, which are based on the questioning of the existent order.

Researchers are still fascinated by the phenomenon of the creative and innovative explosion that started in some European countries and then in the United States. Was the leap to modernity only a coincidence or a result of unique cultural and religious factors?²⁵⁾ A very interesting psychological study published in 2014 in *Science* demonstrates that forms of farming developed hundreds of years before it could influence the current level of innovativeness. An American-Chinese research team conducted large-scale research on the level of innovativeness in different regions of China. The analysis revealed strong correlations between innovativeness and the dominant types of crops: cultivating wheat encourages innovativeness and rice does not²⁶⁾.

According to researchers, cultivating rice requires the organization of production, leading to collective institutional forms, which suppress individual expression. On the other hand, cultivating wheat is in favour of individualized production, which also translates into the creation of social order not blocking individual expression. As a result, dependence on the form of cultivating crops has led to the development of different forms of social organizations in China. These, in turn led, to cultural forms stabilising certain psychological predispositions. Consequently, a delayed result of farming based on wheat is greater individualism and a tendency to take up individualized actions, which in turn is a condition for innovation.

On the other hand, Dietz Vollrath brings back the debate between economists concerning the relationship between the level of trust in a society and the dynamics of development. Pioneer works in this field²⁷⁾ indicate a direct connection between culture, which is norms passed within the society, and the level of trust, which further the effectiveness of economic activity. The simplest explanation of the relevance of trust is the reduction of transaction costs; however, trust itself is a product of cultural factors. Referring to recent literature on the subject, Vollrath demonstrates that the factor which could have a determining influence on the "outbreak" of innovativeness in North-Western Europe was the family model which was developed in that area. In turn, development of this model was closely linked

²⁴⁾ F.S. Phelps, op.cit.

²⁵⁾ D.F. Noble, *The religion of technology: the divinity of man and the spirit of invention*, A.A. Knopf: Distributed by Random House, New York 1997.

²⁶⁾ T. Talhelm, X. Zhang, S. Oishi, C. Shimin, D. Duan, X. Lan, S. Kitayama, *Large-Scale Psychological Differences within China Explained by Rice Versus Wheat Agriculture*, *Science* 2014, 344(6184), 603–608. Doi:10.1126/science.1246850

²⁷⁾ L. Guiso, P. Sapienza, L. Zingales, *Does Culture Affect Economic Outcomes?*, *Journal of Economic Perspectives* 2006, 20(2), 23–48. Doi:10.1257/jep.20.2.23

to the development of farming based on cultivating cereals, which encouraged the development of open family structures and social organization, which was in favour of constant contacts with “others,” persons from outside the closest family circle. Such structures developed in the period 800–1100, permanently determining the high level of trust of the representatives of the societies of North-Western Europe. In this context, the durability of low trust in Poland should be considered, which was strengthened in the period of long-lasting institutional order based on serfdom and manor farms²⁸⁾.

Innovative jungle

Acknowledging the results of the study on the long lasting of social structures and cultural factors that may be of relevance to the economic dynamism and innovativeness, further in this study, I will search for the possibility to oppose to the cultural and historical determinism. However, I will not try to criticise the aforementioned studies, but I will focus on the attempt to answer the question arising from Edmund Phelps’ analysis indicating that the condition for economic dynamism is the bottom-up energy of entrepreneurship, creativity, and innovativeness. This energy is stimulated by the culturally developed system of favourable standards for taking risk, individualism, cooperation, and self-realisation.

A systematic response to Phelps’ challenge is a summary written by Victor W. Hwang and Greg Horowitz, “The Rainforest. The Secret to Building the Next Silicon Valley”²⁹⁾. The authors argue that innovation-oriented policy should depart from mechanic systemic thinking and that innovation-friendly environment should be treated as the ecosystem of a rain forest. The structural fact beyond this metaphor is that the ecosystem of a rainforest is a complex, diverse, and dynamic adaptive system with a structure of a network. Innovations, namely a creative expression of evolution and adapting to the changing context, are an expression of the systemic resilience and an outcome of complexity at the same time.

Hwang and Horowitz operationalize the rainforest metaphor by showing that an economic system characterised by dynamism, and thus having innovation potential, it must have a structure similar to a rainforest, which cannot be reduced to simple explanatory mechanisms, such as market demand and supply law. The dynamism of the systems depends on many simultaneously affecting factors of both infrastructural and cultural nature. For this reason, good technical infrastructure favouring the dissemination of knowledge and ideas places facilitating communication between people, legal regulations stabilizing the creation and dissemination of knowledge, and ideas are necessary for development.

Their supply itself largely depends on cultural factors: the variety of human environment, both cultural and psychological variety. The supply of innovations is facilitated by various motivations to take risk: for some it is money, and for others, it is the taste of adventure or the need for personal fulfilment. Trust, referred to above on several occasions, and an unwritten net of rules governing the “forest” related to it, are necessary. The authors argue that reductive systems for supporting innovations, which are similar to organized, planted forests, have no chance to reach their objectives. For instance,

²⁸⁾ J.T. Hryniewicz, *Polityczny i kulturowy kontekst rozwoju gospodarczego* [Political and cultural context of economic development], Wydawnictwo Naukowe Scholar, Warsaw 2004.

²⁹⁾ V.W. Hwang, G. Horowitz, *The rainforest: the secret to building the next Silicon Valley*, Calif.: Regenwald, Los Altos Hills 2012.

developing regional innovation systems based on the idea of a strong territorial relationship between the academic and economic background areas is rarely successful. In the era of globalisation, the cost of reaching the right solution is not a matter of distance but the accessibility of information. Similarly, academic units are not limited to distributing their achievements in their proximity, but they can operate in a global network. The statement concerning the limited effectiveness of territorial innovation-oriented policies is supported by Polish research conducted by Agnieszka Olechicka³⁰⁾.

The “rainforest” concept formulated by Hwang and Horowitz does not raise any significant doubts, although, its practical implementation is not an easy task, because it requires the use of complex instruments, constituting a challenge to public management systems developed on the basis of hierarchy and reductive rules. The analysis of the possibility to implement the “rainforest” recommendation in Poland would require a separate analysis. Further in this study, I will focus on the key aspect that is the creation of an innovative ecosystem: recognizing innovation-oriented resources, understood as both human resources and cultural factors.

Heading for the meta-culture of innovation

Proposing the concept of meta-culture, Greg Urban, an American anthropologist, provides interesting material for the discussion³¹⁾. He uses this concept to explain how societies geared towards lasting for a long time started to appreciate novelty as a value, per se.

This needed an appropriate meta-culture, namely the way culture describes itself. In traditional, pre-modern societies, the meta-culture of repetition prevailed, in which the value was the attachment to a myth, a story founding the community. The key element of that meta-culture was the technology of reproducing and disseminating that story. It was based on the closest possible repetition of a memorised story, and the reproduction and expression processes were united in one act of creation.

The invention of print opened up new perspectives because it made it possible to detach the reproduction process from the process of disseminating works. However, an appropriate meta-culture, promoting the creation of new content, was needed to fully use this ability. Over time, for instance periodicals and summaries published in them have become the elements of such meta-culture. Periodicity forced the demand for new critical essays, while their authors demanded pretexts to write more reviews and studies. By its very existence, everyday newspaper forces the production of political, cultural, and scientific events.

Over time, the meta-culture of modernity has developed into a complex system of promoting the production of innovations with the use of contests, prizes, festivals, that is into a complex ecosystem of incentives to take risk, creation and innovativeness, which James English called “the economy of prestige”³²⁾. An element of the meta-culture of modernity that facilitates the development of

³⁰⁾ A. Olechnicka (2012). *Potencjał nauki a innowacyjność regionów* [The potential of science and the innovativeness of regions] Warsaw: Wydawnictwo Naukowe Scholar.

³¹⁾ G. Urban (2001). *Metaculture: how culture moves through the world*. Minneapolis, MN: University of Minnesota Press.

³²⁾ J.F. English (2013). *Ekonomia prestiżu: nagrody, wyróżnienia i wymiana wartości kulturowej* [The Economy of Prestige Prizes, Awards, and the Circulation of Cultural Value]. (translated by Ł. Zaremba). Warsaw: Narodowe Centrum Kultury (National Centre for Culture).

innovations is prizes for technical solutions that often are a better stimulation for inventors than patent protection³³⁾.

Greg Urban draws attention to the interesting aspect of the meta-culture of modernity that results from separating reproduction from dissemination. This separation results in the fact that the demand for new products of culture and technology does not have to be satisfied with endogenous production. The readiness to watch new films and use new technologies does not necessarily mean the ability to produce them. The meta-culture of modernity does not determine the endogenous development of modern economy based on innovations and creativity.

This remark, based on dissemination of the meta-culture of modernity worldwide, is of key importance under conditions of globalisation. However, according to Peter Thiel³⁴⁾, the demand for modernity created by meta-culture is satisfied mostly by horizontal innovations, i.e. those based on small modifications of the basic template. This helps to explain the paradoxical gap between the actual situation of decreasing dynamism and the belief, maintained by meta-culture, concerning the growing pace of technological change.

The expanding sphere of meta-culture (the growing number of information sources on new technologies and scientific discoveries) encourages the instant production of events in order to satisfy the demand created in the framework of the economy of prestige; however, it does not create appropriate incentives to engage in projects of potentially ground-breaking importance and in which the prize is postponed. This transfer of energy that young entrepreneurs and innovators devote to creating trivial, yet fashionable, applications (e.g. for the smartphone market) is visible in the field of advanced technologies.

Disappearing society

When attempting to answer the question concerning the possibility to restore the dynamism of the economy, one should bear in mind not only the meta-cultural aspect of the issue but also the rapidly changing social context. The current meta-culture of modernity, supporting the dynamism of industrial capitalism, developed in a society with a structure stabilised by institutions and culture that ensure the reproduction of the social order and development resources. This order no longer exists, because societies shaped decades ago do not exist either³⁵⁾. On the one hand, a process of individualization took place, based on the liberation of an individual from the supervision of further elements of the social structure that influenced their lives: family and the state. This is a result of demassification stemming from the declining role of industry and related forms of organizing the creation of economy value.

On the other hand, the post-industrial transformation of the economy initiated in the early 1970s resulted in increased importance of the financial capitalism of a global scope. Its autonomy, in respect to the nation state structures, caused a crisis of the legitimization of infrastructures regulating the

³³⁾ J. Stiglitz (2007). Policy Innovations – Prizes, Not Patents. Downloaded on 22 December 2014 from: http://www.policyinnovations.org/ideas/commentary/data/prizes_not_patents/pf_printable.

³⁴⁾ P.A. Thiel & B. Masters (2014). *Zero to one: notes on startups, or how to build the future*.

³⁵⁾ A. Touraine (2013). *La fin des sociétés*. Paris: Éd. du Seuil.

M. Marody (2014). *Jednostka po nowoczesności: perspektywa socjologiczna*. Warsaw: Wydawnictwo Naukowe Scholar.

lives of modern societies. They are starting to become zombie categories, and they still exist, have their chairmen and directors, yet their helplessness is growing. The case of state and politics is similar, where authority has detached from power that is the ability to fulfil objectives³⁶⁾.

The gap left by institutions does not have to be filled with anomy, because an individualized modern inhabitant fills the gap with increasingly more intense communication enabled by the development of IT networks. By doing this, s/he becomes a networked individual coordinating his/her actions via social operation system created by the network environment (technology infrastructure, assess devices and logical interfaces)³⁷⁾. In a society constructed in such a way, where the structure is falling apart and it is losing its support in an increasingly individualized and fragmented culture, the crisis affects also institutions creating meta-culture. In a network society, everyone may be the creator of cultural and technological innovations, and everyone may be the author of meta-cultural judgements evaluating these innovations. Evaluations by professionals acting on behalf of institutions acknowledged in the past must compete with assessments coming from experts who became authorities due to network acknowledgement mechanisms. This mechanism is similar to the one governing the competition between Wikipedia and classical encyclopaedias.

Jaron Lanier, a well-known critic of such a model of modern civilisation development, warns against digital Maoism, which causes the transfer of all creative energy to the production of unimportant paraphernalia that create the illusion of innovation, while real innovations are scarce³⁸⁾. In other words, the creative and innovative potential of networked individualists is not optimally used. As stated before, there is also a lack of effective mechanisms of capital allocation to the most creative areas of the innovative ecosystem.

Poland, the paradox of innovation

The situation in Poland, which is a catching-up country, is rather special. On the one hand, its membership in the European Union is related to structural violence, i.e. the pressure from better-developed countries who forcing their development models, that are adequate to their level of economic advancement. This pressure means opportunities resulting from accelerated modernisation of administrative and management structures. At the same time, however, it might be a source of threats listed by the authors of the article: "The Power of Market Creation. How Innovation Can Spur Development"³⁹⁾. They divide innovation into three categories. The first one is efficiency innovation, based on the constant improvement of methods of creating economic value, which leads to increasing productivity.

Increased productivity does not necessarily lead to development, unless it is accompanied by a supply of innovations maintaining the economic paradigm (e.g. new waves of automotive technologies which ensure maintaining the automotive sectors' potential). However, innovations creating new markets satisfying the unrevealed consumption are the most important. Based on this typology,

³⁶⁾ U. Beck (2005). *Władza i przeciwwładza w epoce globalnej: nowa ekonomia polityki światowej* [Macht und Gegenmacht im globalen Zeitalter: neuwelt politische Ökonomie]. (translated by J. Łoziński). Warsaw: Scholar.

³⁷⁾ H. Rainie & B. Wellman (2012). *Networked: the new social operating system*. Cambridge, Mass.: MIT Press.

³⁸⁾ J. Lanier (2010). *You are not a gadget: a manifesto*. New York: Alfred A. Knopf.

³⁹⁾ B.C. Mezue, C.M. Christensen & D. van Bever (2015). *The Power of Market Creation. How Innovation Can Spur Development*. *Foreign Affairs*, 94(1), 69–76.

the authors show that developing and catching-up countries often make the mistake of focusing their development policies on infrastructure investments and attracting direct foreign investments, forgetting about the key importance of innovations creating new markets. New infrastructure and foreign investments in fact play the role of efficiency innovations, thus they do not ensure sustained growth. The balance of the developmental effectiveness of infrastructure investments conducted in Poland is due to the earlier availability of European funds. Experts' preliminary assessments indicate that a high proportion of such investments will not have a developmental effect, and conclusions developed so far allow for a statement that these investments did not deliver the main strategic objective, i.e. they did not increase coherence. On the contrary, the intra- and interregional coherence declined⁴⁰⁾. At the same time, Poland is experiencing the process of deindustrialization⁴¹⁾, which does not facilitate the growth of innovation intensity. In the view of the above-mentioned arguments, the reports concerning a significant increase of innovative activity in Poland should be analysed with caution⁴²⁾.

Analysing the effectiveness of different instruments of national innovation-oriented policies does not constitute the purpose of this study, since they are the subject of numerous analyses and recommendations. However, attention should be drawn to a statement from the above-mentioned "Heading for innovation" report: Coming out of the development drift and opening up development perspectives does not depend on the business circumstances and its measures or on parametric corrections but on taking up politically difficult systemic changes – structural and institutional – which allow for the formation of a new development model for Poland. Not only the use of widely understood innovation potential of the private sphere, but also the use of the cumulated, although mostly frozen, innovation potential of the public and civil sphere, must be the heart of this model. It must be done in such a way as to make it possible to launch the national creativity and innovation potential on a large scale. Should this task not be undertaken or should it not succeed, the Polish economy will enter a stagnation stage and will be brought to a peripheral position for years in the system of new global economic architecture, and, in any event, will be far from the centre⁴³⁾.

The potential of sociological vacuum

The "frozen resources" thesis is similar to the previously mentioned thesis concerning the suboptimal use of creative and innovation potential due to changes in the social structure, the fragmentation of culture, and dynamic development of meta-culture. These changes result in the fact that the existing institutional order does not correspond to the ongoing process of new society structuration, which to a large extent takes place in the paradigm of networked individualism. How to create an innovative ecosystem with the characteristic of a "rainforest" in this situation? Given the above-mentioned long

⁴⁰⁾ G. Gorzelak (2014). *Różnice będą rosły | Sorry, taki mamy model* – Polityka.pl. Downloaded on 30 November 2014 from: <http://www.polityka.pl/niezbednikinteligenta/1597645,1,roznice-beda-rosly.read>.

⁴¹⁾ European Commission & Directorate-General for Enterprise and Industry. (2013). *Industrial performance scoreboard: a Europe 2020 initiative: Commission staff working document*. Brussels: EU.

⁴²⁾ D. Gołębiowska-Tataj (2014). *Poland: emerging innovation leader of the Visegrad Group*. Warsaw: Central and Eastern Europe Development Institute: EU Economic Department Ministry of Foreign Affairs of the Republic of Poland.

⁴³⁾ J. Hausner (ed.). (2011). *Kurs na innowacje: jak wyprowadzić Polskę z rozwojowego dryfu?* [Heading for innovation. How to lead Poland out of a development drift?] Kraków: Foundation of Economy and Public Administration.

duration of standards and attitudes shaped by culture, especially trust (or rather lack of it, when it comes to Poland), are such attempts possible at all?

The processes of the social decomposition and multidimensional change of structure and culture carry many risks; however, they open up opportunities for social reconstruction based on a more developmentally effective institutional order, similar to the rainforest suggested by Hwang and Horowitz. Polish society is subject to similar global trends⁴⁴; however, their implementation is conducted in a local context. An important aspect of this context is the “sociological vacuum,” a concept introduced in 1970s by the sociologist Stefan Nowak⁴⁵. He wrote, “There is a sociological vacuum in Poland. There are two entities: the nation of a virtual and moral nature, rather than causative, and the primary community, which is the family. There is emptiness between them: a neighbour does not trust another neighbour, a passenger on the bus does not trust another passenger.”

As we remember, a year later “Solidarity” broke out in Poland, a movement that Alain Touraine described as the most important social innovation of the second half of the 20th century. How could “sociological vacuum” cause such an effect? Apparently, places creating social bond and social capital, not revealed by the research methods available at that time, must have existed in the empty space between the national and family structures. Due to studies conducted on the Polish transformation, we now know that these places were factories. Workplaces functioning in the situation of deficit economy forced cooperation between their employees as well as nonstandard, creative actions, beyond the technological standard, due to which it was possible to conduct the task⁴⁶.

The concept of sociological vacuum was brought back to the political discourse by Janusz Czapiński, the author of large-scale, periodical social research “Social Diagnosis”⁴⁷. Czapiński’s statement concerning the lack of society is confirmed by numerous other studies regarding different aspects of social and cultural life. According to periodical Edelman Trust Barometer surveys, social trust visibly decreased in Poland in the last period⁴⁸. At the same time, a radical decrease in the intensity of participation in culture took place⁴⁹. Soon to be published results of research concerning the system of values of the Polish people show that family and health are the most relevant values for the inhabitants of Poland. Popular and civic values are far from the most relevant⁵⁰. On the other hand, unpublished qualitative research on the identity of Poles at the time of change show a deep change of the symbolic framework. Over a decade of being a member of the European Union, the understanding of “personal homeland” has narrowed down, which rarely exceeded the area of a gmina (county or township). The project to build regional identities did not succeed, voivodeship (district) capital cities are as distant

⁴⁴ M. Marody op.cit.

⁴⁵ S. Nowak (1979). *System wartości społeczeństwa polskiego [The Value System of Polish Society]*. Studia Socjologiczne, (4).

⁴⁶ E.C. Dunn (2008). *Prywatyzując Polskę: o bobofrutach, wielkim biznesie i restrukturyzacji pracy [Privatizing Poland: Baby Food, Big Business, and the Remaking of Labor]*. (translated by P. Sadura). Warsaw: Wydawnictwo Krytyki Politycznej.

⁴⁷ J. Czapiński, T. Panek, D. Batorski, Polska. Główny Urząd Statystyczny & Zakład Wydawnictw Statystycznych. (2013). *Diagnoza społeczna 2013: warunki i jakość życia Polaków: raport [Social diagnosis 2013: conditions and quality of life in Poland: report]*. Warsaw: Zakład Wydawnictw Statystycznych.

⁴⁸ 2014 Edelman Trust Barometer - Global Results. (2014). Downloaded on 21 January 2015 from: <http://www.edelman.com/insights/intellectual-property/2014-edelman-trust-barometer/about-trust/global-results/>.

⁴⁹ European Commission - PRESS RELEASES - Press release - Survey shows fall in cultural participation in Europe. (2013). Downloaded on 30 November 2014 from: http://europa.eu/rapid/press-release_IP-13-1023_en.htm.

⁵⁰ R. Drozdowski, B. Fatyga, M. Filiciak, M. Krajewski, T. Szlendak, *Praktyki kulturalne Polaków*, Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika, Toruń 2014.

for the citizens of gminas as the capital city of Poland; however, powiat (larger than a gmina and smaller than a voivodeship) capital cities have become more important. At the same time, the openness to changes has increased, which is best illustrated by the results of local elections from 2014.

Social reconstruction

The Polish society is in undergoing changes, whose direction is difficult to clearly indicate. The observed signs of anomy and “sociological vacuum” may be a symptom of a crisis leading to regression as well as to social reconstruction. The effect will result from complex, mutually interacting processes of semiosis (creating concepts describing the new reality) and structuration. These processes are explained by a theoretical apparatus of Cultural Political Economy (CPE)⁵¹. Its authors draw attention to the fact that images of the social world that we use in different public discourses, from media to the discourse of power, result from the reduction of complexity with the use of interpretation concepts and structures. They will never fully illustrate the whole richness of “the world of life”; however, they are necessary for the effective coordination of individual and joint actions.

The mentioned images of the world develop in the process of semiosis, naming the aspects of reality and thus making it present in the discourse, which in turn enables the structuration process based on turning the phenomena hidden beyond concepts into the form of institutions and structures. Reinforced structures and institutions start to actively participate in the process of semiosis and creating social knowledge themselves, often driven by political intentions. Their objective does not necessarily have to be to aim at uncovering the largest possible area of the social reality, aiming at the reproduction of the existing order is much more probable. Such a strategy is successful as long as the institutional order does not differ from the social reality, because an overly large discrepancy between the image of the social world used by institutions in their process of legitimisation and the image of social reality leads to a crisis.

An example of this is the evolution of urban movements in Poland. Their assumed beginning should be the process of semiosis, when a growing group of young researchers living in cities started to describe the situation of cities differently from the knowledge reproduced by the structure, namely the existing authorities and cultural and scientific institutions. Semiosis, initiated at the margin of culture, turned out to be an adequate description of reality for the growing number of actors who entered the structuration process by sharing this description: First, the Congress of Urban Movements emerged, then Urban Movements Alliance, which created institutions able to reproduce alternative knowledge, and over time also able to effectively act in the areas dominated by “traditional” institutions. The confrontation has been conducted at both the level of structure (a battle for power with the use of political mechanisms and a creation of political innovations redefining the area of power) and culture (a creation and control of interpretive discourses).

There are more examples demonstrating that the “social vacuum” is filled with the potential energy of social acting. At the end of January and beginning of February 2012, anti-ACTA protests broke out. Mostly young people engaged in them, portrayed in the report “Młodzi 2011” [“Youth 2011”]⁵². This study did not indicate the possibility of a youth, mass protest. To an even smaller extent, one could have expected young people to be able to organize actions, tactical

⁵¹ N.-L. Sum & B. Jessop (2013). *Towards a cultural political economy: putting culture in its place in political economy*.

⁵² K. Szafraniec, *Młodzi 2011*. (M. Boni, red.), Kancelaria Prezesa Rady Ministrów. Warsaw 2011.

innovations, and intensive work with symbols depicting the stake of the fight and values associated with it⁵³⁾.

A map is not a territory

An analysis of these cases leads to the hypothesis elaborating on the statement concerning the frozen innovation potential, mentioned in the "Heading for Innovation" report. The hypothesis was developed during a seminar and research project "Culture and Development" conducted under my chairmanship by the National Centre for Culture and Collegium Civitas, and at its final stage, also by the "BęcZmiana" Foundation. The hypothesis says that an inadequate identification of resources is used in the Polish development discourse. The potential resources that could influence the growth of dynamism are in the "sociological vacuum," and, for this reason, they can never become the subject of relevant policies and the destination of the allocation of resources.

The verification of this hypothesis has become the subject of the last phase of "Culture and Development" project implemented in 2014 under the name "Fraktale"⁵⁴⁾. This case study and a meta-analysis of other studies revealed the complex structure of factors due to which the "maps" of resources used in dominant discourses and policies that they shape do not reflect the "territory" that is the real image of social space and the developmental potential of creativity and innovativeness hidden in it.

Inspired by the philosopher Gaston Bachelard's study, I named these factors "epistemological barriers"⁵⁵⁾. In the analysis of the shaping of a modern scientific mind, Bachelard proved the difficulty of the process of shifting pre-modern thinking to modern, using rational categories and scientific terms in the everyday discourse. Overcoming epistemological barriers made it possible for a scientific mind to emerge, caused by a new human perspective of the world, revealing its resources hidden from a pre-modern mind. The mobilisation of these resources enabled the industrial revolution to take place.

Nowadays, we face a similar, yet a reverse process. Epistemological structures created in the modern age are not appropriate for a post-modernist description of "the world of life"; however, it is impossible to fully describe its variety, because a new conceptive framework is needed, which enables one to reduce the complexity to the categories that enable a new structuration and building of the institutional order which facilitates growth. This process has not been determined, however, one may try to identify epistemological and structural barriers that hinder its growth, and then present proposed solutions of meta-cultural nature, i.e. solutions that will adapt the selected processes of semiosis in the area of culture, stimulating structuration and post-developmental social and institutional change.

The power of unstable identity

Before indicating the identified epistemological barriers, it is worth thinking about the ways in which Poles create social self-knowledge. How do they build joint information and symbolic database used to

⁵³⁾ E. Bendyk (2012). *Bunt sieci* [Network's Rebellion]. Warsaw: Polityka Spółdzielnia Pracy.

⁵⁴⁾ E. Bendyk (2014). SPISEK KULTURY [CONSPIRACY OF CULTURE]. Downloaded on 22 December 2014 from: <http://spisekkultury.wordpress.com/>.

⁵⁵⁾ G. Bachelard (2002). *Kształtowanie się umysłu naukowego: przyczynek do psychoanalizy wiedzy obiektywnej*. Downloaded on 22 December [La Formation de l'espritscientifique]. (translated by D. Leszczyński). Gdańsk: Słowo/Obraz Terytoria.

take up individual and joint actions? The authors of “Gabinet Luster” [Hall of Mirrors]⁵⁶⁾ are attempting to answer this question, indicating the complexity and multidimensional nature of the process of creating social self-knowledge on the basis of the interpretation of different sources discussed in the discourse: surveys (becoming increasingly more important), press and media (information creating self-sustaining explanatory discourses, culture narrations stabilizing the elements of collective identity). To what extent does this map correspond to reality?

It is impossible to assess this issue quantitatively. The problem of the most radical assessment is that the map uses concepts that are completely detached from the social substance, since false codes leading to incorrect symbolisation are used for creating it. The society, largely composed of peasants, considers itself a post-gentry nation, cultivating Sarmatian and romantic traditions, on top of that, in a reduced version, nationalizing today’s cultural homogeneity of Poland (Sowa, 2011). In the identity discourse of Poles, on the map presenting their identity, there is no room for cultural diversity, which was a feature of the Republic of Poland in the past. Blank areas where neighbours used to be were actively erased in the course of unprecedented, and in fact a revolutionary process of the change of social structure and geographical territory related to mass movements of people, and the extermination of whole groups⁵⁷⁾.

Could such a reduced and falsified identity constitute developmental resources? Is the discursive clash, the difference between the social substance and its cultural hypostasis, a developmental barrier or, on the contrary, is it a source of tension generating social dynamism, making Poles function in the hybrid space for longer than the concept itself, proposed by Manuel Castells, exists?⁵⁸⁾ As a result, because they have never undergone a full modernisation, they are more post-modern than openly multicultural societies, because everyone carries the “protean self”⁵⁹⁾, which allows shifting between the codes – from “peasant-like” cupidity to great creativity, thus ensuring greater resilience and adaptability.

This flexibility in terms of identity makes skilfully undertaken actions based on corrections of the existing map introducing forgotten or actively erased areas to the map become a source of culture-forming process and of organizational and technological innovations. The mentioned case studies analysed some areas with developmental resources of high creative and innovative potential. Now, it is time to identify the barriers that stop us from seeing them or from wanting to notice them.

Obstacle I – data and terms

This issue seems trivial, however, it is enough to analyse any discussion of creative industry. Then it will turn out that a large part of it will be taken by the attempt to define the discussed area, and then to measure it with the use of quantitative indicators. It is a typical example of the borderline between different spheres of social, cultural, and economic life with an enormous creative and cultural potential, however, falsified and unrecognized due to the lack of a basic information database. The problem lies with both the statistical data and their interpretation. A good illustration are calculations concerning

⁵⁶⁾ A. Giza-Poleszczuk (ed.). (2013). *Gabinet luster: o kształtowaniu samowiedzy Polaków w dyskursie publicznym* [Hall of mirrors: shaping self-knowledge of Poles in public discourse]. Warsaw: Wydawnictwo Naukowe Scholar.

⁵⁷⁾ A. Leder (2014). *Prześlona rewolucja, ćwiczenie z logiki historycznej*. Warsaw: Wydawnictwo Krytyki Politycznej.

⁵⁸⁾ M. Castells (2013). *Sieci oburzenia i nadziei: ruchy społeczne w erze internetu* [Networks of Outrage and Hope. Social Movements in the Internet Age]. (translated by O. Siara). Warsaw: Wydawnictwo Naukowe PWN.

⁵⁹⁾ R.J. Lifton (1993). *The protean self: human resilience in an age of fragmentation*. New York, NY: BasicBooks.

the film industry, which has been dynamically developing since the establishment of the Polish Film Institute in 2005, which is proven by the growing number of cinema tickets sold in total, especially Polish films. However, this optimistic information is disturbed by alarming conclusions of sociological studies saying that, at the same time, the number of people who go to the cinema decreases. The combination of these two pieces of information would mean that a declining number of spectators go to the cinema more often. What about those who no longer go to the cinema? What are the reasons for which they resign, and do they mean a declining demand for films or a change of its structure?

Obstacle II – methodology

Problems concerning the basic information database and the interpretation of existing data are mostly a result of the second epistemological barrier stemming from methodological barriers. How does one examine the world *in statu nascendi*, at the time of deep changes whose consequences are unknown? Since methodological assumptions no longer relate to existing structures, one may be led to wrong conclusions. Depending on the methodological perspective, the analysed new phenomena may be interpreted as irrelevant epiphenomena of the existing structure or as symptoms of a ground-breaking change.

The processes of the self-organization of networked individualists with the use of new media will not be noticed by researchers for whom a sign of social self-organization are concrete structures, e.g. social organizations. Similarly, researchers attached to the analyses of innovative processes as phenomena typical of the sphere that is on the border of the world of science and business will not notice the innovative potential of social, cultural, technological, and economic practices which are occurring in alternative areas.

Obstacle III – theory

Barriers identified above are largely due to the lack of the acceptance of or knowledge about theoretical models allowing an interpretation of the observed processes. The structural change hypothesis requires testing of theoretical proposals that take this process into account. The study accompanying the project entitled „Fraktale” revealed that Polish researchers are not very receptive when it comes to the latest theoretical proposals outlining subjectivity transformations and a comprehensive structural change. Without reference to these proposals, it is impossible to explore culture of an isolated subsystem.

Obstacle 4 – Institutional barrier

The shortage of methodological and theoretical innovation, which manifests itself not only as the absence of new proposals, but also as the poor reception of research proposals formulated by the global scientific community is, to a certain extent, the result of subjective conditions associated with the attitudes of researchers; however, it also has an institutional dimension. Epistemological conservatism is a consequence of the conservatism of research institutions focused on self-reproduction, which results in their petrification, inter alia through maintaining divisions between disciplines and barriers hindering inter-institutional exchange.

Obstacle 5 – Recognition barrier

The world of science, just as the world of culture, is vigorous and dynamic. The emerging phenomena result in new knowledge flows that bypass the identified obstacles, knowledge referring to the latest data, or to interpretive and theoretical models. Knowledge generated in a growing number of «knowledge manufactories» that are formed at the institutional border between the world of science and other worlds is filled with «white spots» on the existing maps of culture. However, it does not become any form of social self-consciousness, because it encounters a barrier due to the inertia of dominant discourses.

This inertia, as in the case of Obstacle 4, means that social communication institutions and actors that influence social discourse attempt to reproduce dominant discourses, because they support the reproduction of the existing structure. Faced with this inertia, new knowledge is marginalized and regarded as a curio, something exotic or foreign. In the mainstream discourse, it is replaced with stereotypes. The reproductive drive of institutions and discourse structures is not only an expression of systemic conservatism, but can also be attributed to the interests of individual actors. Institutions of social communication are part of the media industry, just like many communities and institutions representing the cultural sphere define their interests with respect to the system of copyright and intellectual property rights. As a result, not only do new practices (actually or potentially threatening this interest) fail to be recognized, but they also are actively delegitimized, including at the level of awareness and knowledge about them.

Obstacle 6 – Meta-cultural obstacle

Epistemological barriers mutually determine each other forming a complex system of cross-references. As a consequence of the lack of recognition, or even the delegitimization of new phenomena in dominant discourses, institutions are not interested in them, which in turn leads to an absence of incentives for the development of data, methods, and theories. The complex system of institutional and discursive conditions behind the obstacles forms the abovementioned meta-culture.

Meta-culture of newness is a distinguishing feature of modern society. However, as we have seen, it does not seem to affect our ability to innovate. The separation of the processes of creation, reproduction, and dissemination means that there can be a modern society – in the sense of circulation of new artefacts and innovation within a specific culture and a social system – which is incapable of their independent creation.

The situation is further complicated by the transition towards postmodernity (or late/ liquid modernity). It is associated with the dissemination and intensification of the meta-culture of newness on a global scale, and this intensification is due to the globalization of culture and the advent of the global meta-culture that coexists with local meta-cultures. At the same time, transformation that takes place within culture itself and involves the breakdown of the hierarchy, replaced with a „federation of subcultures,” which is associated with the transformation of normativity. The importance of meta-culture is growing, because it is expected to determine what is new and important (worthy of consumption). However, these judgements are no longer based on objectified „academic” evaluations stemming from the cultural hierarchy, but rather reflect the position of the meta-cultural actor in the economy of prestige and attention. Celebrityism is a striking example of the phenomenon.

This transformation does not mean „the death of authorities,“ but rather a change in the process of their legitimization. It is less influenced by the place within the structure, and increasingly by recognition that one enjoys in one’s community. A sort of meta-meta-culture is formed, i.e. a subtle system, based mainly on network communication, of explicit (e.g. “likes” on Facebook) and implicit (clicks measured by search engine algorithms), references that form the meta-cultural position of the reviewer.

Modern institutions, which by definition had a meta-cultural status, i.e. they determined what was new and important through the power of their existence alone, have lost this self-validating legitimacy. If they wish to pursue their mission, they must renew their mandate, which can be done through references to the mechanisms of postmodern meta-meta-culture or to structural violence, capable of ensuring institutional reproduction. Epistemological barriers described above suggest that the latter strategy, based on violence, dominates in Poland.

We are faced with a paradoxical situation, in which the existing meta-culture of newness is used, on the one hand, to disseminate innovation coming from the outside and, on the other hand, to generate cultural and scientific artefacts used for the reproduction of the existing structure, but creating nothing new. The dominant circuit of production and dissemination of endogenous innovations develops alongside the system, partly taking advantage of the meta-culture of newness enhanced by the postmodern meta-meta-culture that places value on non-institutional cultural and scientific developments in alternative networks of social recognition (blogs; Facebook as the main tool of the meta-meta-culture; crowd funding services).

Paradoxically, therefore, the existing structure and institutions of knowledge and culture that aim reproduction actually become “demodernized”: they lose their ability to generate innovation, while building their legitimacy by referring to the modern meta-culture. The expression of modernity is supposed to be the visibility of modernization achievements. Meta-culture, based on epistemological barriers, prevents a correct assessment of modernization, conceals its imitative nature, and prevents us from becoming aware of the fact that creative and innovative resources tend to shift outside the structure.

Consequently, on the one hand, we observe a meta-culturally stabilized and increasingly anachronistic world of modernization based on the cargo cult, which in fact becomes demodernised in structural terms and, on the other hand, the world of life that develops alternatively and will be subject to structuration based on an alternative meta-culture. The type of meta-culture is yet to be determined. It is not certain that a meta-culture stimulating the development of structures enabling us to use the potential of non-existing resources will be formed. Nevertheless, if we are aware of this tension, we can design a development policy based on meta-cultural intervention, i.e. on supporting institutional and structural innovation that meta-culturally stimulate the reproduction, diffusion, and importantly the supply of innovation.

Chapter 6

TRENDS THAT GENERATE INNOVATION

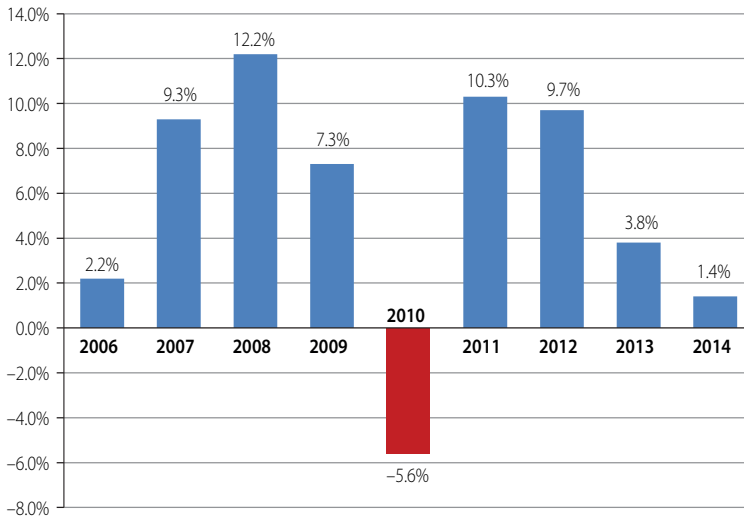
The annual study „Global Innovation 1000”¹⁾ focuses on the analysis of innovation and on prospects of 1,000 global companies that rank highest in terms of R&D expenditure. Even though information about these enterprises does not give us insight into businesses and their innovativeness in general, certain correlations are universal. Future prospects perceived by the leaders of these organizations are similar to those faced by smaller companies.

Let us begin by addressing these correlations. The authors of the latest edition of the study analysed the expenditure on R&D in 1,000 global companies over the last 10 years. At the first glance, no clear trend is discernible. Data for 2006 indicates a slight increase in expenditure on R&D compared to 2005 (by 2.2 %). The next two years are a period of significant growth, followed by a slight decline and a sharp fall in 2010. In 2014, in turn, the recorded growth rate was the lowest (1.4% y/y). Authors suggest several interpretations, pointing to two cycles that took place during this period. The first cycle ended in 2006, i.e. five years after the dotcom bubble burst. They suggest that, as a result of a serious market maelstrom, spending on R&D may begin to decline approximately 5 years after such an event (market disruption), and the Internet bubble exemplifies this correlation. 2010 is the beginning of the second cycle, which was the culmination of the financial crisis and a global recession. In the years that follow, expenditure on R&D starts to increase after a sharp decline. The low growth rates in 2013 and 2014 are interpreted by the authors as the likely effect of levelling off towards an average value.

What does this mean for the economy and for entities that operate on a smaller scale and do not even contemplate undertaking innovative activities? The recent economic crisis that began in late 2008 continues to affect many economies, including Poland. What is more, large companies are regarded as role models. They are the main generators of knowledge and of market demand for its generation. If they bring their development activity to a halt, they cease to encourage other economic operators to develop. Expenditure on R&D is not the sort of expenditure that will continue to grow and bring better results due to greater spending, because there are other factors that may prove equally important. Expenditure grows if companies believe that increasing outlays is beneficial. Creating innovation is also not a systematic process (innovation is either a success or a flop), as opposed to the development of innovation, which should be systematic.

¹⁾ B. Jaruzelski, V. Staack, B. Goehle, *Global Innovation 1000. Proven Paths to Innovation Success. Ten years of research reveal the best R&D strategies for the decade ahead*, strategy+business, Issue 77, winter 2014.

Chart 1. Increase in R&D expenditure of companies (Global Innovation 1000) in 2006-2014 (%)



Source: Bloomberg data, Capital IQ data, Strategy&Analysis.

Economic operators must adapt to such market changes, even if adaptation does not always bring positive consequences. In additions, companies can create new development prospects or respond to emerging trends. Managers of the 1,000 largest companies have identified these prospects for the next 10 years. They seem interesting enough to be applied by both the largest global corporations and by any development-oriented business.

Business strategies

The first prospect concerns the sphere of business management through a new approach to the development and implementation of the corporate strategy. Managers assume that, in the coming years, **business strategies will have to go hand in hand with innovation strategies**, and that they will actually be adapted to the latter. This constitutes a momentous change in the approach of managers, as this outlook on strategies opens a business up to the search for new sources of competitive advantage. It also facilitates the development of innovations, which are no longer limited by business objectives. The harmful impact of business objectives on innovation has been discussed by Edwin Bendyk (referring to C. Christensen): „Currently used corporate performance measures nurture decisions ensuring a quick return on investment and the highest return on equity over a short period. This attitude discourages businesses from investing in solutions that need several years to mature and can form the basis of innovative breakthroughs”²⁾. This new approach to business strategy shows that the entities that form the „outpost” of innovative global companies are increasingly aware that associating business objectives with innovation objectives will have a positive effect on the development of a company as a whole. In short, these companies already know that development means innovation, even though only some of them have actually started to put this approach into

²⁾ E. Bendyk, *Innowacje w kryzysie. Paradoxy rozwoju*, in (ed.) P. Zadura-Lichota, *Świt innowacyjnego społeczeństwa*, PARP 2013, p. 99.

practice (including the so-called needs seekers³⁾); others only plan to do it. An example of a Polish company that implements this prospect on the strategy level is the PGE Capital Group, which defines its latest strategy in the following manner: "In an era of rapidly changing markets and technologies, business leaders throughout world find it difficult to maintain their position. Therefore, in order to enable the PGE Group to adapt to changes and seize new market and technological opportunities, we have made innovation the focal point of our new strategy"⁴⁾. Meanwhile, many companies are faced with another challenge that must be addressed prior to the integration of business and innovation strategies, namely, the initiating of any innovation processes within the company. Only one in four Polish firms is involved in innovation activities (23%, not including micro-enterprises). The remaining 77% of enterprises are not interested in innovation. This result is most disappointing, particularly, if we take into account that, at EU level, Poland is ahead of only one country – Romania⁵⁾. How can we account for the fact that innovation, commonly associated with competitiveness, has been introduced so reluctantly into Polish businesses? This is all the more intriguing when we take into account that these 23% of Polish firms are increasingly successful, invest more into innovation and R&D, launch new products, and are quickly catching up with the EU average, thus proving with their results that innovation pays off. Why, then, does innovation remain a theoretical concept for the majority of companies that fail to incorporate it into their business practices?

Cooperation

These considerations bring us to the question of cooperation, the density and quality of relationships among businesses and in their environment, and finally to the issue of trust. Cooperation has recently become an important issue in the discussion on innovation, which can be explained by the fact that many countries, in particular the most innovative, have observed that innovations tend to be generated at the junction of sectors and that the success of a product depends on how it is received by consumers, who have many options to choose from. Additionally, information and knowledge are rapidly spreading. This means that guarding one's knowledge and putting great efforts into working out one's own solutions do not guarantee that someone else will not come up with a similar idea earlier and implement it more efficiently, for example, through working with different entities, and that their invention will not reach the market first. It should also be emphasized that the importance of cooperation is not always the same, and all depends on the level of economic development of a country. Research conducted by PARP, inter alia in the framework of the international project Global Entrepreneurship Monitor (GEM)⁶⁾, indicates that the level of economic development is proportional to cooperative tendencies of companies, **and thus high levels of cooperation are a proof of the economy's maturity**. This correlation is particularly evident in cooperation in the sector of manufacturing. Among the three types of firms identified by GEM in the weakest countries, referred to as factor-driven, only 20% of companies engage in cooperation (mainly in Africa). In efficiency-driven

³⁾ Typology of companies: "seekers needs", "market readers" and "technology drivers" is an original proposal of the authors of the annual report "Global Innovation 1000". More about this typology in (ed.) P. Zadura-Lichota, *Świt innowacyjnego społeczeństwa*, PARP 2013, pp. 13–14.

⁴⁾ <http://www.gkpge.pl/innowacje>, access on: 06/03/2015.

⁵⁾ More information can be found in M. Nieć, *Działalność innowacyjna przedsiębiorstw w Polsce na tle Europy*, in this volume.

⁶⁾ D. Węclawska, *Relacje w biznesie* in report Global Entrepreneurship Monitor – Poland 2012, PARP 2013.

countries (Latin America, a number of European countries), the percentage of cooperating enterprises stands at 38%, while in innovation-driven countries (North America, the majority of EU countries), nearly 50% of economic operators engage in cooperation. In the case of Poland, the results of this study are very interesting. As an efficiency-driven country, aspiring to the group of innovation-driven states, Poland ranks very high in terms of cooperation and is way ahead of the average for innovation-driven countries. Similar conclusions can be drawn from the analysis of Eurostat data in terms of cooperation among enterprises engaged in innovation activities with other entities. In this respect, Poland ranks average among EU Member States⁷⁾. It can be assumed that Polish companies have already benefitted from cooperation and have a substantial development potential in this area. However, it may apply only to a small group of innovators, while other firms operate outside of these correlations. A certain confirmation of this phenomenon can be found in the results of a recent survey conducted by PARP pertaining to innovation in micro-enterprises⁸⁾. The study shows that firms that do not cooperate with any other entity are less trusting than other enterprises (they believe – more often than other entities – that placing one’s trust in a business partner will end up badly). In addition, companies that have implemented innovations over the last three years, tend to establish cooperation more willingly than those that are not innovative (89% vs. 69%). They also tend to work more often with foreign companies, which make their cooperation activity seem superior both quantitatively and qualitatively.

Incremental innovation versus radical innovation

The issue of cooperation is an important element of the following perspective in innovation development, which has been pointed out by managers from 1,000 global firms. They assume that, in the coming years, **transition from incremental innovation to radical innovation** will speed up in their enterprises. At the moment, 58% of expenditure in these companies is absorbed by incremental innovation; 28% are innovations with a significant level of originality, and only 14% are radical solutions. They believe that, in the future, expenditure on incremental innovation shall decline to the benefit of highly original and radical solutions. This assumption implies at least two other premises.

Firstly, respondents must have assumed that there is a demand for this type of innovation (highly original and radical) in the economy and society. In recent years, journalists, economists, and sociologists have proven in their analyses that innovation has been stagnating and that the conditions conducive to the generation of innovations have deteriorated. Certain innovations have also been challenged and considered as solutions that do not contribute to social development (they are due to a temporary fad) and eliminate jobs without proposing anything valuable in return (efficiency innovations). This stagnation or even the crisis of the current model forces us to believe that something has to change. We can expect a new technological revolution or some kind of breakthrough in thinking about innovation. If this proves true, we really are going to experience a wave of radical innovations likely to distort the existing order. Then, the willingness of firms to create entirely new solutions will become most desirable.

⁷⁾ More information can be found in M. Nieć, *Działalność innowacyjna przedsiębiorstw w Polsce na tle krajów Europy*, in this volume.

⁸⁾ More information can be found in D. Węclawska, *Zbyt małe, żeby współpracować – analiza współpracy w mikropodmiotach*, in this volume.

Secondly, radical innovation will require closer cooperation among entities. Firstly, their generation will be an onerous task; therefore, the diversity and interdisciplinary character of innovation teams will be conducive to their (faster) success. Secondly, a larger number of stakeholders will limit the risk borne by each shareholder, and thus encourage cooperation. This implies (at least theoretically) that the next technological breakthrough will be a catalyst in the development of cooperation between businesses and their environment. We should emphasize that this type of innovation will remain primarily the domain of the strongest entities, namely the top 1,000 global innovators, as well as large companies operating on a national scale. On the other hand, these entities are the most capable of diffusing innovations at the enterprise level. This can be accounted for by their position at the beginning or at the end of the value chain (R&D as the beginning and services and marketing as the end of the chain). They create demand for new products and, consequently, force their suppliers to adopt new and innovative solutions.

Development of the service sector

The third perspective of the expected change is associated with the proportion change in the structure of the created goods: preference is given to services, to the detriment of manufacturing activities. This trend has already been observed for a while, since more mature economies tend to have a higher share of the service sector, which can also be perceived as B2B, B2C, and M2M. However, many interesting phenomena are taking place at the level of enterprises themselves, which seem more willing to add services to their traditional manufacturing activities within the sector in which they operate. This is largely due to the development of information and communication technologies that permeate new areas of social and economic life and provide an impulse for the creation of new solutions in industries that have not yet had recourse to ICT. An example of this phenomenon is the American company VISTEON, which is a manufacturer of electronics and thermal management solutions for the automotive industry. At the moment, the scope of its activities has been expanded to encompass the development of wireless technology allowing communication between vehicles. This type of service could be successfully developed by an ICT start-up; implemented independently by Visteon, it may allow the company to grow and develop in an entirely new direction. At the same time, the company will not lose sight of its strategic objective: creating solutions for the automotive industry. Another example of the blurring of boundaries between sectors is the Polish company Integrated Solutions, an entity of the telecom operator Orange, which was set up to provide ICT and ICT infrastructure management services. Integrated Solutions supplies cloud services to its customers (who are also the customers of Orange) from network and communication services, to data security solutions. Integrated Solution and the new product range of Visteon exemplify a fresh trend: Businesses add to their portfolio of services solutions from adjacent sectors, which helps them meet the needs of their customers.

New model of funding innovation

The prospects outlined by the managers of the top 1,000 companies are far from a complete picture of changes that can be expected in the future, or those that are already taking place and will continue to do so. Another aspect that seems worth emphasizing in the context of new perspectives is the thriving model of financing new business under **corporate venturing**. This phenomenon may also

have a strong impact on strengthening cooperation between enterprises, on a more streamlined process of seizing new solutions, including the reduction of internal R&D costs. Creating venture funds within corporations already has a certain tradition. The first such initiatives were carried out in the United States in the 1980s and 1990s, and since then the trend has been on the up. Among 1,100 corporate venture funds identified at the end of 2014, 475 had been in operation since 2010⁹⁾.

What drives companies towards establishing their own investment funds? The main reason is an attempt to „keep the finger on the pulse,“ because one of the greatest fears tormenting executives of large companies is the emergence of technology that will literally sweep their business off the market. Gathering market information by attracting the emerging ideas seem to be a clever method of gaining access to new knowledge and reducing R&D expenditure, since the cost of acquiring a project from a start-up are lower than the expenditure that embarking on a research project would necessitate. It is also easier to withdraw from investment in a new business than to close a project developed by full-time employees in the company’s „R&D laboratory.“ Finally, it is a wise manner of acquisition and, as shown by the data, the percentage of start-up acquisition financed in the framework of corporate funds is higher than in the case of traditional, private VC funds¹⁰⁾. On the other hand, from the point of view of start-ups, this is a potential source of funding and an opportunity to establish a direct cooperation with a large company. This type of cooperation between companies has a great growth potential and is conducive to the diffusion of the innovation, e.g. through the dissemination of this model of funding even in medium-sized companies. The probability is quite high, because it opens up interesting development possibilities for medium-sized enterprises, not through growing to the size of a large company (and losing certain advantages of smaller companies, such as not being coerced to compete with giants), but through establishing cooperation with smaller innovative firms and implementing joint projects.

First: the consumer

Another area that has been continually evolving and developing through new ideas is the approach to the consumer and the role of the latter in innovation. As shown by the results of research conducted within Global 1000¹¹⁾, companies that begin their search for innovation by identifying customer needs achieve significantly better results than companies opting for other strategies (e.g., following the market, remaining on the edge of technological innovations). Taking customers into account in the last stage of product development, providing them with „beta“ products for testing, and focus groups of potential customers are all known and applied measures, but by no means common in the business world. However, another phenomenon is also taking place. An increasing number of entities operating on the market are starting to lay the foundations of the *sharing economy*.

This paradigm involves the omission of intermediaries in business, while providing a platform that connects users. The sharing economy penetrates every area of modern, innovative economy. Its

⁹⁾ R. Rahal, *Will corporate Venture Capital Disrupt the Traditional Investment Ecosystem?*, December 16, 2014, (<http://www.entrepreneur.com/article/240904>, access on 06.03.2015).

¹⁰⁾ M. Lennon, *Corporate Venture Investors starting to look a lot more like private VC*, November 5, 2013, Crunchbase. (<https://info.crunchbase.com/2013/11/corporate-venture-investors-starting-to-look-a-lot-more-like-private-vcs/>, access on 06.03.2015)

¹¹⁾ B. Jaruzelski, J. Loehr, R. Holman, *The Global Innovation 1000: Making Ideas Work*, strategy+business, 27.11.2012, (winter/2012/Issue 69).

development has affected manufacturing, services, and consumption. It has changed the manner in which we travel, study, and spend our free time. The best examples of transformation are global platforms, operating within a business model that eliminates intermediaries, such as Uber, Airbnb, Lending Club, or BlaBlaCar. In the context of business decentralization, the greatest challenge for the economies is the adaptation of their legislation – the existing legal systems are often out of sync with the new conditions created by market operators¹²⁾.

The sharing economy connects consumers and often builds its potential and capacity on the collective knowledge and on other resources (also material) collected from individual customers. In this perspective, the role of the consumer is significantly greater, because he/she becomes the manufacturer and marketer of services. Every stick has two ends – the branch of the sharing economy based on the sharing of material resources (as opposed to sharing knowledge, which can – at least theoretically – serve everyone) is available only to those who already have certain resources, while excluding those deprived of them, who satisfy similar needs within the traditional economy. However, it costs them more¹³⁾.

A new wave of entrepreneurship?

The final perspective presented here refers to changes in entrepreneurship itself: the increasing number of new businesses, demographic changes in the ownership structure and the growing ambitions of relatively young companies. This perspective shall be outlined through reference to the situation in Poland.

Entrepreneurship and self-employment are becoming increasingly accepted by Polish society as alternatives to full-time employment. We may wonder about the reasons for this change of attitude and can certainly point to the relationship between self-employment and the emergence of new professions that enjoy social recognition, such as experts and consultants. Alternative names to self-employment are in use and have positive connotations, such as the English “freelancer” or its Polish equivalent, „*wolny strzelec*”. Self-employment is not only popular among young people, but interest in this mode of working has been growing among economically active persons of all ages. Taking into account both of these trends, we can assume that the self-employment trend is likely to spread further.

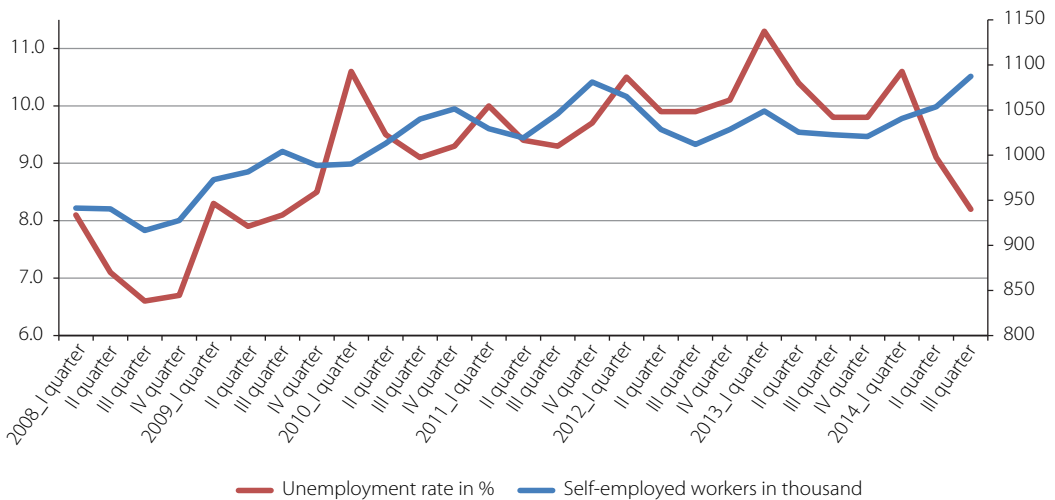
In Chart 2, the blue line represents the number of self-employed Poles (who do not hire employees), and the red line represents the unemployment rate in subsequent quarters starting from the first quarter of 2008. Generally, an increase in unemployment is accompanied by an increase in the number of new firms. It is a natural phenomenon associated with the contraction of the labour market: people are looking for other ways of earning a living. These correlations are visible in the chart: an increase in unemployment rates is usually followed by an immediate rise in the number of self-employed, reflected by the ascending blue line. Similarly, in the case of a drop in unemployment, the number of new companies tends to decrease.

¹²⁾ Quote from an unpublished study summarizing the meeting organized by PARP in cooperation with the Platinium Foundation, "Innovation in ICT" in December 2014.

¹³⁾ M. Piątkowska, P. Górecki, *Atak wolnych strzelców*, Gazeta Wyborcza, 7–8 March 2015.

In this context, the subsequent quarters of 2014 look interesting and promising. Despite a marked decline in unemployment, the number of new firms perceptibly grows (the blue and the red line at the end of the graph clearly diverge). If this trend continues (in the fourth quarter, unemployment rates fell again), we will be able to announce a new wave of entrepreneurship, which is not due to necessity (given that unemployment is falling), but rather to the awareness of new market opportunities. The latest results of an international study, The Global Entrepreneurship Monitor, give us reasons to expect it. In 2013, there was a significant increase in the share of new Polish firms whose owners declared that they decided to establish an enterprise because of new market opportunities (59% in 2013 against 32% in 2012), with a decline in the number of firms established out of necessity (37% in 2013 against 47% in 2012)¹⁴.

Chart 2. Unemployment rate in % and the number of the self-employed in 2008–2014



Source: Author’s compilation based on Eurostat data.

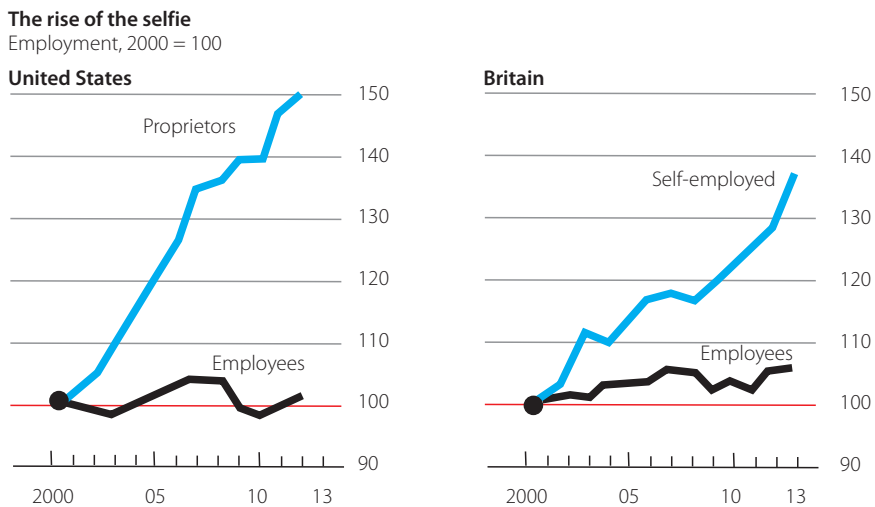
According to employment data from the US and the UK, in 2000, the number of economically active Americans remained unchanged, while the number of businesses increased by 50%. In the case of the UK, a similar trend was observed (although with slight data changes): the number of employees increased by approx. 7%, while the number of the self-employed rose by nearly 38%. In the fourth quarter of 2013, 90% of new jobs were created by the self-employed.

In Poland, the majority of new firm owners are under 30 years of age. Nearly four out of ten new firms established in Poland in 2012 were founded by the youngest entrepreneurs. The share of firms in the structure of newly established enterprises grows from year to year (with the exception of 2011, when a significant decrease in the share of firms founded by those below 30 years of age (28%) was recorded). However, soon after (in 2012), the trend clearly changed and **firms established by people under 30 formed the largest group among new firms**. A similar situation had already been observed in 2010, but differences between this and the next age group (30–39 years) were minimal: entrepreneurs

¹⁴ GEM 2014. Global Report (<http://www.gemconsortium.org/docs/download/3616>, access on: 06.03.2015); Raport *GEM Poland 2013*, PARP 2014 (<https://www.parp.gov.pl/files/74/75/76/479/21585.pdf>, access on: 06.03.2015).

under 30 founded 36.4% of new businesses, while those aged 30–39 established 36.2% of them¹⁵⁾. This trend should continue to be observed, as the available data suggests, it is likely to intensify, resulting in a growing share of firms founded by very young people in the general structure of the new firms. This also has a significant impact on the social perception of entrepreneurs. The traditional view (which has also been proven by the statistical data), according to which one should think about creating a firm later in life (at the age of 40–44), after having acquired relevant work experience and collected the necessary funding, as well as the belief that the best way to start one's career is full-time employment, are becoming obsolete and give way to the growing interest in entrepreneurship among very young people.

Chart 3. The share of employed and self-employed workers in the US and in the UK in 2000–2013



Source: On their own. What explains the surge in self-employment?, The Economist, April 12, 2014 (<http://www.economist.com/news/finance-and-economics/21600735-what-explains-surge-self-employment-their-own>, access on: 06/03/2015).

Young businessmen predominate in modern industries, particularly in the sector of information and communication technologies (in 2011, one in two newly established ICT firms belonged to a person under 30 years of age, while in 2012, their share was even greater: it rose from 50.5% in 2011 to 62.2% in 2012). Young entrepreneurs tend to develop their business activity in the service sector. Some of these activities do not necessitate substantial financial layouts, and they tend to be knowledge-intensive, thus requiring the employment of qualified staff. Among firms created in 2012, the following industries were most popular among entrepreneurs under the age of 30:

- Information and communication – 62.2% share in the structure;
- Real estate – 53.7%;
- Other services – 52%;
- Healthcare – 47%;
- Accommodation and catering – 45.9%;
- Administrative and supporting services – 35.3%;

¹⁵⁾ *Warunki powstania i działania oraz perspektywy rozwojowe polskich przedsiębiorstw powstałych w latach 2008–2012*, CSO 2014.

- Education – 34%; and,
- Culture, entertainment and recreation – 27.3%¹⁶⁾.

In the framework of the GEM study referred to above, growth aspirations of companies in early stages of development, i.e. those that have operated on the market for no more than 3.5 years, were examined. The available data shows that, in factor-oriented countries, less than 17% of entrepreneurs plan to create five new jobs in the next five years. In innovation-focused countries, their share stands at nearly 26%. Plans to increase employment by at least 50% within the next five years are declared by 9% of entrepreneurs in factor-oriented countries and by 17% of entrepreneurs in innovation-oriented countries. It transpires that, in 2013, growth aspirations of young Polish firms were quite high – 39% of entrepreneurs declared that they intended to create at least five jobs over the next five years, while 27% planned to hire ten new employees and increase the employment by at least 50% within the next five years. In terms of growth aspirations, Poland ranks third in the EU – only Romanians and Latvians have greater growth ambitions¹⁷⁾.

This perspective – namely, changes in the age structure of entrepreneurs and the growing number of young businesses – is particularly important from the point of view of public institutions supporting the economy and its environment. This trend is likely to strongly determine the nature of entrepreneurship and innovation policy; it will greatly affect the labour market and, consequently, regulations in this area.

Conclusions

These development perspectives, which seem to have a positive impact on the innovativeness of businesses, are only part of the equation. They will occur, but may be affected by negative factors or take place less rapidly than we might expect. In Poland, we simultaneously observe a growing willingness of firms to cooperate, the development of the service sector, a greater awareness of the importance of innovation, the development of the start-up market, and a slow, yet positive growth of R&D expenditure. Will these changes prove sufficient to sustain economic growth and development of innovative Polish companies? The answer to this question is probably negative, because the real change that we need is systemic, as claimed inter alia by E. Bendyk.

¹⁶⁾ Ibid.

¹⁷⁾ Raport *GEM Poland 2013*, PARP 2014 (<https://www.parp.gov.pl/files/74/75/76/479/21585.pdf>, access on: 06.03.2015).

List of publications of the Polish Agency for Enterprise Development issued in the years 2010–2014

(depending on the publication
the summary, selected chapters or the full report are available in English)

1. *Global Entrepreneurship Monitor Research Report – Poland 2013*. A. Tarnawa, P. Zadura-Lichota, P. Zbierowski, M. Nieć, Warsaw 2014.
2. *Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce w latach 2012–2013*, [Report on the Condition of Small and Medium-sized Enterprise Sector in Poland in 2012–2013], A. Tarnawa, P. Zadura-Lichota (ed.) Warsaw 2014.
3. *PPP Market from the Perspective of Public Entities*. I. Herbst, A. Jadach-Sepiolo, E. Marczevska, T. Jagusztyn-Krynicky, Warsaw 2014.
4. *Who Are the Graduates of Polish Schools?* K. Kasperek, M. Magierowski, Warsaw 2014.
5. *Future Professionals of the Polish Economy*, M. Jelonek, P. Antosz, A. Balcerzak-Raczyńska, Warsaw 2014.
6. *The Development of Competences by Adult Poles*. A. Szczucka, K. Turek, B. Worek, Warsaw 2014.
7. *Professional Activity and Education of Poles*. S. Czarnik, K. Turek, Warsaw 2014.
8. *Demand for Workforce*. M. Kocór, A. Strzebońska, Warsaw 2014.
9. *Competences of Poles and the Needs of the Polish Economy*. J. Górniak (ed.), Warsaw 2014.
10. *Cluster Benchmarking in Poland – edition 2014*. B. Plawgo, Warsaw 2014.
11. *Innovation Centres in Poland (incl. Business Incubators)*. 2014 Research Report. A. Bąkowski, M. Mażewska (ed.), Warsaw 2014.
12. *Innovation Centres and Business Incubators in Poland in 2014*. A. Bąkowski, M. Mażewska (ed.), Warsaw 2014.
13. *(R)evaluation 2. Knowledge in Action*. A. Haber, K. Olejniczak (ed.), Warsaw 2014.
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15. *Service Provider & Client Survey of the National SME Services Network (NSS) Pilot Service in Marketing and Sale of Products Micro and Small Enterprises of the Agri-Food Sector*. A. Włodarczyk, T. Klimczak, A. Miller, P. Rumińska, Warsaw 2014.
16. *Service Provider & Client Survey of the National SME Services Network (NSS) Pilot Service in Management of Energy Efficiency of Enterprises*. M. Owczarek, T. Klimczak, A. Miller, P. Rumińska, Warsaw 2014.
17. *Final Report. Service Provider & Client Survey of National SME Services Network (NSS) Consultation Points*. Warsaw 2013.
18. *Entrepreneur! Take It!* A. Walczyk-Jansson, E. Planutis, U. Gielniowska, D. Lewińska, S. Marczyńska, A. Wieruszewska, M. Kopytek, J. Rawski, A. Szwoch (ed.), Warsaw 2013.
19. *Professionals and Development. Experience and Good Practice in Selected Projects Co-financed Under the Human Capital Operational Programme for 2007–2013*. Garski Multimedia, K. Garski, W. Wierzyński (ed.), Warsaw 2013.
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30. *Review of Public Procurement by the President of the Public Procurement Office. Based on Bulletins of the Public Procurement Office of July 2012 to June 2013.* The Public Procurement Office, Warsaw 2013.
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91. *Report on the Condition of Small and Medium-sized Enterprise Sector in Poland*. A. Brussa, A. Tarnawa, K. Buczek, A. Haber, B. Jankowski, J. Łapiński, J. Orłowska, J. Pokorski, G. Rzeźnik, M. Wasilewska,

- D. Węclawska, P. Zadura-Lichota, R. Zakrzewski, G. Drozd, K. Garski, K. Kartus, N. Stawicki, Z. Wołodkiewicz-Donimirski, Warsaw 2011.
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The Polish Agency for Enterprise Development (PARP) is a government agency that has been providing support to entrepreneurs since 2000. The objective of PARP is the development of small and medium-sized enterprises in Poland, i.e. establishment of new companies, improvement of qualifications and increase in capacity, strengthening of the competitive position based on innovation and modern technologies, creating a business-friendly environment and providing appropriate conditions for conducting business activity. While performing its activities supporting entrepreneurs (as well as business environment institutions, local government units, state budget units, higher education institutions), PARP uses the funds from the state budget and the European Union funds. Both before and after the accession of Poland to the European Union, PARP has provided financial support, training, advisory support and information to entrepreneurs. In the years 2007–2015, the Agency has been and still is responsible for the implementation of measures mandated under three operational programmes, namely, **Innovative Economy, Human Capital** and Development of Eastern Poland, and actively participates in developing the premises for support programmes under the 2014–2020 financial plan.

PARP has vast experience not only in providing EU assistance to entrepreneurs. Several years ago the **Enterprise Research Centre** was established at the Agency to conduct research on entrepreneurship, innovation, human resources and services supporting the business activity. The research results provide the basis for drafting the premises for other support programmes that respond to the identified needs of entrepreneurs. Starting from 2013, PARP has been implementing a pilot project to analyse the impact of planned and existing regulations on the small and medium-sized enterprise sector (SMEs).

For the support to be efficient, entrepreneurs must have easy access to information about such assistance. PARP has initiated the establishment of the **National SME Services Network (KSU)**. The KSU offers advisory services to companies at each stage of business activity: starting from registration, through efficient operation and management of the company to suspension or termination of activity. All KSU centres (approximately 170) operate according to set standards of services, thus ensuring that entrepreneurs receive the highest quality services.

The **Enterprise Europe Network** centre operating at PARP offers entrepreneurs the chance to seize opportunities in the European market. The centre offers free-of-charge comprehensive services including information, training and consulting mainly on European Union legislation and policies, business activity in Poland and abroad, access to financing, internationalisation of enterprises, technology transfer and participation in EU framework programmes.

PARP regularly adjust its information and advisory offer to the changing needs of entrepreneurs and emerging new communication channels. The Agency currently operates around a dozen **specialist websites and social networking websites** offering e-learning courses, e-books, transmissions from training meetings and conferences, information on financial support possibilities and how to apply for them, knowledge databases, publications and research results. All these web sources (as well as additional Information and tools) can also be accessed on the main PARP website: www.parp.gov.pl. This website is used by almost a million internet users a month.

Anyone interested in obtaining information on support programmes offered by PARP to entrepreneurs and business environment institutions may use the helpline operated by the PARP Information Centre. PARP's consultants provide information by phone and e-mail and also meet directly with the interested parties.

You are welcome to use our services!

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