

## Determinants of the innovativeness of Polish enterprises



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**Abstract.** Among the factors contributing to the growth of innovation in enterprises, the state should play a special role by defining the long-term directions of developmental policy. The basic factors that create the opportunities for the development of innovation include the removal of obstacles to the demand for goods and services, easing the fiscal burden, facilitating access to the sources of capital, as well as building new business structures. The article presents basic tools of support for the development of innovation and the factors that contribute to the restriction of this process in Poland.

### Problem statement

Innovative activity means that economic entities engage themselves in all sorts of technical, scientific, financial, organizational and commercial operations which are aimed at or lead to the implementation of innovations. Innovative activities is seen as a source of competitiveness and economic growth. The innovation of Polish enterprises is usually assessed on the basis of three elements, i.e. the percentage of innovative enterprises, expenditures of entrepreneurs on R&D activities and patent activity in the Polish and European Patent Office. Innovation is considered to be the implementation of a new or significantly improved product (goods or service), or a process, a new organizational or marketing method in economic practice, or the organization of a workplace or relations with the environment. However, a new or significantly improved product is implemented when it is launched onto the market. New processes and organizational or marketing methods are implemented when they start to be used in the company's activities. The classic division of innovations implemented by the enterprises includes technological innovations of the product itself and the innovations concerning the production process. Product innovations consist in improving the existing product or launching a new product (goods or service) onto the market. The improvement refers to technical specification, components, materials, and other functional features. Process innovations mean the implementation of a new or significantly improved production or delivery methods, including changes in technology, equipment and software. Moreover, the types of innovation also include organizational and marketing innovations. R&D activities are considered to be

a special form of innovative activity of enterprises. Innovative activities are perceived as a source of competitiveness and economic growth. Fast development of markets and modern international competition are aimed at achieving high quality and modernity and therefore the importance of innovation in shaping the economy is great. The determinants of the development of enterprises and their innovativeness are, among others, investments in their research and development activities. Innovativeness of Polish business entities receives negative assessment on more than one occasion. The objective of this article is to assess the innovativeness of Polish business entities in relation to the innovative actions of the EU enterprises. Based on the results of a survey conducted in the selected group of entrepreneurs, innovation-related problems which restrict this process in Polish enterprises were listed in detail.

### Assessment of the innovativeness of enterprises

Community Innovation Survey is a joint venture of Eurostat and the Innovation and SME Programme started in 1991 (CIS I) in order to strengthen the empirical bases of the European innovation policy. As innovations are regarded such economic units which launched a new or an improved product or technological process onto the market in the period covered by a survey. CIS I surveys are a source of data and information on innovative undertakings collected from enterprises operating in all EU countries. Information obtained from the analysis of these data allows to assess the level of development of the European economy and defining the directions of the research and development policy. One of the most

innovativeness of enterprises is the percentage of business entities implementing product or process innovations. According to the most recent Community Innovation Survey (2012), on average more than a half of enterprises in the UE countries can be classified as innovative (Figure 1). Among the 28 EU countries the most innovative business units were located in Germany (72%), Belgium (65%), the UK (66%), Ireland (57%) as well as Austria and Finland (both 53%). The lowest activity is characteristic of the entrepreneurs from Romania, Hungary, Lithuania, Latvia and Poland where the percentage of innovative enterprises does not exceed 30% of all business entities. The innovative contribution of the enterprises does not exceed 30% in total. Poland is one of the last on the list of the EU-28 countries in terms of the number of innovative enterprises to the total number of enterprises in the *Industry* (Figure 1).

In Poland, the largest number of regional innovative industrial enterprises is in

the Masovian [*Polish: mazowieckie*] (29%), Pomeranian [*Polish: pomor-skie*] (28%) and Lower Silesian [*dolnośląskie*] (27%) Voivodeships. The lowest number of actively operating innovative industrial enterprises was in the Łódź Voivodeship (16%) and the Lubusz Voivodeship (15%) (Figure 2).

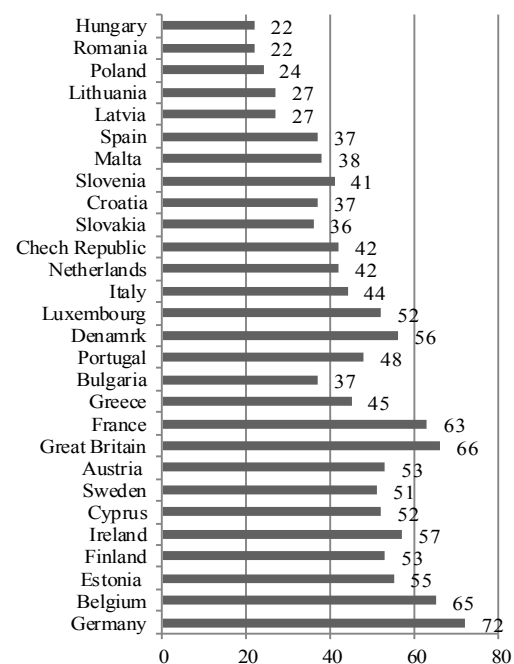


Figure 1 Percentage of companies by type of innovation activities in terms of products and processes in Industry in the EU countries (%) at the end of 2013

One of the main innovation problems of business entities is their difficult financial situation and too high costs of implementing the innovations. These factors were stressed in the Report on the innovative activities of enterprises for the years 2010 - 2013, i.e.

more than 40% of small and more than 30% of large businesses pointed to insufficient funds as a barrier to innovative activities. On the other hand, too high costs of innovation posed a problem for 39% of small and 35% of large enterprises. The barrier quite often pointed to was a difficult access to funding from external sources, particularly from the EU budget, as indicated by 30% of small and 26% of large enterprises. Proper support for innovative activities by appropriate national innovation policy associated with the EC policy is becoming the main aspect (Bukowski et al. 2012). The key role in creating a competitive advantage is played by the development of the R&D sphere of a given country. R&D activities mean systematic approach to creative work undertaken in order to increase knowledge and find new solutions. A distinct difference in the percentage of industrial enterprises running internal R&D activities can also be found in interregional comparisons (Figure 3).

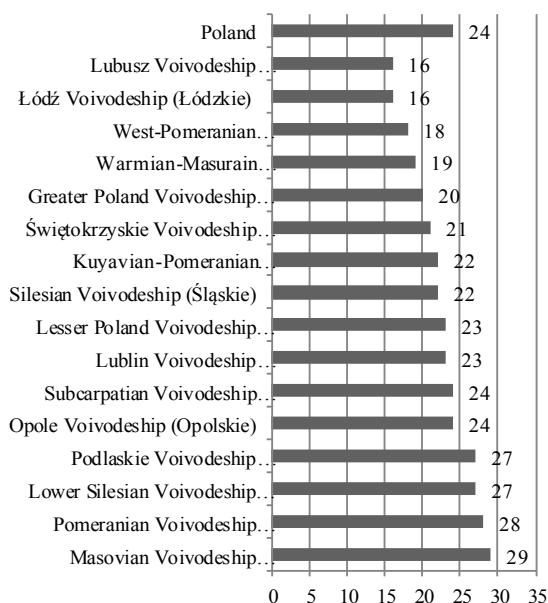


Figure 2. Percentage of innovative enterprises by voivodeship in Poland at the end of 2013 (%)

A relatively large number of companies willing to carry out internal R&D works is in the Silesian, Greater Poland and Masovian Voivodeships, i.e. 10%, and Lesser Poland, Lower Silesian, Pomeranian and Lubusz Voivodeships - 9%. The companies

from the last two voivodeships also showed the greatest tendency to conduct continuous R&D works - 4% of companies in each of these regions conducted such activities. The lowest percentage of companies conducting R&D activities was reported in the Warmian-Masurian, Świętokrzyskie and Opole Voivodeships - 5%. In the Warmian-Masurian and West-Pomeranian regions the lowest percentage of enterprises running internal R&D activities on a continuous basis was reported, i.e. below 1%.

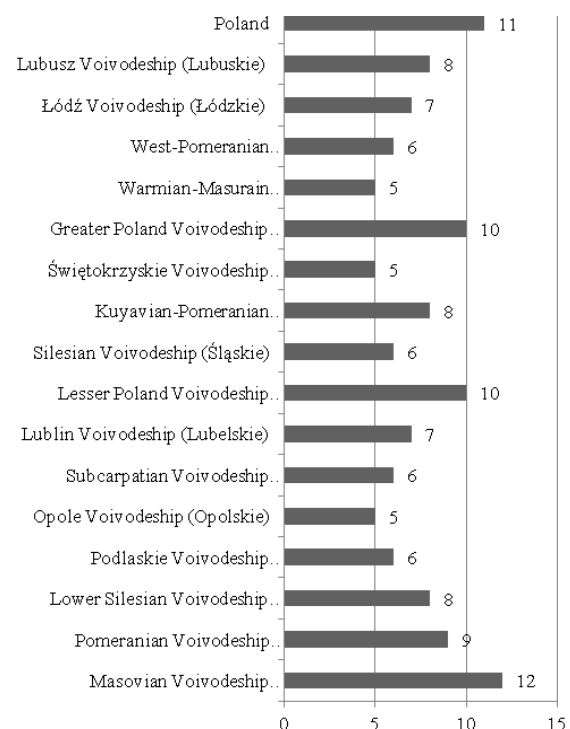


Figure 3. Percentage of enterprises running R&D activities by voivodeship in Poland at the end of 2013 (%)

### Selected instruments supporting the innovative activities of Polish enterprises

The level and intensity of innovative behaviour depends on the potential which a given enterprise has at its disposal. The intensity of innovation activities changes depending on the factors such as: legal, financial and institutional environments (Okoń-Horodyńska et al. 2008). The determinants of the innovativeness of enterprises can be divided into the internal ones based on internal resources of the

enterprise such as: human capital, tangible assets, its own research and development facilities, knowledge and technological information as well as external factors created by the environmental resources at the disposal of the enterprise. Innovativeness becomes one of the key indices of competitiveness. Innovation activities generate significant added value for industry and services, and contribute to strengthening the competitive ability of the national economy on the international market. Innovativeness of Polish enterprises, measured by indicators, differs significantly from the levels recorded in most EU countries (Kosała et al. 2011). This applies not only to product and process innovations, but also to organizational and marketing ones the importance of which is increasing all the time in the world today. Polish companies are among those companies which are the bottom of the list in terms of average expenditure on innovation activities, the percentage of companies implementing innovations, or the average value of the sales of new or significantly improved products. Polish companies are also on a low position compared to other EU countries as far as the R&D activities are concerned, both in terms of expenditure and the number of companies engaged in such activities.

In Poland, the state policy in the field of innovation includes programmes, government documents, tools and mechanisms that are aimed at the state's direct or indirect influence on the level of innovativeness of economy, and hence its individual entities, sectors or regions. A strategic document "Kierunki zwiększania innowacyjności gospodarki na lata 2007 - 2013" [*Eng. Directions of Increasing the Innovativeness of economy for the Years 2007-2013*], adopted in August, 2005, identifies four ways of the development of Polish economy. They include the use of new technologies to enhance the competitiveness of traditional sectors, creation of new enterprises based on innovative solutions and the development of small and medium-sized enterprises by means of modern technologies and methods of knowledge management, stimulating the development of cooperation between the enterprises and between the enterprises and business institutions in the field of innovation activities and motivating

large enterprises to conduct research and implement its results. "An increase in the innovativeness of enterprises in order to keep the economy on the track of a rapid growth and creation of new jobs" is considered to be the strategic objective of innovation policy. This objective will be achieved through the implementation of the following actions: human resources for modern economy, research for the economy, intellectual property for innovations, capital for innovations and infrastructure for innovations. At the same time, the National Development Strategy for the years 2007 - 2015 includes a wide range of system activities such as training and consulting activities, as well as a direct and indirect financial support for the newly founded enterprises. The largest array of instruments of support for innovative activities was provided in the Operational Programme Innovative Economy 2007 - 2013 (for short: OP IE/ in Polish: PO IG), the main objective of which is the development of Polish economy on the basis of innovative enterprises. This goal is being achieved through specific objectives concerning an increase of the innovativeness of enterprises and the competitiveness of Polish science, an enhancement of the role of science in economic development, an increase in the number of innovative products of Polish economy on the international market and the creation of permanent and better jobs. In order to achieve the above mentioned objectives actions which lead to an increase of the innovativeness of economy must be taken. The policy in Poland in the context of the European research and technical integration should be conducted in a way parallel to both an internal and external integration, i.e.:

- internal (national) integration must be pursued through market reforms in the field of science and technology which lead to the creation of an integrated national system of innovation,

- external (international) integration is a system of national reforms adapted to the course of actions taken pursuant to the EU documents.

### **Barriers hampering innovative activities of Polish enterprises**

Nowadays, the implementation of innovations decides about the competitive advantage of enterprises. Innovations are a prerequisite for a more favourable position in the world economy also for Polish enterprises and Polish economy. This issue is of particular importance before Poland joins the European Union, the economy of which is on a much higher level than the Polish economy. The most important factor of the enterprise competitiveness is quality. Product innovations and other innovations introduced in the company were considered to be an equally important factor influencing the competitiveness. Other factors of competitiveness included economic and financial factors (such as costs, investments and prices) and competition by managerial staff, excellent organization and management (Danik et al. 2011).

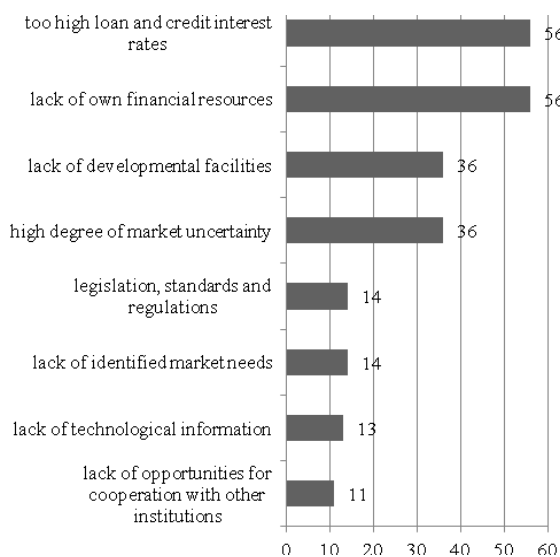


Figure 4. Barriers to the implementation of innovation in enterprises (response in %)

In order to strengthen their competitive position, the enterprises are planning a number of activities, among which the most important ones are the introduction of technical progress, expansion of the production potential and product promotion. Although Polish enterprises are aware of the need for continuous implementation of innovations, it is not directly reflected in practice. Comparing the level of the innovativeness of Polish economy and

enterprises, significant disproportion in relation to the highly developed countries can be observed. A relatively low level of the innovativeness of economy and enterprises can be illustrated with the information on the R&D expenditure, as well as the results of the research and development studies, production results and business results. In order to do this, indicators such as the percentage of R&D expenditure in GDP, innovation expenditure in enterprises, the number of patent applications, the percentage of the new and modernized products sold in industry and others are used.

In the years 2007 - 2013 the percentage of investments in R&D in GDP in Poland was on a very low level and did not exceed 0.73%.

In the EU countries most active as far as the R&D activities are concerned, this index was between 4.8 and 6.5%.

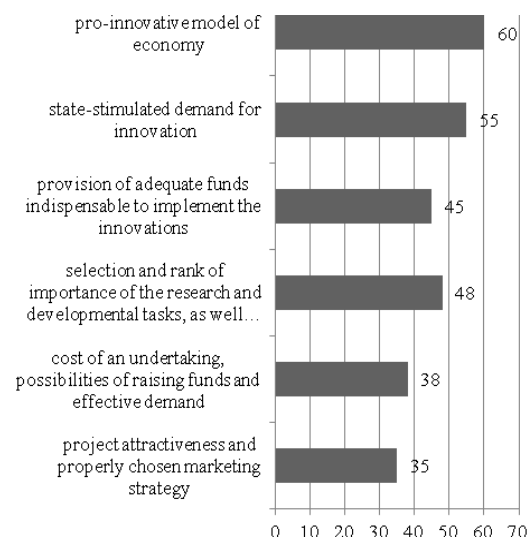


Figure 5. External factors conditioning the potential of innovative enterprises (%)

The results of empirical research (Figure 4.) point, at the same time, to the existence of many barriers to the innovativeness of Polish enterprises. These barriers are to be found both in the environment of enterprises and inside the enterprises. Among the barriers of the first group the most important is the general state of economy which does not release the mechanisms efficient enough for the enterprises to absorb innovations. Furthermore, the market demand which does not generate sufficient demand for technically

advanced products either, is also limited. The barriers to the growth of innovativeness must also be ascribed to the industrial policy. Although a number of programmes designed to stimulate innovation activities in enterprises have been introduced in recent years, it did not lead to a fundamental breakthrough in the increase of innovation. Another barrier to the increase of the innovativeness of enterprises is a financial one. The research carried out by various centres show that the lack of financial resources often prevents the implementation of innovations.

The results of the survey (Figure 5) indicate that the major obstacles to innovations are related to the environment and the influence the state has on innovation activities. However, a number of obstacles seem to be inside the enterprises themselves. This group of obstacles includes the lack of qualified personnel trained to conduct developmental research and studies and manage the innovations, and the lack of adequate technical infrastructure.

An insufficient offer from various scientific and research institutions, namely the lack of instruments of technological transfer, contributes to further deterioration of the conditions unfavourable for the introduction of the innovativeness of enterprises. The barriers to innovation occurring inside Polish enterprises, as well as in their surroundings,

call for the properly targeted economic policy, especially the industrial and pro-innovative one, friendly to the enterprises seeking innovations and implementing them. External innovative potential means a series of environmental determinants influencing the innovative possibilities of an enterprise. Innovations can be a primary source of building the skills of an enterprise. Their range depends largely on the amount of financial resources for R&D provided both by the state and by the entrepreneurs. According to the surveyed entrepreneurs, the most important determinants of the efficiency and effectiveness of the innovation processes should include the pro-innovative economy introduced by the state where innovation is a crucial developmental factor (60%), the stimulation of the demand for innovation (55%) and the participation in the costs of obtaining the capital for innovations (45%). Using the summary of results (Figure 5), one can prove that the state macroeconomic policy affects the creation of an innovative climate and supports business entities in enhancing their competitiveness at the same time.

## Conclusion

The study presents the main arguments for the innovation as the main factor shaping the competitiveness of enterprises. The results of the research illustrating the level of the innovativeness of Polish enterprises were discussed and the main barriers and determinants of its growth were indicated. Despite the developmental processes observed in Poland, there are still barriers hampering the innovative activities. The barriers listed in the survey prevent the full use of the developmental potential of enterprises. Limited access to capital is the main factor hampering the innovative activities.

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