



## ORIGINAL ARTICLE


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## The usage pattern of development method to assess the functioning of special economic zones: the case of Poland

**JEL Classification:** R11; R58

**Keywords:** *entrepreneurial region; multivariate comparative analysis; regional development; special economic zones*

### Abstract

**Research background:** In this article the characteristics of the terms of an entrepreneurship of a region and a local development were presented. Likewise, it demonstrates the results of research about using the development model method to classify special economic zones (SEZ) in terms of the most important indicators referring to the economic activity of zones in Poland, as well as showing the potential of zones — by noting their advantage or distance in relation to another zone in terms of criteria for functioning of privileged areas forming together a group.

**Purpose of the article:** The aim of the article is to show the possibility to use a multidimensional comparative analysis method to recognize the level of a region's development in a time-space system on the example of SEZ operating in Poland.

**Methods:** The essential data source about the article's description were reports published by the Ministry of Economy and then the Ministry of Enterprise and Technology: Information on the implementation of the Act on Special Economic Zones. The empirical analysis used the method of multidimensional comparative analysis used to recognize the diversification of the functioning of fourteen SEZ operating in Poland in a time-space system. The examination procedure covered the years 2009–2017. A constant development pattern was adopted for all the years of the study.

**Findings & Value added:** The results of conducted analysis show that in SEZ there were real development processes. However, these processes were accompanied by persistent disproportions in the level of development of individual zones.

## **Introduction**

The change in political situation after the year 1989 caused substantial changes in the Polish law system, which resulted in changes in the functioning of the economy. These changes induced serious consequences for the whole country and local environments. During the last twenty years, there has been an important change of the Polish economic model. SEZ deserve an attention in this area. In 1994 —14 SEZ were established in the least-developed regions in Poland. They are an example of the dynamic development of private business entities and the restructuring of public enterprises (Ambroziak & Hartwell, 2018, p. 1322). Since the creation of SEZ in Poland, their rapid development has taken place (Hajduga *et al.*, 2018, pp. 84–85). As a result, the special economic zone has become an important tool for stimulating the country's economic development. In these zones, good conditions for the functioning of enterprises and investment placement were created (Ambroziak, 2016, p. 248). SEZ are the popular kind of help to enterprises all over the world because they are assigned a general goal related to generating economic benefits and accelerating the economic development of the regions (see: Rustidja *et al.*, 2017, pp. 138–139). SEZ are tools applied to support regional development and enterprises and institutions working with them.

The considerations defined in the article concern the issues of the functioning of SEZ in Poland, recognized through the prism of the most important indicators concerning the economic activity of the zones, and also showing the potential of these zones — by recognizing their advantages or their distance from other zones, from the point of view of criteria of functioning of privileged zones together forming a group-

The aim of the article is to show the possibility to use a multidimensional comparative analysis method to recognize the level of a region's development in a time-space system on the example of SEZ operating in Poland. The examination procedure covered the years 2009–2017.

The first part presents the theoretical basics connected with a term of a region's development. The next part describes the procedure of determining the taxonomic general measure of development as a synthetic measure of the region's development level. The next section discusses the empirical results. The final section concludes.

## Literature review

Today, entrepreneurship is a very important factor conducive to the survival and development of business organizations. Entrepreneurship has a global, regional and local dimension. It can be also a trait of individual subjects. Entrepreneurial foundations determine competitiveness and market potential of the organization, but also affect the development of the region and the entire economy. The development process of the region includes all changes taking place at different rates and with varying intensity in the economic, social, technical and environmental spheres (Kosiedowski, 2013, p. 42). According to Poliński (2010, p. 7), local development is a qualitative increase in the economic potential of the region and a lasting improvement in the competitiveness and standard of living of the society. The similar definition of regional development is added by Krawczyk-Sokołowska (2011, pp. 99–100), who circumscribe the regional development as a process of positive quantitative and qualitative changes in region's potential. It depends on the inside organization's potential as well as the creativity of a regional community. It is determined by outside factors.

There is a distinct relationship between entrepreneurship of business entities and regional development. Pilewicz (2013, p. 27) claims that an entrepreneurial region is a kind of organization which stimulates and supports individual and economic entrepreneurship, learns, stimulates and supports innovation, actively acquires new investors, is strategically agile (has the ability to quickly and repeatedly adapt the strategy and business model to the changing market and external environment without incurring major losses) and manages its development. Theories of regional development attach great importance toward entrepreneurship. As one of the major factor that allows the development itself. The entrepreneurship in a regional development is understood as a process of creating and developing enterprises and entrepreneurial environments (Klasik, 2006, p. 11). According to Kongolo (2010, p. 2290) and Meyer and Meyer (2017, pp. 150–151), entrepreneurship and business development should be coordinated by local business chambers. Hajduga *et al.* (2018, p. 81) consider showing that regional policy focuses on supporting the development of network connections among business entities, local authorities and business environment. What is the SEZ role here? They are aimed at shaping the internal competitiveness of regions using the instruments of economic, legal and administrative character. In these fields entrepreneurs can lead an economic activity which promotes creating entrepreneurship through the use of a number of economic policy instruments. Regional state aid in SEZ has a specific character and

mechanism of receiving, and thus influencing, a region's economic and social development (Ambroziak, 2016, p. 259).

The problem of regional development is currently the subject of intensive research. There are numerous studies at different spatial levels evaluating and analysing the impact of regional development in EU and in Poland. Some studies seek answers as to the question what factors affect the level of European Union development, including: innovation, sustainable and technological development, economic development, quality life and many more (see also: Thompson, 2004, pp. 62–97, Pearce & Zhang, 2010, pp. 481–498, Castro-Gonzales *et al.*, 2016, pp. 373–386, Cheba & Szopik-Depczyńska, 2017, pp. 488–492, Balcerzak, 2011, p. 457).

A separate group of research concerns the application of taxonomic measure of development method in the field of regional development analysis in Poland. Some of them concern the analysis of the level of unemployment (Tatarczak & Boichuk, 2018), while others focus on managing the region (Kola-Bezka, 2012, Ambroziak & Hartwell, 2018) and others are about economic development at the voivodeships level (Balcerzak & Pietrzak, 2017) or the regional variety in quality of life (Nowak, 2018).

## **Research methodology and sample description**

The most popular tool which is used to group and data classificatate in economic research is numerical taxonomy (Suchecki, 2010). The taxonomy is the field of multidimensional analysis that deals with the principles and rules of the classification of multi-feature objects (Heffner & Gibas, 2007; Młodak, 2006; Zawada, 2007; Strahl, 1998). In the calculation one of the numerical taxonomy methid was used, the Hellwig's pattern of development method. The main advantages of Hellwig's method are its methodological simplicity and the flexibility of its application (see Balcerzak, 2016, pp. 11–27). The introduction to the proper analysis in the methods of multivariate comparative analysis is the selection of a set of possible to use variables describing the subject of the study, the so-called potential variables. In connection with the above, a choice of eight traits was made. The final set of variables are characterized by high spatial variability with low correlation within the selected variabes (Balcerzak, 2011, pp. 457–458, Cheba & Szopik-Depczyńska, 2017, pp. 487–504). These traits were given the numbers from 1 to 8. All of the traits are stimulants (the higher a value is the more beneficial a position is, that is SEZ), which means that an increase in the value of the explanatory variable leads to an increase in the value of the explained variable (see Table 1). These varia-

bles are present in all of the spheres studied and they characterize by high spatial diversity. These indicators characterize the demographic, social, economic and infrastructural potential of the privileged zones studied. A vector is examined:

$$X = [x_1 \ x_2 \ x_3 \ x_4 \ x_5 \ x_6 \ x_7 \ x_8 ],$$

where:

$X$  – a representative of a single object;

$x_1x_2x_3x_4x_5x_6x_7x_8$  – values of the examined features.

A process of determining the development pattern consisted of three stages. In the first stage the abstract observation was made, the so-called taxonomic character development pattern  $z_{0j}$  representing the best (maximum) values for each variable. Standardized variables were used to determine the so-called development pattern  $z_0$ , which was a vector with coordinates  $z_{01} \ z_{02} \ \dots \ z_{0j} \ \dots \ z_{0m}$ . The values of the characteristics  $X_j$  are standardized according to the formula:

$$z_{ij} = \frac{x_{ij} - \bar{x}_j}{s_j} \quad (1)$$

where:

$x_{ij}$  – the output value of  $j$ -th feature in the  $i$ -th object,

$z_{ij}$  – the standardized value of  $j$ -th feature in the  $i$ -th object,

$\bar{x}_j$  – the arithmetic mean of the  $j$ -th feature,

$s_j$  – the standard deviation of the  $j$ -th features

In the second stage the similarity of the observations to the abstract, best observation was checked by calculating the Euclidean distance of each from the development pattern. The distance from a given pattern is estimated with the following equation:

$$d_{i0} = \sqrt{\sum_{j=1}^m |z_{ij} - z_{0j}|^2}, \quad i = 1, 2, \dots, n; \quad j = 1, 2, \dots, m. \quad (2)$$

Based on standardized variables for each spheres, the distance of individual zones from the development pattern was determined. A collected data led to calculate the mutual distances  $d_{ij}$  between fourteen SEZ due to the eight characteristics studied. For assurance the equal impact of each of the traits (variables)  $z_1, z_2, z_3, z_4, z_5, z_6, z_7, z_8$  on the value of the distance was standardized for each feature.

The more the object is similar to the pattern, i.e. the less distant from it, the higher the level of the complex phenomenon for this object. The third — the last stage was setting the measure of development normalized within the range [0,1] for each taxonomic object. The synthetic variable proposed for this method by Hellwig is:

$$m_i = 1 - \frac{d_{i0}}{d_0} \quad (3)$$

where:

$m_i$  – measure of development for  $i$ - of that object,

$d_0$  – the Euclidean distance of the object from the reference object.

Assignment of a taxonomic measure of development allowed to hierarchization of examined multi-feature objects as well as their grouping. Such constructed measure helped to assess the level of entrepreneurship development in the set of SEZ subjects. The data analyzed came from reports Information on the implementation of the Act on Special Economic Zones published on the website of the Ministry of Enterprise and Technology.

The first analyzed variable was a number of valid permissions for business activity in SEZ. The number of business permits issued in all zones amounted to 349 in 2017. The total number of permits issued from the beginning of the zones until the end of 2017 amounted to 4 036. A part of which was revoked, extinguished, annulled or revoked. Their number can also decrease because of a withdrawal of the permit as a result of the entrepreneur's failure to comply with the permit conditions as well as cessation of activities covered by the permission.

The second analyzed variable necessary to estimate the economy activity SEZ is size and diversity of investments made by entrepreneurs who run their own businesses on SEZ area. From the appointment of the first SEZ till the end of 2017 investors who led activities on the basis of valid permits incurred investment outlays worth more than 106.6 mln złotych, which in comparison to 2016 decreased by almost 5.7 mln (ie by 5%). The most invested capital, 68% in total, come from: Poland, Germany, The United States, The Netherlands, Italy and Luxembourg.

The next very important determinant is the level of employment achieved in the areas of the zones. When establishing the SEZ, it was assumed that 160,000 new jobs will be created in the zones. The predicted number was achieved in 2007. The dynamics of creating new jobs is important from the point of view of the effects of regional policy. At the end

of December 2017 investors hired 353 thousand of employees. New work places posed 60.3 %.

Next, the analysis was subjected to achieved effects calculated on the total expanse of zones in hectares. The effectiveness of activities of zone managers has an impact on development of the investment area that the zone has (Pastusiak, 2011, p. 204). SEZ and its activity range 181 cities and 305 boroughs. The number of boroughs where privileged areas are established is systematically growing. Their total area is over 22 thousand hectares. At the end of 2017 the total area of SEZ was developed in almost 60%, but there are visible disproportions between the areas. It proclaims about a high attractiveness of an investment in SEZ.

Another analyzed variable were the costs of infrastructure building in million zlotych. According to Article 8 (Act on SEZ, 1994), the law of SEZ the tasks of the manager include conducting activities aimed at developing business activity in the zone. The main activities of managers are building infrastructure and promoting zones.

The same as in case of costs of infrastructure building, the costs of zones promotion are the priority tasks assigned to zone management companies. Inclusively, in 2017, management companies spent 7.07 million zlotych on zones promotion.

The next very important SEZ result criterion is the financial result of companies managing zones in a given year in thousand zlotych. Companies managing SEZ are business entities that base their activities on the provisions of the Code of Commercial Companies, the law of income tax on legal body and the act on the freedom of economic activity. The main income's source for management companies are incomes from sales of land, fees for the administration and management of the zone, paid by entrepreneurs operating within the zone.

Attracting a large number of investors is reflected in the financial results of the zone management companies. 2016 and 2017 were the years in which all SEZ management companies achieved a positive financial result.

The last analyzes variable was the size of tax exemptions for companies managing zones in a given year in million zlotych. The size of given aid in shape of an income tax exemption is limited by the amount of costs eligible for aid and the maximum intensity of regional public aid calculated for a given area. It depends on the size of the company (on average, the size of the aid is 10% more, for small and micro entrepreneurs the aid raises to 20%). Zone management companies benefit from tax exemption under the provision of § 2 of the ordinances of the Council of Ministers establishing individual zones. Under this legal regulation, the income of the zone manager in the part spent in the tax year or the year following for the develop-

ment of the zone, including the acquisition by the manager of real estate or other things used to run business in the territory, is exempt from income tax zone and for the modernization and expansion of economic and technical infrastructure within the zone.

## **Results**

In the further part of a given research for fourteen SEZ a calculation of distance values of each tested zone from the determined pattern of development and ordering of objects in the order from the best to the worst in the analyzed years was made. The results obtained in the presented research procedure for 2009–2017 are presented in Table 2.

In 2009 an undisputed leader was Katowicka SEZ. Out of eight of the examined traits, five (the number of valid permissions for running a business on SEZ area, incurred investment outlays, created jobs, expenditures for the construction of infrastructure, expenses of management companies for the promotion of zones) are exemplary values, i.e. the most advantageous ones.

Year 2010 brought a change of a SEZ's leader. Wałbrzyska zone went up from the second position in 2009 to the first position, and reached the value of expenditures for the construction of infrastructure, corresponding to the pattern of development. In Wałbrzyska zone in 2010 18 valid permits were issued for running a business (in Katowice zone half less). In comparison to 2009 management companies achieved the highest financial result in terms of value (16 776 thousand złotych). In 2010, Katowice SEZ occupied the second position, despite achieving in five studied characteristics the value corresponding to the development model. This result was influenced by lower expenditures on infrastructure construction and tax exemptions for zone management companies.

Year 2011 brought a change on the leader. Katowicka SEZ again took the first position and achieved the values of the developmental pattern for the five variables examined (number of valid permits for running a business in a SEZ, investment outlays in million złotych, jobs created in zones, expenditures for infrastructure construction in million złotych, management companies' expenditure on promotion zones in million złotych). In 2011 the most workplaces were created — 5068, and the investments costs increased by 1285 million zloty. The second position went to Wałbrzyska SEZ. The fall of this zone on a lower position was caused by the lower financial result of the zone management companies compared to 2010 (by 1413.29



thousand zlotych) and tax exemptions by 2.33 million zlotych. Łódź SEZ collapsed from fourth to third position.

2012 was a successful period for Wałbrzyska SEZ which took the first position and three of examined traits (total area of the zone, financial result of companies managing zones in a given year in thousand zlotych, tax exemptions of companies managing zones in a given year in a given year in zlotych) reached the standard values. On the second position fell Katowicka SEZ, four examined traits assumed the standard values, but the least expenditures for infrastructure construction were incurred (10 million zlotych) and the lowest tax exemption rate among the best zones (Wałbrzyska, Łódzka, Tarnobrzeg) was obtained, compared to 2011.

The year 2013 consolidates the advantage of Wałbrzych zone over Katowice zone, which still had a leading position. On the third position was Łódzka zone, Mielecka zone was promoted to the fourth position. The leaders of 2013 obtained the most permits to conduct a business activity, i.e. out of 253 permits issued in 2013, the Katowicka zone received — 28, Wałbrzyska — 27, Mielecka — 25 and Łódzka — 19 permits for running a business.

In 2014 an undisputed leader was Katowicka SEZ. From the second position in 2013 it advanced into the first position. From eight of examined traits, six are the best or most favorable values. On the second position there was Łódzka zone, the third position was occupied by Tarnobrzaska zone. Wałbrzyska zone decreased to the fourth position. 2014 was the next successful year for the SEZ. A significant increase (of 72%) of amount of entrepreneurs granted business permits proves that. SEZ occupying top positions in 2014 also had the largest share in the number of jobs created, which amounted to 18.9% in Katowice zone, 15% in Wałbrzyska, 11% in Łódzka, and 9.2% in Tarnobrzaska.

In 2015 on the leader's position there was still Katowicka zone, on the second position there was Wałbrzyska zone, which advanced from the fourth position in 2014. At the same time, Łódzka zone dropped from the second to the third position. The largest number of permits for business activity was held by Katowice zone — 330, Wałbrzyska — 284 and Łódzka — 206. SEZ in Łódź took third position, earning a profit of 5.2 million zlotych.

In 2016 the Katowice SEZ remained the leader for the third time. Out of eight of the examined traits, three are the best or most favorable values: created jobs, financial result of companies managing zones in a given year and tax exemptions of management companies. The second position went again to Wałbrzyska SEZ, reaching as many as four of the best or most

favorable values. From the fourth in 2015, the Tarnobrzeg zone was promoted to the third place.

In 2017, the Katowice SEZ remain the leaders, which for the fourth consecutive year ranks first, followed by the third year in Wałbrzyska SEZ, and the third place was promoted by the Kostrzyńsko-Słubicka SEZ. The last place belongs to the Starachowice Zone — 13th place and the Kamiennogórska Zone — the last place. All the features studied have reached the reference values, i.e. the most favorable in the zones occupying the first three places.

## **Discussion**

To sum up, it should be certified that SEZ play an important role in the Polish economy. At the beginning, an idea to create SEZ was to strive for counteracting negative economic and social effects caused by the liquidation of jobs and prevention of structural unemployment in selected regions of the country. The first zone was created in 1995 and year by year the number of permits issued for running a business and the number of start-ups were rising. An increasing degree of the development of the area of zones, the growing number of employees in a significant way testify to the strength of SEZ and the sense of their appointment, and the fact that zones affect the development of entrepreneurship in the region. SEZ build competitiveness and innovation potential.

This paper has examined the effect that SEZ have had on regional development in Poland across a broad range of metrics. Free economic zones turned to be especially effective in the field of attracting foreign investors to the country and well-known international corporations. These influence the constantly rising level of international competitiveness of the Polish economy. The overarching goal of the state aid administered via SEZs in Poland was to address a geographical imbalance in investment distribution across the country. However, the analysis of SEZ's effects functioning in Poland shows that the best results are achieved mainly by big zones (Katowicka, Wałbrzyska, Łódzka, Tarnobrzaska) placed in southern or western Poland. In the worst condition are smaller zones (Słupska, Suwalska, Starachowicka i Kamiennogórska). Katowicka zone owes the position of the leader to the economic attractiveness of Upper Silesia. However, still very little interest of big investors falls to the zones located in preferential agricultural regions of northern Poland.

## **Conclusions**

The aim of the article was to show the possibility to use a multidimensional comparative analysis method to recognize the level of a region's development in a time-space system on the example of special economic zones operating in Poland. In the analysis the phenomenon of regional economic development was considered as a multivariate problem. Methods of multivariate comparative analysis which lead to consult many aspects of development at the same time can be a helpful tool for the local government authorities assessing the accuracy of decisions taken in the past and the effectiveness of the region's management instruments used in the past. The main advantages of Hellwig's method are its methodological simplicity and the flexibility of its application (Balcerzak, 2016, pp. 11–27).

Summing up, I can observe that the regional development means systematic activities of the local community, authorities and other entities operating in a given region, aimed at creating favorable conditions for local entrepreneurship. A concept of a local development is concentrated on stimulating entrepreneurship, which has a positive impact on regional development. The creation of new business entities in the areas of SEZ brings demand for investment goods, and the creation of new jobs — for consumer goods. It is then very important if entrepreneurs and local authorities create a climate which aids the entrepreneurship because it boosts the regional development and the interaction between entrepreneurs and local authorities is a feedback and bi-directional.

Based on the obtained result, it can be said that SEZ accomplishes the role of an entrepreneurial region. This paper has some important policy implications. Namely, the results could help decision makers to identify regional similarities/dissimilarities in the special economic zones in Poland. The conducted research may be a source of interesting results for authors dealing with regional policy in Poland. As the future direction of research, the author wishes to further analyze the impact of economic factors on the development of zones in Poland. However, it should be remembered that the lack of certainty concerning the future of SEZ in Poland can stop the inflow of new investments, thus reducing the positive impacts of special economic zones.

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## Annex

**Table 1.** Variables describing the subject of the study

Variable	Characteristics of variables
$x^1$	A number of valid permits to conduct business activity in SEZ (cumulatively).
$x^2$	Incurred investment outlays in PLN million (cumulative).
$x^3$	Created jobs in special economic zones (total).
$x^4$	Total area of the zone (in hectares).
$x^5$	Expenditures for infrastructure construction in milion złotych(cumulative).
$x^6$	Financial result of companies managing zones in a given year in thousands of PLN.
$x^7$	Expenditures of management companies for the promotion of zones in million złotych (cumulative).
$x^8$	Tax exemptions for companies managing zones in a given year in million złotych.

**Table 2.** Special economic zones arranged according to Hellwig's measure in the years 2009 and 2017

P	2009		2010		2011	
	SEZ	TMR	SEZ	TMR	SEZ	TMR
1	Katowicka	0.7746	Wałbrzyska	0.7950	Katowicka	0.9160
2	Wałbrzyska	0.7197	Katowicka	0.6862	Wałbrzyska	0.7679
3	Łódzka	0.6031	Pomorska	0.5810	Łódzka	0.6457
4	Tarnobrzaska	0.4933	Łódzka	0.5543	Kostrzyńsko- Słubicka	0.5683
5	Mielecka	0.4536	Tarnobrzaska	0.4653	Tarnobrzaska	0.5454
6	Kostrzyńsko-Słubicka	0.4451	Mielecka	0.4399	Mielecka	0.5444
7	Pomorska	0.4393	Kostrzyńsko-Słubicka	0.3998	Pomorska	0.5100
8	Warmińsko-Mazurska	0.2929	Legnicka	0.2874	Legnicka	0.3429
9	Legnicka	0.2736	Warmińsko-Mazurska	0.2512	Warmińsko- Mazurska	0.3037
10	Krakowska	0.2143	Krakowska	0.2180	Krakowska	0.2799
11	Słupska	0.2134	Starachowicka	0.2053	Starachowicka	0.2588
12	Starachowicka	0.2129	Słupska	0.1887	Suwalska	0.2226
13	Suwalska	0.1802	Suwalska	0.1857	Kamiennogórska	0.2092
14	Kamiennogórska	0.1561	Kamiennogórska	0.1662	Słupska	0.1366
P	2012		2013		2014	
	SEZ	TMR	SEZ	TMR	SEZ	TMR
1	Wałbrzyska	0.7859	Wałbrzyska	0.8000	Katowicka	0.6869
2	Katowicka	0.6291	Katowicka	0.7072	Łódzka	0.5178
3	Łódzka	0.5033	Łódzka	0.5474	Tarnobrzaska	0.4384
4	Tarnobrzaska	0.4601	Mielecka	0.4936	Wałbrzyska	0.4196
5	Mielecka	0.4056	Tarnobrzaska	0.4421	Mielecka	0.3988
6	Kostrzyńsko-Słubicka	0.4019	Kostrzyńsko-Słubicka	0.4298	Pomorska	0.3779
7	Pomorska	0.3822	Pomorska	0.4067	Kostrzyńsko- Słubicka	0.3601
8	Legnicka	0.2836	Krakowska	0.2909	Krakowska	0.3228
9	Krakowska	0.2360	Legnicka	0.2718	Legnicka	0.2735
10	Warmińsko-Mazurska	0.2355	Warmińsko-Mazurska	0.2431	Słupska	0.1785

**Table 2.** Continued

P	2012		2013		2014	
	SEZ	TMR	SEZ	TMR	SEZ	TMR
11	Ślupska	0.2066	Ślupska	0.2153	Warmińsko-Mazurska	0.1681
12	Starachowicka	0.1840	Starachowicka	0.1904	Suwalska	0.1326
13	Suwalska	0.1765	Suwalska	0.1847	Starachowicka	0.1294
14	Kamiennogórska	0.1521	Kamiennogórska	0.1627	Kamiennogórska	0.1180
P	2015		2016		2017	
	SEZ	TMR	SEZ	TMR	SEZ	TMR
1	Katowicka	0.9156	Katowicka	0.8156	Katowicka	0.8222
2	Wałbrzyska	0.5712	Wałbrzyska	0.6284	Wałbrzyska	0.6879
3	Łódzka	0.5493	Tarnobrzaska	0.4514	Kostryńsko-Słubicka	0.5913
4	Tarnobrzaska	0.5456	Kostryńsko-Słubicka	0.4365	Łódzka	0.5285
5	Kostryńsko-Słubicka	0.4573	Łódzka	0.4247	Mieiecka	0.4686
6	Pomorska	0.4326	Mieiecka	0.4161	Pomorska	0.4358
7	Mieiecka	0.3994	Pomorska	0.4013	Tarnobrzaska	0.4329
8	Legnicka	0.2989	Krakowska	0.3068	Krakowska	0.3189
9	Krakowska	0.2941	Legnicka	0.2577	Legnicka	0.3073
10	Warmińsko-Mazurska	0.2505	Ślupska	0.2373	Warmińsko-Mazurska	0.2522
11	Ślupska	0.2344	Suwalska	0.2354	Ślupska	0.2039
12	Suwalska	0.2268	Warmińsko-Mazurska	0.2197	Suwalska	0.1961
13	Starachowicka	0.1869	Starachowicka	0.1446	Starachowicka	0.1643
14	Kamiennogórska	0.1622	Kamiennogórska	0.1298	Kamiennogórska	0.1517

P – position, SEZ – special economic zones, TMR – taxonomic measure

Source: own elaboration based on Information on the implementation of the Act on Special Economic Zones (2010-2018).