

DETERMINANTS OF ECONOMIC DEVELOPMENT OF SUBREGIONS IN THE MASOVIAN VOIVODESHIP

Eugeniusz Kwiatkowski, Agnieszka Krzętowska

Warsaw University of Technology, College of Economics and Social Sciences, Plac Politechniki 1,
00-661 Warsaw, Poland

Abstract

The subject of the article is the economic development of subregions in the Mazowieckie voivodship in the years 2010–2020. The main purpose of the undertaken analysis is to show the differentiation of the level and dynamics of economic development of the aforementioned subregions and to indicate factors determining their economic development. The analyzes carried out show that the economic development of subregions in the Mazovian voivodship was strongly diversified in the years 2010-2020, both in terms of the level of economic development and its dynamics. Both in 2010 and in 2020, the highest level of development measured by GDP per capita took place in the subregions of the City of Warsaw and Płock, and the lowest level - in the Ostrołęcki and Radomski subregions. The conducted analyzes of econometric modeling indicate that important factors influencing the economic development of subregions are: labor productivity, investment and entrepreneurship.

Keywords: economic development, subregions, Mazovian voivodship

INTRODUCTION

Economic development processes play an essential role in the economy and social life. They shape the level and quality of life of the population. It is, therefore, crucial to identify the factors determining this development. Their identification is essential for the economic development support policy.

The main subject of this article is the economic development of subregions in the Masovian voivodship in the years 2010–2020. The primary purpose of the undertaken analysis is to show the differentiation of the level and dynamics of economic development of the subregions mentioned above and to indicate the factors determining their economic development.

Research on the economic development of Polish subregions has already been undertaken many times in the economic literature. The study by T. Czyż, showing the differentiation of the economic development of subregions based on the model of potentials (Czyż, 2002), should be mentioned here. The article by G. Adamczyk-Łojewska, in which similar subregions were identified based on relative GDP indicators and sectoral structures of the economy (Adamczyk-Łojewska, 2004), the study of the divergence of the development of Polish subregions by P. Wójcik and M. Herbst (Wójcik, 2006; Herbst, Wójcik, 2012) or the analyzes of A. Harańczyk examined the economic development of subregions based on a broad set of economic and demographic indicators, social infrastructure, and a synthetic indicator of taxonomic development (Harańczyk, 2007). It should be emphasized that these studies were undertaken in different periods when slightly different classifications of subregions were in force¹. Therefore, their results are only partially comparable.

The analyzes are based on annual statistical data on subregions from 2010–2020 from the Local Data Bank of the Statistics Poland. Gross domestic product per capita (GDP per capita) was adopted as a measure of economic development. In order to show the diversification of the economic development of the subregions, the methods of ranking and indices of dynamics and indicators of the average annual growth rate were used. The selection of factors determining the economic development of subregions was based on the theoretical achievements of economics in the field of growth and economic development factors. In order to capture the importance of factors determining the economic

¹ Until 2008, there was a division into 45 subregions in Poland. From 2008 to 2014 the country was divided into 66 subregions, and since 2015 into 72 subregions.

development of subregions, econometric methods of cross-time analysis were used (9 subregions, 2010–2020), in which the impact of individual factors on the economic development of subregions was estimated.

The sequence of further considerations is as follows. The analyzes begin with the presentation of the factors of growth and economic development in economic theory. Then, the characteristics and differentiation of the economic development of subregions in the Mazovian Voivodship in 2010–2020 are shown, after which the analyzes focus on the role of selected determining factors in shaping the economic development of subregions based on econometric regression analyses. The final part of the analyzes contains basic conclusions.

DETERMINANTS OF ECONOMIC GROWTH AND DEVELOPMENT IN ECONOMIC THEORY

The research of economic theory on economic development has a long history, as it was initiated in classical economics. However, it was only in the mid-twentieth century that space and the regional approach began to be emphasized in analyzing growth and economic development factors. An essential role in shaping the views of later economics on the fundamental factors of development was played by Adam Smith, who in his work of 1776, emphasized that human work is the fundamental source of wealth, and its growth requires the accumulation of capital. Another classical economist, D. Ricardo, put forward a claim about the critical role of foreign trade for economic development, justifying it by differences in the relative costs of producing goods between countries.

It is also worth paying attention to J. B. Say's claim from the beginning of the 19th century that work, capital and land are the fundamental factors of production (Kwiatkowski, 2007, pp. 91–96).

Neoclassical economics emphasized the essential role of capital, labour and the technical progress in economic development. In the Solow growth model based on the achievements of neoclassical economics (cf. Tokarski, 2005, pp. 20–27), production in the economy (Y) was made dependent on three factors: labour resources (Z), physical capital resources (K) and scientific and technical progress (A), taking the exponential form of the function. This relationship can be written as:

$$Y = A K^{\alpha} Z^{\beta} \quad (1)$$

Moreover, the production growth formula, after appropriate transformations, can be formulated as follows:

$$y = a + \alpha k + \beta z \quad (2)$$

where the designations were adopted:

y – production growth rate,

a – the rate of technical progress,

k – the growth rate of physical capital,

z – the growth rate of the labour force,

α – share of physical capital inputs in production,

β – share of labour inputs in production.

Solow emphasized the vital role of capital accumulation in the growth of physical capital and the growth of production (Solow, 1956). This factor was used to explain the differences in the level and dynamics of economic development of countries until the end of the 1960s. In the 1960s, T. W. Schultz and G. Becker drew attention to human capital as an important factor in economic development. T. W. Schultz emphasized that the faster growth of production in the economy compared to the increase in labour and capital inputs is associated with an increase in employees' education level. (Schultz, 1961). G. Becker introduced the concept of investing in human capital and emphasized its importance for future income and economic growth (Becker, 1962). Schultz and G. Becker's views on the importance of human capital

became the basis for further theoretical and empirical analyses. Noteworthy are the considerations of Nelson and Phelps (1966), who noted that the impact of human capital on economic development is mediated through its impact on the total productivity of production factors. Mankiw, Romer and Weil (1992) examined the impact of production factors on countries' economic development based on the Solow model, using statistical data from 130 countries. Only the extension of the model to include factors related to human capital resources allowed for a satisfactory explanation of the differences in countries' economic development levels. A characteristic feature of the concepts of economic growth and development presented above was the omission of space as a separate development factor. This approach needs to be revised in regional economics (Capello, 2007, p. 183 et seq.). They considered space and regions in the economic development analysis resulted in the identification of a number of new development factors (Przygodzki, 2009; Gałązka, 2017).

In a paper put forward by D.C. North's theory of the economic base, attention was drawn to the fact that an important factor stimulating the economic development of a region is the external demand for goods produced in the region (North, 1955). Therefore, branches producing for export are essential in the region, forming the region's economic base (in practice, this applies to branches of industry) because, through multiplier effects, they contribute to the development of the region's economy.

J. Schumpeter drew attention to innovation as an essential factor in economic development. He emphasized that the appearance - as a result of entrepreneurs' decisions - of new technical achievements in specific sectors of the economy (the so-called fundamental innovations) leads to their dissemination (in the form of the so-called derivative innovations), which results in the acceleration of economic development (Schumpeter, 1961). Schumpeter's ideas about the role of innovation in the economy were later used in several regional development theories, e.g. in the theory of metropolisation of space by M. Castells and endogenous development theory of regions by W.B. Stohr (Gałązka, 2017).

It is also worth mentioning the recently developed gravity models of economic growth and development, which have been used in regional and local development analyses in Poland. In these models, it is assumed that the economic development of regions depends, among others, on the spatial interactions of the region with other regions, consisting of trade, capital flows and migrations of people between regions, while the strength of these interactions, called the gravitational effect, depends directly on the economic potential of the cooperating regions and inversely on the distance between them (Chojnicki, 2011; Mroczek, Tokarski, Trojak, 2014; Mroczek, Tokarski, 2014; Mroczek, Tokarski, Trojak, 2015).

The presented review of the achievements of economic theory in the field of growth and economic development factors shows that it emphasizes such factors as human labour input, amount of tangible capital involved, investment outlays, technical progress, amount of human capital, education, export, the scale of industrial development, innovations, gravitational effect or distances between economic centres. Not all of these factors can usually be considered in empirical analyses. When selecting variables, one should be guided not only by the indications of economic theory but also by the availability of statistical data.

DIFFERENTIATION OF ECONOMIC DEVELOPMENT OF SUBREGIONS

The Mazovian Voivodship, located in the central-eastern part of Poland, is the largest voivodeship in Poland in terms of area. Since January 2018, it has been a NUTS 1 macroregion, consisting of two NUTS 2 regions: the Warsaw capital region, which covers Warsaw and nine poviats, and the Mazovian regional region, covering the rest of the voivodeship. At the same time, the Mazovian Voivodeship is divided into nine subregions, non-administrative units of the NUTS 3 level: Ciechanów, Płock, Ostrołęcki, Siedlecki, the City of Warsaw, West Warsaw, East Warsaw, Radom and Żyrardów. Map 1 shows the location of the subregions in the Mazovian Voivodeship.

The city of Warsaw's subregion is the country's most important economic area, with a high concentration of capital and the development of metropolitan functions. It is the subregion with the smallest area, occupying 1.5% of the area of the Mazovian Voivodeship, and at the same time, the most populated, as it is inhabited by about 33% of the population of Mazovia. A modern employment structure with a clear

dominance of the service sector characterizes it. The subregion of city of Warsaw is the least agricultural subregion of Mazovia. Warsaw specializes in services; it is here that over 60% of those working in services in the entire voivodship are concentrated. The industrial sector's share is also relatively high, with about 35% of all employed in the Mazovia Voivodship working here. It is a subregion with the lowest unemployment rate (at the end of 2022, it was 1.5%).

The Western Warsaw subregion has a significant economic potential and opportunities for rapid development, primarily due to the capital's proximity. Two national routes run through the territory of the subregion: Warsaw - Poznan and Warsaw - Gdansk, and the main railway line: Moscow - Berlin, along which production, service and trade companies are located. There are many transport, forwarding and customs companies in the subregion. It is a subregion with one of the lowest unemployment rates in Mazovia, which at the end of 2022 was only 2.8%. The Western Warsaw subregion is one of the smallest, accounting for only 7% of the voivodeship area. 69% of all employees in the subregion are employed in the services sector, and 25% are in industry and construction.



Map 1. Subregions in the Mazowieckie Voivodeship

Source: <https://stat.gov.pl/statystyka-regionalna/jednostki-terytorialne/klasyfikacja-nuts/rewizja-klasyfikacji-nuts-2016/>.

The Eastern Warsaw subregion does not have a solid economic specialization, although the industry is the economic sector in which employment is significantly higher than the average in the voivodeship (28.5% in the subregion compared to 19.3% in the Mazovian Voivodship in 2018). In the subregion, we also have a lower share of people employed in agriculture (10% compared to 11.3% in the voivodship) and a lower percentage of people employed in services than in the voivodship (61.5% compared to 69.4% in the entire voivodship). The unemployment rate in the Eastern Warsaw subregion in 2022 was close to 5.5% and was one of the lowest in the voivodship. The Zegrzynski Reservoir is a tourist and

recreational advantage of the region. The subregion is home to the National Center for Nuclear Research in Swierk, one of the largest scientific institutes in Poland and an official partner of the Joint Research Center of the European Union. The Płock subregion is the most industrialized subregion of Mazovia, taking into account the ratio of the share of people working in the industrial sector in the subregion in comparison to the corresponding share in the voivodship. The subregion is dominated by the refining, petrochemical, fuel and energy industries, and the largest refinery in Poland, PKN Orlen, is located in Płock. In other poviats of the subregion, the agricultural sector plays a dominant role (e.g. in the Sierpc powiat, the share of people working in the agricultural sector is nearly 40%). The unemployment rate at the end of 2022 was 8.6%. Within the subregion, one of the few lakes is significant in terms of recreation in the Mazovian Voivodeship. A unique element of the landscape is also the Vistula escarpment, unique in Europe and preserved in its natural shape. The Ostrołęka subregion specializes in agriculture and industry, similar to the Ciechanów subregion. The Ostrołęka subregion covers the largest area in the Mazovian voivodship, over 18%, with one of the smallest populations in the voivodship (only 6.3% of the population of the Mazovian voivodship lives in the subregion). Crops of cereals, potatoes and pig farming dominate the southern part. Local processing plants use these raw materials. The largest, adapted to European standards, is Meat Plants JBB in Lyse. Dairy cattle breeding - is determined by a large, as much as 50% share of grassland in the structure of agricultural land. The Ostrołęka subregion has the highest cattle density per 100 ha of agricultural land and the highest milk production in the Mazovian Voivodship. The unemployment rate at the end of 2022 was 8.9%. The share of those employed in agriculture was 35%, compared to the average share for the voivodeship amounting to 19%. The Radom subregion, similarly to the Ciechanów and Ostrołęka subregions, specializes in agriculture and industry, and the share of people working in services is lower than the average in the voivodship. Growing vegetables under cover on over 2,000 hectares are significant for the local and internal market, mainly peppers. The areas where peppers are grown, mainly the Przytyk commune, have been called the pepper basin, where 80% of the national production of this vegetable comes from. Radom is a critical railway junction where the lines Warsaw - Krakow and Radom - Dęblin and the line Radom - Lodz intersect. The city is located at the intersection of the main communication routes from east to west and from north to south, leading to the state borders. National roads intersect here: Gdansk - Krakow, Radom - Rzeszow, Lodz - Lublin. The unemployment rate at the end of 2022 was 12.6%, the highest in the voivodeship.

The Siedlce subregion belongs to the agricultural regions of Mazovia, where the industry share is also significant, with a small representation of the service sector simultaneously. It belongs to the largest subregions in the Mazovian Voivodship, occupying 17% of its area, with agricultural land covering about 70% of the total area. In the subregion, there are mainly agricultural and food processing plants; the largest include Sokołów Podlaski District Dairy Cooperative, SOKOLOW S.A. Branch of Sokołów Meat Plants. The Zyrardów subregion has the smallest population of the voivodeship subregions (only 4.8% of the population of the Mazovian voivodship). Those employed in agriculture account for 28.1% of all employees in the subregion, 22.4% in industry and 49.6% in services. The subregion is a leader in local entrepreneurship, as every 11th inhabitant runs a business here. The Grójec powiat, which belongs to the Zyrardow subregion, is the most important Polish region for growing and processing apples (which provides about 40% of the domestic production of apples). When analyzing the level of economic development of subregions in the Masovian voivodship based on GDP per capita, it is worth noting that this indicator, averaged for the entire Mazovian voivodship is the highest compared to other voivodships. In 2020, it amounted to PLN 49,438 for Poland (in 2010 prices), and PLN 78,394 for the Mazovian Voivodship. Analogous data for the subregions of the Mazovia for the years 2010 and 2020 are presented in Figure 1.

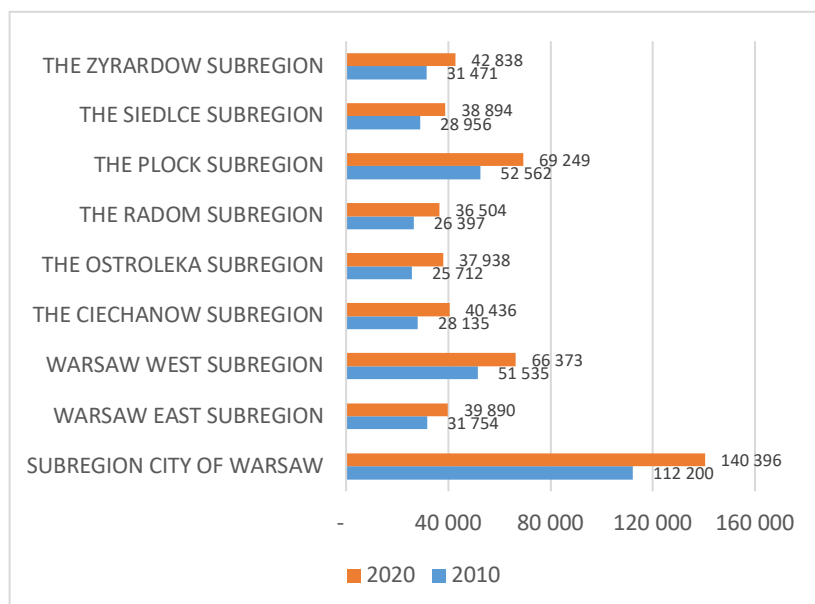


Figure 1. GDP per capita by subregions in the Mazovian voivodeship in 2010 and 2020 (in PLN at prices of 2010)

Source: Own elaboration based on <https://stat.gov.pl/statystyka-regionalna/>

For the remaining subregions of the Mazovian voivodeship, GDP per capita ranges from 74% in the Radomski subregion to 87% in the Zyrardow subregion of the value for Poland. Therefore, there is a stronger concentration of GDP in the subregion of Warsaw and the western part of the voivodeship. GDP values in a territorial breakdown show disproportions in the level of economic development of subregions. The lowest GDP per capita in 2020 was in the Radom and Ostroleka subregions, and in 2010 in the Ostroleka and Radom subregions. Comparing the values of GDP per capita in the subregions of the Mazovia in 2010 and 2020, it must be stated that the absolute spread of indicators between the subregion with the highest indicator (the city of Warsaw) and the subregion with the lowest indicator (Ostroleka or Radom) increased in 2020 compared to 2010 (from PLN 86,798 in 2010 to PLN 103,892 in 2020). However, the ratio of the indicators between these subregions slightly decreased in 2020 compared to 2010 (from 4.4 to 3.8).

No.	Subregion Ranking	Percentage increase in GDP per capita in 2020 compared to 2010	Average annual growth rate (%) of GDP per capita in 2010-2020
1	THE OSTROLEKA SUBREGION	49,04	3,97
2	THE CIECHANOW SUBREGION	44,30	3,69
3	THE RADOM SUBREGION	39,04	3,29
4	THE ZYRARDOW SUBREGION	36,43	3,13
5	THE SIEDLCE SUBREGION	35,16	2,99
6	THE PLOCK SUBREGION	31,51	2,80
7	WARSAW WEST SUBREGION	28,29	2,56
8	WARSAW EAST SUBREGION	25,24	2,31
9	SUBREGION CITY OF WARSAW	25,07	2,27

Table 1. Dynamics of changes in GDP per capita by subregions in the Mazovian voivodeship in the years 2010 - 2020 (in %)

Source: Own elaboration based on <https://stat.gov.pl/statystyka-regionalna>.

Analyzing the dynamics of changes in GDP per capita in the subregions in 2010-2020 (cf. Table 1), it should be stated that the Ostrołęka subregion in 2020 was a leader in terms of growth dynamics determined using single-core dynamics indices and the average annual growth rate. In 2020, compared to 2010, there was an increase in GDP in this subregion by 49.04%, and the average annual growth rate was the highest and amounted to 3.97% in 2010-2020.

In terms of the growth rate, the Ciechanow subregion also stands out, where the increase in GDP per capita in 2020 compared to 2010 was 44.30%, and the average annual growth rate was 3.69%. The following subregions: Ostrołęka, Ciechanow, Radom, Zyrardow, Siedlce, and Plock, are characterized by an average annual growth rate of GDP per capita higher than the average annual growth rate for the voivodship, amounting to 2.77%. The situation is reversed in the case of the following subregions: Warsaw West, Warsaw East and the City of Warsaw. The theory of economic convergence shows that poorer regions develop faster than rich regions. Based on the analysis, it can be concluded that, in accordance with this theory, the Ostrołęka subregion is developing and is the leader in the growth rate.

The above analysis allows to present a few observations. Firstly, the economic development of the subregions in the Mazovian voivodship was characterized by great diversity, both in terms of the level and dynamics of development. Secondly, the subregions of Warsaw, Plock and Warsaw West are characterized by the highest indicators of the level of economic development, while the subregions Radom and Ostrołęka have the lowest indicators. Thirdly, the Ostrołęka and Ciechanow subregions show the highest growth rate of GDP per capita, while in the following subregions: the city of Warsaw and Eastern Warsaw, the growth rate was the lowest. Fourthly, the changes in subregions' position in the GDP per capita ranking between 2010 and 2020 were minor.

DETERMINANTS OF ECONOMIC DEVELOPMENT OF SUBREGIONS IN THE LIGHT OF MODEL ANALYSIS

The analyzes carried out in the previous part of the study constituted the first stage of the undertaken research. We are currently undertaking the second stage of identifying factors influencing the economic development of subregions. For this purpose, we construct an econometric model to verify the significance of the impact of factors determining the economic development of subregions. The analysis

covers the years 2010-2020. Limiting the time range to 2020 results from the lack of data on the values of explanatory variables for later years. Economic development is measured by GDP per capita.

The selection of potential explanatory variables for the model is based on the theoretical achievements of economics presented in the first part of the study and the availability of statistical information on subregional level. For these reasons, the basic determinants influencing economic development include:

- investment outlays in enterprises per capita,
- gross value of fixed assets per capita,
- gross value added per 1 working person,
- registered unemployment rate,
- Covid-19 pandemic.

All economic variables were included in relative formulas, allowing for comparisons between subregions.

When evaluating potential explanatory variables in statistical terms, their high variability should be pointed out (value of the coefficient of variation above 30%). The correlation analysis using the Pearson linear correlation coefficient showed the existence of relatively strong statistical relationships between some explanatory variables (especially between investment expenditure per capita and the gross value of fixed assets in enterprises per capita, where $r = 0.956$, and between the gross value of fixed assets in enterprises per capita and gross value added per 1 working person, where $r = 0.864$). Despite the high level of dependence between some explanatory variables, it was decided to use them in the model due to slightly different aspects of their impact on the dependent variable.

The econometric analysis was carried out on the basis of panel data, cross-sectional and time (annual data on 9 subregions in the years 2010-2020), using the power function, the logarithm of which looks as follows:

$$\ln Y_{it} = \alpha_0 + \alpha_1 \ln GVFA_{it} + \alpha_2 \ln IOE_{it} + \dots + \alpha_3 \ln GVA \ 1 \ EMP_{it} + \alpha_4 \ln RE_{it} + \alpha_5 \ln COV_{it} + \varepsilon_{it} \quad (3)$$

where the following designations were adopted:

Y_{it} – GDP per capita in subregion i in year t in PLN (2010 prices),

$GVFA_{it}$ – Gross value of fixed assets per capita in subregion i in year t in PLN (in 2010 prices),

IOE_{it} – Investment outlays in enterprises per capita in subregion i in year t in PLN (in 2010 prices),

$GVA \ 1 \ EMP_{it}$ – Gross value added per 1 employee in the subregion i in year t in PLN (in 2010 prices),

RE_{it} – Registered unemployment rate in subregion i at the end of year t in %,

COV_{it} – Cov-19 pandemic

ε_{it} – random component,

α_0 – intercept,

$\alpha_1 - \alpha_5$ – parameters for explanatory variables.

The subject of estimation in the model were the parameters $\alpha_0, \alpha_1, \alpha_2, \alpha_3, \dots, \alpha_5$, estimated by the least squares method (LSM).

An elasticity approach is used to interpret the estimation results.

The estimated values of the α_i parameters should be interpreted as a percentage increase or decrease in the value of GDP per capita in the subregion resulting from the increase in the value of the explanatory variable by 1%, assuming *ceteris paribus*.

Referring to statistically significant estimates of parameters for which the absolute values of the student's t-statistic are greater than 2,3, the following relationships can be indicated, assuming the ceteris paribus assumption (see Tab. 2).

Variable	Corr. $R^2=0,97153275$ $F(5,93)=669,91$ $p<0,0000$ std error estimation : 0,07933			
	b*	Bł. std.	t(93)	p
GVFA	0,4289	0,052980	8,0965	0,00000
IOE	0,1610	0,043150	3,7317	0,00033
GVA 1 EMP	0,2541	0,040304	6,303	0,00000
RE	-0,223	0,025385	-8,7649	0,00000
COV	-0,088	0,018395	-4,791	0,00001

Table 2. The results of the regression analysis of GDP per capita for the subregions of the Mazovia
Source: own calculations in the Statistica program

When analyzing the model estimation results, it should be emphasized that the estimates of all parameters turned out to be statistically significant (relatively high absolute values of the student's t-indices, and p values lower than the assumed significance level of 0.05).

The first variable that had a statistically significant impact on the economic development of the subregions in the analyzed period was the value of the production assets existing in the subregions, measured with the gross value of fixed assets per capita (GVFA).

An increase in the value of fixed assets per capita by 1% was associated with an increase in GDP per capita by 0.429%. This relationship is consistent with theoretical findings emphasizing the dependence of production volume in the economy on the value of accumulated machinery, equipment and production halls.

Investment outlays in enterprises also had a statistically significant impact on the GDP per capita. This is not surprising in the context of the previously discussed importance of the gross value of fixed assets, as their level is the result of cumulative investments from previous years.

It is thanks to investments that the productive capacity of the economy and, consequently, GDP per capita increase. Estimates show that an increase in investment outlays in enterprises (IOE) by 1% entails an increase in GDP per capita by 0.16%.

GDP per capita in subregions turned out to be strongly dependent on the level of labor productivity measured by gross value added per 1 employee (GVA 1 EMP). Estimates show that an increase in this variable by 1% causes, ceteris paribus, an increase in GDP per capita by 0.254%.

This relationship is consistent with the findings of modern theories of economic growth, which emphasize the leading role of labor productivity in shaping the level of economic development.

The estimation of the parameter determining the impact of the unemployment rate on GDP per capita in the subregions is consistent with the theoretical assumptions. The results of the estimation indicate that a 1% increase in the unemployment rate is associated with a 0.2222% decrease in GDP per capita. It is worth noting that the unemployment rate is a kind of measure of the degree of unused labor resources, hence its high level implies a reduction in production growth in the long run.

The Covid-19 pandemic occurring in 2020 contributed to a decrease in GDP per capita by 0.088%.

To assess the level of fit of model estimates to empirical data, the coefficient of determination was used.

A high coefficient of determination (Corr. $R^2=0.971$) indicates that the regression model can explain more than 97% of the variance of the dependent variable. In order to verify the correctness of the functional form of the model, the Anova test was carried out, which shows that $F = 669.9$ and $p < 0.05$, so it can be assumed that the functional form of the model is correct. The Kolmogorov-Smirnov test was used to test the normality of the distribution of residuals. The obtained results ($d=0.9625$, $p>0.20$) indicate a normal distribution of model residuals, the significance is higher than the assumed level of $\alpha = 0.05$. Concluding, it should be stated that there are no grounds to reject the H_0 hypothesis that the random components have a normal distribution.

CONCLUSIONS

1. For the analyzes undertaken in this paper, devoted to factors determining the economic development of subregions in the Mazovia, considerations on the achievements of theoretical economics in the field of economic growth and development turned out to be helpful. These achievements show that along with the development of research on economic growth and development, the evolution of views on factors determining economic development took place: from emphasizing traditional factors, such as labor resources and physical capital resources, to emphasizing the leading role of qualitative factors, such as labor productivity, human capital, innovations, space. This evolution was not without significance for the selection of factors determining the economic development of subregions in the Mazovian voivodeship.
2. The analyzes carried out in this paper show that the economic development of subregions in the Mazovia was strongly diversified in the years 2010-2020, both in terms of the level of economic development and its dynamics. Both in 2010 and in 2020, the highest level of development measured by GDP per capita took place in the subregions of the City of Warsaw and Plock, and the lowest level - in the Ostroleka and Radom subregions. The absolute spread of the above indicators between these subregions in 2020 was even greater than in 2010. On the other hand, the dynamics of GDP per capita growth in the subregions in the analyzed period varied. The highest average annual growth rate of the indicator occurred in the Ostroleka and Ciechanow subregions, and the lowest in the Warsaw subregions. It should be stated that the convergence processes were most visible in the Ostroleka and Ciechanow subregions.
3. The conducted analyzes of econometric modeling allow not only to indicate important factors determining economic development in the subregions of the Mazovia, but also formulate recommendations for economic policy, especially with regard to less developed subregions.

Firstly, due to the strong stimulating effect of labor productivity on economic development, it would be advisable - especially in less developed subregions - to take measures to increase labor productivity. To this end, investment outlays should be increased, which increase the value of production assets and technical equipment for work, and actions should be taken to improve the qualifications of employees. Encouraging foreign investors to invest their capital in subregions works in a similar direction.

Secondly, the development of entrepreneurship is always an important stimulator of economic development, but faster development effects would be achieved by creating larger enterprises or their branches, especially in less developed subregions.

Thirdly, due to the relatively higher unemployment rates in less developed subregions, it is necessary to develop professional activation programs for the unemployed in these regions, in particular vocational training courses improving and changing professional skills.

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