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Instruments of support for Polish enterprises' innovativeness

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Abstract: Innovativeness, as the ability to be innovative in regional, national and global environments, is nowadays the indicator of success in business. Due to rapidly changing environment, business units need to take risky measures in the field of new technologies and manufacturing techniques. Therefore, innovative activity of enterprises is supported by economic policies of countries that aim at achieving high level of innovativeness in their economies. There are various forms of instruments targeted at business units and the instruments themselves are available at various levels (a region, a country, the European Union). Enterprise output innovation may indicate varying regional needs for innovative support from the state. The aim of the article is to systematise the available forms of support for Polish enterprises and to assess regional variations in enterprise output innovation. The assessment includes 16 Polish voivodeships. Secondary information sources, such as statistics provided by the Polish Statistical Office and the Government's reports on entrepreneurship, were used in the article. A review of Polish innovation policy instruments described on the government websites was made in order to systematise the instruments of innovation support. To assess regional output innovation variations (2014-2016), a comparative analysis of indicators such as: innovative enterprises as the share of the total industrial/service enterprises, revenues from sales of new or significantly improved products, was carried out. To define the regions with the structures similar in terms of enterprise output innovation, the agglomerative method of non-linear classification (Ward's method) was applied. The analyses carried out allow systematising the available instruments of enterprise innovativeness support in terms of their sources of financing as well as their division into legal, financial, institutional and infrastructural instruments. The value of public support for innovative activity, in the light of public statistics, differs across regions. The assessment of enterprise output innovation also shows regional differences that seem to result from spatial aspects of development as well as from the size of public contribution. Recognition of these conditionings may have an impact on their effectiveness, while proposing and applying the instruments of Polish innovative policy.

Keywords: innovativeness of enterprises, innovative policy instruments, regional variations

JEL codes: *O31, O38, R13*

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1. Introduction

Nowadays, innovativeness, defined as the capability of being innovative in regional, national and global environments, has become the indicator of success in business. Due to rapidly changing environment, business units need to take risky measures in the field of new technologies and manufacturing techniques. Therefore, innovative activity of enterprises is supported by economic policies of countries that aim at achieving a high level of innovativeness in their economies. There are various forms of instruments targeted at business units and such instruments are available at various levels (a region, a country, the European Union). Enterprise output innovation may indicate varying regional needs for innovative support from the state. The aim of the article is to systematise the available forms of support for Polish enterprises and to assess regional variations in enterprise output innovation.

The role of innovation in economic growth causes governments to attach great importance to supporting implementation of research results, knowledge, inventions and improvements in the economic practice. While addressing this challenge, the economic policy supports innovative processes, encouraging cooperation in the field of innovation, mutual interaction of institutions in the creation and diffusion of knowledge, through providing external innovative services, favourable fiscal policy or tax relief for enterprises which conduct innovative activities (Podręcznik Oslo/Oslo Manual 2008: 35, Stawasz 2013: 212). This requires the use of resources and instruments from various areas, such as education, information, consulting, legal regulations, infrastructure for innovative activity and financial resources. The essence of thus-understood policy is in exerting an impact on four areas: general conditions, including institutional and legal ones, scientific and engineering base, transfer of information and knowledge, and a system of factors affecting innovations in enterprises (Stawasz 2008: 243). Innovation can be regarded as an innovative ability and an innovative position. The first approach examines the ability to create and commercialise innovation (the amount of expenditure on innovation activity) and is a multifactor concept that includes the internal and external conditions of the enterprise. The second one analyses the outcome side and measures the effects of innovative activity (the impact of innovation on sales volume, patents, licenses). These approaches in the measurement of enterprise innovativeness are referred to as, respectively, outlay - input and result - output ones (Karbowski 2015: 72-73). For the assessment of innovativeness of Polish enterprises, an assumption was adopted whereby the research will cover the innovative activity of enterprises in

terms of result innovativeness. The subject of the study are enterprises based in 16 regions (voivodeships) over the period 2014-2016, analysed together. There were 16 initial variables selected, characterising enterprise innovativeness, following the substantive and formal criterion (Zeliaś 2000: 37-38), using the relevant data provided by the Central Statistical Office in the area of innovative activity of enterprises (Table 1).

Table 1. Characteristics of the initial set of variables

Variable	Coefficient of variation
x1 Enterprises innovation-active in industry in %	13.91
x2 Enterprises innovation-active in services in %	48.24
x3 Innovative enterprises in industry in %	13.86
x4 Innovative enterprises in services in %	51.08
x5 Innovative enterprises in industry that have introduced new or significantly improved products in %	15.75
x6 Innovative enterprises in services that have introduced new or significantly improved products in %	55.26
x7 Innovative enterprises in industry that have introduced new or significantly improved products in %	13.94
x8 Innovative enterprises in services that have introduced new or significantly improved products in %	50.50
x9 Industrial enterprises that have introduced organisational or marketing innovations in % of the total number of enterprises	20.41
x10 Service enterprises that have introduced organisational or marketing innovations in % of the total number of enterprises	55.70
x11 Revenues from sales of new or significantly improved products in industrial enterprises in 2016 as % of total sales	37.56
x12 Revenues from sales of new or significantly improved products in industrial enterprises in 2016 as % of total sales	101.03
x13 Industrial enterprises that obtained a patent from the Patent Office of the Republic of Poland in % of the total number of enterprises	34.57
x14 Service enterprises that obtained a patent from the Patent Office of the Republic of Poland in % of the total number of enterprises	168.63
x15 Industrial enterprises that filed inventions in foreign patent offices in % of the total number of enterprises	36.97
x16 Service enterprises that filed inventions in foreign patent offices in % of the total number of enterprises	71.23

Source: author's own elaboration

Using the Statistica program, the discrimination capacity of variables was analysed, using the classic coefficient of variation, setting the reference value at V=10%, on the basis of which all variables were included in the further stages of the study. Next, using the Hellwig parametric method, the information potential of variables was investigated by examining their correlation

with other variables (the level of significance of the correlation coefficient was set at 0.5). For the accepted variables, in the procedure of 3-fold selection of the central feature and its satellite features (whose resemblance to the central one is considerable), 3 central features and 2 isolated features, i.e. ones not belonging to central and satellite features, were left for further analysis (x6, x1, x16 and x2, x11). For such selected features, the evaluation of result innovativeness was carried out, using the agglomeration methods which assume that each object (here voivodeship) creates a separate cluster. At subsequent stages, new clusters are created, combining objects-voivodeships and clusters created earlier. The Ward method, which uses the variance analysis approach in determining the distance between objects, was adopted as a rule defining objects which are similar enough to create a cluster. The distance between the groups is defined as the relative value of the differences between the sums of squares of the distances between the points from the centres of the groups to which the points belong (Strahl 2006: 236). In the grouping of Polish voivodeships, the agglomeration algorithm was used, calculated as the geometric distance in the multidimensional space (Euclidean distance).

2. Instruments of the Polish innovation policy

Support instruments for innovativeness of Polish enterprises are diversified, available from domestic and foreign public resources, both at the regional, national and international level (OECD 2010: 5-6). Due to the source of financing, they can be divided into national, including budgetary, and foreign funds from the European Union. Entrepreneurs have access to national innovation support programs financed from the state budget and largely implemented by government agencies, such as the Polish Agency for Enterprise Development, which implements programs aimed at promoting and developing innovative attitudes, projects and enterprises. The second source is operational programs co-financed from the EU funds, implemented by a number of entities, starting from ministries, through territorial local governments and business environment institutions. There are regional, supra-regional and national operational programs in which entrepreneurs are the main beneficiaries. In the financial perspective of 2014-2020, the key national operational program is Smart Growth Operational Program, the main objective is to support innovation and competitiveness of the Polish economy while increasing R+D outlays, in particular private ones, as well as supporting projects from idea to market launch, supporting

projects implemented in cooperation between science and business sectors, focusing on smart specialisations, i.e. thematic areas of the highest scientific and economic potential on a national and regional scale. As part of the program, entrepreneurs use such instruments as:

- Vouchers for innovations for SMEs - the aim is to stimulate cooperation between the science and economy sectors with support provided for the implementation of projects involving the purchase of services from a scientific unit (development of a new or significantly improved product, service, production technology or a new design project);
- Market research - the aim is to provide funds for the implementation of investment projects, which must result in the introduction of new or significantly improved products or services onto the market; the subject of the project may also be experimental development works and consultancy;
- Pro-innovative services of business environment institutions for SMEs - the aim is to support SMEs in the process of developing and implementing product or process innovations of a technological character by co-financing the purchase of pro-innovative services provided by accredited business environment institutions; investments must be implemented in the areas of the National Smart Specialisations;
- Internationalisation of National Key Clusters - the aim is to increase the internationalisation of enterprises operating within the National Key Clusters and co-financing includes comprehensive services, advisory services included, supporting the introduction of the cluster's offer onto foreign markets (Entrepreneurship in Poland 2017: 82-85).

In line with the classic division, legal, financial, institutional and infrastructural instruments can be identified. Legal instruments are of regulatory character, especially the protection of intellectual property (including industrial property) as well as the law and regulations for monopoly control. Financial instruments have a supportive/participatory dimension: grants, subsidies, loans, guarantees, tax reliefs. Institutional and infrastructural instruments support companies through the services offered by advisory and training institutions, technology transfer (institutional) and through cooperation networks or the infrastructure available for companies in technology parks (infrastructural). Infrastructural instruments include, in the light of the nomenclature of the Ministry of Enterprise and Technology, accredited Innovation Centres, which provide innovation consulting services and innovation support

services. The first group includes consulting and training in the area of knowledge transfer, protection of intangible and legal assets and assistance in navigating this type of legal regulations. There are over 20 detailed services in this field, among them the creation of development paths related to the implementation of innovations, search for partners, suppliers, recipients of R+D and new technologies (Table 2) (Ministry of Enterprise and Technology 2017).

Table 2. Consulting services in the field of innovation offered by Innovation Centres

Categories of consulting services in the field of innovation	
Innovation Audit	Identification and mapping of key business processes related to the implementation of innovations, their modification and optimisation.
Analysis of alternative development paths by implementing innovations	Assistance in developing functional / technical documentation necessary for the implementation of innovations
Specialisation and evaluation of the chosen development path related to the implementation of innovations	Developing a marketing strategy for a product or service that is subject to the implementation of innovative technology
Preparation of a detailed financial model for an innovation which is being developed or implemented	Development of a detailed plan for the implementation of the innovation
Consultation on the selection of innovative ideas	Analysis of the risks of implementing innovations
The search for partners for the implementation of R+D and innovative projects	Consulting and assistance in the development and pilot implementation of innovations
Searching for and establishing contacts with the supplier or recipient of innovative technology	Consulting, assistance and training in the full implementation of innovations
Assistance in the process of preparing and conducting negotiations with the supplier or recipient of innovative technology	Monitoring and evaluation of the effects of innovation implementation
Assistance in the process of preparing and conducting negotiations with the investor in the scope of developing and/or implementing innovations	Analysis of the impact of implementing innovative technology on the natural environment
Consulting in the process of preparation/verification and conclusion of a contract between the supplier and recipient of innovative technology	Consulting in the area of human resources development related to the implementation of innovations
Consulting in the management of intellectual property, including the protection of intellectual property rights, state of the art and patent purity research	Other reasonable consulting essential for the implementation of technological innovation

Source: author's own elaboration based on: Ministry of Enterprise and Technology (2017)

The second group of services refers to the support for greater efficiency of companies in the scope of implemented processes, products or services. Here, among others, access to market

research, data banks, laboratories, testing, labelling and certification of quality or office space are provided. It depends on the type of innovation centre, because the objectives of such institutions, like the technological, scientific or industrial and technological park, as well as technology incubator, technology transfer centre, innovation centre or academic business incubator differ. Quality of services offered is an issue commonly raised in assessments of such institutions. Institutions like technological parks do not offer specialised services and instead focus on basic enterprise support, such as rental and administration of office space or equipment (Nowak 2016: 465-469; Wróblewski, Kwieciński 2017: 22).

The enterprise innovation support system evolves along with the changing conditions of business operations in Poland and the EU. Facilitations in the conduct of innovative activity were introduced by the provisions of legal acts adopted in 2015-2017, related to the innovative activity of enterprises and the commercialisation of R+D activities. The Act of 4 November 2016 amending certain acts defining the conditions of conducting innovative activity and the Act of 9 November 2017 on amending certain acts to improve the legal environment of innovative activities are of key importance. In order to significantly reduce the barriers in conducting innovative activity, the attractiveness of tax instruments for supporting innovative activities in Poland has been increased, in particular with regard to tax reliefs for R+D activities. This instrument gives the right to deduct from the taxable amount the tax-deductible costs incurred by the entrepreneur in the process of R+D activities, called the eligible costs. The Act of 2017, which came into force on January 1, 2018, increases the maximum deduction of all eligible costs incurred in the process of R+D activities from the tax calculation base to 100%, and for entrepreneurs with the R+D centre status – to 150% (previously 50% of personnel costs, 50% of costs if the taxpayer is a micro-entrepreneur, a small or medium-sized entrepreneur, and 30% of costs for other entrepreneurs) (Table 3).

Table 3. Instruments supporting the innovativeness of enterprises in Poland

Instrument/form and the purpose of support	The entity providing support
A subsidy and preferential loan for the implementation of innovative environmental technologies and a preferential and market loan, capital investment for the promotion of environmental technology	National Fund for Environmental Protection and Water Management
Co-financing of the co-implementation cost of the project with the participation of foreign partners by small and medium-sized business enterprises conducting research, which plan to implement the results of	National Centre for Research and Development

the project within 2 years of its completion	
Co-financing the cost of joint project realisation with the participation of foreign partners in the scope of development, implementation and production of a new and innovative product, technology or service, which has a chance of commercial market sale	National Centre for Research and Development
Co-financing for the development and implementation of innovative technologies, devices, materials and products in the non-ferrous metals industry	National Centre for Research and Development jointly with KGHM
Co-financing of project implementation costs in the field of scientific research and development works for the national defence and security	National Centre for Research and Development
Reducing the tax burden on entrepreneurs with the status of a research and development centre through exemption from property, agricultural and forestry taxes	Ministry of Finance
Support for investment, development works by enabling taxpayers to choose the manner of charging developmental work costs into tax deductible costs	Ministry of Finance
Support for research and development of an entrepreneur with the status of a research and development centre by introducing a two-year period during which the funds of the innovation fund can be used without the need to determine the revenue	Ministry of Finance
Support for research and development in the form of tax relief in income taxes, which allows for deducting from the tax base the so-called eligible costs incurred by taxpayers for research and development	Ministry of Finance
Support for research and development in the form of a relief in tax liability payments: postponing the date of tax payment or spreading the payment of tax into instalments, postponing or spreading the payment of tax arrears with interest for late payment or interest on delayed tax advances, remission of tax arrears in full or in part, remission of interest for late payment	Ministry of Finance
Financial feedback support for large enterprises: innovative projects in the phase of technology implementation, capital and/or debt support	Industrial Development Agency
Support in obtaining financial partners for projects as well as financial, legal and technological consulting in the commercialisation of innovative projects of large enterprises	Industrial Development Agency
Support in acquiring scientific, industry partners, R+D sphere and public administration units enabling the implementation of large enterprises' projects in the field of their commercialisation	Industrial Development Agency
Support in accessing preferential business locations for the development of large enterprises using innovative solutions	Industrial Development Agency
Consulting services: technological evaluation of innovative projects, valuation of innovative projects, analysis of benefits and risks, consulting support for the commercialisation of innovative projects of large companies	Industrial Development Agency
Organisation of the technology transfer process between SMEs (small and medium-sized enterprises) and large enterprises based on reported technological needs	Industrial Development Agency
Support for innovative projects by accelerating the development of business ventures within industry accelerators	Industrial Development Agency
Development of a 'open innovation' culture by organizing events, combining donors with technology recipients (through direct,	Industrial Development Agency

individualized brokerage activities, co-financing consultancy preparing the technology transfer process (grants for consulting), co-financing technology transfer (grants for technology transfer) through the Technology Transfer Platform	

Source: author's own elaboration based on: Ministry of Investment and Development (2017). The summary list of available support instruments, state as on 1 October 2017.

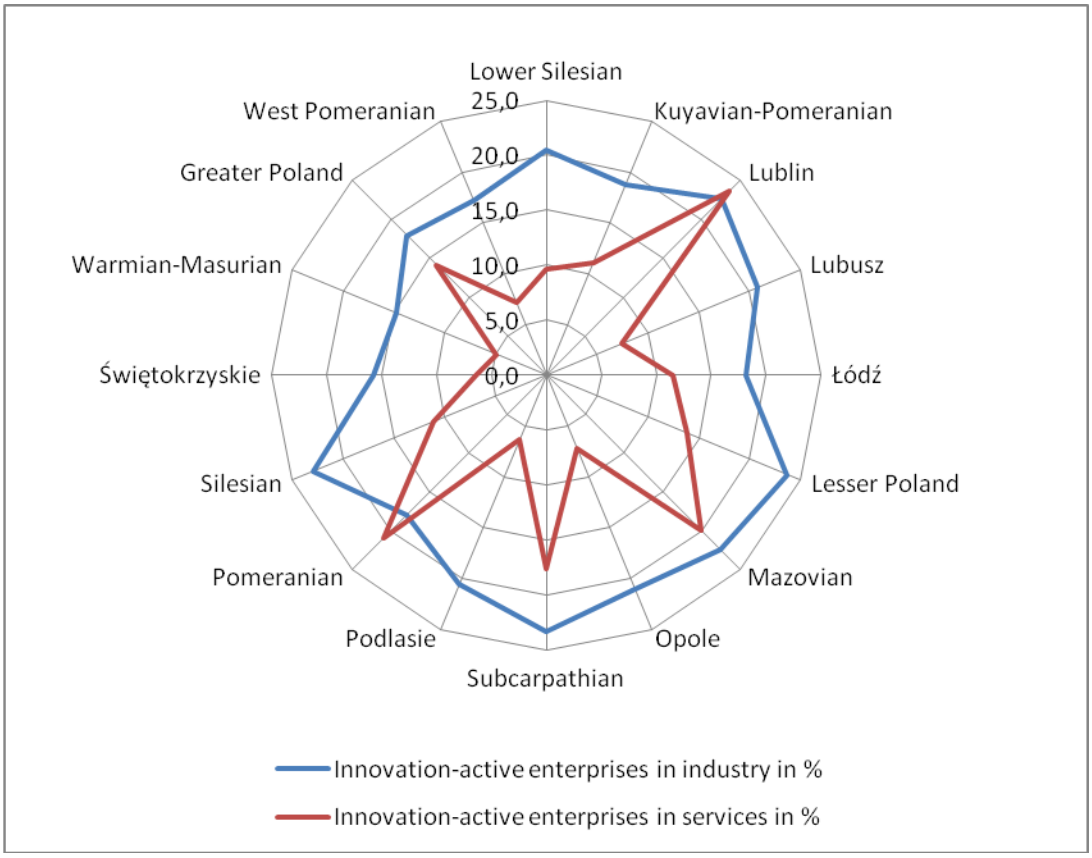
In the enterprise innovation support system, the assistance for enterprises within international programmes, which focuses on activities initiated by the EU, should be distinguished. The key role is the activity of Polish centres of the network called Enterprise Europe Network (EEN), financed from the resources of the Program for the Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) and under the multiannual programme "Poland's participation in the Program for the Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) and in financial instruments of EU programs supporting competitiveness of enterprises over the period 2015-2021". The activity of Polish centres of the EEN is an important element in supporting the level of innovation and internationalisation of Polish small and medium-sized enterprises. The network offers enterprises comprehensive services that help them develop their potential and innovative capabilities. The essence of the network offer is the assumption that all companies receive information and access to personalized services tailored to their needs. EEN centres participate in the implementation of services financed under the next instrument – the EU's Horizon 2020 programme in the field including consulting services aimed at increasing innovation management capacity in SMEs. Using the EEN services gives SMEs an opportunity to adapt their products and services to the requirements of the Common Market. Support for innovative activities at the EU level is financed under the Horizon 2020 programme, being mutually complementary with the COSME programme. If innovation policies are to contribute to more dynamic innovation processes, a variety of instruments suited to specific needs of particular regions must be employed. Development of smart innovation policies in the EU is the tool enhancing effectiveness of innovation support which assumes a diversified approach to public support of regional innovation, as some regions are active participants in the process of innovation from research and development to implementation, whereas some others are merely capable of imitating innovations produced elsewhere (Camagni, Capello 2012: 22). Innovation-oriented activities of countries and regions are also affected by national and regional innovation systems. They involve

on-going interactions among key social and political actors: universities-industry-administration, and represent a non-linear approach to innovation (Andersson, Karlsson 2004: 12).

3. Innovation of Polish enterprises

In the analysed years, innovation-active industrial and service enterprises accounted for 20.3% and 14.5% of the total number of these entities, respectively. The analysis of the regional level of innovative activity of enterprises leads to the conclusion that the innovative activity of companies is quite diverse. Traditional industrial entities are more active in terms of innovation than service organisation, although with some exceptions (Lublin and Pomeranian regions, where 24% and 21% of service companies are active in terms of innovation, respectively against 23% and 18% of industrial companies) (Figure 1).

Figure 1. Innovative enterprises in industry and services in 2014-2016 (in %)

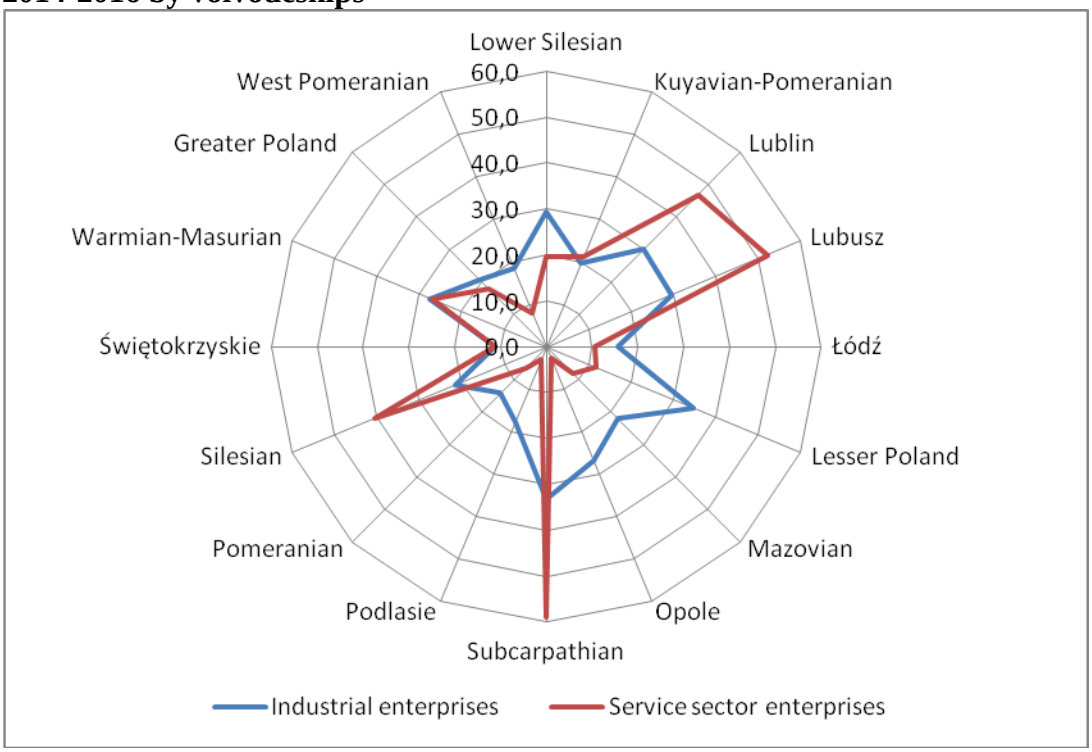


Source: Author's own elaboration

The largest percentage of industrial enterprises that introduced at least one product or process innovation or carried out at least one innovative project that was interrupted or not completed, occurred in Lesser Poland (Małopolskie) voivodeship (23.7%). On the other hand, the most active innovation service units were found in Lublin voivodeship 23.6%. The distance between voivodeships with the highest and lowest rates was 8.9 percentage points in the case of industrial enterprises, and 18.7 percentage points in the case of services.

Over the investigated period, 23.5% of innovative industrial companies received public financial support for innovative activities as did 18.3% of service companies. In regional terms, public support was mostly used by entities from Lesser Poland voivodeship (34.7% of innovation-active industrial enterprises) and Subcarpathian (Podkarpackie) voivodeship (59% of innovation-active service enterprises) (Figure 2).

Figure 2. Public support for innovation activities in industrial enterprises over the period 2014-2016 by voivodeships



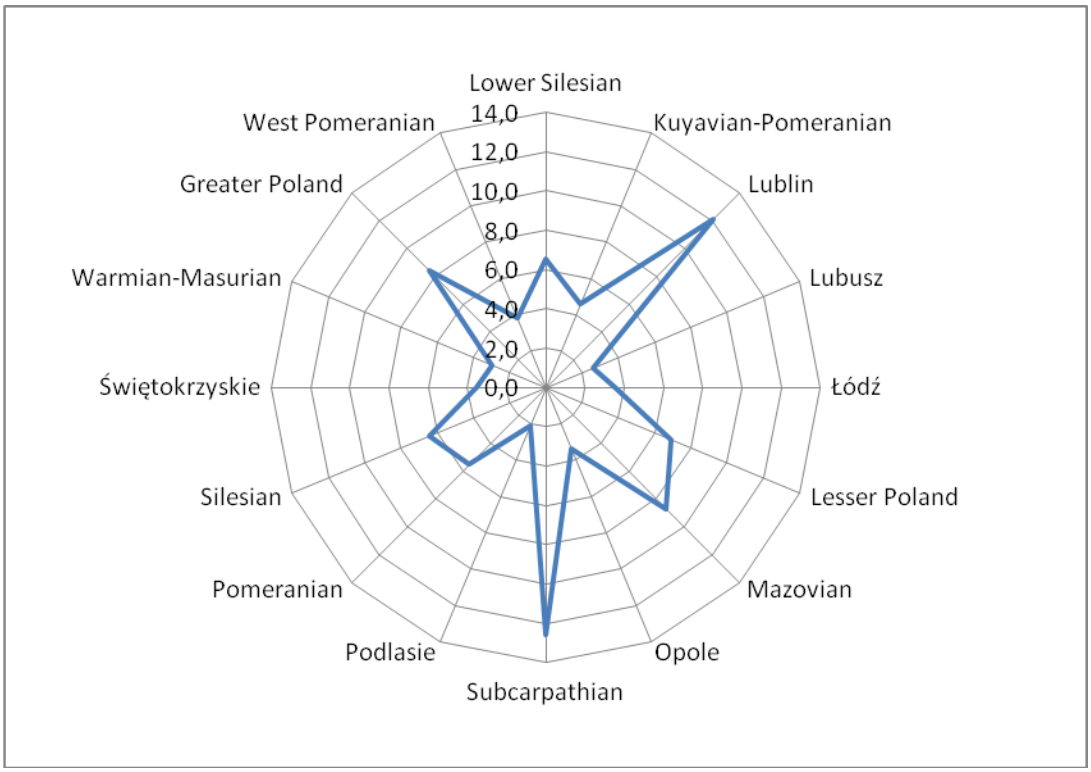
Source: author's own elaboration

Innovative enterprises from Świętokrzyskie Voivodeship benefited from the support to the lowest degree, just 11.1%. An even smaller percentage of service enterprises from Opole Voivodeship received public support - 2.8%. The disproportions between innovation-active industrial entities benefiting from public support in voivodeships reach 23.6 percentage points, and in the case of service companies - 56.2 percentage points.

Considering the use of public support for innovative activities in industrial and service enterprises, in both cases the top regions are Subcarpathian, Lublin and Lubusz. Units from these voivodeships rank in the top four in terms of the support received. It should be emphasized that the voivodeships, in which the highest percentage of innovation-active entities occurs, also have the highest percentage of enterprises using public support for innovative activities. Similar trends are not observed when regions with the lowest percentage of innovative enterprises are taken into account.

The situation looks slightly different for innovative enterprises, i.e. those that during the investigated period introduced at least one product or process innovation onto the market (a new or significantly improved product or a new or significantly improved process). The highest percentage of innovative service enterprises was found in Subcarpathian (12.6%) and Lublin (12.1%) voivodeships, while the lowest was found in Podlaskie voivodeship (2.1%) (Figure 3).

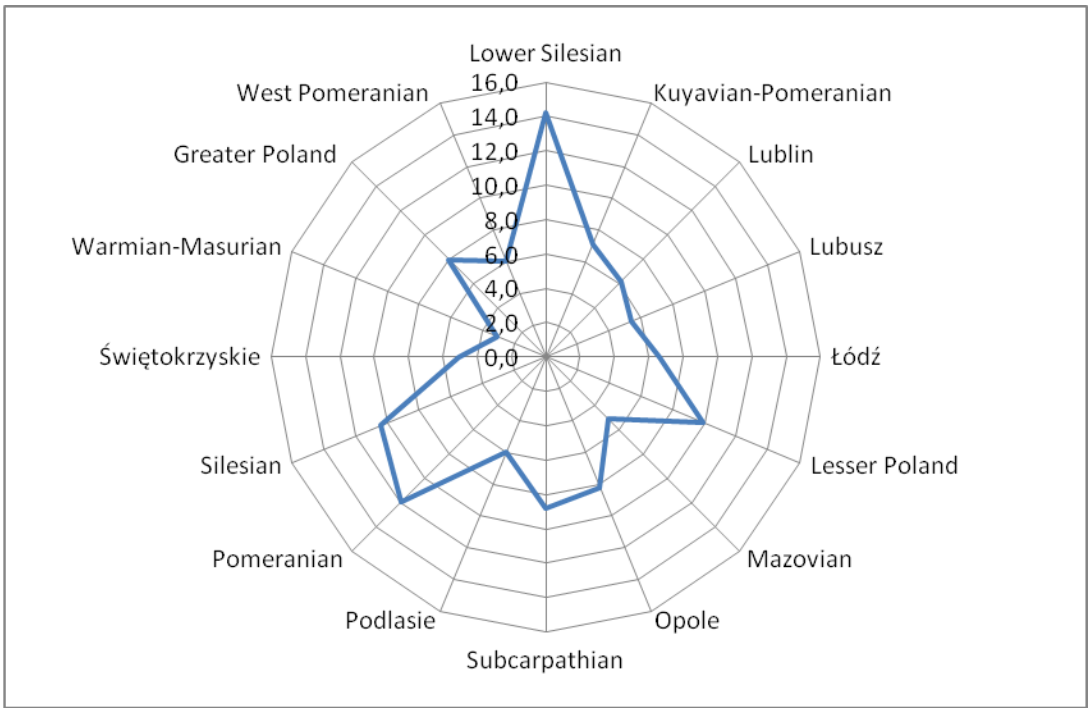
Figure 3. Innovative enterprises in services which have introduced new or significantly improved products in 2014-2016 (in %)



Source: Author's own elaboration.

The leaders of this ranking hold a considerable advantage over Mazovian voivodeship ranked next, in which 8.7% of service companies introduced at least one innovation. The distance between the leading Subcarpathian voivodeship and Podlaskie voivodeship holding the last position is 1:6. Similarly, the long distance between the leader and the region in the last position occurs in relation to revenues from sales of new or significantly improved products in industrial enterprises (1:4.6 between Lower Silesian and Warmian-Masurian voivodeships) (Figure 4).

Figure 4. Revenues from sales of new or significantly improved products in industrial enterprises in 2016 as percentage of total sales

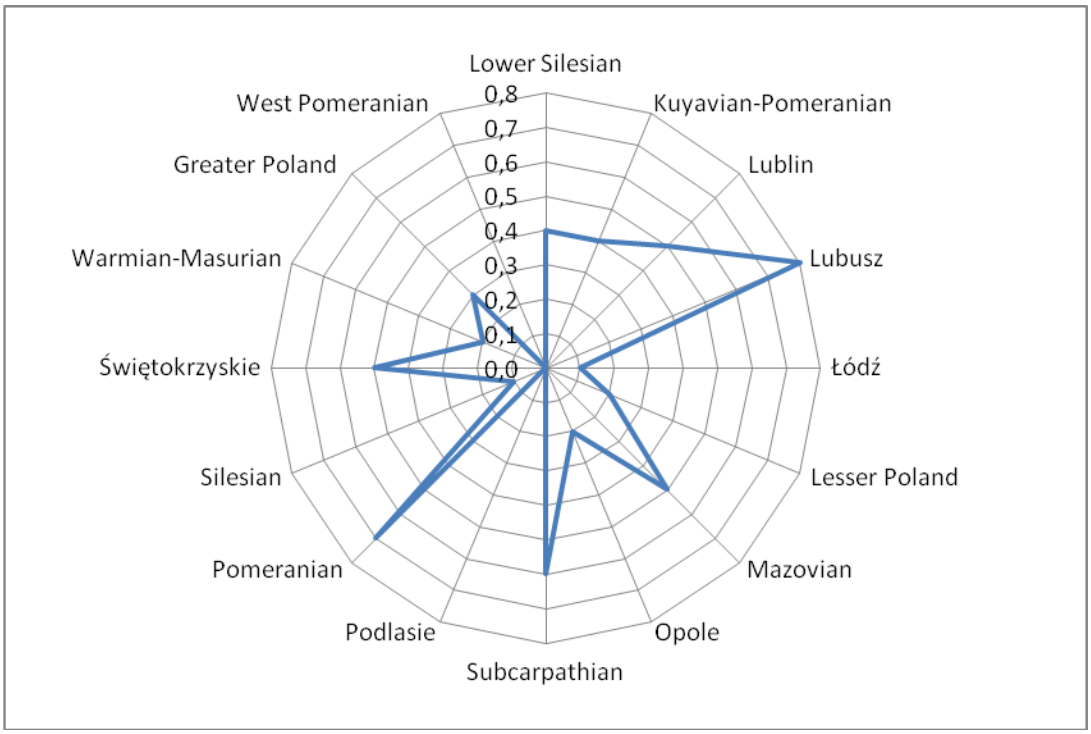


Source: author's own elaboration

Sales generated due to new or significantly improved products are the most advantageous among industrial enterprises from the Lower Silesian Voivodship (14.2), slightly less favourably among the companies of Pomeranian (11.9%) and Silesian (10.4%) voivodeships. However, products placed on the market during the period 2014-2016 generated the lowest revenue as a percentage of the total sales of industrial enterprises in the following voivodeships: Warmian-Masurian (3.1%), Świętokrzyskie (5.1%) and Mazovian Voivodeships (5.1%).

The ability of service companies to assume the ownership of the benefits from innovative activities in the form of acquiring ownership rights to innovations is highly varied. It reflects the ability of enterprises to protect innovation from being imitated by market competitors. On the other hand, innovative firms with strong legal protection are willing to share their knowledge, which fosters more rapid propagation of innovation (Jaumotte, Pain 2005: 5). The index of innovative service companies that filed inventions in foreign patent offices is the most favourable in Lubusz Voivodeship and amounts to 0.8% (Figure 5).

Figure 5. Service companies that filed inventions in foreign patent offices during the period 2014-2016 as the percentage of all companies



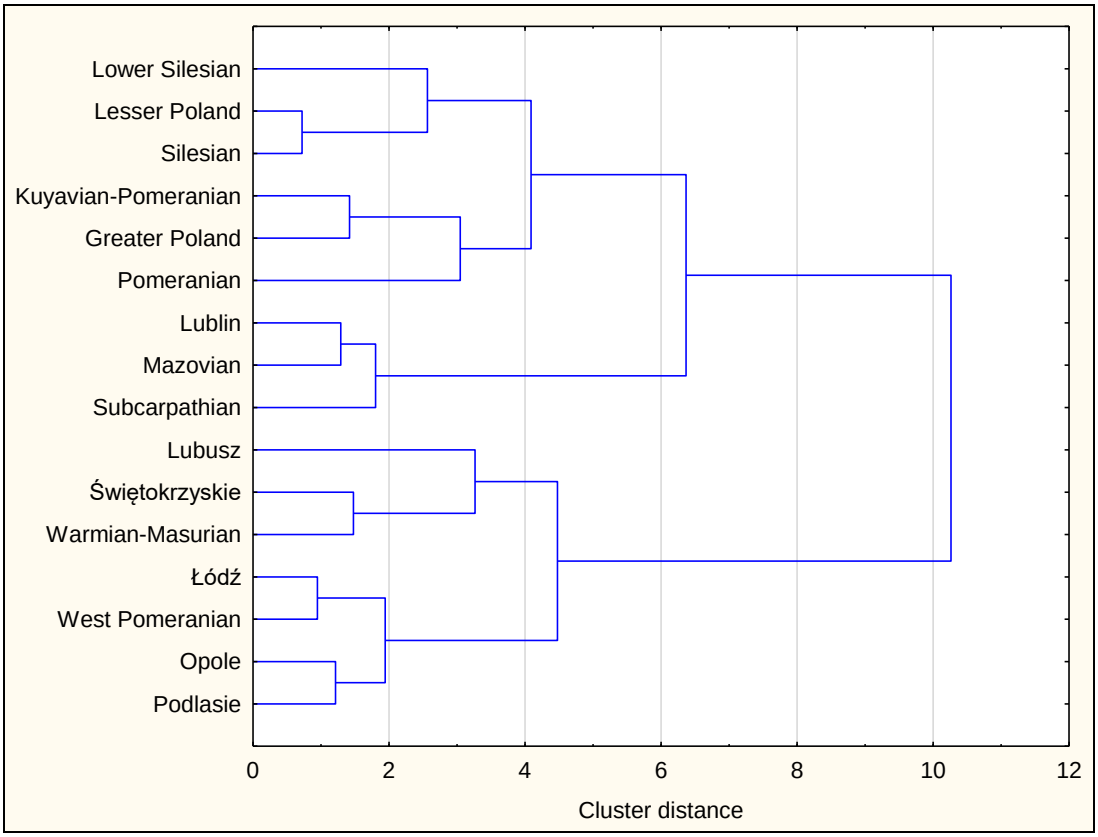
Source: author's own elaboration

Pomeranian and Subcarpathian Voivodeships, holding consecutive positions in the ranking, reach the index value at the level of 0.7% and 0.6%, respectively. As many as 10 more regions reach the index value below the level of 0.5%. On average, 0.4% of service companies in Poland made such a notification. In two voivodeships: Podlaskie and West Pomeranian voivodeships, the above phenomenon did not occur at all.

4. Innovation of Polish companies using cluster analysis

Using the features adopted in the procedure described above, as a result of grouping Polish voivodeships, a hierarchical tree was created, which is shown in the dendrogram (Figure 6).

Figure 6. The classification of voivodeships in terms of innovation, using Ward's method during the period 2014-2016



Source: author's own elaboration

In the grouping procedure, the clusters of voivodeships with relatively homogeneous features were distinguished. The resulting dendrogram reveals, at the bonding distance of 4, five clusters, comparable in relation to their size. The research objects (voivodeships) created four three-element clusters and one four-element cluster. Three different clusters formed at a bonding distance of 6. The most numerous group was formed by Lubusz, Świętokrzyskie, Warmian-Masurian, Łódź, West Pomeranian, Opole and Podlaskie Voivodships. The six-element cluster includes the following Voivodeships: Lower Silesian, Lesser Poland, Silesian, Kuyavian-Pomeranian, Greater Poland and Pomeranian.

In both analysed cases, the voivodeships: Lublin, Mazovian and Subcarpathian form separate clusters. The separation of their structures from the other regions is clearly visible in all indicators examined. These voivodeships are at the forefront of the ranking in terms of innovative enterprises in services that have introduced new or significantly improved products, thereby

taking the first three positions. In turn, the following indicators: enterprises which are innovation-active in industry, enterprises which are innovation-active in services and service enterprises that have filed inventions in foreign patent offices, locate these voivodeships in the country's top five. The situation changes slightly in relation to the index of the revenue from the sales of new or significantly improved products in industrial enterprises, in the case of which Subcarpathian Voivodeship remains among the top five (the 5th position), while Lublin and Mazovian Voivodeships land in the second half of the ranking (the 10th and the 14th position, respectively).

5. Conclusions

Polish entrepreneurs can use a diverse set of instruments supporting innovation activities: legal, financial, institutional and infrastructural ones. Legal instruments have a regulatory character, in particular the protection of intellectual property (including industrial property), while financial instruments, such as grants, subsidies, loans, guarantees and tax benefits have a supporting and participatory dimension. Institutional and infrastructural instruments support entrepreneurs through the services of entities, such as consulting and training institutions, technology transfer (institutional) and through cooperation networks and infrastructure for companies in technology parks (infrastructural). The group of infrastructural instruments includes accredited Innovation Centres, which provide companies with innovation consulting and innovation support services.

The conducted research points to the following conclusions:

1. The value of public support for innovative activities, in the light of the analysis, is regionally diversified: public and service enterprises in the Podkarpackie, Lublin and Lubusz Voivodeships benefit the most from public support for innovative activities.
2. It should be emphasised that voivodeships with the highest percentage of innovation-active entities also have the highest percentage of enterprises using public support for innovative activities.
3. The evaluation of enterprise innovativeness also reveals regional diversification. They are most visible in the percentage of innovative enterprises in services and the percentage of innovation-active service enterprises.

4. Cluster analysis revealed the greatest similarity of the structures in Subcarpathian, Mazovian and Lublin Voivodeships. The separation of their structures from the other regions is clearly visible in all indicators examined. These voivodeships are at the forefront of the ranking in terms of innovative enterprises in services that have introduced new or significantly improved products, thereby taking the first three positions. In turn, the following indicators: enterprises which are innovation-active in industry, enterprises which are innovation-active in services and service enterprises that have filed inventions in foreign patent offices, locate these voivodeships in the group of country's top five.

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Paulina NOWAK

Instrumenty wsparcia innowacyjności polskich przedsiębiorstw

Streszczenie

Innowacyjność jako umiejętność bycia innowacyjnym w regionalnym, krajowym i światowym otoczeniu jest współcześnie wyznacznikiem sukcesu w biznesie. Szybko zmieniające się otoczenie wymaga od podmiotów gospodarczych ryzykownych działań w obszarze nowych technologii i technik wytwarzania. Dlatego działalność innowacyjna przedsiębiorstw wspomagana jest przez politykę gospodarczą państw, które dążą do wysokiej innowacyjności gospodarek. Adresowane do podmiotów gospodarczych instrumenty występują w różnych formach i dostępne są na różnych poziomach (region, kraj, ugrupowanie integracyjne). Innowacyjność wynikowa przedsiębiorstw, może wskazywać na zróżnicowane regionalnie potrzeby innowacyjnego wsparcia ze strony państwa. Celem artykułu jest systematyzacja dostępnych form wsparcia innowacyjności polskich przedsiębiorstw oraz ocena regionalnych zróżnicowań w innowacyjności wynikowej przedsiębiorstw. Przedmiotem analizy jest 16 polskich województw. W artykule wykorzystano wtórne źródła informacji, takie jak dane statystyczne Głównego Urzędu Statystycznego oraz rządowe raporty o przedsiębiorczości w Polsce. W porządkowaniu instrumentów wsparcia innowacyjności dokonano przeglądu instrumentów polityki innowacyjnej w Polsce opisanych na rządowych portalach. W ocenie regionalnych zróżnicowań innowacyjności wynikowej (lata 2014-2016) zastosowano analizę porównawczą wskaźników takich jak: odsetek przedsiębiorstw innowacyjnych w przemyśle/usługach, przychody ze sprzedaży produktów nowych lub istotnie ulepszonych. Dla określenia regionów o podobnych strukturach pod względem innowacyjności wynikowej przedsiębiorstw wykorzystano aglomeracyjną metodę porządkowania nieliniowego (Warda). Przeprowadzone analizy pozwalają na uporządkowanie dostępnych instrumentów wsparcia innowacyjności przedsiębiorstw ze względu na ich źródła finansowania jak również w podziale na instrumenty prawne, finansowe, instytucjonalne i infrastrukturalne. Wartość publicznego wsparcia na działalność innowacyjną, w świetle statystyki publicznej, jest zróżnicowana regionalnie. Ocena innowacyjności wynikowej przedsiębiorstw również ujawnia zróżnicowania regionalne, które jak się wydaje wynikają z przestrzennych uwarunkowań rozwojowych, jak również z wielkości wsparcia publicznego. Rozpoznanie tych uwarunkowań może mieć wpływ na większą trafność w proponowaniu i zastosowaniu instrumentów polskiej polityki innowacyjnej.

Słowa kluczowe: innowacyjność przedsiębiorstw, instrumenty polityki innowacyjnej, zróżnicowania regionalne.