



CHANGES IN THE SPATIAL DIFFERENTIATION OF THE DEVELOPMENT OF WARMIA AND MAZURY IN THE YEARS 2000-2022

Rafał Warzala

Faculty of Economic Sciences
University of Warmia and Mazury in Olsztyn
ORCID: <https://orcid.org/0000-0001-8677-977X>
e-mail: rafal.warzala@uwm.edu.pl

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Abstract

The aim of the article is to assess the level of economic development of the Warmia and Mazury region in the years 2000-2022 in three aspects: in comparison to the average development level in Poland, in comparison to the average value of regional GDP growth for the entire EU and in comparison to the internal differentiation of economic development in Warmia and Mazury according to NUTS 3 subregions.

The research process was carried out using primary data from public statistics: Eurostat and the Central Statistical Office. Classical methods of statistical analysis were used to achieve the research objective, i.e. dynamics analysis, structure indicators and comparative analysis. The reference point was all EU regions, all regions in Poland, and the Warmia-Masuria voivodeship itself. The results obtained indicate that the Warmia and Mazury region is still in one of the last places in terms of the level of development achieved, but this process is progressing in a positive direction and results in slow approach both to the EU and Polish average. This is accompanied by internal differentiation of development, which is also – although to a lesser extent – decreasing.

ZMIANY ZRÓŻNICOWANIA PRZESTRZENNEGO ROZWOJU WARMII I MAZUR W LATACH 2000-2022

Rafał Warżala

Wydział Nauk Ekonomicznych
Uniwersytet Warmińsko-Mazurski w Olsztynie

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Słowa kluczowe: region, rozwój regionalny, zmiany strukturalne.

Abstrakt

Celem artykułu jest ocena poziomu rozwoju gospodarczego regionu Warmii i Mazur w latach 2000-2022 na tle średniej wartości wskaźników ogółem w Polsce, na tle średniej wartości wzrostu regionalnego PKB dla całej Unii Europejskiej oraz ocena wewnętrznego zróżnicowania rozwoju gospodarczego na Warmii i Mazurach według podregionów NUTS 3.

Proces badawczy przeprowadzono z wykorzystaniem danych pierwotnych statystyki publicznej: Eurostatu oraz Głównego Urzędu Statystycznego. Do realizacji celu badań wykorzystano klasyczne metody analizy statystycznej, tzn. analizę dynamiki, wskaźniki struktury oraz analizę porównawczą. Punktem odniesienia były wszystkie regiony UE, wszystkie regiony w Polsce oraz samo województwo warmińsko-mazurskie. Otrzymane wyniki wskazują, że region Warmii i Mazur pozostaje wprawdzie na jednym z ostatnich miejsc pod względem osiągniętego poziomu rozwoju, proces ten jednak postępuje w pozytywnym kierunku i skutkuje powolnym zbliżaniem się do średniej UE oraz Polski. Towarzyszy temu wewnętrzne zróżnicowanie rozwoju, które również – choć w mniejszym stopniu – ulega zmniejszeniu.

Introduction

The issue of regional development, taken up in many scientific and non-scientific discussions, is still relevant. The development of regions is the subject of interest of both economic theory, economic practice and the regional authorities themselves. However, the analysis of regional development processes is not an easy task. This results from the complexity and multidimensionality of this phenomenon. The dynamics of regional development is of great importance for the economy of each country, and its strengthening with external (EU) funds is currently the subject of many substantive discussions conducted at the national and international level (Warżala, 2012, p. 57).

The implementation of regional development policy in Poland actually took place with the administrative reform initiated in 1999, and then strengthened by Poland's accession to the European Union. This created conditions for applying for European funds, the purpose and scale of which had no equivalents before. Thus, 2000 can be considered a breakthrough year for the implementation of regional development policy in Poland. After 23 years of conducting regional

policy, a certain assessment can be made from the point of view of the position of the Warmia and Mazury region among all other regions in Poland and changes in the internal situation in the studied region. The above constitutes the aim and research intention of this article.

Regional Development – Literature Review

The concept of regional development has already been widely described in the literature on the subject. Therefore, this work focuses on the latest research related to it.

The issue of regional development is multi-faceted, which is why it is difficult to define it unambiguously. Nevertheless, the literature indicates a certain set of factors influencing the direction, efficiency and pace of development (Tuziak, 2022, p. 57; Pike *et al.*, 2006, p. 23; Hudson, 2007, p. 79; Larty *et al.*, 2017, p. 16). In the general sense, the concept of regional development refers to the growth of the socio-economic potential of a region, which is accompanied by a lasting improvement in its functioning and the standard of living of its inhabitants (Poliński, 2020, p. 13).

The literature on the subject indicates four dimensions of regional development (Strzelecki, 2008, p. 26). The first is the process of all changes taking place in the region, mainly of an economic nature, consisting in the transformation of regional factors and resources into goods and services. Secondly, regional development is also a social process, due to the fact that it creates the basis for changes in the way, level and quality of life of the inhabitants of the region. Thirdly, regional development also has an efficiency dimension, i.e. it aims to use the endogenous factors and resources of the region more effectively and rationally. The fourth dimension is environmental in nature. In this case, it is a process referred to a sustainable development. It should be emphasized that this last aspect of regional development is currently gaining in importance. However, the overall process of regional development should certainly be a process encompassing changes taking place in all these four spheres simultaneously. Balancing the process can enable the durability of economic and social development (Augustyn, 2020, p. 17).

Regardless of the review presented above, in the contemporary paradigm of regional development, in addition to economic and spatial factors, the importance of qualitative factors of the location of economic activity is emphasized. These include issues such as the diversity of the economic structure, the efficiency of administration, living conditions, the quality of human capital, as well as the quality and condition of transport infrastructure (Gorzelak, 2003, p. 28). In such a multidimensional perspective, regional development is understood as the coexistence of phenomena of an economic, socio-cultural and political nature

(Hryniewicz, 2000, p. 41). The above characteristics of regional development are universal, regardless of the way in which the region was designated (Dębowski, 2013, p. 87).

According to Nowak (2018, p. 53), regional development should be interpreted as a process of changes of a socio-economic nature that takes place within the social system in a given area. As he states, the endogenous potential of the region and the flow of people, information and goods are integral parts of regional development. The flows of production factors – as the Author notes – are more intensive within the territory, which is characterized by homogeneity, than in relation to exogenous areas.

Churski *et al.* (2018, p. 78) takes a similar position, stating that regional development is a process of a socio-economic nature that takes place in a regional system or within the boundaries of a single region. However, he emphasizes that its nature or mechanism deviates from a uniform, linear vision of development. This results from the complexity of development processes and aspects such as the state or transformation of factors influencing development (Churski *et al.*, 2018, p. 19).

Ziółkowski (2018, p. 24) and Tuziak (2022, p. 59) unanimously emphasize the multidimensional nature of regional development. Tuziak emphasizes social aspects as key in assessing the level of regional development. Ziółkowski recognizes that regional development, which is supported by social factors, can become one of the most important elements of decentralization progress and the development of local government at the local level.

The concept of regional development is a category that is currently used all over the world. Regardless of the method of delimitation of the region, i.e. the method of marking the border of the region using the selected method, it is always possible to indicate whether and with what intensity the process of regional development occurred in a given area. Identification of this phenomenon is possible thanks to the use of selected tools for measuring the direction and pace of regional development. Regional development is also an important component of regional policy, i.e. the policy pursued by local government authorities in the region and the policy of central authorities focused on the development of specific areas. In the context of the conducted regional policy, the ongoing development enables the implementation of its goals. It is also in itself the goal of regional policy and is at the same time its creator, because the achieved level of development poses new challenges for the entities of regional policy and leads to periodic reorientation of goals. Regional development is therefore a phenomenon that directly affects the shape of regional policy, creating conditions for its rational and effective implementation.

Methodology and Research Objective

Since 1 January 2018, there have been 17 administrative units in Poland subject to the criteria for allocating funds under regional policy. The city of Warsaw has been excluded from the Mazovian Voivodeship and has become a separate statistical unit at the NUTS 2 level. Thus, the eastern and northern areas of the Mazovian Voivodeship may still be beneficiaries of the aforementioned funds. In addition to the analysis at the NUTS 2 level, the Central Statistical Office publishes data at the NUTS 3 level, the so-called subregions.

In relation to the average value of regional GDP in the EU countries, measured in PPS, in the Warmia and Mazury region there was an increase in the value of the indicator from 38% of the EU average in 2000, to 47% in 2010 and 56% in 2022. Of course, it should be remembered that as a result of the accession of new countries to the EU in the analyzed period, the average value of regional GDP evolved, which also affected the relationship of this indicator for Warmia and Mazury to the EU average.

The share of the Warmia-Masuria voivodeship in the total value of the country's GDP decreased from 2.8% in 2000 to 2.5% in 2022. Taking into account the average GDP value for the entire Polish regions as a reference point, the GDP of the Warmia-Masuria voivodeship constituted 77.5% of the regional average GDP value in 2000, 72.9% in 2010, while in 2022 it was only 71.3% of this average. As it results, the problem is not even maintaining the value in relation to the average regional development, but not increasing the distance that occurred at the time before accession to the EU. This is to some extent the result of a specific economic structure and the fact that the two largest metropolitan centers of Warmia and Mazury – Olsztyn and Elbląg – do not have such a strong impact on the region as, for example, Wrocław. The comparison of regions in terms of population is even less favorable. Here, the Warmia-Masuria voivodeship, together with the Podlaskie voivodeship, belong to the group of two regions of Poland with the lowest population density per 1 km² of area. In 2004, the population density in Warmia and Mazury was 36.6% of the national average, while in 2022 it was only 33% of the average. This strengthens and perpetuates the negative consequences in the form of poorly developed infrastructure, and thus poor communication accessibility of some areas of Warmia and Mazury.

The main objective of the research is to assess the position of the Warmia and Mazury region in terms of the dynamics of economic development compared to the average development level both in Poland and the entire EU area and changes in the internal economy in the studied region. In view of such a defined research objective, three main research questions can be formulated:

1. How and whether it is possible to talk about the economic development of the Warmia-Masuria voivodeship in the years 2000-2022?

2. Are there processes of convergence or polarization of development within the Warmia and Mazury region?

3. What is the development of entrepreneurship in the region in the period studied?

The time scope of the analysis, due to data availability – covered the years 2000-2022. The spatial scope concerns the area of the Warmia-Mazuria voivodeship.

Classical methods of statistical analysis were used to assess changes in the economy of Warmia and Mazury in the period under study, i.e. dynamics analysis, structure indicators and comparative analysis. The reference point in the last case were all EU regions, all regions in Poland, and the Warmia-Mazuria voivodeship itself. When it was possible – analysis was made on the Warmia and Mazuria subregions level, i.e. NUTS 3. All obtained results are presented in graphs and tables.

Research Results

The Warmia-Mazuria voivodeship is divided into three subregions: Elbląg, Elk and Olsztyn. In terms of the differentiation of development measured by the value of GDP per capita in terms of purchasing power parity, in the period under review (2000-2022) there was an increase in all three subregions (Fig. 1).

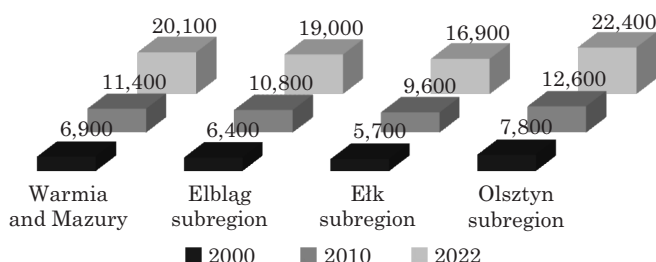


Fig. 1. Value of GDP per capita of Warmia and Mazury region according to purchasing power parity (in euro)

Source: based on data from Eurostat.

If we take into account the absolute changes in the indicator level, then the highest increase in GDP per capita was noted in the Olsztyn subregion (an increase from EUR 7,800 to EUR 22,400, i.e. 14,600 EUR more). The second in this respect was the Elbląg subregion (an increase from EUR 6,400 to EUR 19,000, i.e. 12,600 EUR more). The lowest level of development throughout the entire period under review was noted in the Elk subregion (an increase from EUR 5,700 to EUR 16,900, i.e. 11,200 EUR more). However, if the dynamic of growth

will be compared, the highest value in this respect presents Elbląg subregion (growth by 196% in the analyzed period). The second was the Olsztyn subregion (growth by 187%), and the lowest – but slightly, was the share of Elk subregion (growth by 197%). This means that over the course of 22 years all subregions managed to increase about three times their income per capita.

Taking the average value of GDP per capita for the EU27 as a reference point, in the years 2000-2022 the Warmia-Mazuria voivodeship reduced its development gap from 37% of the EU average in 2000 to 56% of the average in 2022, which means an increase of 19 percentage points. Taking into account subregions, the increases were as follows: for the Olsztyn region 19 percentage points (from 43% to 62%), for the Elbląg region 18 percentage points (from 35% to 53%), and for the Elk region 16 percentage points (from 31% to 47%) (Fig. 2).

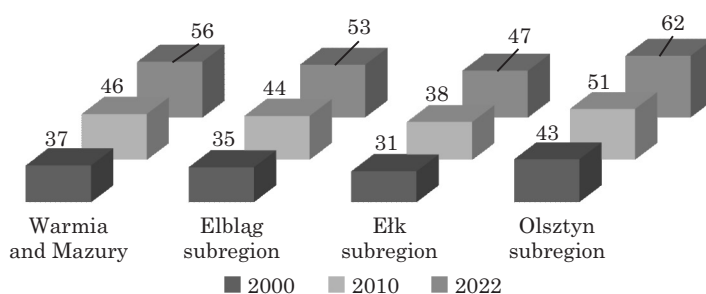


Fig. 2. Value of GDP per capita of Warmia and Mazury region according to purchasing power parity (EU = 100)

Source: based on data from Eurostat.

Taking into account the differences between regions in terms of the value of income calculated according to purchasing power parity, Warmia and Mazury managed to reduce the economic gap from 37% of the EU average in 2000 to 56% in 2022. This is an important and positive change, although it does not result solely from the result of GDP growth in the region, but is also a consequence of the so-called statistical effects (decline in population and absorption of larger flows of funds for regions whose GDP does not exceed 75% of the EU average). Currently, some regions of Poland, such as metropolitan Mazovia, Lower Silesia or Greater Poland, have exceeded the above-mentioned threshold and will no longer be able to apply for funds on such a scale as before. The new 17th region is also noteworthy – regional Mazovia, which in the years 2000-2022 achieved an increase in relation to the EU average by 36 percentage points (from 38% to 74% of the EU average). This is the effect of the strong influence of the Warsaw metropolitan area. Overall, Poland reduced its gap to the EU average in the years 2000-2022 from 49% to 78%, i.e. by 29 percentage points, which should undoubtedly be considered a success of integration with the EU in the economic dimension.

In relation to the dynamics of development for Poland in general, the situation is less favourable for Warmia and Mazury (Fig. 3). Thus, in the period under review, there was a regression of the development gap from 77.5% to 71.3% of the national average value of GDP per capita calculated for the country as a whole. However, if we take into account individual subregions, the Elbląg subregion lost the least in relation to the national average (from 72.4% to 69.2%, or 3.2 percentage points), followed by the Elk subregion (from 64.5% to 57.9%, or 6.6 percentage points), and the Olsztyn subregion by as much as 8.8 percentage points (from 88.1% to 79.3%). The decrease in the value in relation to the national average means that during the analyzed period, other regions of the country developed relatively faster than all subregions of Warmia and Mazury.

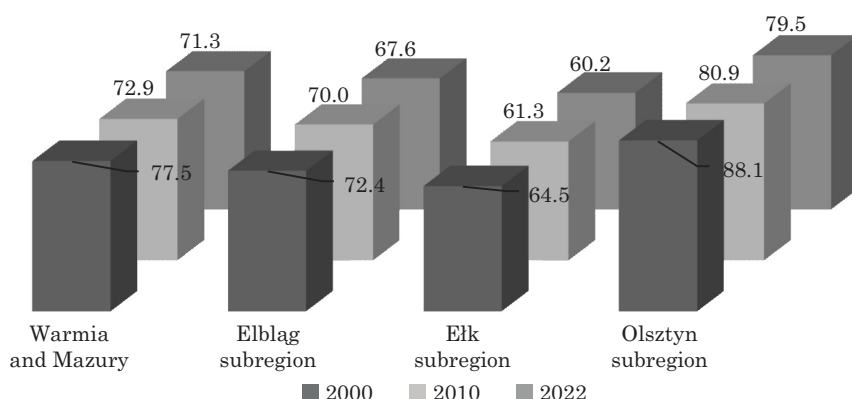


Fig. 3. Gross domestic product per capita of Warmia and Mazury region by subregions (Poland = 100)
Source: own study based on Central Statistical Office data.

Moving on to the assessment of the development of the Warmia-Masuria voivodeship itself, divided into districts, it should be noted that this development is very diverse (Fig. 4). The lowest level of development in 2000, i.e. four years before the accession data, was recorded by the following districts: Węgorzewski, Goldapski, Olecki and Nidzicki. The highest values are characteristic of two cities – Olsztyn and Elbląg, together with the area directly adjacent to them. In the period under review, a high level of stability of this differentiation can be observed. A positive phenomenon in this context is the fact that despite the fact that the districts from the southern and eastern part of the voivodeship (Nidzica, Szczytno, Piski, Elk, Goldap and Olecko) remain at the lowest level of development in the Warmia and Mazury region, the economic distance to the districts with the highest level of development is decreasing. This means that while on an interregional scale in Poland divergence processes prevail, within the Warmia and Mazury region a slight but progressive convergence can be observed in this respect.

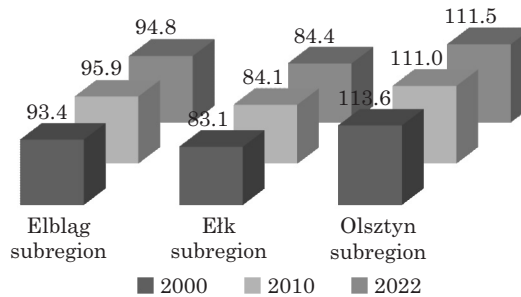


Fig. 4. Gross domestic product per capita of Warmia and Mazury by subregions (voivodeship = 100)
Source: own study based on Central Statistical Office data.

Moving on to the analysis of spatial differentiation within the Warmia-Masuria voivodeship, it can be noted that in the period under review, the Elbląg subregion developed the fastest, with the GDP per capita value increasing from 93.4% to 94.8% of the average for the Warmia-Masuria voivodeship. In contrast to Elbląg, the Olsztyn subregion lost 2.1 percentage points during this time (a drop from 113.6% to 111.5%). The third subregion – Elk noted similar to Elbląg growth scale, i.e. 1.3 percentage point (growth from 83.1% to 84.4% of the voivodeship average – Fig. 4).

In the light of the literature, the convergence mentioned above may take two forms – sigma and beta convergence (Próchniak, 2019, p. 224). Sigma convergence means a decrease in the differences in income per capita between regions or countries over time (Heller & Warżala, 2019, p. 4). Beta convergence occurs when less developed areas (with lower GDP per capita) show a faster rate of economic growth than more developed countries (regions) (with higher GDP per capita) (Próchniak, 2006, p. 27). While not in all Polish regions these processes take place in the desired direction, in the case of the Warmia-Masuria voivodeship there are positive changes in both types of convergence, which should of course be considered a success of internal regional policy.

In the case of spatial analysis of GDP calculated per 1 km² of area in the analyzed period, a regression can be observed in relation to three northern counties of the region (Węgorzewski, Gołdapski, Olecki) and three southern ones (Nidzicki, Szczycieński and Piski). This process is also due to the increasingly worse economic relations with the Królewiec Oblast, whose presence and functions have changed from a development opportunity into a threat and burden for the region, and in particular for the border districts.

To sum up, it can be stated that in all counties of the Warmia-Masuria voivodeship, there was an increase in real GDP per capita, but the dynamics of this growth were varied. In three counties (Bartoszyce, Węgorzewo, Gołdap) and in the city of Elbląg, the increase in real GDP per capita was lower than the average indicator for Poland. In turn, a higher dynamics of GDP per capita growth compared to the national average was recorded for three counties: Olsztyn, Elbląg and Działdowo.

Referring to the division of the Warmia-Masuria voivodeship into NUTS 3 subregions, it can be stated that two out of three subregions distinguished by the European Commission are clearly stronger economically (Elbląg and Olsztyn), while the third one – Elk – is much weaker in this respect. However, despite this, we observe convergence processes within the subregions, which should be considered a positive phenomenon.

Table 1

Structure of gross value added by type of activity
in the Warmia-Masuria voivodeship (in %)

| Year | Total | Agriculture, forestry, hunting and fisheries | Industry | Construction | Trade, repairs, transport, packaging, Treatment | Financial activities and insurance | Other services |
|------|-------|---|----------|--------------|--|---|-------------------|
| 2000 | 100 | 10.4 | 20.3 | 7.8 | 27.4 | 10.4 | 23.7 |
| 2010 | 100 | 8.2 | 24.0 | 8.0 | 25.5 | 9.3 | 25.0 |
| 2022 | 100 | 7.3 | 27.0 | 6.4 | 23.7 | 9.9 | 25.7 |

Source: own study based on Central Statistical Office data.

One of the manifestations of development – apart from the growth of GDP per capita – is the change in its structure, presented in Table 1. In the Warmia-Masuria voivodeship, this evolution was consistent with general global trends, i.e. there was a decrease in the share of agriculture (from 10.4% in 2000 to 7.3% in 2022) in favour of an increase in the share of the industry sector (from 20.3% to 27%). Regarding to services the slight decrease was observed (from 61.5% to 59.3%), mainly due to the drop of trade, repairs and transport sectors. The individual subregions were characterized by much greater dynamics of structural changes. In the Elbląg subregion, the largest decrease concerned agriculture, including forestry, hunting and fishing (by 4.2 percentage points), while the largest increase occurred in the share of the industry sector (by 10.3 percentage points). In the Elk subregion, the largest decrease occurred in the following sectors: agriculture (5.3 percentage points) and trade and repairs (by 5.5 percentage points). The largest increase in the share of GDP in this subregion concerned industry (by 8.2 percentage points). In the Olsztyn subregion, the largest decrease was observed in the agriculture sector (by 4.5 percentage points) and financial services (by 5.3 percentage points), while the largest increase was observed in the services sector (by 7.7 percentage points). The share of services increased in each of the remaining subregions, but to a slightly smaller extent. Similar changes concerned the share of employees in the individual sectors of the economies of the individual subregions.

The positive development trend in the years 2010-2022 is also evidenced by the increase in the level of entrepreneurship in Warmia and Mazury region (Fig. 5). It can be presented by the increase in the number of active microenterprises (entities employing up to 9 people). In all three subregions, the number of active microenterprises increased (Fig. 5). In the Elbląg subregion, this was an increase of 10.5%, in the Elk subregion by 5.7%, and in the Olsztyn subregion there was an increase of as much as 17%. Based on the information presented above, a general conclusion can be drawn that Warmia and Mazury as a region noted positive changes in development in the analyzed period, although with different levels of intensity for individual subregions.

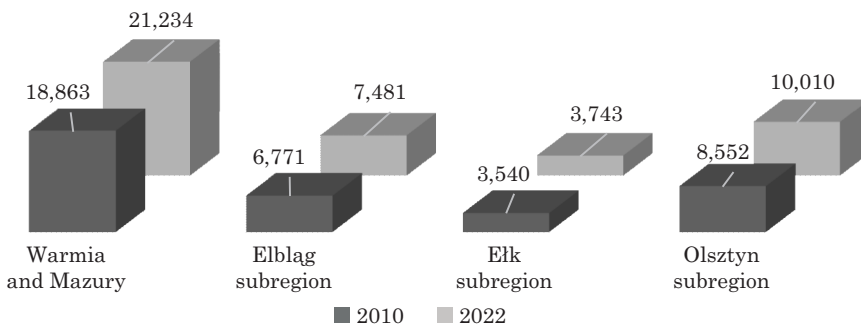


Fig. 5. Change in the number of microenterprises in Warmia and Mazury region in the years 2010-2022

Source: *Business demography...* (2025).

When analyzing the process of changes on the map of the economic development of the Warmia and Mazury region, attention should be paid to the change in the situation in five border counties of the region: Braniewo, Bartoszyce, Kętrzyn, Węgorzewo and Gołdap. Although there are no spectacular changes in GDP per capita, it should be remembered that these are the counties with the largest outflow of population, which causes an “artificial” increase in GDP per capita. Given their proximity to the Królewiec Oblast, these areas should be considered problematic. This is particularly important in the context of the ongoing war in Ukraine and the related defense operations in the areas directly adjacent to the Królewiec Oblast. The current situation creates significant barriers to the local development of border areas. Therefore, two processes are observed here at the same time – depopulation as a result of the ageing population and the decline of entrepreneurship due to unfavorable changes in the economic environment.

Conclusions

The Warmia-Masuria voivodeship, as one of the five regions of the so-called Eastern Poland, is one of the least developed voivodeships in Poland. However, this does not mean that no changes have occurred in this region over the past 23 years. Although in terms of wealth, it still shows a negative distance not only in relation to the average value for the entire EU, but also in comparison to other regions in Poland. In this context, the fact that the economic distance to average GDP per capita values is decreasing is a positive thing. Even if this is to some extent due to the “statistical effect” related to the admission of relatively poor countries to the EU, in absolute terms these changes are positive.

Referring to internal changes in the development of the Warmia and Mazury region, it should be noted that it is not uniform and depends mainly on the location of a given subregion and related conditions. Generally, subregions located in the central and western part of the province show a higher level and dynamics of development, compared to eastern subregions. In some cases, the GDP growth is technical in nature (as a result of population outflow), and in others it is due to the location – in the vicinity of the richest region in Poland, which is the Mazovian province, or in the vicinity of important corridors and road or rail junctions. In the longer term, further development of the Warmia and Mazury region can be assumed. However, what is currently emphasized in the literature on the subject and which also corresponds to the image of the Warmia-Masuria voivodeship is important – that this development is sustainable, i.e. that the economic, ecological and social goals are correlated with each other and do not cause degradation of this naturally valuable region, which is Warmia and Mazury.

Translated by: Rafał Warżala

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