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Polish enterprises – innovators or followers of already existing technological solutions

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Abstract. The aim of the article is to verify whether projects implemented by enterprises in Poland are the result of the own research and development of these enterprises or co-operation with research centers, or whether they are the result of readymade solutions acquired from the market.

Keywords: *innovation, imitation, economic development, investment projects*

Introduction

While studying the issue of innovation in economy more attention should be drawn to the phenomenon of imitation of technologies, products, services or processes, as a lot of projects implemented by enterprises are not the direct effect of their work on research and development or their cooperation with scientific centers while working on these solutions. These projects lie mainly in purchasing new technologies or adopting already existing solutions to meet the needs of the enterprise. However, as it is often emphasized, the novelty of the applied solutions, their very limited use on a particular market as well as significant contribution to improving competitiveness give rise to qualify them as innovation projects. Therefore it is worth considering whether investments like these should be treated as equal to projects which are created in-house or in research centers to meet the needs of business units, and whether they may be viewed as innovation. The answer to this question is not provided by the very definition of the concept of innovation. The first definition presented by J.A. Schumpeter clearly indicates that the key element of innovation is novelty, both in the context of technology, the method of production, market, resources as well as the product itself.[7] Thus projects connected with imitation, according to the definition by the Austrian scientist, should not be considered as innovative. By contrast, another crucial definition proposed by A. Hargadon and R.I. Sutton indicates that innovations result from the exchange of knowledge from various functional areas of the company and from its surrounding. As the result of using the solutions existing in the business environment in a new unexpected manner, there appear new services, products and processes. Hence, implementation might be also the implementation of a well – known solution onto a completely new area.[2] This definition explicitly takes into account imitation, i.e. adopting existing ideas for the needs of particular enterprises or sectors. Similar conclusions may be drawn on the base of the OECD economic definition from the Oslo Manual handbook, which is most frequently referred to in the subject literature and used in practice. In accordance with OSLO methodology, innovation is to be understood as implementation of a new or significantly improved product or a process, a marketing method or an organizational method into the economic practice, organization of a workplace or relations with the surrounding.[4] In this way the adoption of existing solutions for the benefit of the project is covered by the proposed definition since most often it is made by the improvement of an already existing solution. This divergence in views justifies verification, attempted in the arti-

cle, to what extent implemented projects result from the works on research and development in-house or co-operation with research centers, as well as, to what extent it is the effect of acquiring new solutions from the market.

The research area covers Polish enterprises and entities based in Lublin Voivodeship. The paper aims at examining the hypothesis that the prevailing orientation of enterprises towards adopting existing technological solutions provides the potential for the long-term development of the Polish economy. The considerations presented in the paper will be carried out on the base of the data analysis of secondary research which compares innovation of particular countries published in Innovation Union Scoreboard 2013, as well as primary research achieved due to the questionnaire research carried out among entrepreneurs of Lublin Voivodeship in QIV 2011 within the research project NN 113 303038.

1. The significance of innovation and imitation for the economic development

In the subject literature much attention is paid to the analysis of the impact innovation exerts on economic development. Nearly all of them unanimously point out the benefits from incurring costs for this purpose in the long-term perspective. One should also note, however, the analysis of the impact of investments which are rather imitative than innovative. The findings of the research carried out by J. B. Madsen, Md. R. Islam, J. B. Ang on the sample of 23 countries of OECD and the sample of 32 developing countries, showed that the long-term efficiency of these strategies is different. The countries with a higher level of development generate their economic growth through expenditures on research and development, which results mainly in innovative projects. By contrast, developing countries generate their economic growth by taking advantage of imitation. Currently, both strategies are complimentary and effective, yet in the long run changes are necessary, which, in turn, rules out mutual benefits. The results of the research show that developed countries are still interested in keeping the technological distance to developing countries, thus they should strive to continue high spending on research and development so as to hold the position of a creator of innovation. It allows them to preserve the competitive advantage on the market and benefit not only from the area of sales of goods and services but also from readymade technological solutions. On the contrary, countries which are at present mostly imitators should intensify expenditure on research and development to minimize the technological distance and to get closer to countries with a high level of

development in the area of creating their own innovative solutions.[3] On the base of the above it may be concluded that the strategy of imitation of technological solutions brings numerous benefits only in the short run. Unfortunately, implementing an innovative strategy countrywide is quite costly, and what is more, some enterprises show little interest in the change like this. As O. Shenkar's research on particular business entities proves following the solutions already existing on the market and adopting them for one's own needs is cheaper and less risky, and what is more, quite often more effective in economic terms. This may be proved by the performed analysis which show that companies which frequently imitate a given solution are economically more successful compared with those entities which claim to be the authors of a particular innovation.[8] Yet, to continue development of economy as a whole system in the long term, it is desirable to reduce this technological distance to the countries with the highest level of economical development and to shift the burden of development towards innovative strategy. One of the solution is to use a mixed strategy during the transition period which allows to expose to enterprises the benefits from creating their own innovations. Furthermore, such changes require significant expenditure by the state to support research carried out for the sake of

entrepreneurs who search for new innovations. Still more, there is a need for the change in the system of education, which would allow companies to create their own innovations.[10] Such activities are costly, however, the sooner they are taken the more benefits are brought to enterprises, and consequently for the whole economy. [5]

2. Innovation of Polish economy against other EU countries

Over the last few years Polish economy has been gradually shifting from the strategy of imitation towards the strategy of innovation. As the data in Figure 1. show innovation in Poland measured with the integrated index (SII)¹ is ranked very low. In 2012 among the EU 27 countries Poland came twenty-fourth outperforming only three other countries, i.e. Bulgaria, Romania and Latvia. The value at the level of 0.270 was half lower than that of the EU average and accounted for 35% slightly over of the index value of the most effective country in this area, i.e. Sweden. Poland was outdistanced by most countries with a similar level of economic development such as Slovenia, Estonia, the Czech Republic and Hungary. It proves low potential of economic development in the subsequent years.

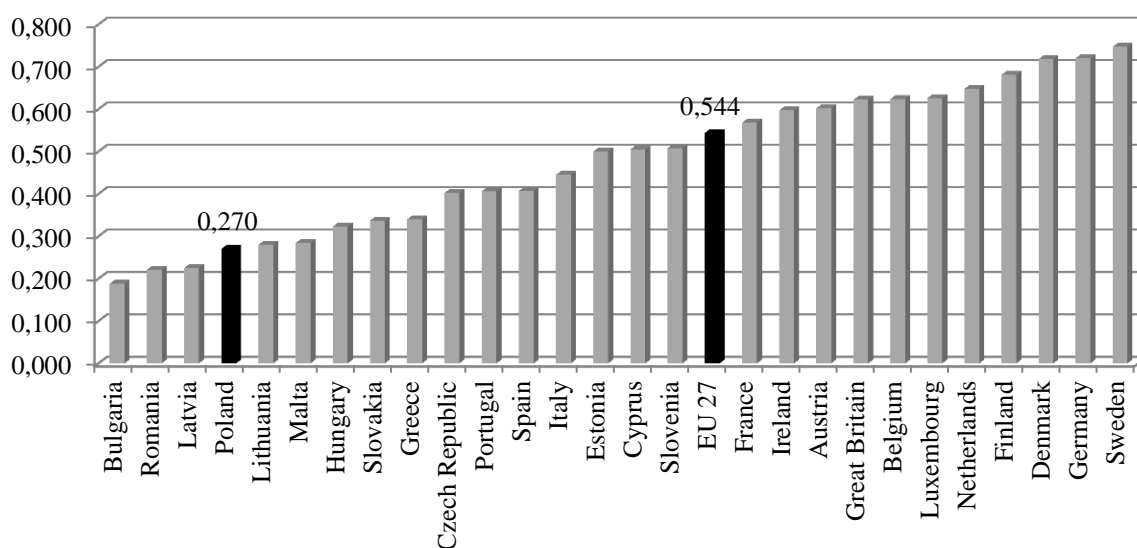


Figure 1. Summary Innovation Index (SII)* for the EU in 2012

(Source: Innovation Union Scoreboard 2013, http://ec.europa.eu/enterprise/policies/innovation/facts-figures-analysis/innovation-scoreboard/index_en.htm, p. 74)

Two selected specific parameters SII - Linkages and Entrepreneurship and Intellectual Assets - will serve to compare the extent to which implemented projects are the result of the company's own research and development, and to which extent they result from purchasing readymade solutions at the market in particular EU countries. The first parameter examined here is made up by the following variables: SMEs innovating in-house (% of SMEs), Innovative SMEs collaborating with others (% of SMEs),

Public-private co-publications per million population. This indicator mainly reflects the ability of the sector of small and medium companies to generate their own innovations as well as the extent to which these innovations are commercialized and used in co-operation with other entities. The data in Figure 2 indicate a very difficult situation of Polish economy in this area because small and medium enterprises are characterized by a very low degree of innovation.

¹ SII (Summary Innovation Index) is a relative indicator and shows how with particular parameters a given economy performs compared with other examined countries. As it is assumed the best country is assigned 1 in a particular category and the country with the worst index value - 0. Other countries are given 0-1 depending on their values compared to the highest and lowest assessments. For the Summary Innovation Index analysis there were selected the following variables: Human Resources, Research system, Finance and support, Firm investment, Linkages and entrepreneurship, Intellectual Assets, Innovators, Economic effects.

The examined indicator is higher only in Romania and Bulgaria, and nearly six times lower than the EU average. Still worse, Poland was outrun in this area not only by the countries with a high level of innovation but also the majority of Central and Eastern Europe. In conclusion, the majority of Polish companies are imitators of solutions al-

ready functioning on the market, they are not innovators. By this very fact, the process of strategy transformation has just been started and the effects of the changes, which are being introduced, are likely to appear no sooner than in a few years.

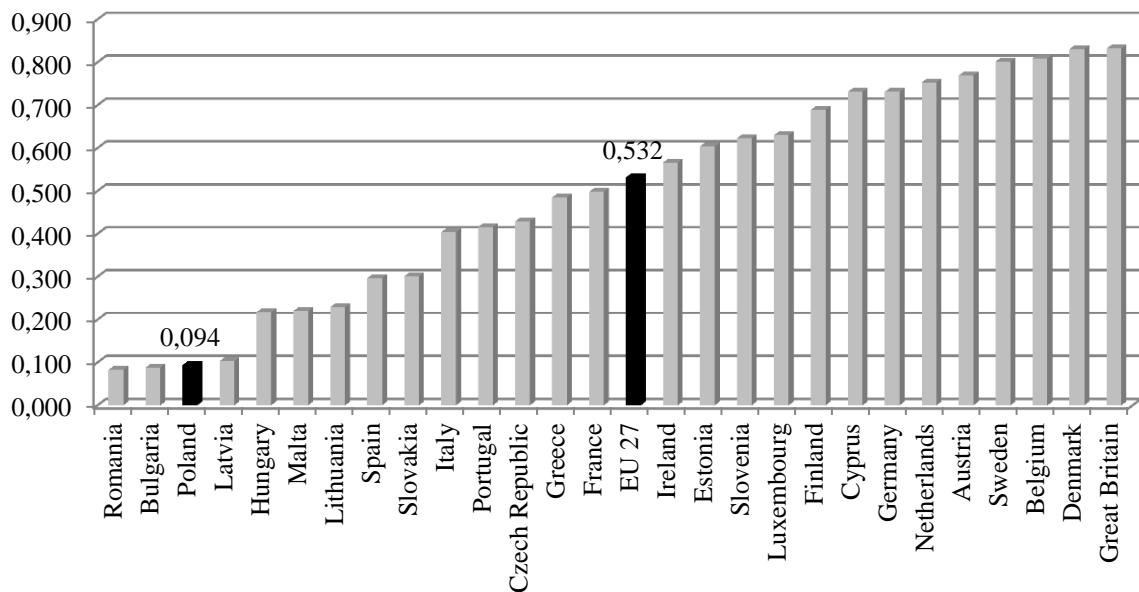


Figure. 2. Linkages and Entrepreneurship Indicator in the EU countries in 2012 (Source: Innovation Union Scoreboard 2013)

It is also proved by the detailed analysis of the other parameter, i.e. Intellectual Assets, which is made up of the following variables: PCT patent applications per billion GDP (in PPP€), PCT patent applications in societal challenges per billion GDP (in PPP€), Community trademarks per billion GDP (in PPP€), Community design per billion GDP (in PPP€). This indicator reflects mainly the society's ability to create innovation both in scientific research

and enterprises themselves. Therefore, it allows to verify whether Polish economy is already able to execute fully the strategy of innovation or whether companies are forced to purchase modern solutions from abroad. As the data show, due to the current situation Polish enterprises are more willing to realize the strategy of imitation rather than innovation.

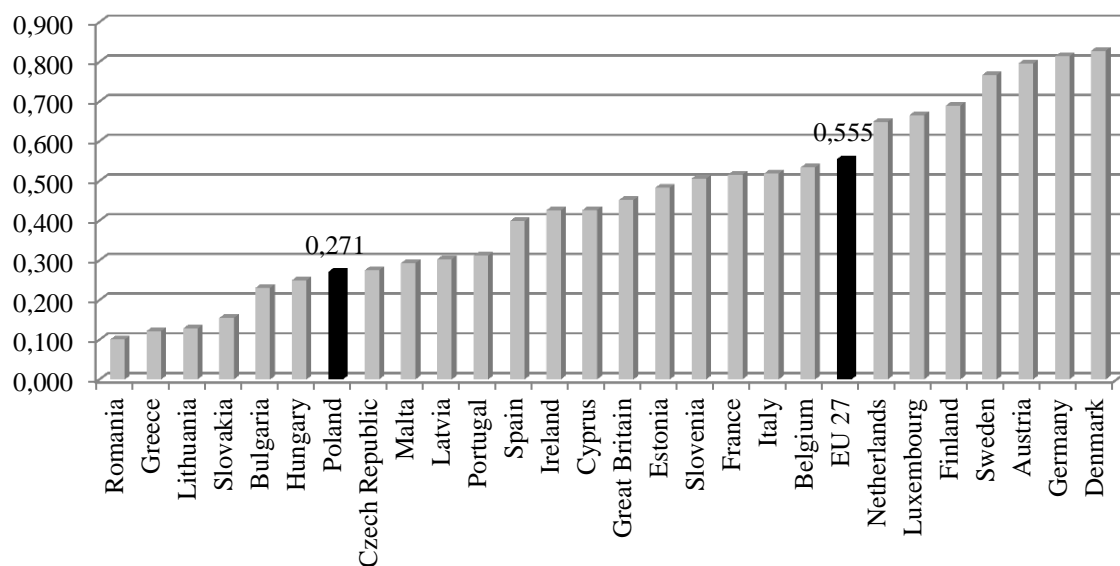


Figure.3. Intellectual Assets Index in the EU countries in 2012 (Source: Innovation Union Scoreboard 2013)

Admittedly, Poland managed to outrun a few countries of the EU, yet, the distance to the EU average, and to most active in this area Denmark, Germany and Austria is real-

ly huge. Such a situation is only the consequence of the weakness of Polish science and the lack of the proper policy which would foster running research and development

of companies. The activities which have been undertaken recently and which aim to increase commercialization of the research in academic centers as well as boosting the activity of companies in creating their own solutions through research, are not yet directly transposed to the desired effects. Hopefully, the processes instigated in this area will exert a significant impact on the change of the situation in the long term.

3. Sources of innovation in Lublin Voivodeship

In 2011 within the research project “Financial Instruments of Supporting Development of Innovation of Enterprises in the Lublin Voivodeship” financed by MNiSW (the Ministry of Science and Higher Education) No NN 113 303038 the survey research was done whose one aim, among others was to identify the sources of inspiration for innovative projects. The research covered 395 enterprises in the Lublin Voivodeship, 190 of which implemented various kinds of new solutions on new product or services, the process of manufacturing, the organization of company’s functioning, or marketing instruments. In this way the share of innovative companies was significantly higher than the country average and that of the Lublin Region. It should be noted, however, there are also entities in this group which actually bought readymade solutions on the market, thus the projects they realized were, in fact, imitation. The analysis proved that, in terms of the scale of the enterprise activity, prevailing were local and regional enterprises which accounted respectively for 30,8% and 34,5% of the research table. Much lower was the number of business units surveyed on a country scale (23,5%) and international (11,2%). It should be empha-

sized, however, that this structure is typical both for the whole country and the researched voivodeship.

As the data in Figure 4 present, among 190 enterprises, which were realizing their own innovation projects or those of imitation nature, while implementing them, the majority were inspired by the sources indicating the purchase of solutions already existing on the market. Only 17,3% of respondents were carrying out their own research and development, and merely 7% were co-operating with universities and research centers. These entities are still in minority among the researched companies even if one adds up to this group a relatively high number of enterprises which were looking for solutions on their own in the subject literature and academic papers (slightly below 15%). It shows the dominant role of imitations in realized research projects. For comparison, the majority of enterprises found out about the applied technology from the companies in their business environment, i.e. clients (40,3%), technology providers (37,7%), company’s direct suppliers (36,1%) and competitors (31,9%). Although it shows the prevalence of imitation, some positive symptoms may be also noticed as in Poland the process of diffusion of innovation increasingly gains in its importance. Business entities are compelled by the market to see new solutions and use new technologies, which only gives a good forecast for the future. The analyzed research also confirmed that the Internet is the key way to search for new solutions, as it was pointed out by 50,3% of the companies examined. Additionally, business entities look for information on prospective innovations or used solutions which are likely to be adopted for their needs at workshops, conferences (27,7%) or at sector fairs (26,7%).

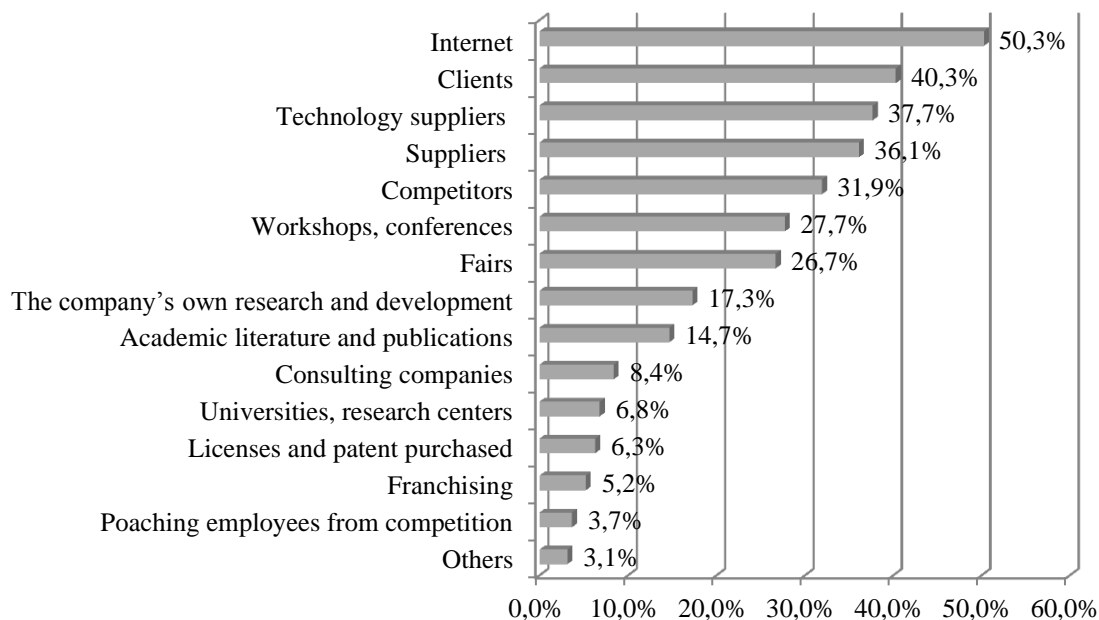


Fig.4. Source of inspiration for implementing innovation in enterprises in the Lublin Voivodeship (a few sources could be marked by the respondents)
(Source: The author’s own study based on questionnaire research)

The comparative analysis of the responses of enterprises with various ranges of activity presented in Table 1 shows that business entities with cross border area of activity, and even a domestic one, take advantage of a much wider

spectrum of sources of inspiration. Equally important is the fact that within this group of respondents many more companies started co-operating with universities or research and development centers, or they carry out their

own research and this should bring about their own innovative solutions. This means the companies willing to compete on a bigger market have already started the transition process from imitation to innovation. They can see

in innovations an opportunity to build up a competitive advantage, which, apart from winning new clients, will allow them to get a bigger margin of sales.

Table.1

Source of inspiration for implementing innovation in enterprises in Lublin Voivodeship which have various areas of activity (a few sources could be marked by the respondents)
(Source: the author's own study based on questionnaire research)

Sources of inspiration for innovation	The range of business			
	local	regional	home	cross-border
Company's own research and development	9,5%	15,9%	20,0%	27,6%
Clients	35,7%	47,8%	37,8%	34,5%
Fairs	26,2%	23,2%	24,4%	41,4%
Suppliers	42,9%	37,7%	26,7%	37,9%
Competitors	35,7%	27,5%	26,7%	41,4%
Workshops and conferences	11,9%	36,2%	28,9%	31,0%
Universities, research and development centers	7,1%	1,4%	6,7%	17,2%
Consulting companies	4,8%	8,7%	11,1%	6,9%
Internet	45,2%	56,5%	42,2%	65,5%
Academic books and publications	14,3%	14,5%	15,6%	17,2%
Poaching employees from competition	2,4%	7,2%	0,0%	3,4%
Licences, patent purchased	2,4%	5,8%	4,4%	17,2%
Franchising	11,9%	5,8%	2,2%	0,0%
Technology suppliers	23,8%	39,1%	40,0%	51,7%
Others	2,4%	4,3%	2,2%	3,4%

The situation is quite different in the case of local enterprises or those of regional character. While realizing investment projects, the majority of them acquire ready-made solutions and adopt them for their needs. In this way they become imitators, because such activities are cheaper and, above all, less risky.

Yet, one may note that the transition process from imitation to innovation has already been started in Polish enterprises, as entities which would like to compete internationally or be strongly competitive on the domestic market, more often create innovative solutions on their own and become the leader forcing changes in smaller entities, too. One may rightly expect these changes, which are currently under way in Poland, and which in the subsequent years are going to get dynamised with compliance with the Strategy of Innovation and Effectiveness of Economy „Dynamic Poland 2020”[6], will result in a wide range of benefits in this area in the long term.

Conclusion

As it has been argued above, in the recent years Polish economy has been at the stage of a slow transition from the strategy of imitation to the strategy of innovation. However, the majority of technological investments still lie in purchasing readymade solutions and, what is more, limited expenditure on research and development does not allow the enterprise to generate its own technological solutions, which would, in turn, provide the basis for using them in the strategy of innovation.[9] Additionally, the policy of the state does not sufficiently encourage a fast change in this field, as the both types of solutions are treated as equal , and in this way business entities can get funding both on innovative projects and projects which are merely the purchase of already existing solutions. It is proved by the procedures of applying for aid within the Programu Operacyjnego Innowacyjna Gospodarka or re-

gional operational programs for co-financing innovative investments. In this case an innovating project is most often viewed as the one which results in the use of technology, launching a product/ service, or implementing process changes, functioning on a given market no longer than three years and whose prevalence in a given sector is lower than 15%.[1] Therefore, it may be clearly concluded that the imitation of solutions existing on the market is regarded as innovation. Such an approach is confirmed in Poland also by the opinions of entrepreneurs themselves. The research done among business entities from the Lublin Voivodeship showed that only 20% of respondents pointed at co-operations with scientific and research institutions as a characteristic of an innovating company, while 17.5 % -at financing development research. A considerably bigger group of the examined business entities viewed factors characteristic for imitation as essential for innovators.

Yet, it should be noted that there is a chance for the current difficult situation in this area to be changed in the long term. The actions taken in the country which aim to increase the commercialization of the research carried out at universities and in scientific and research institutions, to popularize and support financially the development research carried out in business entities, to develop the infrastructure of scientific and research development and to activate it to meet the needs of business, in a few years are to change the strategy of development of Poland towards its innovation. Such an action seems necessary, since the potential of the present factors determining the success of Polish economy, i.e. low costs of production along with relatively high effectiveness of labor are slowly running out. The enlargement of the European Union with Romania, Bulgaria and in a few years with Ukraine, as well as the strong competition on the part of Asian countries, by using innovation strategies makes the further

development impossible. Polish enterprises to become competitive cross border have to be more innovative and mainly due to their own ideas and technological solutions.

Unfortunately, the process of these changes is long and requires substantial funding on the part of the state.

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Мистерек В. Польские предприятия – новаторы или последователи уже существующих технологических решений

Аннотация. Целью публикации является проверка, являются ли внедряемые инновационные проекты предприятий в Польше результатом собственных исследований или сотрудничества с исследовательскими центрами, или же результатом приобретения готовых решений на рынке. Представленное в статье сравнение инновационной деятельности предприятий Польши и стран ЕС проводилось на основе анализа вторичных данных опубликованных в Innovation Union Scoreboard 2013. Они показали низкий уровень инновации польской экономики на фоне других стран ЕС, а также преобладающий, доминирующий уровень имитации в польских предприятиях. Эта ситуация была подтверждена в первичных исследованиях, полученных на основе опроса, проведенного среди предпринимателей Люблинского воеводства, из которого явствует, что большинство фирм, осуществляющих инновационные проекты, пользовалось уже существующими на рынке решениями. Анализ, представленные в публикации, показывают, что на данный момент польская экономика является на этапе медленного перехода от стратегии имитации к стратегии инновации. В краткосрочной перспективе такая ситуация дает определенную пользу, однако, для поддержки долгосрочного экономического роста необходимо значительное увеличение расходов на исследования и развитие, а также интенсификация сотрудничества экономических субъектов и испытательных учреждений с целью разработки большего количества собственных инноваций. Показано, что в долгосрочной перспективе для экономики в целом стратегия инновации гораздо более эффективна, чем стратегия имитации.

Ключевые слова: инновации, имитации, экономическое развитие, инвестиционные проекты