BARRIERS OF INNOVATION ON THE EXAMPLE OF POLISH ENTERPRISES

PhD Eng. Piotr Chwastyk
PhD Eng. Mariusz Kołosowski
Institute of Technical Sciences
University of Applied Sciences in Nysa
48-300 Nysa, Armii Krajowej 7, Poland
piotr.chwastyk@pwsz.nysa.pl
mariusz.kolosowski@pwsz.nysa.pl

Abstract

Poland occupies a distant place in the rankings of innovative countries. This article describes problems that make Polish companies were not yet interested to grow through innovation. The financial and organizational barriers of innovation are presented. The legal solutions to encourage innovation and ways to encourage cooperation between research units and enterprises were also mentioned. This article explains the reasons for innovation barriers in the context of Poland's development successes. The future of Poland is associated with the need to support innovative solutions, therefore defining areas for improvement seems important for Poland's further economic development.

Key words: innovation process, research&development, diffusion of innovation,

1. Introduction

Innovation processes, which in recent times are seen as a critical elements in the development, are a major challenge for enterprises. This particularly concerns radical innovations that have a strategic importance. Choosing the correct innovation idea, innovation process planning and its efficient introduction requires appropriate knowledge, ability to make quick decisions, securing necessary resources, and above all the approval of the environment. Ensuring the right conditions favoring the atmosphere of innovation in the enterprise environment is the first important element of innovation activities. Factors that have a significant impact on the level of innovation in the company are defined as innovation diamonds.

Innovation processes in nature are different from other processes within the framework of the business. They are characterized by a high level of risk and high uncertainty of the expected results. The results of particular stages of the innovation processes have a big impact on the way of implementation of the process's successive stages. Hence derives the need to implement these processes in a sequential (serial) way, which clearly can be observed in all of the

innovation process model.

Introduction of innovation, as a consequence of the modern market mechanisms aim through introduction of new constructions and technologies in products or implementation of modern processes to bring particular benefits - tangible or intangible. Not only the level of novelty is important, but also the economic benefits that will be achieved thanks to it. Having these benefits in mind, can not be forgotten the costs to be incurred as a result of the introduction of the innovation process. To think in perspectives of future profits, it is necessary to conduct economic analyzes of innovative project's cost-effectiveness. In this paper is raised the problem of estimating the costs, which carried out in the right moments of the innovation process, allow to obtain assurance of the projected outcomes, and to make the right decisions during its implementation.

As a result of economic and political transformation, Polish companies were subjected to a strong competition on the market. Present actions were conducted in the direction to lower the costs of the current activities and have proven to be inadequate. Reduction of prices ceased to satisfy customers who are now oriented for modern products and heir appropriate quality. Orientation for the production of innovative products is necessary to follow the path of innovation. Until recently, Polish companies tried only to imitate innovative solutions. Currently it can be observed, that there is a change of perception of innovation. Polish companies try independently to develop and implement innovations. However, hence the potential of Polish enterprises is not large, the implementation of innovative processes or products without the support of external institutions is often not possible. As a result of the policy of privatization of Polish companies, the biggest of them, with big traditions have been passed into the hands of large foreign corporations. Therefore, the innovative activities are limited to the implementation processes.

On the Polish market, on the other hand, were created many young companies based on the Polish capital, which have not much experience in the implementation of innovation processes. However, they try to meet a strong competition by introducing innovations, their own efforts are often insufficient to cope with the difficult tasks. Innovation processes are subject to a number of global studies and a number of publications were dedicated to them. It should be noted, that these processes are highly influenced by the specificity of the market and the economy of the country. Therefore, to support Polish companies in the area of innovation process planning were undertaken tasks of analyzing innovation processes of Polish companies to develop planning and costs estimating models. They are designed to help managers and people responsible for implementing innovation processes in the area of organization and

management.

The research was financed by the National Science Center. They were completed in 2014 and the results were published in the book.

One of the stages of this research was to identify the barriers to innovation in Polish enterprises. This article is about this part of the research due to the understanding of such a low position of Poland in the country's innovation ranking prepared by Eurostat (fig. 1). Data for research were collected in randomly selected 30 enterprises belonging to the group of 100 most innovative companies in Poland representing various industries.

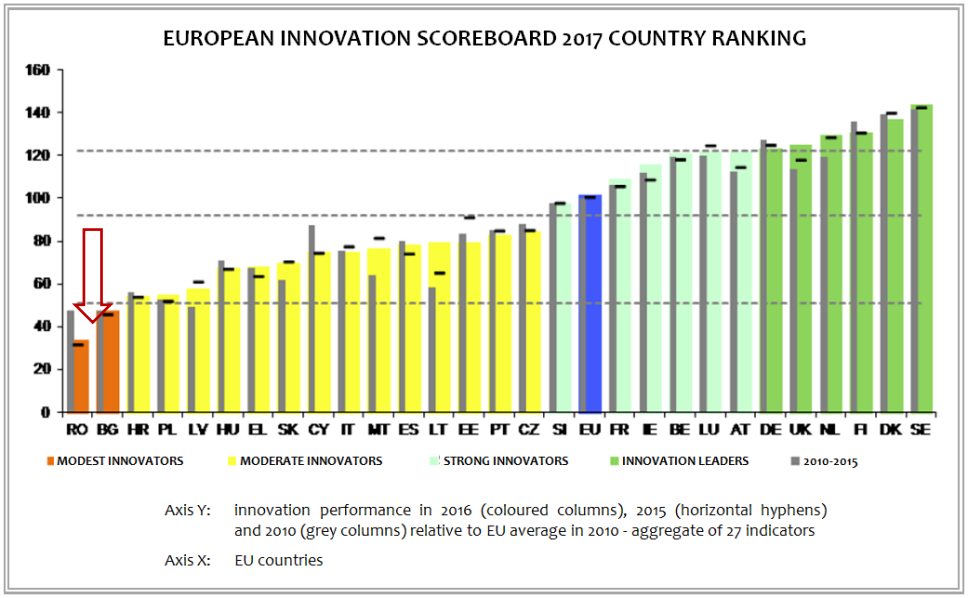

Fig. 1. European innovation scoreboard 2017 country ranking

Source: Eurostat

2. Innovation processes

Rapidly developing market poses difficult problems for businesses. Surviving on the competitive market requires a flexible approach to the ever-changing conditions. Not only adapt to the demands of the market is important, but also to anticipate upcoming changes and proper preparation for them. Innovation is the best way to prepare for these new market conditions. They also allow for the development of the company and the effective fight against competitors. Important elements of the innovation are the ability to perceive the market opportunity, creating conditions for the development of innovative solutions and the ability to organization and management of innovation processes. But the most important element of innovation is the ability to make decisions under uncertainty. The uncertainty is associated with the implementation of activities that have a unique character. They were not carried out in the past

and thus can yield surprising results. Therefore, managing the process of innovation brings with it a high risk that may affect the need for high costs and even the failure of the realized process. The process of creating new solutions is complex and usually does not run linearly. Not every innovation is the result of research and development. often new ideas appear and are implemented on the occasion of regular business operations, in particular, it applies to incremental innovations that improve already existing processes and products. Similarly – in a diffusion process - some of the innovations can be implemented and developed by the company based on external solutions. However, at the level of the entire economy, each stage of innovation creation is important. The existence of bottlenecks in this chain leads to systematic waste of resources (eg when the results of R&D works are not further implemented) or dependence on increasingly expensive and inaccessible foreign know-how and marginalization on the international market of modern technologies (when, despite financing the implementations and diffusion there are no funds for any of the R&D stages). That is why designing an effective innovation support policy requires a holistic view of all stages of creation and implementation. In this analysis, five of them were distinguished - from basic research to the diffusion of new solutions (fig. 2).

Fig. 2. Stages of creating and implementing innovation.

2.1. Fundamental research

The aim of fundamental research is acquiring new knowledge, which does not have immediate, direct practical application, but it can be the basement for further implementation-oriented R&D works. Conducting basic research has, besides the cognitive motive, also an intermediate utilitarian goal - economic. Knowledge obtained by the incurring expenses can be used by other entities, also from other sectors. Blocking the dissemination of basic research results is not only difficult but also not optimal from the social point of view due to the loss of positive externalities. This causes the private sector to be reluctant to get involved without public support. That is why the public sector is the main founder of fundamental research in developed countries. This does not mean, however, that only the wealthiest economies should engage in conducting fundamental research. On the contrary. Public expenditures for fundamental research induce companies to incur additional own expenditures on innovations,

because only in this way is guaranteed a better use of available external knowledge. Companies will be more willing to invest in research, the better external research facilities will be offered to them. In addition to new knowledge, the outlays for fundamental research bring significant benefits to companies in the form of highly qualified R&D staff, scientific infrastructure for rent, as well as more easily accessible networks of scientific institutions and teams with appropriate methodological preparation. The resources created for basic research can be used in the next stages of innovation. This means that entrepreneurs located in a medium developed country will be more willing to invest in innovation, the better the university facilities will have at their disposal, so the more the government invests in basic research and university education from public funds.

2.2. Applied research

Applied research is conducted to acquire new knowledge that has specific practical application. The private sector has a greater share in the financing of this type of research, but still high uncertainty of results, financial constraints and the presence of positive externalities means that without public intervention this area would be underfunded compared to the social optimum, which would also mean wasting the potential of knowledge gained in during basic research, and therefore also public funds. At the same time, however, at this stage should be clear justification for the research activity - a willingness to use the results by the private sector or public institutions. The effective model of public support in this case is the co-financing of research from various sources interested in their implementation, i.e. creating, supported by public funding, platforms for cooperation between scientific institutions and business. Additional incentives can provide tax relief for expenditure on business R & D, particularly effective in the case of larger companies have their own research departments and able to fully benefit from tax because already earned income. This solution does not require public administration to make decisions about granting aid, leaving companies to decide on involvement in the most promising projects from their perspective

2.3. Product development and demonstration innovation

Implementation of new ideas during the development and demonstration of innovation are not always the result of research conducted in the company. A significant part of the new solutions comes from ideas created as part of running a regular business or is born in the minds of creative employees or entrepreneurs. Rationality, type and scope of public support at this stage arise from the novelty of the project and the possibility of obtaining financing from other

sources. In the case of the most innovative projects, high-risk and requiring costly demonstration, it may still be required non-refundable aid. This is particularly important for small entities, including startups. They can also be provided with help in the form of basic infrastructure useful in the incubation phase of the company and support in obtaining a patent. In the case of lower risk projects, where the main problem is the inadequacy of the financial market or positive externalities, more appropriate forms of intervention will be repayable assistance or tax breaks.

2.4. Diffusion

Diffusion of innovation is the last stage of the process of creating and implementing innovations, based on their taking over by other enterprises. Diffusion can concern new solutions for both the company as well as for the domestic market. It can also be an innovative foreign solution. In any case, as a result of diffusion of innovation, the productivity of the entire economy increases. While the previously listed stages were associated with a high risk, and only a small participation of the company in benefits brought by innovation, for the diffusion of innovation these problems are insignificant. Motivations for public intervention may be in this case, only imperfection of the financial market, which limits investment opportunities for small and medium-sized enterprises, and not recognizing the business benefits of implementing modern solutions. At the stage of diffusion, an important form of public pro-innovation policy may be support for the construction of necessary human resources - both in the science sector and for entrepreneurs.

3. Barriers of innovation indicated by Polish entrepreneurs

The above-mentioned ways of overcoming financial barriers to the development of innovation (in addition to the diffusion stage) can be included in the push policy, focused on stimulating the supply of new solutions. They are complemented by a pull policy that creates demand for innovation. They may take the form of the previously indicated support for diffusion of new solutions in the private sector, as well as imposing their introduction through regulations and standards (in particular, environmental and health issues) and direct demand by the state through public procurement of innovative solutions or the establishment of awards and a guarantee of purchase of an innovative good in the event of solving a specific problem (eg development of a vaccine). A positive aspect of pull policies is that they create markets for innovators and attract private investors without selecting the winners in advance.

From the point of view of Polish companies, the biggest barriers limiting innovation are:

- Lack or insufficient equipment of research units,
- Access to financing sources,
- Conflict of interests between an entrepreneur and scientific units,
- Lack of highly educated staff.

3.1. Equipment of R&D units

This problem should be considered in the context of changes that have occurred in Poland over the last several decades. At the beginning of the nineties Poland, after the collapse of the Soviet Union, entered the path of democratic change by opening itself to the world. The first contact with the realities of the capitalist market caused the collapse or sale of the largest Polish companies. Many people lost their jobs and unemployment began to rise. Instead of large companies, micro and small companies started to emerge. They noticed their chance on the market by producing products that were missing on the market or were much cheaper than imported products. High unemployment guaranteed cheap labor, resulting in low production costs. This was the first stage of the development of the Polish economy. The next stage took place when the market saturated with the manufactured products. To maintain their position on the market, companies had to provide modern products. The production costs in Poland were still low due to the persistent unemployment, which is why it was enough to copy modern solution from world markets. It was a period of imitation of innovative. In both the first and the second development period, there was no need to invest in modern research and development facilities. Such investments are very costly and researches are risky. The guarantee of low production costs as a result of high unemployment allowed Poland to develop well.

Currently, Poland has entered the third phase of economic development. Poorly paid workers started to look for work abroad. A huge wave of economic emigration caused the outflow of well-educated employees. Unemployment has dropped significantly and employers have problems finding employees. To find a good employee the entrepreneur must provide him with better working conditions and a higher salary. Production costs are rising and can no longer compete on price by offering the same products. It is necessary to change the development strategy towards innovation. Unfortunately, Polish companies, mainly small and medium ones, have not invested in research and development before. That's why they are not prepared to run such an activity despite having a lot of ideas.

In developing economies, which is Poland, public research and development units should support these companies. Unfortunately, there is another barrier here, because over the years also the development of these units has not been taken care of. However, there is a chance to

eliminate this barrier. As a small country, Poland has not experienced a global crisis, and is constantly growing. GDP is growing and the government is devoting more and more resources to the development of research and development units. In the recently published Innovation Ranking of the Global Innovation Index 2017, Poland is a leader in the dynamics of growth of expenditures on research and development works by companies in the years 2008-2015. During this time, an increase of 212 percent was recorded.

3.2. Access to sources of financing for innovation

Polish companies can use many programs supporting innovative activities. You can obtain financing for innovations from both domestic and foreign sources. However, the surveyed enterprises pointed not to the lack but to the difficulty in accessing these funds. Own financial contribution is often a big problem. Small and medium-sized companies do not have such large financial resources. Although it is the ability to take advantage of the credit, but it is very risky. Another reason for not using funding under EU programs is big bureaucracy. Detailed elaboration of all application documents and then a large number of documents to be prepared during the implementation of the project requires a lot of work. It requires the employment of additional people, or delegation of own employees to this task. The additional costs of the enterprise are mainly borne by small companies.

3.3. Conflict of interests between enterprises and the scientific unit

As mentioned in point 3.1, academic centers and scientific units should support the development of innovative ideas. In Poland, scientific units are mainly based on state subsidies. The size of these subsidies is granted on the basis of scientific achievements measured by the number of publications, the number of citations and promoted scientists. The surveyed enterprises pointed to the problem of cooperation with scientists who were interested in obtaining data and information allowing to publish as many articles as possible. The conflict consists in the fact that the entrepreneur wanted to receive a ready-made practical solution, and the scientific units to demonstrate the conduct of research and the number of publications. The enterprises often did not receive the ready solution or received a solution that could not be implemented.

3.4. Highly qualified staff

This is another problem of the Polish education system. In order to raise the level of education of the society, activities for the development of universities have been launched.

Polish universities receive funding depending on the number of students. Universities began to receive more students. With the increase in the number of students, the quality of their education has dropped. In Poland, there were also many private schools focused mainly on profit, which did not support the quality of education. Numerous people with higher education have increased, but their preparation to practice is insufficient. An entrepreneur in Poland have to spend many months for preparing a graduate to work. Better graduates, talented and ambitious graduates found employment in large companies abroad Polish.

4. Summary

In recent years Poland is trying to catch up with the developed countries and it should be said that it does it rationally. The lack of involvement in innovations, which are costly and risky, has so far been a sensible activity. A large development of the economy was achieved using traditional methods of gaining a competitive advantage. Low production costs guaranteed demand for Polish goods, providing stable economic growth. Customers at home and abroad eagerly bought Polish goods because they were cheap and of good quality. Such a policy of economic growth also allowed to save the Polish economy from the global crisis in opposite to highly developed countries, which invested in high-risk innovations and suffered the negative effects of the crisis (Fig. 3)

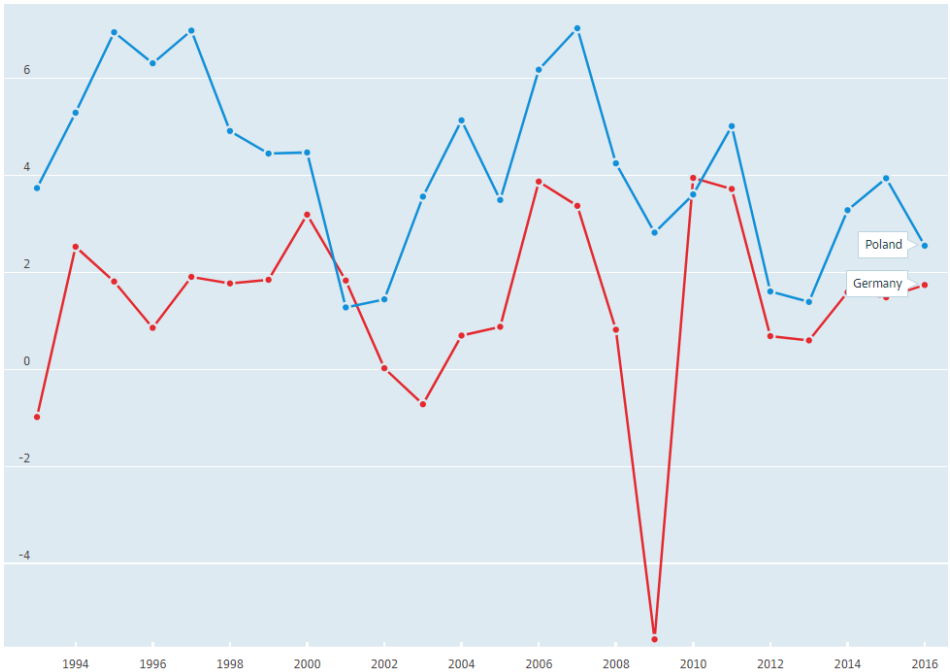

Fig. 3. GPD, Annual growth rate (%), 1993 – 2016 in Poland and Germany.

Source: data.oecd.org

The period of using simple market tools to achieve success has already passed and the level of development achieved has forced Poland to invest in innovation. The barriers that are the result of the previous policy should now be effectively removed. In order to encourage state institutions and enterprises to develop through innovation, a number of changes in legal regulations have been introduced. It should be mentioned above all the allocation of large financial resources for research and development for enterprises under the condition of cooperation with scientific institutions and amending the law on higher education, which changes the funding of universities and scientific institutions depending on the number of innovative solutions implemented to the industry. This law also limited the number of students going towards raising the quality of education, and promotes the practical training and higher schools with professional profiles. The undertaken actions give hope that Poland will start to be higher and higher in the ranking of innovative countries.

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