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THE EFFECTIVENESS OF INNOVATIVE ACTIVITY IN THE AGRI-FOOD SECTOR IN THE PODLASKIE VOIVODSHIP

Key words: innovation, innovation factors, food industry innovation

ABSTRACT. The aim of the article is to present the effectiveness of innovative activity of enterprises from the agri-food sector in the Podlaskie Voivodship. One of the priorities indicated in the Europe 2020 strategy is intelligent development based on a knowledge and an innovation-based economy. The strategy clearly emphasizes the need to increase expenditure on research and development throughout the European Union. Knowledge and innovation are key drivers of economic development. These aspects are particularly important in regions with a low level of industry development, significantly increasing the effectiveness of the local economy. Innovation is associated with the introduction of new products and the improvement of products, services or technologies. Analysis was based on literature on subject and primary data. The research results lead to the conclusion that the vast majority of enterprises implement product innovation, and the scale of innovation concerns the domestic market. The stimulator of innovation development is the amount of expenditure on research and development as well as the level of competence of the management staff. Unfortunately, research shows that, between 2014 and 2016, the amount of expenditure on research and development in the Podlaskie Voivodship was at a relatively low level. Internal expenditure amounted to PLN 261.5 million, which put the voivodship in 17th position.

INTRODUCTION

One of the priorities indicated in the Europe 2020 strategy is its intelligent development on the basis of an economy based on knowledge and innovation. The strategy clearly emphasizes the need to increase expenditure on research and development throughout the European Union. According to the data published in the Innovation Union Scoreboard 2018 report, Poland belongs to so-called moderate innovators (the third of four groups) and only ranks 25th [EC 2018]. There was a decrease in Poland's position in this area in 2011, by 2 positions. Referring to the assessment of the situation in the Podlaskie Voivodship, it should be stated that it is similar to the one presented in the national dimension. The main barriers to innovation development include the outflow of qualified staff and a relatively low level of expenditure on R&D.

The main goal of the article is to present the effectiveness of innovative activities of enterprises from the agri-food sector in the Podlaskie Voivodship.

RESEARCH METHODS

The article was prepared on the basis of primary and secondary sources of information. Empirical research on the perspectives of innovation growth in Podlasie companies was carried out in 2016 and 2017. The population of the studied enterprises was deliberately selected from a group of medium-sized production enterprises belonging to the agri-food sector. Empirical research was carried out using a questionnaire that was sent electronically to eighty-three companies. Fifty-six companies responded to the questionnaire. The results of primary research included business plans for the implementation of product, process, organizational and marketing innovation, as well as methods of financing them. As part of the study, results were obtained regarding the level of innovation of Podlasie enterprises from the agri-food sector, which were presented in the article.

Secondary sources of information came mainly from the studies of the Central Statistical Office and a review of the literature on the subject. Data of food industry enterprises on innovative activity and its economic aspects were presented. In the research conducted by the Central Statistical Office, the selection of enterprises is made using the Polish Classification of Activities (PKD) 2007, in accordance with the Statistical Classification of Economic Activities of the European Union. The analysis used data covering product, process, organizational and marketing innovation.

POSITION AND DEVELOPMENT DIRECTIONS OF THE AGRI-FOOD SECTOR IN POLAND

The development of the agri-food sector is related to the economic situation of the country. Therefore, it should be recognized that the global crisis of 2008-2009 was a breakthrough in the transformation process of the Polish economy. This crisis resulted in the limitation of Poland's economic activity. The slowdown in GDP dynamics was not a permanent effect, as since 2010 the country's economic situation has already improved. This was reflected in the stabilization of the growth rate in the second decade of 2000, at a level above 3%, on an annual basis [Adamowicz 2017].

In the assessment of the position and competitive advantages of leading producers on the domestic and international market, the concentration of the production ratio is important. It should be emphasized that this concept is not always a basis for maintaining a competitive advantage, especially in the long run. This applies particularly to current trends on the global market and the large dependence of individual economies on the global economy [Samuelson 1995]. This can be traced on the example of Poland, where the development of the economy undergoing transformation remained under the influence of foreign investment. The highest concentration ratios included those related to the industrial processing department, including food production and beverage production throughout the entire analyzed period – Table 1 [GUS 2018]. From 2005 to 2016, the values of concentration ratios of sold production ranged from 0.791 to 0.781, for the production of food products, and from 0.765 to 0.689, for production of beverages, slightly deviating from the values achieved for total production (Table 1). This confirms the hypothesis about the large impact

Table 1. Ratios of concentration of sold production in the food industry between 2005 and 2016

Specification	Production concentration ratios			
	2005	2010	2015	2016
Industrial processing	0.815	0.814	0.792	0.792
Food production	0.791	0.792	0.781	0.782
Beverage production	0.765	0.709	0.649	0.689

Source: [GUS 2018]

of foreign capital on the development of the concentration of food industry production in Poland. The inflow of foreign capital was the result of both European integration and a high assessment of the attractiveness of the Polish market by global corporations.

In the first and second decade of the 21st century, there were significant changes in food demand. They covered changes in the level of satisfying food needs as well as in the area of purchasing preferences. Research conducted on the level of satisfying food needs in Poland shows that between 2001 and 2015 there was a significant increase in their saturation level [Szwacka-Salmonowicz 2003, Szwacka-Mokrzycka 2018, Kwasek 2012]. This applies especially to basic food products. On the other hand, in terms of highly processed products, a significantly lower level of meeting needs is observed. Analysis of the level of saturation of food consumer needs indicates weakening domestic demand. Developing export-oriented activities and acquiring foreign sales markets, to a greater extent, is important in generating food demand. Changes in food demand must be taken into account when designing its supply. The adjustment processes of food industry enterprises to reported market demand cover various areas of activity. The following should be considered as a priority [Michalczuk 2013]:

– the production of high-quality health-promoting food,
– the production of food with a composition adapted to the needs of specific groups of consumers (offer for obese people, diabetics),
– the production of food intended for elderly consumers,
– the production of designed food adapted to the dietary needs of an individual consumer or selected consumer groups,
– the food offer with various levels of processing.

DIRECTIONS OF INNOVATIVE ACTIVITY IN THE PODLASKIE VOIVODSHIP

Over the first and second decades of the 21st century, there has been a significant development of innovative processes that have created the basis for increased business management efficiency. The concept of innovation is used in a variety of contexts. The research presented in the 'Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data' is most often used in research on business innovation. According to it, innovation is: "the implementation of a new or significantly improved product (product or service) or process, a new marketing method or a new organizational method in busi-

ness practice, workplace organization or in relations with the environment" [Oslo Manual 2005]. The innovative activity of enterprises includes internal and external activities, and their goal and results include the introduction of new, better products, processes and organizations, as well as gaining new markets [Mizgajska 2002]. An innovative enterprise is one that, in the examined period (usually three years), introduced at least one technical (technological) innovation, i.e. a new or improved product or process, which is new at least from the point of view of that enterprise [Stawasz 2005]. It is undeniable that, nowadays, innovation undertaken in various areas of enterprise activity constitutes the basis of intelligent and sustainable economic development. Between 2014 and 2016, in the sector of industrial enterprises in Poland involved in the production of foodstuffs, 13.3% of companies implemented innovation [GUS 2017]. According to research that was carried out in 2016 and 2017 in the Podlaskie Voivodship, this percentage is much higher and amounts to 89.09% [Szwacka-Mokrzycka, Miara 2017, p. 178]. Directions of innovative activity are presented in Figure 1.

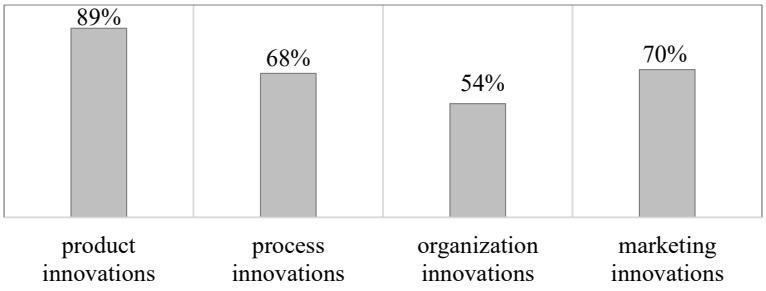

Figure 1. Directions of innovative activity of Podlasie enterprises from the agri-food sector

Source: [Szwacka-Mokrzycka, Miara 2017]

The data presented in Figure 1 shows that among Podlasie enterprises from the agri-food industry, the most implemented is product innovation (89%). Marketing innovation comes second (70%) and process innovation comes third (60%). In the analyzed period, entrepreneurs from the agri-food sector in Podlasie implemented organizational innovation (54%) the least. Research results also show that all companies implemented at least one innovation. This result may seem surprising. However, taking into account the technological backwardness of Podlasie entrepreneurs in relation to companies from other regions of Europe or Poland, this only means catching up. This is confirmed by the research results showing the level of innovation of Podlasie enterprises (Figure 2).

The data presented in Figure 2 shows that the vast majority of innovation applies to the regional and national market. The least innovation takes place on a global level, which confirms that Podlasie companies are followers in implementing innovation.

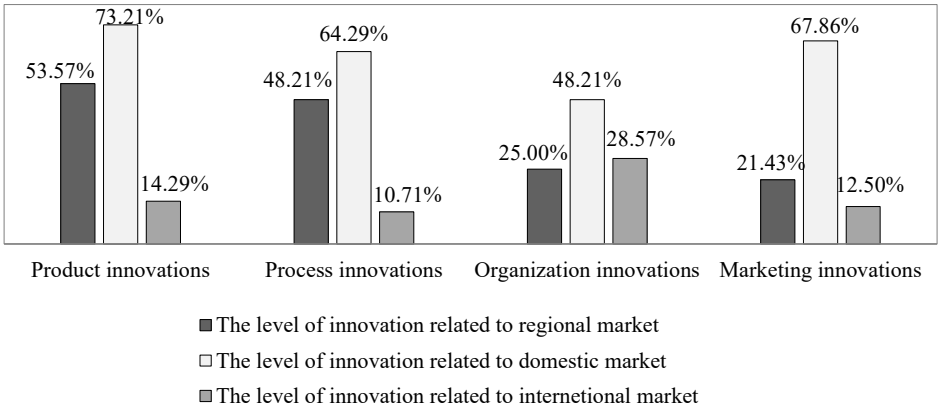

Figure 2. The level of innovation of Podlasie enterprises from the agri-food sector
Source: own elaboration based on conducted research

AN EVALUATION OF THE EFFECTIVENESS OF INNOVATIVE ACTIVITIES IN PODLASIE ENTERPRISES

EFFICACY ASSESSMENT MEASURES

The complexity of the concept of innovation and how it is interpreted affects the variety of measures used to define the effectiveness of actions taken in this field [Rutkowska-Gurak 2010]. There are many definitions of effectiveness, selected both in economic and management sciences. One of the most popular definitions of effectiveness indicates that it is an action that aims to achieve a certain degree of a goal [Sienkiewicz 1987]. Effective action is one that leads to the achievement of the effect planned as a goal. So, the measure of effectiveness is the degree of goal achievement. The assessment of the effectiveness of an enterprise's innovative activity may be based on a balanced composition of measures relating to: input, processes and results. The first of these categories includes: financial and human resources related to innovation activities, as well as the number of patent applications filed. As part of process measures, the following can be mentioned: the speed of the innovation process as well as the horizontal approach to the formulation of ideas. The results category includes: the number of new products or services, the share of new products in revenues and the share of new clients in a company's profits [Motyka 2011]. As a measure of the effectiveness of innovative activities in relation to research and development and innovation, the number of patent applications that reflect the development of a new technology and the volume of revenues from the sale of new and significantly improved products in the value of total sales can be taken into account. As Ireneusz Rutkowski reports, ad hoc systems are most often used in enterprises. According to this approach, the assessment of the effectiveness of innovative activities is carried out on the basis of financial measures [Rutkowski 2011].

THE EFFECTIVENESS OF INNOVATIVE ACTION

In the presented study, the effectiveness of innovative activities of Podlasie enterprises was assessed on the basis of the number of patent applications and the amount of revenues from the sale of new and significantly improved products in the value of total sales (Figures 3 and 4). The data presented in Figure 3 shows that the number of patent applications in the Podlaskie Voivodship is steadily increasing, although their relative share in all patent applications in Poland is still low. In 2014 it accounted for 1.34%. In the following, 2015, it increased slightly to 1.41%, and in 2016 reached 1.54%. The data presented in Figure 3 confirms the relatively low level of progress of research and development work. Hence, it can be concluded that innovation introduced in Podlasie agri-food sector companies is imitative.

The share of revenues from the sale of new and significantly improved products in the total sales value can be assumed as the economic measure of effectiveness. Figure 4 presents data illustrating the situation in this respect depending on the size class of the enterprise in the Podlaskie Voivodship.

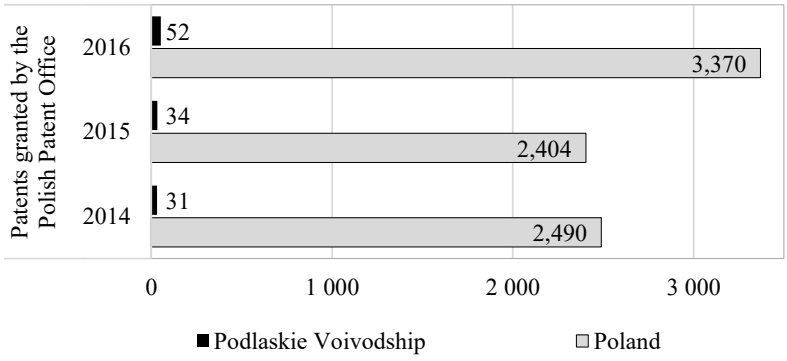

Figure 3. The number of patent applications filed in the Podlaskie Voivodship as compared to the entire country

Source: [GUS 2018]

Data presented in Figure 4 show that the highest level of revenue from the sale of new and significantly improved products in the total sales value is achieved by medium-sized enterprises (employing between 50 and 249 people). In the case of large enterprises, employing over 250 people, the volume of sales of new or significantly improved products in the total sales value of Podlasie companies was much smaller compared to Poland. Small businesses relatively achieve the lowest sales results. In the first two years, the value of revenue of enterprises from the Podlasie Voivodship compared to Poland was smaller, but the difference was not too high. However, in 2016 a significant decrease can be observed -from 2.39% to 0.34%. The research results presented in Figure 4 justify the statement that medium-sized companies are the driving force behind the development of innovation.

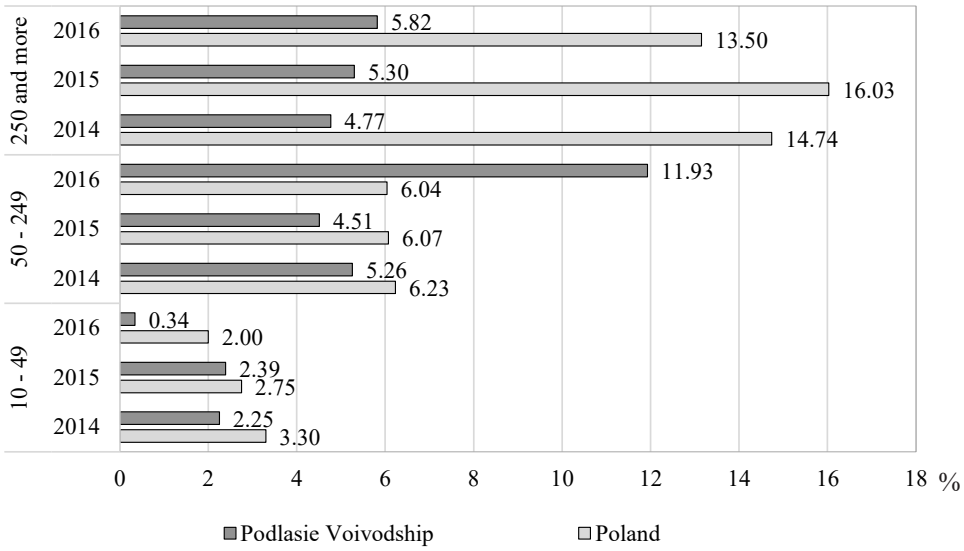

Figure 4. Revenues from the sale of new and significantly improved products in the total value of sales as compared to the entire country

Source: [GUS 2018]

SUMMARY

The assessment of the effectiveness of innovative activity has been an important element of control in the enterprise management process for many years. Research on measures of the effectiveness of new product development shows that the most commonly used are reactive ones, showing the past situation. However, it is recommended to use wider than before predictive measures indicating the course of innovative processes in the future [Hart 1996]. The research results presented in the study, conducted in the last few years, indicate that the vast majority of enterprises implement product innovation, and the scale of innovation concerns the domestic market. The stimulator of innovation development is the amount of expenditure on research and development as well as the level of competence of the management staff. Research shows tha,t in the years 2014-2016, the amount of expenditure on research and development in the Podlaskie Voivodship was at a relatively low level. Internal expenditure amounted to PLN 261.5 million, which put the voivodship in 17th position. This situation translates into a relatively low effectiveness of innovative activity. It seems necessary to increase investment in scientific research, not only by public entities, but also by private entities. The concept of smart specializations may be introduced by the European Union in the financial perspective 2014-2020, which could prove helpful in this respect. Whether smart specializations will contribute to an increase in R&D expenditure and, what is associated with it, an increase in innovation and competitiveness of enterprises, will be the subject of further research.

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SKUTECZNOŚĆ DZIAŁAŃ INNOWACYJNYCH W SEKTORZE ROLNO-SPOŻYWCZYM W WOJEWÓDZTWIE PODLASKIM

Słowa kluczowe: innowacje, czynniki innowacyjności, innowacyjność przemysłu spożywczego

ABSTRAKT

Celem artykułu jest przedstawienie skuteczności działań innowacyjnych przedsiębiorstw z sektora rolno-spożywczego w województwie podlaskim. Jednym z priorytetów wskazanych w strategii „Europa 2020" jest inteligentny rozwój na bazie gospodarki opartej na wiedzy i innowacjach. W strategii wyraźnie podkreślono konieczność zwiększania nakładów na działalność badawczo-rozwojową w całej Unii Europejskiej. Wiedza i innowacje są kluczowymi stymulantami rozwoju gospodarczego. Te aspekty są szczególnie ważne w regionach o niskim poziomie rozwoju przemysłu, w których podnoszą w znaczny sposób efektywność lokalnej gospodarki. Innowacyjność związana jest z wprowadzeniem nowości i ulepszeniem produktów, usług lub technologii. Analizę przeprowadzono na podstawie literatury przedmiotu oraz danych pierwotnych. Wyniki badań skłaniają do wniosku, że przedsiębiorstwa w zdecydowanej większości wdrażają innowacje produktowe, a skala innowacyjności dotyczy rynku krajowego. Stymulatorem rozwoju innowacji jest wielkość nakładów na badania i rozwój oraz poziom kompetencji kadry kierowniczej. Niestety z badań wynika, że w latach 2014-2016 wielkość nakładów na badania i rozwój w województwie podlaskim kształtowała się na relatywnie niskim poziomie. Nakłady wewnętrzne wynosiły 261,5 mln zł, co dało województwu 17. pozycję.

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