CONTRIBUTION OF SELECTED FACTORS TO THE CREATION OF REGIONAL AND NATIONAL ECONOMIC GROWTH. EXAMPLE OF POLAND IN YEARS 2000-2020

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Purpose: The purpose of this article is to present the role of regions in Polish economic growth in 2000-2020 with an attempt to identify the main factors driving regional and national growth.

Design/methodology/approach: The study is based on both literature and statistical data analysis. The factors of regional growth are identified using the selected elements of growth decomposition method. The analysis covered 16 regions in Poland in the period of 2000-2020.

Findings: Through the literature and statistical analysis, sources of economic growth at regional and national level are identified. The research, based on the GDP decomposition method, indicated regional differences between 16 Polish voivodeships. The shares of regions in the national and European GDP vary both in time and across regions. Regions with higher GDP growth than the Polish and European GDP one are also characterized by increase in the shares of employment, productivity, and the service sector in the values of these indicators for the whole Polish economy. The economic performance of both regions and the country is also significantly influenced by the direction of regional structural. The characteristic phenomenon for the Polish economy is still the lack of improvement of the analyzed components in regional growth with their low share in the national GDP.

Research limitations/implications: Data analysis is limited to 16 regions in Poland in 2000-2022. Further research may cover more regions of other countries, may involve a different aggregation of them, or a larger time horizon. Growth decomposition can also be carried out using more factors, at a deeper level of specification, especially in the areas of employment and productivity.

Practical implications: Knowledge of regional development factors may be the basis for policymaking, which is one of the factors ensuring high and sustainable economic development dynamics, both at regional and macroeconomic level.

Social implications: Excessive economic inequalities lead to social conflicts. Therefore, one of the objectives of the state's economic and social policy should be to reduce regional inequalities to promote development and improve the quality of life in all regions.

Originality/value: The statistical analysis covers the most recent statistical data of selected factors of regional growth. The article is addressed to all stakeholders of regional development, including local authorities, citizens, enterprises, as well as other researchers.

Keywords: regional economic growth, decomposition of economic growth, sources of regional economic growth.

Category of the paper: Research paper.

1. Introduction

The economic growth problem has long been the subject of theoretical and empirical works. Its mechanisms and causes have been the most important research topic in the economic thought history. The research direction dealing with those problem was the one termed the growth theory. The foundations of that trend were created by Robert Solow studies (Crafts, 2009) which have still been the standard research approach to explain the income level differences between countries by decomposing the economic growth (Rapacki, Próchnik, 2009). The model created by Solow indicated that the economic growth rate in the long term is determined by technological progress which increases productivity of production factors (Solow, 1957). However, subsequent studies indicated also other factors, thus reducing the technical progress contribution to shaping the economic growth. Examples of such views can be found in the works of Denison (Denison, 1962), Dale Jorgenson and Griliches (Dale Jorgenson, Griliches, 1967), Mankiw, Romer and Weil (Mankiw, Romer, Weil, 1992), in which the authors proved the relevance of human capital accumulation and labour force quality as the production growth factors. One of the most comprehensive attempts to explaining the causes of productivity growth was made by Maddison (Maddison, 1987), although, as he admitted, it was a more speculative one than the one supported by research. He concluded that the economic growth should be attributed to a combination of numerous factors, not just to the quality of labour and better allocation of resources, but also to changes in using of production factor, reduction of technology gaps and the economies of scale, believing that the technical change may bring about just a small increase. Kuznets, who studied the reasons for the economic growth in industrial economies together with Abramowitz, proved that only 25% of production growth per capita results from the increase in capital per one worker (Kuznets, 1971). Broadberry linked the changes in productivity to changes in economic structures, claiming that the productivity increases thanks to shift of resources from the agricultural to the service sector, while assuming that the productivity level in industry remained constant for 150 years (Broadberry, 1998). One of the most important works which was a frequent point of reference for analytical works was the Krugman's article in which he argued for the importance of industry specialization in the production as a factor of economic growth (Krugman, 1991). Based on the mentioned study results, it can be inferred that the stable and permanent economic growth exists if the undertaken measures improve the production factors' productivity. However, these results referred to the macroeconomic scale of economy. It was only in 1980s that both scientists and politicians sensed that the state's boundaries were not the only boundaries delineating important economic areas (Spiezia, Weiler, 2007). In subsequent years, the region began to form in economic theory and practice as crucial "competitive space" (Brenner, 2000).

2. Sources of regional economic growth. Review of the literature

The newly emerging 'new regionalism' idea in research, raised the importance of the regional scale (Bristow, 2010). Even before that, Schumpeter (Schumpeter, 1960) noticed that the entrepreneur who, striving to maximize profits, introduced new combinations of production factors by using new innovative solutions on the market was a creator of economic development. This view pointed to the fundamental importance of business behavior as a driving force of development processes in the economy. For the new regionalism proponents, the region and regional entities became a site of economic development and wealth creation where the force driving the competitive advantage throughout the whole economy was born (Storper, 1997). This statement started a scientific debate which attempted to explain the determinants of differences between regions and their impact on the entire economy results. The detailed analysis of the self-accelerating changes in regional inequalities according on the stage of development in the industrialization period was carried out by Williamson in his work (Williamson, 1965). In his opinion, they could be perceived, in a sense, as a by-product of the process of development and industrialization, and any attempt to reduce its level may ultimately inhibit this process. Similar conclusions were presented in the works by Kim and Marago who proved that the increased industrialization in the United States in the second half of 19th century aggravated the regional differences in region income (Kim, Margo, 2003). European experiences may be considered relatively significant when it comes to the increased dynamics of regional inequalities as a result of the adaptation of the poorest Member States of the European Union (Quah, 1996; Petrakos, Saratsis, 2000; Davies, Hallet, 2002). This was also confirmed by the European Commission's 2004 Report (European Commission, 2004) which indicated that the regional inequalities displayed a growing trend in such countries as the Czech Republic, Hungary, Poland, and the Slovak Republic due to the need to catch up quickly with highly developed members. The Report also indicated that regional inequalities tend to increase on average as the relative level of domestic GDP per capita increases, and then they start to have a decreasing tendency, after reaching a certain relative level of domestic GDP per capita. The identification of the sources of economic growth and development inequalities in regions is carried out by e.g. Spiezia (Spiezia, 2003), Ottaviono and Thisse (Ottaviono, Thisse, 2004), Gorzelak (Gorzelak, 1997), Winiarski (Winiarski, 1999), Skrzyp (Skrzyp, 2009), and Łaźniewska (Łaźniewska, 2013). Those authors usually point to three groups of interrelated factors. The first group includes the measures determining the regional potential which may be perceived as a result of irregular distribution of natural resources, climatic and natural conditions. The second group is based on the belief that the observed differences result from economic and political activities (Ottaviono, Thisse, 2004). The third group of regional development determinants is the structural characteristics of the region, including transport, infrastructure, labor market and human capital (Spiezia, Weiler, 2007). These factors are

determined by a combination of regional factors such as: natural endowments and regional assets, and the economic policies as a national factor. Their distinction is relevant in identifying the sources of economic growth. Problems of regional development and competitiveness were also analyzed by Polish economists (Malaga, 2004; Łaźniewska et al., 2011; Smętkowski, 2015; Gorzelak, 1997; Zaucha at al., 2015; Lewandowski, 2018). The authors published comprehensive literature studies and empirical analyses to explain the regional divergence processes of European Union countries (UE) or, more broadly, of economies belonging to the Organisation for Economic Co-operation and Development (OECD), basically covering statistical data only from the first decade of 21st century. Based on the quoted studies, it may be inferred that the economies do not constitute a homogenous unit, their regions develop at different rates and with different intensities. The regional development level may be differentiated permanently, but it is not necessarily unidirectional, irreversible, and repeatable process. Regional disparities may be either the consequence of or the reason for the development of an economy. This makes the economic growth analysis on the regional level and its contribution to the economic performance of the country constantly relevant and worthwhile. Therefore, this article attempts to analyze the regions' role on the economic growth based on data on the Polish economy in the first twenty years of the 21st century. This issue is important because the knowledge of mechanisms and regularities of regional development may be the basis for shaping a policy, constituting also a factor ensuring high and sustained economic growth dynamics both on the regional and on the macroeconomic level.

3. Methods

Scientists use different methods to measure the sources and disparities of regional development. The most important of them include the methods using the traditional, theoretical competitiveness models, the methods decomposing competitiveness into identified factors and indexes of general competitiveness and regional competitiveness (Łaźniewska, 2013). The method used in this article is based on selected components of methodology described by Spiezia (Spiezia, 2003) and used by such statistical analyses' centers like OECD (OECD Regions at a Glance), Statistics Poland and in some Polish and foreign papers (Łaźniewska, 2013; Lewandowski, 2018). The method proposed by Spiezia (Spiezia, 2003; Spiezia, Weiler, 2007), based partially on the shift-share analysis presented by Creamer and formalized by Dunn (Dunn, 1960), consists in decomposing the gross domestic product into a number of components which, when summed up, make its value. The author of this method proposed 7 main components of regional conditions of gross domestic product: average productivity, industry specialization, change in specialization, employment rates, participant rates, activity rates and population. The advantage of this approach is the simplicity of presentation and

interpretation of results, but it does not include any components expressing the simultaneous impact of several factors included in the decomposition and difficult to ascribe to a specific factor (Lewandowski, 2018).

In this article, the term "region" stands for the territories of individual 16 Polish voivodeships, based on NUTS-2 classification: Dolnośląskie, Kujawsko-Pomorskie, Lubelskie, Lubuskie, Łódzkie, Małopolskie, Mazowieckie, Opolskie, Podkarpackie, Podlaskie, Pomorskie, Śląskie, Świętokrzyskie, Warmińsko-Mazurskie, Wielkopolskie and Zachodnio-pomorskie. The research in this article is based on annual indicators of the level and dynamics of gross domestic product (GDP) and GDP per capita as the measurements of economic growth, and the gross value added (GVA). The analysis refers to the share of individual regions output in creating the national (total Polish GDP) and EU GDP (total EU) GDP and the national GDP per capita (total Polish GDP per capita). The shares in creating the EU and national GDP are calculated using formulas 1 and 2 (Appendix). Faster production growth in all analyzed voivodeships than the production growth calculated for all European Union regions is explained using national factors. On the other hand, the faster production growth of a given region when compared to the growth characteristic of the European Union or Poland will be ascribed to regional factors. In this article, the decomposition of economic growth is based on the following components: employment rate, average productivity, sectoral specialization, and population. The selected components correspond to the economic growth determinants and regional growth factors presented in this article. The employment rate component means the regional employment rate in individual voivodships in 2000-2020. Its contribution to the national GDP is calculated based on formula 3 (Appendix). Changes in this component can result from both improvements in the quality of the labour force and appropriate state and regional regulations that contribute to labour market efficiency. Therefore, it can be considered rather as result of regional assets because state regulation will apply identically to all regions. The employment share changes are compared to the GDP per capita and population changes. Population changes are a result of demographic characteristics, i.e. regional endowments, and state migration policies determine employment changes. The average productivity component is calculated for each region as the value of the regional GVA divided by the number of employees in the region in 2000-2020. The contribution of regional productivity to the value for the entire Polish economy is calculated based on formula 4 (Appendix). The changes of the share of regional productivity are compared to the regional GDP per capita changes. Growth in productivity may result, as described, from improvements in technology, in the quality of the labour force, structural changes and better allocation of resources, thus being the result of regional assets. Higher productivity means higher competitiveness, faster production growth on the one hand, but on the other it may mean decrease in employment. However, a decrease in productivity may result from an increase in employment. The next component, sectoral specialization, is understood, in this article, as the share of three economic sectors in each region: agriculture, industry and services. According to the three-sector theory, introduced by Fisher and developed

by Clark and Fourastie (Kwiatkowski, 1982), the economic development is first accompanied by the industrialization process with reduced share of the agricultural sector. This is followed by a process of reducing the share of the industrial sector, together with a process of servitization (Rostow, 1971). Consequently, the most developed economies are characterized by the highest share of the service sector. The economic structure can be shaped by several factors, among which can be mentioned: the natural resources available, technical progress, foreign trade, economic policy, and the institutional system of the state (Kempny, 1991). Hence, the factors that differentiate regional performance can be defined as a certain combination of natural endowments and regional assets. The sectoral specialization changes are analyzed through the changes in the agriculture, industry, and services shares of individual regions according to national values of these sectors and its correlation with changes in national GDP per capita. Correlation coefficients, calculated using formula 5 (Appendix), take values between 0 and 1 where the higher value indicating greater correlation between variables. The analysis is summed up by the summary compilation of individual regional GDP components. The main source of data is the Local Data Bank of Statistics Poland (GUS-Local Data Bank). The statistical data comes from the period of more than twenty years, from 2000 to 2020, except for the one concerning the EU GDP value (the data available in Eurostat covers the years up to 2019).

4. Results and discussion

The analysis of changes in GDP values reveals regional disparities among 16 voivodeships of the Polish economy in 2000-2020. Figure 1 presents changes in shares of Polish regions and Poland in the total GDP of the European Union in 2000-2019. Although the general trend of changes in these shares is identical for every voivodeship in 2000-2019, the graph shows differences between regions' shares. The voivodeships with the share in the EU GDP higher than that of the entire Polish economy include: Dolnośląskie, Mazowieckie, Wielkopolskie and Śląskie. This means that those regions use their regional resources better than the other voivodeships. The same situation characterizes the value and dynamics of changes in GDP per capita. Figure 2 presents changes in the share in GDP per capita in comparison with the initial value. Again, voivodeships as Dolnośląskie, Łódzkie, Małopolskie, Mazowieckie and Wielkopolskie are characterized with the highest (over 75%) increase in GDP per capita. It is worth mentioning, that those voivodeships are also characterized by higher increase in share in the EU's GDP per capita than that of Poland. The lowest growth dynamics (below 50%) has just one voivodeship, i.e. Zachodniopomorskie. The other voivodeships, in the range of 50-75% of the share in the EU GDP, are regions whose share in GDP is lower than 30%, at the beginning of the analyzed period. The positive aspect is that all voivodeships experienced

the increase in their share in EU GDP per capita. However, the voivodeships with a low share retained their low position. Attention should be paid to the following two voivodeships: Małopolskie and Łódzkie, which note high increase in the analyzed period despite the low initial share level. This gives the highest share in EU GDP at the end of the analyzed period.
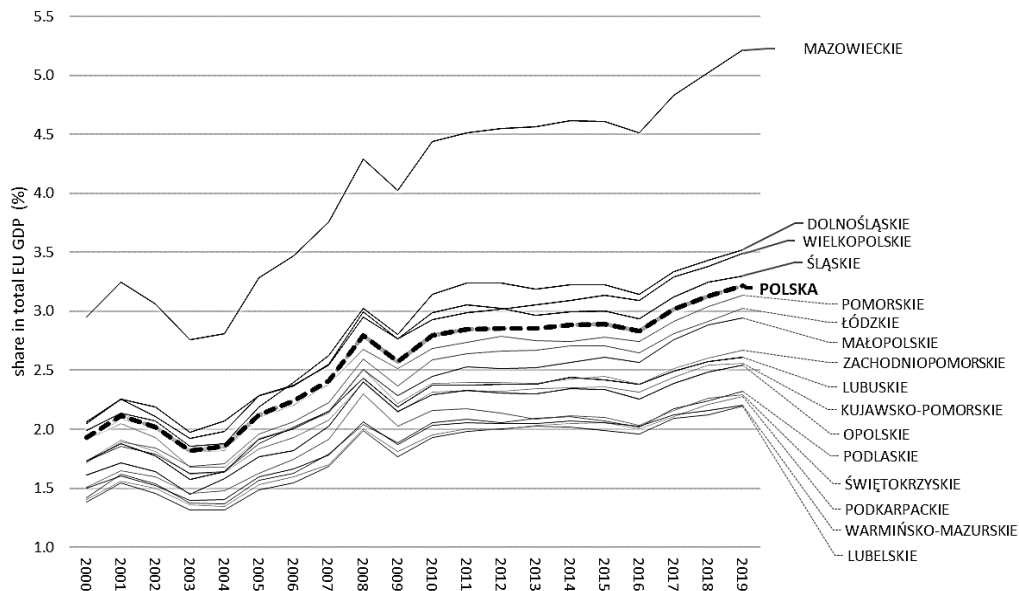

Figure 1. Regional GDP share in total European Union GDP.

Source: own elaboration based on statistical data of the Central Statistical Office of Poland and Eurostat.
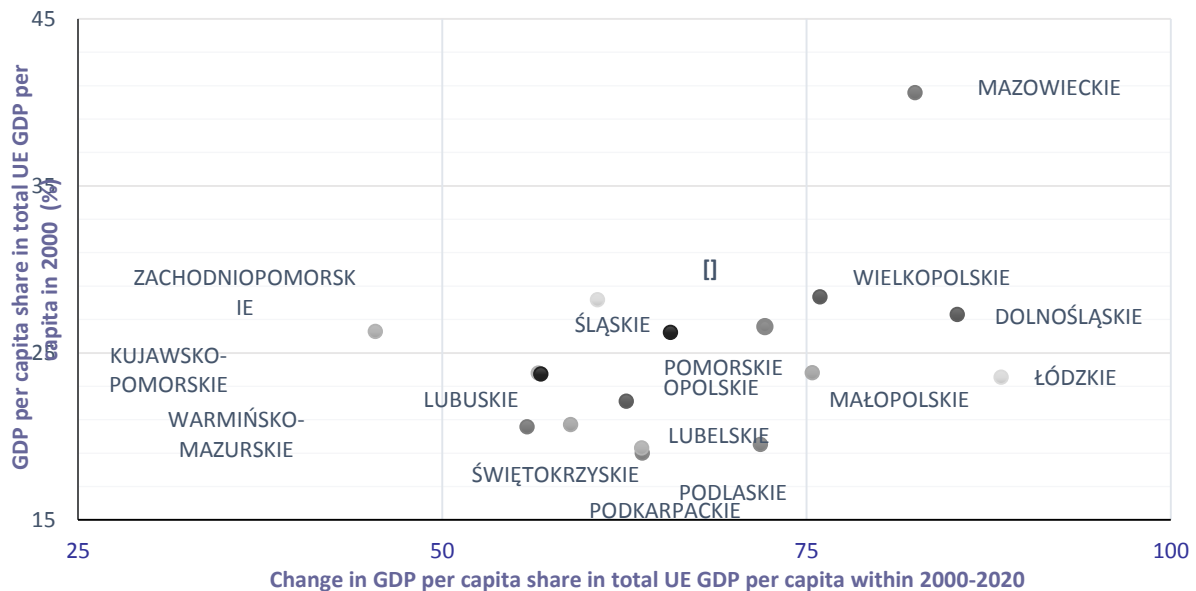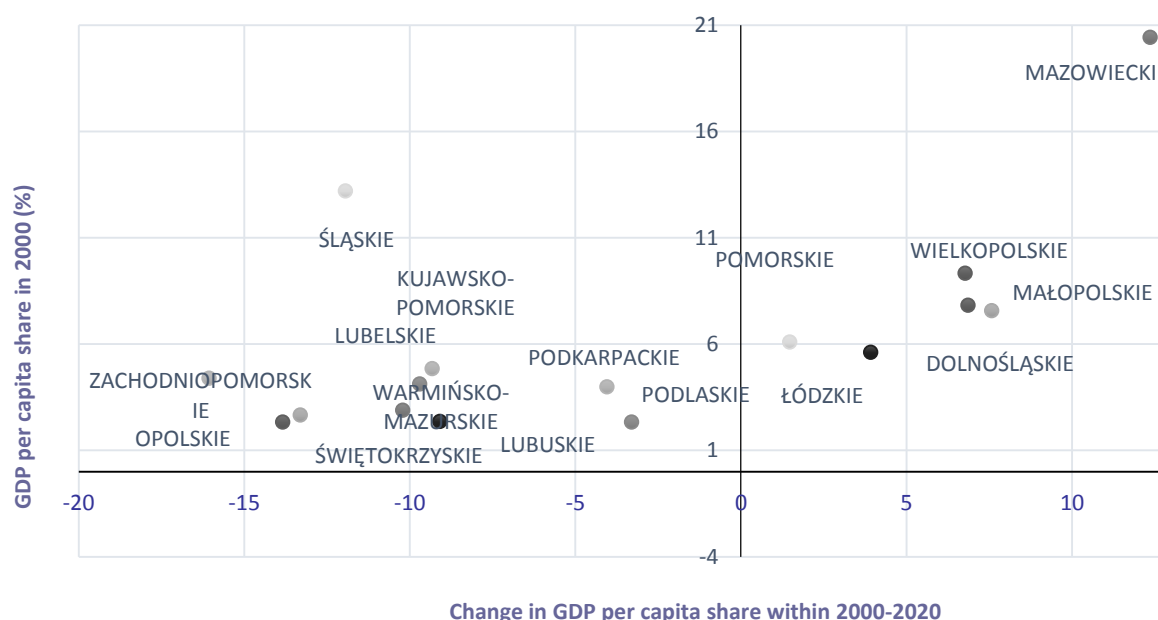

Figure 2. Changes in regional and Polish GDP per capita share in total UE GDP per capita within 2000-2020 in relation to 2000.

Source: own elaboration based on statistical data of the Central Statistical Office of Poland.

Figure 3 presents changes in the share of regional GDP per capita in total national GDP per capita, when compared to the initial value in 2000. The highest increase is recorded in Mazowieckie voivodeship, which is also characterized by the highest share in total national GDP. The Śląskie voivodeship, however, records significant percentage decrease in that share, still takes the second place, after Mazowieckie. Relatively high percentage decrease in share is characteristic of voivodeships with a low initial share in GDP per capita (up to 5%). It is not consistent with the processes observed by Spiezia (Spiezia, Weiler, 2007), who claimed that the lower initial share, the higher its increase is. In the analyzed period, this rule is characteristic only for Wielkopolskie voivodeship (low initial percentage share and significant percentage increase). Voivodeships with medium share (5-10%): Dolnośląskie, Łódzkie, Małopolskie and Pomorskie, note increase. The voivodeships are also characterized by higher GDP increase than the average increase for Poland.
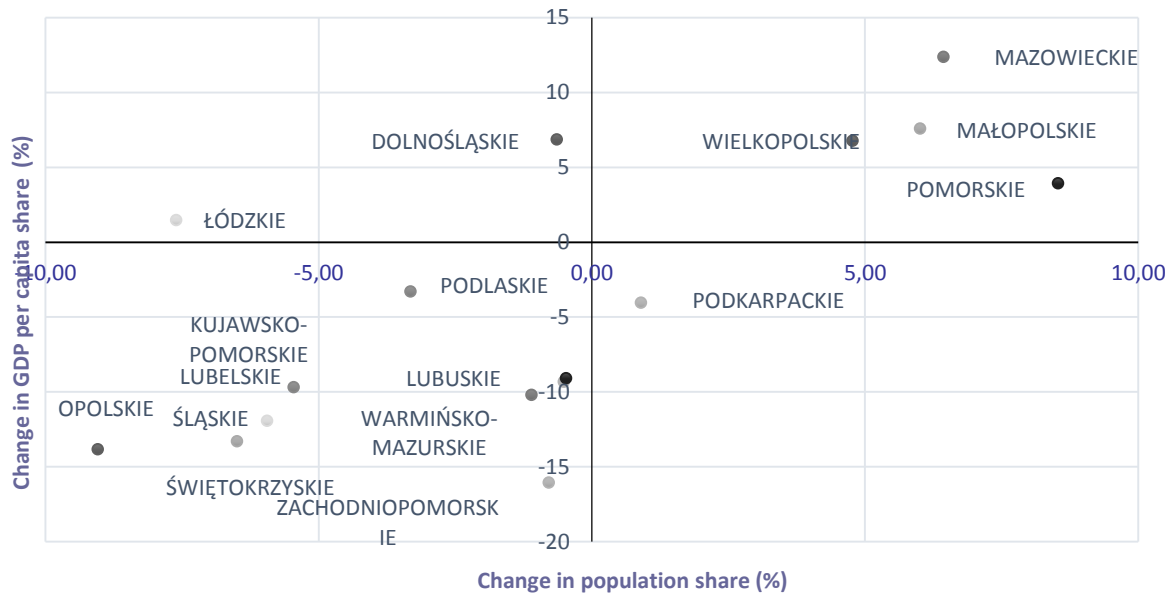

Figure 3. Changes in regional GDP per capita share in total GDP per capita of Poland within 2000-2020 in relation to 2000.

Source: own elaboration based on statistical data of the Central Statistical Office.

The voivodeships in the left part of Figure 3, with decreasing shares, are characterized by lower growth than Poland. To sum up, the voivodeships with the lowest share in EU GDP and GDP per capita note the decreased share in Polish GDP as well. The aggregate results are presented in Table 1. The leading voivodeships in 2000-2020 in this area include Dolnośląskie, Łódzkie, Małopolskie, Mazowieckie, Pomorskie and Wielkopolskie. Figure 4 presents changes in shares of the population in voivodeships in relation to changes in the share of GDP per capita. The total population in many regions of Poland decreases in the analyzed years. The most significant decline rates are recorded for Łódzkie and Opolskie. It can be also observed the growing concentration of the population in the regions with the highest increase of GDP per capita. In the other regions, the population decreased, but only in two voivodeships: Dolnośląskie and Łódzkie, it is accompanied by the increase in GDP per capita.

Figure 4. Changes in regional GDP per capita share in total GDP in Poland in relation to changes in regional population in total population in Poland.
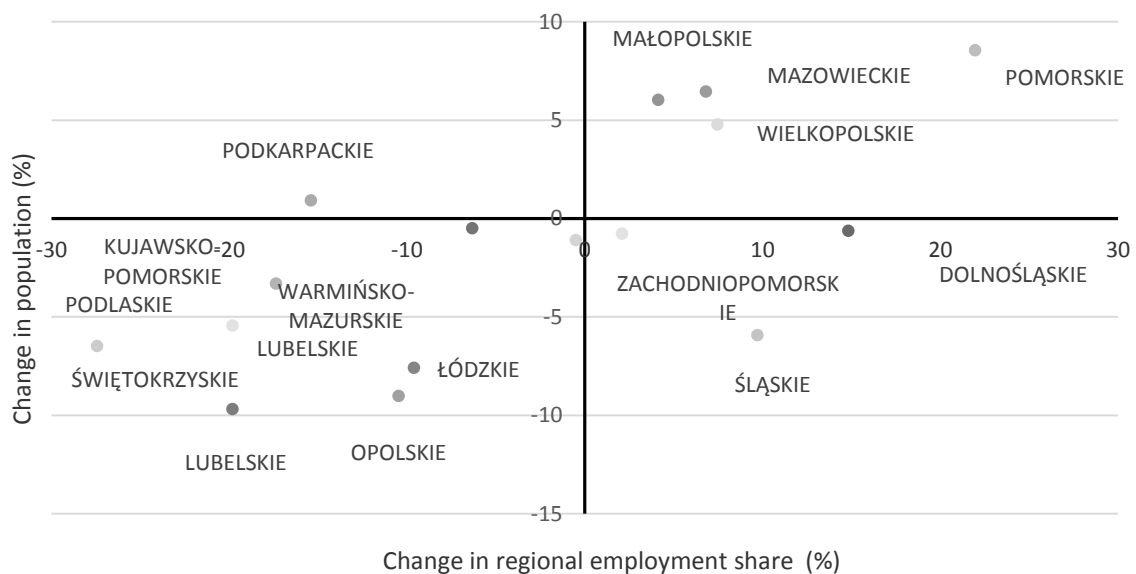
Source: own elaboration based on statistical data of the Central Statistical Office of Poland.
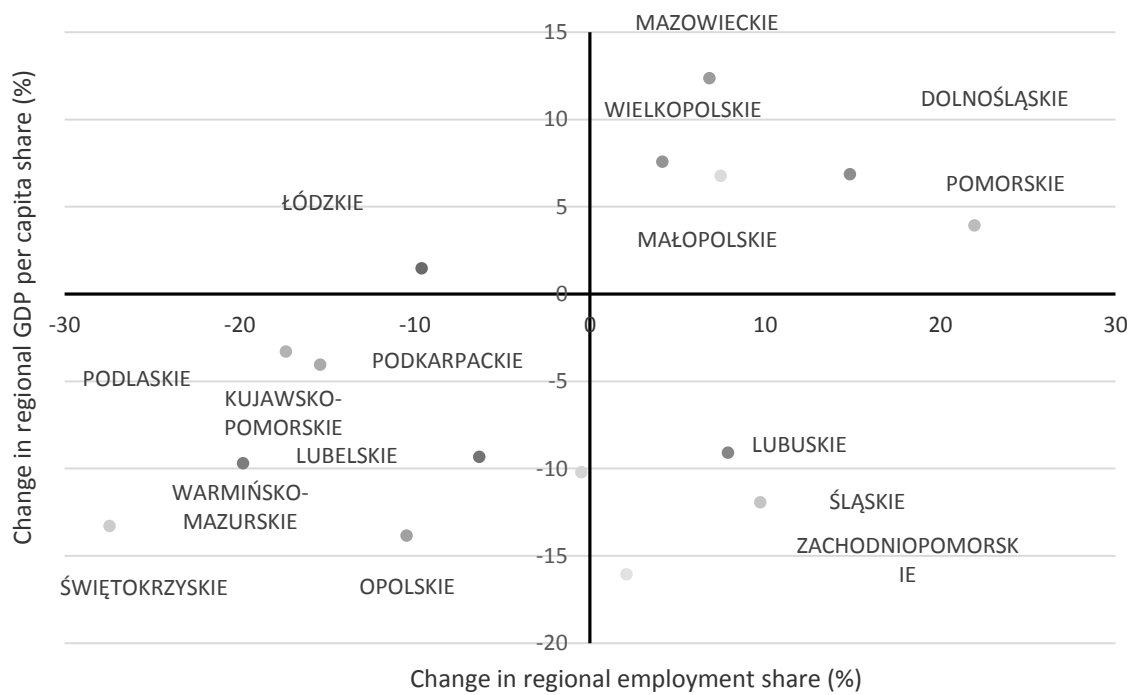
Figure 5. Changes in regional GDP per capita share in total GDP in Poland in relation to changes in regional employment share in total employment in Poland within 2000-2020.

Source: own elaboration based on statistical data of the Central Statistical Office of Poland.

Increase in employment rate share, shown in Figure 5, is characteristic for following regions: Dolnośląskie, Lubuskie, Mazowieckie, Pomorskie, Śląskie, Wielkopolskie, and Zachodniopomorskie (also Table 1). The analysis of the tendency in employment rate changes in individual regions in Poland, the same voivodeships can be mentioned, characterized both by the increase in share in Polish national GDP per capita and employment rate (Figure 5): Dolnośląskie, Małopolskie, Mazowieckie, Pomorskie, and Wielkopolskie. Figure 5 also quite clearly shows that most Polish regions are characterized by decrease in both the share in GDP per capita and in share in employment. In three voivodeships, Lubuskie, Śląskie and Zachodniopomorskie, there is a negative change despite an increase in share of employment rate with relatively significant decrease in GDP per capita share. All three regions are experiencing population decline (Figure 6). To understand the reasons for this phenomenon occurrence and to interpret it, it would be necessary to decompose it further based on the population age structure and activity when compared to the number of workers. Among the above-mentioned three voivodeships characterized by the decrease in the share in population with increased share of employment there is also Dolnośląskie. This voivodeship note the increase in the share in GDP per capita of Poland and EU, as well as increased share of employment, with simultaneous decrease in the population (Figure 6). This points to the increased productivity (Figure 7).

Figure 6. Changes in regional employment share in total employment in Poland in relation to changes in population within 2000-2020.

Source: own elaboration based on statistical data of the Central Statistical Office of Poland.

The changes in share in productivity in relation to the changes in share in GDP is presented in Figure 7.
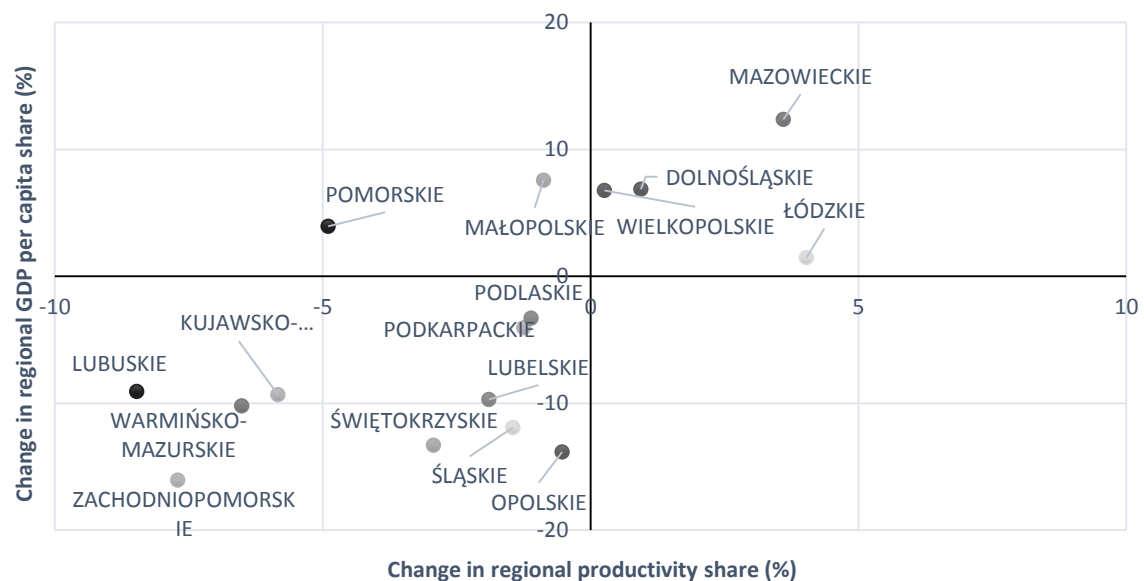
Figure 7. Changes in regional productivity share in total productivity in Poland in relation to changes in population within 2000-2020.

Source: own elaboration based on statistical data of the Central Statistical Office of Poland.

This figure shows the voivodeships characterized by positive productivity increase, besides Dolnośląskie, include: Łódzkie (with the highest positive change of more than 4%), Małopolskie, Mazowieckie, Pomorskie and Wielkopolskie. Three of the above-mentioned voivodeships (Dolnośląskie, Mazowieckie and Pomorskie) experience the productivity higher than the national average throughout the entire analyzed period (Table 1). To the group of such voivodeships, Zachodniopomorskie (but only by 2016) and Lubuskie (by 2007) could be included. Those changes are positive and directly proportional only in four voivodeships, namely Dolnośląskie, Mazowieckie, Łódzkie and Wielkopolskie. In the remaining voivodeships, the negative GDP per capita change of share is accompanied by negative change in productivity. On the one hand, this proves the tendency described in reference works, namely that higher productivity leads to higher increase in production. On the other, however, the increased share of the regional productivity in the total productivity of the Polish economy leads to increased share in national GDP per capita. This regularity does not apply to Małopolskie and Pomorskie, where the increased share of productivity is accompanied by decreased share in GDP per capita. The analysis of the impact of the sectoral specialization on the changes of share in GDP per capita also allows to observe several facts. First, it may be noticed that industrialization processes take place in most regions in the analyzed period which contributes to increased disparities between the regions. Only in Mazowieckie the service sector growth dynamics is the highest. However, in Lubuskie, the highest increase is recorded for the agriculture sector. Figure 8 shows that the share in the value of the GVA in the agriculture and service sector is much higher in Kujawsko-Pomorskie, Podlaskie, Warmińsko-Mazurskie and Wielkopolskie than in the other regions. High share of industrial sector is characteristic for:

Dolnośląskie and Śląskie. However, Śląskie has the highest share in the GVA from the industrial sector, with a very low share of agricultural one. Summing up, the regions with the highest GDP per capita increase have the same direction in sectoral specialization – increase in services sector (Table 1). Figure 8 presents relatively high regional differences with concentration of production in all three distinguished sectors in with the Voivodeships.
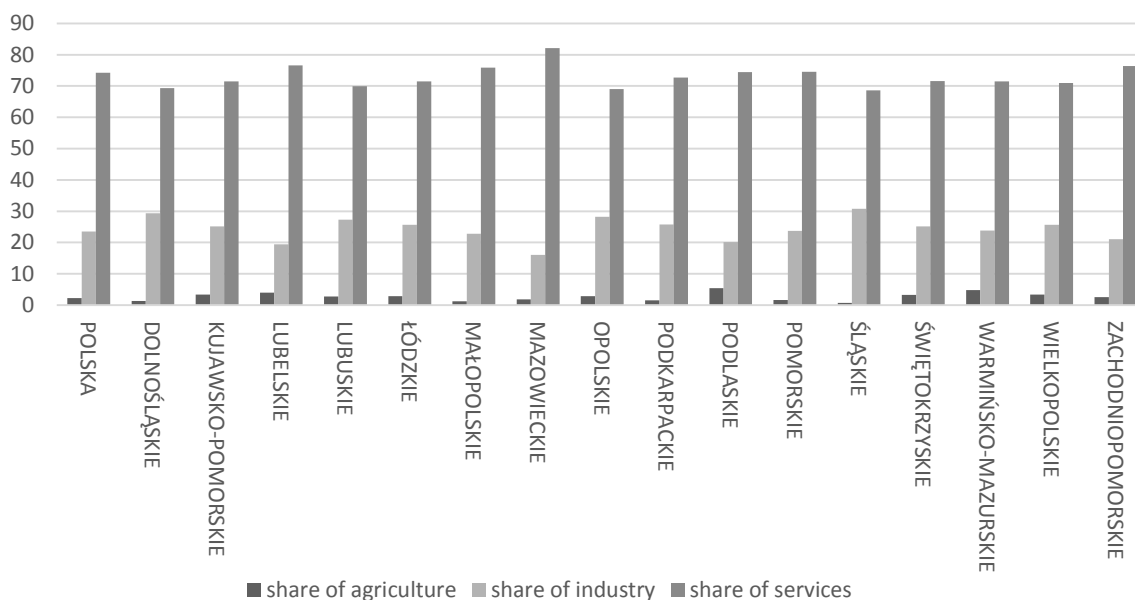
Figure 8. Average shares percentage of three sectors (agriculture, industry and services) in value added of Polish regions in 2000-2020.

Source: own elaboration based on statistical data of the Central Statistical of Poland.

In Figure 8, it can be observed that all regions are characterized by the largest share of the service sector, with a much smaller share of the industrial and agricultural sectors in GVA. This structure is characteristic, according to the three-sector theory, of developed countries. However, such voivodeships as Lubelskie, Lubuskie, Opolskie, Podkarpackie, Podlaskie, Świętokrzyskie and Warmińsko-Mazurskie are characterized by low, about 3% share in the GVA of the Polish economy. Regions with the higher growth in analyzed sectors than these one in total Polish economy are listed in Table 1.

Table 1.
Regions with higher component growth than Poland in 2000-2020

Regions with higher growth than in total Poland of:	
Component	**Regions**
GDP	Dolnośląskie, Łódzkie, Małopolskie, Mazowieckie, Pomorskie, Wielkopolskie
GDP per capita	Dolnośląskie, Łódzkie, Małopolskie, Mazowieckie, Wielkopolskie
Employment	Dolnośląskie, Lubuskie, Mazowieckie, Pomorskie, Śląskie, Wielkopolskie, Zachodniopomorskie
Productivity	Dolnośląskie, Mazowieckie, Pomorskie, Śląskie, Zachodniopomorskie
Share of agriculture	Lubelskie, Łódzkie, Mazowieckie, Podlaskie, Pomorskie, Świętokrzyskie
Share of industry	Dolnośląskie, Lubuskie, Mazowieckie, Podkarpackie, Podlaskie, Pomorskie, Wielkopolskie
Share of services	Dolnośląskie, Łódzkie, Małopolskie, Mazowieckie Pomorskie, Wielkopolskie

Source: own elaboration.

Figure 9 depicts the change of three sectors shares in Polish GVA. The highest increase in shares refering to agricultural production there is in: Lubelskie, Mazowieckie, Podlaskie and Pomorskie. The increased share value in the industrial sector refers to Dolnośląskie, Lubuskie, Mazowieckie, Podkarpackie, Podlaskie, Pomorskie and Wielkopolskie. However, the changes of the service sector share are small, even if they occur, in such voivodeships as Dolnośląskie, Małopolskie, Łódzkie, Mazowieckie, Pomorskie and Wielkopolskie. In five voivodeships, the share in the GVA for the Polish economy decreases in all three sectors in Kujawsko-Pomorskie, Opolskie, Śląskie, Warmińsko-Mazurskie and Zachodniopomorskie. It is observable that the highest decrease in share is recorded for Śląskie despite a relatively high initial position.
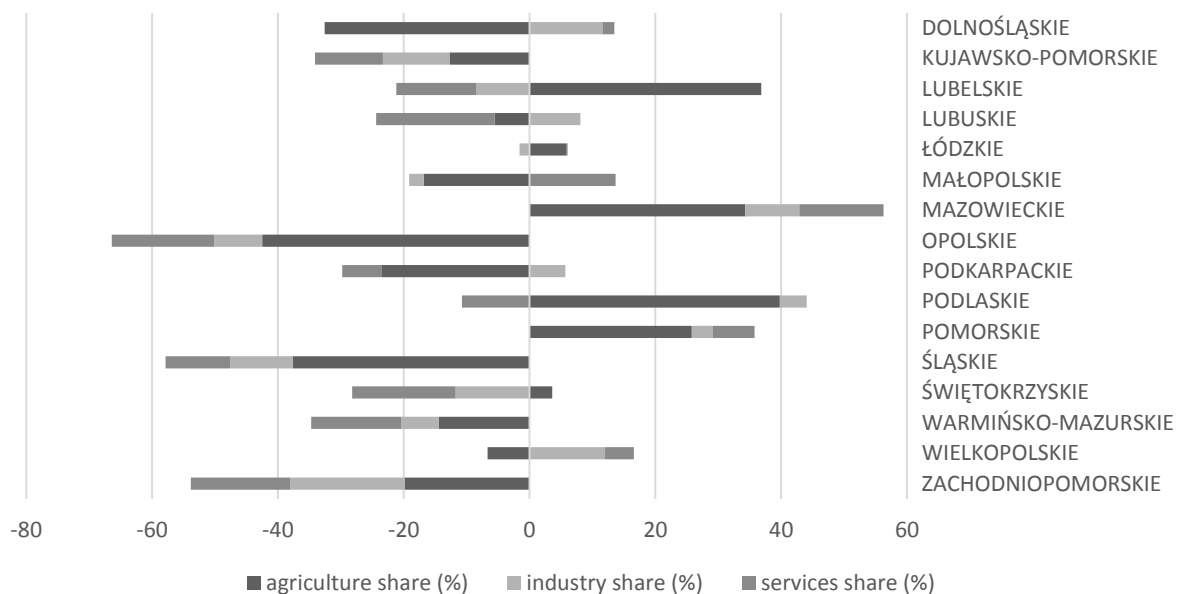
Figure 9. Changes in regional shares of three economic sectors (agriculture, industry, and services) in total value added in Poland in 2000-2020.
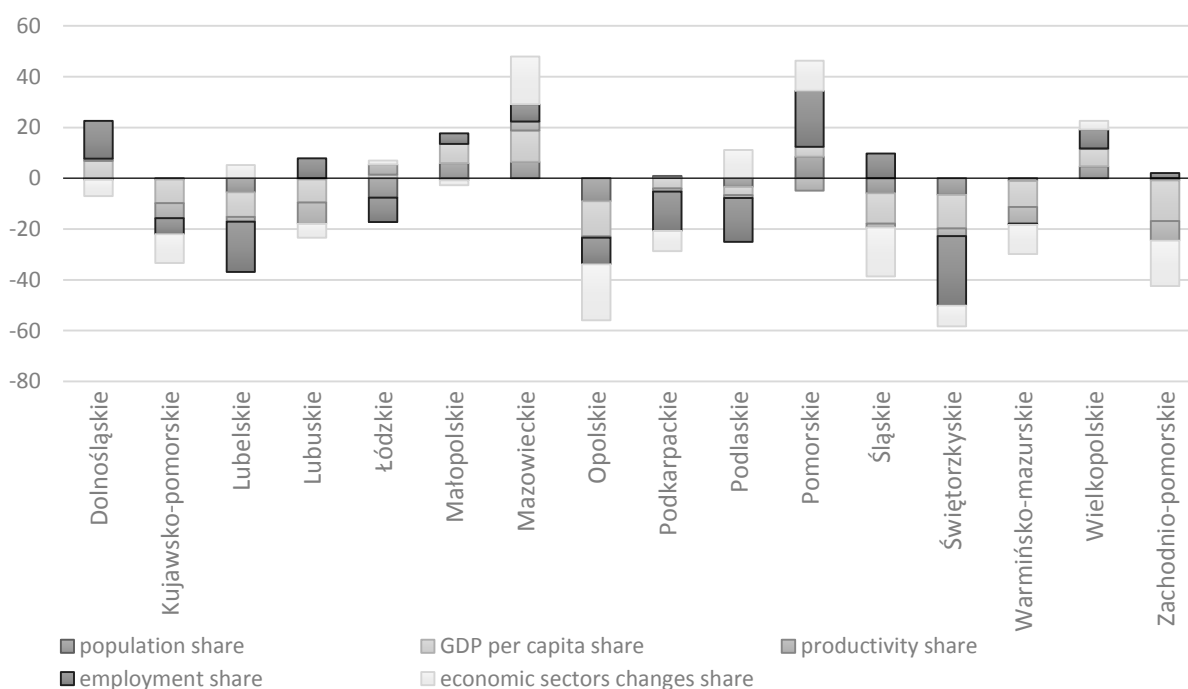
Source: own elaboration based on statistical data of the Central Statistical Office of Poland.

Significant share increase is recorded by Małopolskie in the service sector and Dolnośląskie and Podlaskie in the industrial one.

The calculated correlation coefficient between the GDP per capita values for Poland and the changes in shares of GVA for regions is the highest for the service sector. The coefficient is 0.94 which indicates very high correlation between those variables. The correlation between the regions' shares in GDP and the GVA for industrial sector is slightly lower (0.77), but still significant.

Figure 10 summarizes the analysis of changes of selected GDP components for analyzing regions. It reveals that the share of all components in total national GDP increased in two voivodeships: Mazowieckie and Wielkopolskie. Three voivodeships, on the other hand, record the decrease in those shares, namely Kujawsko-Pomorskie, Opolskie and Warmińsko-Mazurskie. In such voivodeships as Śląskie and Lubelskie, the increase occurs solely in the share of employment, with the decreasing share of the other components. However,

in voivodeships such as Małopolskie and Pomorskie, the share of the productivity is the only one to decrease. What is more, structural changes and changes in employment rate have the highest share in total Polish GDP in 2000–2020. If compared these results presented in this article with the results provided by the other authors for the previous period, certain similarities and differences could be noticed. The lower share of population and productivity changes is noticeable in the analyzed years, and the directly proportional relationship between the productivity and economic growth is confirmed. However, still a characteristic phenomenon for the Polish economy is a visible regional differentiation and lack of improvement of the analyzed components in the regions with the lowest GDP growth along with their low share in the national GDP.

Figure 10. Changes in regional contribution to the total GDP in Poland in 2000-2020.

Source: own elaboration based on statistical data of the Central Statistical Office of Poland.

5. Summary

This article attempts to analyze the regional contribution to economic growth on the example of the Polish economy in the period 2000-2020. Through the literature and statistical analysis, sources of economic growth at regional and national level are identified. The research, based on the GDP decomposition method, indicated regional differences between 16 Polish voivodeships, which is in line with the conclusions of researchers from earlier periods. The shares of regions in the national and European GDP vary both in time and across regions. 90% of regions which record the increase in the share of productivity record the increase of

GDP per capita as well. The inverse relationship of change in the share of employment to the change of productivity occurs in close to 40% voivodeships. The interchangeability of these processes was also confirmed in studies by Spiezia and Weiler (Spiezia, Weiler, 2007), and other authors, while indicating that it is not inevitable. In the remaining 60% of Polish regions, the change in the share of employment was always higher than share of productivity, with the increase both variables in 4 regions. The same 4 regions also note increase their regional GDP per capita higher than Polish. This observation is consistent with the conclusions of the above-mentioned researcher. The directions of structural changes also has significant impact on the regional and national economic performance. Most voivodeships owe their good results to changes in that component values. 4 out of 16 regions are characterized by the increased share of the service sector in GVA with the high economic growth rate and positive change in the share of productivity and employment in national growth. However, still in line with previous studies, e.g. by E. Łaźniewska (Łaźniewska, 2013), the characteristic phenomenon for the Polish economy is the lack of improvement of the analyzed components in regional growth with their low share in the national GDP, especially in the regions of eastern Poland. The study results may constitute a starting point for further, in-depth analysis of key factors shaping the economic results of individual regions.

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Appendix

Formulas for decomposition of regional growth method:

1. GDP share of region i in the GDP of EU:

$$\left(GDPshareinUE\right) = \left(\frac{GDP_j}{GDP_{EU}}\right) * \left(\frac{GDP_i}{GDP_j}\right) \text{ GDP share of region } i \text{ in the GDP of EU} \qquad (1)$$

2. GDP share of region i in the total GDP of Poland:

$$\left(GDPshareinPL\right) = \left(\frac{GDP_i/P_i}{GDP_{PL}/P_{PL}}\right) * \left(\frac{P_i}{P_{PL}}\right) \qquad (2)$$

3. Employment rate share of region i in employment rate of Poland:

$$\left(EMPshareinPL\right) = \left(\frac{GDP_i/E_i}{GDP_{PL}/E_{PL}}\right) * \left(\frac{P_i/E_i}{P_{PL}/E_{PL}}\right) \qquad (3)$$

4. Average productivity share of region i in total average productivity in Poland:

$$\left(PRDshareinPL\right) = \left(\frac{GVA_i/E_i}{GVA_{PL}/E_{PL}}\right) * \left(\frac{P_i/E_i}{P_{PL}/E_{PL}}\right) \qquad (4)$$

where:
GDP_i – gross domestic product of i region,
GDP_{PL} – gross domestic product of Poland,
GDP_{EU} – gross domestic product of European Union,
P_i – population in i region,
P_{PL} – population in Poland,
E_i – employment in i region,
E_{PL} – employment in Poland,
GVA_i – productivity in i region,
GVA_{PL} – productivity in Poland.

5. Correlation coefficient:

$$\left(r\right) = \frac{\sum\left(x_i - x_{mean}\right)}{\sum\left(y_i - x_{mean}\right)} \qquad (5)$$

where:
x_i – values of the x-variable in a sample,
x_{mean} – values of the x-variable in a sample,
y_i – values of the y-variable in a sample,
y_{mean} – values of the y-variable in a sample.