

INNOVATION ACTIVITY OF ENTERPRISES IN THE KUYAVIAN-POMERANIAN VOIVODESHIP AS THE WAY TO THE REGION'S COMPETITIVENESS AND DEVELOPMENT

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Abstract: The introductory part of the paper presents the key concepts related to the subject of the article. The essence of corporate innovation potential, the concepts of innovation and innovation activity are discussed. The next part of the article examines the tasks and the role of the Business and Innovation Centres in Poland as well as their quantitative development. The following part constitutes a presentation and analysis of the results of statistical surveys carried out by Statistics Poland, which show the innovation activity of Kuyavian-Pomeranian enterprises in 2015-2017, in comparison to other regions of the country.

Keywords: corporate innovation activity, innovation, product and process innovation.

1. Introduction

One of the main sources of power, that for centuries has been fuelling the progress and development of economies and societies, is innovation of all kinds. Numerous in-depth scientific studies as well as observations of the environment have confirmed that the level of competitiveness of each country, economy and region, and consequently the standard of living is highly dependent on the ability to create innovation activity and on effective commercialisation of innovation. When considering the innovation phenomenon with regard to a given country's economy, it should be remembered that it entails the sum of the innovations relating to economy's basic cells, that is enterprises. Innovativeness of an economy is a derivative of many different factors that are conducive and adverse to the development of innovativeness, having their source both in enterprises' surroundings and their inner environment. The scope and the pace of innovation implementation are very important components determining achievement of competitive advantage by enterprises on domestic, international and global markets. For many years, numerous enterprises, especially in highly

developed countries, such as the United States, Japan and in Western Europe, have been the examples of this.

Polish enterprises, whether large-, medium-, or small-sized, are still facing such challenges. They should achieve their competitive advantage to even a greater extent, based on innovation. According to multiannual statistical data, Polish economy, in terms of innovation, should be classified within the group of moderate innovator countries. That is the reason why it is necessary to intensify, using various methods, all the activities connected with raising the pro-innovation culture of Polish society and entrepreneurs, as well as to make people aware of the importance the innovation-based business models play in today's world (Goszczyński, 2013).

The main purpose of this article is to present the innovation activity of enterprises in the Kuyavian-Pomeranian region and indicate the place they were ranked among other Polish regions over the years 2014-2017.

Further considerations presented in this article will include the terms used in the literature on the subject, the concepts of which seem worth recalling and specifying.

2. Corporate innovation potential – innovation – innovation activity

Over the past few decades, development of the concept of *corporate innovation potential* has been observed in the literature on the subject, especially in Polish scientific literature of the period after the systemic transformation of the economy. The concept of the innovation potential of an enterprise has always been associated with a company's internal conditions. Nowadays, however, it is increasingly often related to certain external conditions, which economic entities operate in. One of the frequently-cited conceptualisations connected with this term entails an approach presented by K. Poznański. According to this author, a company's specific innovation potential translates into its ability to effectively introduce innovations, e.g. in the form of new products, new technologies, better organisational methods, and innovations in terms of marketing strategies, tools and activities. This author determines the innovation potential through four basic and, at the same time, key elements of business operations (Poznański, 1998):

- physical potential (especially the quality level of the production apparatus),
- financial potential (own resources and ability to raise funds from external sources),
- human potential (number of employees, employee structure as well as the level of qualifications, skills and professional experience),
- knowledge (especially technical, technological and market information).

In the era of the development of economy globalization and digitisation, influence of the environment on individual elements of the innovation potential of enterprises, both the distal potential (macro-environment) as well as the proximal potential (micro-environment), have been growing rapidly. Faced with this assumption, not only the internal, but also the external innovation potential of an enterprise can be considered (Poznański, 1998). Nowadays, external innovation potential is created by such factors as: labour market, technical knowledge and scientific innovation resources, or the system of financial institutions that are ready to supply innovative ventures.

The mere innovation potential of an enterprise does not yet determine the high degree of enterprise innovation, it is only a prerequisite for undertaking innovative activities. The complementary force here is the so-called company's activity-building potential (propensity, entrepreneurship, creativity) for undertaking such activities. This is a necessary trigger and stimulus to act, having significant impact on the choice of the behaviours and the attitudes of the company's management (Andruszkiewicz, 2007). A company's inclination to undertake innovation activities depends, among others, on such factors as (Andruszkiewicz, 2007):

- enterprise's performance aspirations,
- cultural aspirations,
- the power structure in an enterprise,
- the features of strategic leadership characterizing an organisation.

Configurations and levels of these factors (the resultant of their forces) determine, for each enterprise, a different potential of its propensity for innovation activity and provide a specific force, which ignites an enterprise's innovation strategy.

The concept of '*innovation*' in the modern world is ubiquitous, extremely capacious and applies to the technical, organisational, and financial-economic spheres. When studying the literature on the subject, it can be observed that the concept of innovation has been introduced for scientific consideration not only by economists but also by the representatives of specific science (Zastempowski, 2010, Haffer, 1998).

During the dynamic development of the 20th century economies, changes in the way innovation is understood have occurred. The approach began to move from purely technical aspects to a broader contemporary understanding. In the first decade of the 21st century, more and more attempts are being made to narrow down and broaden the approach as well as to define innovation (Jasiński, 1997; Stawasz, 1999; Janasz, 2003; Zastempowski, 2010). According to, among others, W. Janasz, innovation should be treated as the creative changes occurring in the social system, in the economic structure, in technology and in nature (Janasz, 2003). To put it differently, innovation entails all the changes which, under the given spatial and temporal conditions, are perceived as the carriers of novelty, equally related to products of both the material and the non-material culture (Haffer, 1998). In narrow terms, in the literature on the subject, it is assumed that not every novelty can be treated as innovation. Such approach

entails the need for a very precise definition of innovation. In this case, innovation is usually equated with changes in production methods and in products, based on new (original) or previously unused knowledge (Mansfield, 1968; Freeman, 1982). It can be assumed that any first application of an invention is innovation (Mansfield, 1968). It is easy to agree with W. Janasz's stand on the issue, that the theory of economy has been rather dominated by the narrow approach (understood as a scope of technical changes), while in economic practice, the broad conceptualisation of innovation has been adopted (Janasz, 2003).

Innovation activity of an enterprise (understood as the result of innovative undertakings) is a derivative of and is related to the characteristics of business entities, that is, to innovativeness. A company's innovativeness, as a characteristic trait, defines its ability to introduce new products or to use new organisational forms, new production, financial or marketing methods (Ciborowski, 2013). An increase in the level of innovation activity of an enterprise usually leads to the improvement in its competitiveness and is an expression of its development strategy implementation.

The further-discussed concept of *innovatively active and innovative enterprises*, in terms of *product and process innovations*, has been clearly defined, among others, by Statistics Poland (GUS, 2018).

- *An innovatively active enterprise* is one which, in the period under examination, introduced at least one product or process innovation or implemented at least one innovation project, which was interrupted or discontinued during the period under consideration (unsuccessful) or was not completed by the end of that period (i.e. is still being continued).
- *An innovative enterprise*, in terms of product and process innovations, is an enterprise that introduced at least one product or process innovation (a new or a significantly improved product/process) during the period under consideration.
- *Product innovation* entails introduction of a product or service that is new or significantly improved in terms of its features or application. Service-related product innovations entail introduction of significant improvements in the way services are provided, addition of new functions or features to the existing services, or introduction of completely new services.
- *Process innovation* entails implementation of new or significantly improved methods of product /service creation, distribution and support. Process innovation includes new or significantly improved methods for creation and provision of services. It also involves new or significantly improved techniques, equipment and software used in such ancillary activities as procurement, accounting, IT support and maintenance.

3. Business and Innovation Centres in Poland

Before presenting the details of the Kuyavian-Pomeranian region's position in terms of innovation activity, it is worth characterising the distribution of the so-called Business and Innovation Centres¹ on the map of Poland. A certain relation can be noticed between the development and strength of these centres and the situation in the area of innovation activity of individual regions (voivodeships). Business and Innovation Centres are the entities involved in the development of corporate entrepreneurship and innovation in a given region, mainly with regard to the SME sector, through the following (Wiśniewska, 2012):

- dissemination of knowledge (consulting, information, training),
- help in the transfer and commercialisation of new technologies,
- assistance in creation of new companies founded by students, graduates, doctoral students and researchers,
- advisory, technical and accommodation assistance for newly created enterprises,
- financial support offered to persons starting business activity and to newly created companies.

Business and Innovation Centres are divided into three types, according to the tasks they implement (Matusiak, 2010):

- Innovation centres, activity of which is aimed at promotion and incubation of innovative entrepreneurship, technology transfer, pro-innovation services, stimulation of academic entrepreneurship and cooperation between the science and the economy.
- Entrepreneurship centres, activity of which is aimed at promotion and incubation of entrepreneurship, support services for micro and small companies mainly, stimulation of the development of peripheral regions.
- Shadow banking system for financial institutions, the purpose of which is to grant loans and guarantees on preferential terms to newly established companies, especially to those w/o credit history.

Development of Business and Innovation Centres in Poland has been dynamic in recent years. In 1990, there were only 27 such centres, but in 1995 – 174, in 2000 – 263, and in 2010 – 735 respectively. Accordingly, in the years 1990-2010, the number of centres increased by 2722%. Localisation of Business and Innovation Centres throughout the country is not even. Table 1 presents the distribution of the centres in individual voivodeships in 2010.

¹ Original name in PL: Ośrodki Innowacji i Przedsiębiorczości.

Table 1.*Localisation of the Business and Innovation Centres in Poland (as of 2010)*

Voivodeship	Number of centres	Share (%)
1. Silesian Voivodeship (Śląskie)	88	12.0
2. Masovian Voivodeship (Mazowieckie)	67	9.1
3. Greater Poland Voivodeship (Wielkopolskie)	66	9.0
4. Lesser Poland Voivodeship (Małopolskie)	55	7.5
5. Lower Silesian Voivodeship (Dolnośląskie)	54	7.3
6. Lublin Voivodeship (Lubelskie)	51	6.9
7. West Pomeranian Voivodeship (Zachodniopomorskie)	49	6.7
8. Pomeranian Voivodeship (Pomorskie)	45	6.1
9. Łódź Voivodeship (Łódzkie)	44	6.0
10. Subcarpathian Voivodeship (Podkarpackie)	42	5.7
11. Kuyavian-Pomeranian Voivodeship (Kujawsko-Pomorskie)	39	5.3
12. Warmian-Masurian Voivodeship (Warmińsko-Mazurskie)	38	5.2
13. Podlaskie Voivodeship (Podlaskie)	35	4.8
14. Świętokrzyskie Voivodeship (Świętokrzyskie)	24	3.3
15. Lubusz Voivodeship (Lubuskie)	22	3.0
16. Opole Voivodeship (Opolskie)	17	2.3

Source: Matusiak, 2010, p. 26.

In quantitative terms (see Table 1), the support from the Business and Innovation Centres, especially for SMEs, is much smaller in the Kuyavian-Pomeranian voivodeship than in the leading voivodeships (Silesian Voivodeship, Masovian Voivodeship, Greater Poland Voivodeship), while the total number of centres is 39 (a 5.3% share). A possible relation can be observed here, between the number of centres and the position, in terms of innovation activity, of enterprises in the Kuyavian-Pomeranian region.

4. Position of enterprises in the Kuyavian-Pomeranian region with regard to innovation activity in the years 2015-2017

4.1. Innovatively active enterprises

Innovations introduced by enterprises are crucial for their development. Knowledge of innovation activities constitutes the basis for shaping business strategies. Innovations increase the economic potential of individual regions and improve the country's competitive ability. New, improved, and more effective solutions result from the creativity of enterprises, their involvement in research and development activities, or from cooperation with other entities.

The selected research results presented in the article come from the Statistical Analysis of Statistics Poland, entitled: “Corporate innovation activity in 2015-2017 [original title in PL: Działalność innowacyjna przedsiębiorstw w latach 2015-2017]”², GUS³, Warszawa-Szczecin 2018. The study on industrial and service enterprises was carried out in the years 2015-2017; the results were published in 2018. It was conducted as part of the Programme of Statistical Surveys of Official Statistics under items 1.43.02 – Innovations in industry (PNT-02) and 1.43.13 – Innovations in services (PNT-02/u) [original title in PL: Program badań statystyki publicznej w tematach 1.43.02 – Innowacje w przemyśle (PNT-02) oraz 1.43.13 – Innowacje w sektorze usług (PNT-02/u)]. The methodology used was developed by Eurostat and OECD, presented in the Oslo Manual (Oslo Manual, 2008).

In the years 2015-2017, the total innovation activity of Polish industrial and service enterprises accounted for 20.2% and 11.9% of the total number of these entities, respectively (compared to 20.3% and 14.5% in 2014-2016). As in the previous research period, the largest percentage of innovatively active entities was observed among entities employing 250 people or more. In 2015-2017, the share of innovative industrial enterprises amounted to 18.5%, while the share of innovative service enterprises was 10.4%. In the case of industrial enterprises, this value was by 0.2% lower than in 2014-2016, while for service enterprises – by 3.2%. As in the previous years, product or process innovations were most often introduced by entities employing 250 people or more (59.3% of industrial enterprises and 42.3% of service enterprises, against the respective 58.7% and 42.3% in the previous period).

In the period under analysis, as in the previous one, the highest share of innovatively active and innovative industrial entities in the manufacturing sector was observed for the *Pharmaceutical production* sector.

Among the service enterprises, as in 2014-2016, the highest share of innovatively active and innovative enterprises was observed for the *Insurance, reinsurance and pension funds* sector.

Taking into account the territorial division of Poland, Table 2 presents the percentage of *innovatively active* industrial and service enterprises.

² For the purpose of linguistic clarity, all Polish titles cited in the body text of this article have been translated into English. The English titles provided are not actual publications, but translations of the titles only. Original titles are given in square brackets.

³ GUS stands for Statistics Poland (original name in PL: Główny Urząd Statystyczny).

Table 2.

Industrial and service enterprises innovatively active in the years 2015-2017, in voivodeship distribution

Voivodeship	Share of industrial enterprises	Share of service enterprises
1. Lesser Poland Voivodeship (Małopolskie)	23.5	11.8
2. Lublin Voivodeship (Lubelskie)	23.2	8.0
3. Opole Voivodeship (Opolskie)	23.1	2.7
4. Masovian Voivodeship (Mazowieckie)	21.4	16.9
5. Subcarpathian Voivodeship (Podkarpackie)	21.2	13.1
6. West Pomeranian Voivodeship (Zachodniopomorskie)	20.9	9.4
7. Świętokrzyskie Voivodeship (Świętokrzyskie)	20.8	5.4
8. Silesian Voivodeship (Śląskie)	20.8	10.6
9. Lower Silesian Voivodeship (Dolnośląskie)	20.4	13.6
10. Pomeranian Voivodeship (Pomorskie)	20.2	14.9
11. Greater Poland Voivodeship (Wielkopolskie)	19.4	9.6
12. Podlaskie Voivodeship (Podlaskie)	18.6	6.2
13. Kuyavian-Pomeranian Voivodeship (Kujawsko-Pomorskie)	18.6	6.8
14. Łódź Voivodeship (Łódzkie)	17.3	9.6
15. Warmian-Masurian Voivodeship (Warmińsko-Mazurskie)	16.0	3.9
16. Lubusz Voivodeship (Lubuskie)	15.8	12.7

Source: Raport GUS. Działalność innowacyjna przedsiębiorstw w latach 2015-2017, GUS Warszawa-Szczecin 2018, p. 24.

Bearing in mind the territorial division of the country, the Kuyavian-Pomeranian voivodeship ranked 13th in terms of innovation activity of industrial enterprises and 12th in relation to innovation activity of service enterprises. The largest percentage of innovatively active industrial enterprises was observed in the Lesser Poland voivodeship (23.5%) and the Lubusz voivodeship (23.2%), while the largest percentage of innovation activity with regard to service enterprises was noted in the Masovian voivodeship (16.9%) and the Pomeranian voivodeship (14.9%). The lowest values of this indicator for industrial enterprises were recorded in the Lubusz voivodeship (15.8%) and the Warmian-Masurian voivodeship (16.0%); for service enterprises – in the Opole voivodeship (2.7%). The region characterised by a very high percentage of innovatively active enterprises was the Warsaw Capital Region, where 24.9% of industrial enterprises and 20.7% of service enterprises showed innovative activity in 2015-2017.

4.2. Innovative enterprises

Taking into account the territorial division of Poland, the percentage of innovative industrial and service enterprises in the years 2015-2017 was calculated and presented in Table 3.

Table 3.

Industrial and service enterprises innovatively active in the years 2015- 2017, in voivodeship distribution

Voivodeship	Share of industrial enterprises	Share of service enterprises
1. Opole Voivodeship (Opolskie)	22.6	2.5
2. Lesser Poland Voivodeship (Małopolskie)	20.7	9.4
3. Lublin Voivodeship (Lubelskie)	20.1	8.0
4. Masovian Voivodeship (Mazowieckie)	19.5	14.2
5. Subcarpathian Voivodeship (Podkarpackie)	19.4	11.1
6. Silesian Voivodeship (Śląskie)	19.3	9.3
7. Świętokrzyskie Voivodeship (Świętokrzyskie)	19.2	5.2
8. Greater Poland Voivodeship (Wielkopolskie)	18.6	8.9
9. Podlaskie Voivodeship (Podlaskie)	18.2	6.2
10. West Pomeranian Voivodeship (Zachodniopomorskie)	18.1	9.2
11. Pomeranian Voivodeship (Pomorskie)	17.9	13.2
12. Lower Silesian Voivodeship (Dolnośląskie)	17.8	11.8
13. Kuyavian-Pomeranian Voivodeship (Kujawsko-Pomorskie)	17.4	6.8
14. Łódź Voivodeship (Łódzkie)	16.0	9.4
15. Lubusz Voivodeship (Lubuskie)	15.3	8.0
16. Warmian-Masurian Voivodeship (Warmińsko-Mazurskie)	14.3	3.9

Source: Raport GUS. Działalność innowacyjna przedsiębiorstw w latach 2015-2017, GUS Warszawa-Szczecin 2018, p. 29.

With regard to the administrative division of Poland, the Kuyavian-Pomeranian voivodeship ranked 13th in terms of innovative industrial enterprises and 12th in terms of innovative service enterprises. When analysing innovativeness, in territorial terms, it can be noticed that, among industrial enterprises, the largest percentage of entities that introduced innovations in 2015-2017 was observed in the Opole Voivodeship (22.6%) and the lowest – in the Warmian-Masurian voivodeship (14.3%). The highest increase in the share of these enterprises, compared to the data recorded for 2014-2016, was observed in the Świętokrzyskie voivodeship (by 4.2%), while the largest decrease – in the Lubusz voivodeship (by 3.8%). The largest percentage of innovative service enterprises was noted in the Masovian voivodeship (14.2%), while the smallest – in the Opole voivodeship (2.5%). In relation to the years 2014-2016, the share of innovative service enterprises increased the most in the Lubusz voivodeship (by 3.55) and decreased the most in the Lublin Voivodeship (by 15.3%).

4.3. Product and process innovations

The results of the survey on innovation activity indicate that with regard to Polish industrial and service enterprises, the share of enterprises that introduced process innovations (new or significantly improved processes) in 2015-2017 was higher than the share of product innovations (new or significantly improved products). Compared to 2014-2016, the percentage of industrial enterprises that introduced innovative products and processes decreased by 0.2%, and the percentage of service enterprises – by 0.4%.

The process innovations introduced by Polish industrial enterprises in 2015-2017 most often concerned new or improved methods of producing (manufacturing) products and services (10.6% of enterprises implemented such innovations, as in the previous period under analysis), while in service enterprises – new or improved methods (systems) supporting the processes in enterprises (5.9% of enterprises, compared to 6.3% in 2014-2016). The results of the Statistics Poland survey on product and process innovations do incorporate the territorial division of the country into voivodeships.

5. Summary

The results of the research and of all statistical analyses show that innovations introduced by enterprises are of key importance for their development. The knowledge and the skills associated with innovation activities constitute the basis in the shaping of corporate development strategies. Innovations also increase the economic potential of individual regions and improve the country's competitive ability. New, better and more effective solutions result from the creativity of enterprises, their involvement in research and development activities, or from cooperation with other entities.

Summing up the issues discussed in the article, which aimed to present the innovation activity of enterprises in the Kuyavian-Pomeranian region and to show their position among other Polish regions over the years 2014 – 2017, several conclusions can be drawn.

1. A relation between the number of Business and Innovation Centres in the region and the position of the Kuyavian-Pomeranian region in terms of innovation activity in Poland can be noticed.
2. In the years 2015-2017, the total innovation activity of Polish industrial and service enterprises accounted for 20.2% and 11.9% of the total number of these entities, respectively (compared to 20.3% and 14.5% in 2014-2016). As in the previous research period, the largest percentage of innovatively active entities was observed among entities employing 250 people or more.
3. Taking into account the territorial division of the country, the Kuyavian-Pomeranian voivodeship, in terms of *innovation activity* of industrial enterprises, ranks 13th, while service enterprises rank 12th in terms of *innovation activity*.
4. Taking into account the territorial division of the country, the Kuyavian-Pomeranian voivodeship, in terms of *innovative industrial enterprises*, ranks 13th, while *innovative service enterprises* rank 12th.

References

1. Andruszkiewicz, K. (2007). *Strategiczne zarządzanie marketingowe w polskich przedsiębiorstwach w warunkach kryzysu*. Toruń: Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika.
2. Ciborowski, R. (2013). *Aktywność innowacyjna firm w warunkach kryzysu gospodarczego*. Lublin: Wydawnictwo KUL.
3. *Działalność innowacyjna przedsiębiorstw w latach 2015-2017. Analizy statystyczne* (2018). Warszawa-Szczecin: Główny Urząd Statystyczny [Statistics Poland].
4. Freeman, C. (2003). *A Schumpeterian Renaissance?* SPRU Working Papers, 102.
5. Goszczyński, T. (2013). *Innowacje w przedsiębiorstwie przyszłości*. Lublin: Wydawnictwo KUL.
6. Haffer, M. (1998). *Determinanty strategii nowego produktu w polskich przedsiębiorstwach przemysłowych*. Toruń: Wydawnictwo UMK.
7. Janasz, W. (2003). Innowacje i ich miejsce w działalności przedsiębiorstw. In: W. Janasz (ed.), *Innowacje w modelach działalności przedsiębiorstw. Rozprawy i Studia, (DXX)446*. Szczecin: Uniwersytet Szczeciński.
8. Jasiński, A.H. (1997). *Innowacje i polityka innowacyjna*. Białystok: Wydawnictwo Uniwersytetu w Białymstoku.
9. Mansfield, E. (1995). *Innovation Technology and the Economy*. Aldershot: E. Elgar.
10. Matusiak, K.B. (ed.) (2012). *Ośrodki innowacji i przedsiębiorczości w Polsce. Raport 2009*. Łódź-Warszawa: PARP.
11. *Podręcznik Oslo. Zasady gromadzenia i interpretacji danych dotyczących innowacji*, Łódź-Warszawa (2008). Warszawa: OECD – Eurostat-Ministerstwo Nauki i Szkolnictwa Wyższego [Ministry of Science and Higher Education].
12. Poznański, K. (1998). *Uwarunkowania innowacji w małych i średnich przedsiębiorstwach*. Warszawa: Dom Wydawniczy ABC.
13. Wiśniewska, S. (2012). *Ośrodki innowacji i przedsiębiorczości w Polsce*. Oficyna Wydawnicza Politechniki Rzeszowskiej.
14. Zastempowski, M. (2010). *Uwarunkowania budowy potencjału innowacyjnego polskich małych i średnich przedsiębiorstw*. Toruń: Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika.