EU Cohesion at sub-Regional Level. The Case of the sub-Regions of Warmińsko-Mazurskie Voivodship

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Abstract

Warmińsko-Mazurskie Voivodship is one of the poorest EU regions. The region is internally diverse at the sub-regional level. The aim of the study is to assess the effectiveness of cohesion policy in the sub-regions (NUTS 3) of the Warmińsko-Mazurskie Voivodship: Ełcki, Elbląski, and Olsztyński. The basis of assessment that was adopted was the change of position relative to all EU-sub-regions. Changes of economy structure are studied using the changes of the shares of sectors — NACE Rev. 2 in creating the Gross Value Added. The source of data is Eurostat. The results are ambiguous. Although some indicators (employment and GDP per capita) have improved, sigma convergence does not occur and the positions of those sub-regions do not show any significant changes, only Olsztyński sub-region noted small improvement in the ranking. Very small progress in the ranking means that the pace of catching up is too slow. Despite this, effects of membership in the European Union for employment and growth is positively assessed.

Keywords: convergence, sub-regions at NUTS 3 level, cohesion policy

JEL: F15, R1

Introduction

On 1st May 2004 Poland joined the European Union, which has greatly facilitated the relations and social-economic connections with other EU-Member States. As one of the poorest EU-members, Poland has become one of the largest beneficiaries of cohesion policy. Regional policy is crucial for the economic restructuring to promote socio-economic convergence of countries and regions, levelling territorial disparities by supporting uncompetitive regions. Among the priorities of economic restructuring are: promotion of structural reconstruction and development of peripheral regions, financial assistance to regions where there is industry stagnation and long-term unemployment, support for employment initiatives, subsidizing of agricultural areas and acceleration of their restructuring, reducing the differentiation in levels of economic development for new EU member-states (Panukhnyk 2016, 64).

The Warmińsko-Mazurskie Voivodship belongs to the poorest regions in Poland, which is developing slower than many of its competitors.[1] It is reasonable to examine the cohesion within the region. The voivodship is divided into three areas of NUTS 3 type (Elbląski, Olsztyński and Ełcki sub-regions). In Poland the sub-regions at NUTS 3 level are not a level of local administrative

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1. See: Competitiveness of Warmia and Mazury — Problem Diagnosis. W. Dziemianowicz and J. Szlachta, Marshal's Office of the Warmińsko-Mazurskie Voivodeship, Warsaw, August 2005, page 22, [@:] http://strategia2025 .warmia.mazury.pl/site/showFile/59.html?id_menu=25.

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units. The main subject of regional policy are regions (voivodships), but cohesion within the region is very important. Sub-regions are thought to a limited extent to be also the subject of regional policy. Therefore, coherence studies at NUTS 3 level are needed.

The aim of this study is to assess the effectiveness of cohesion policy in the sub-regions (NUTS 3) of the Warmińsko-Mazurskie Voivodship: Ełcki, Elbląski, and Olsztyński. Two research questions were posed:

- Have Ełcki, Elbląski, and Olsztyński sub-regions reduced disparities in economic development in relation to the European Union?
- Is there any convergence or divergence at the level of NUTS 3 sub-regions within Warmińsko-Mazurskie Voivodship?

An analysis was conducted at NUTS 3 level. The subjects of the study were the sub-regions of the Warmiańsko-Mazurskie Voivodship in two perspectives: in relation to each other and in relation to all sub-regions of the EU. The following measures were used: Gross Domestic Product (GDP) adjusted in the purchasing power standard (PPS) per inhabitant both in euro and in percentage of the EU average, Gross Value Added (GVA) at basic prices by NUTS 3 regions by sector — NACE Rev. 2, and number of employees in thousands. Gross Domestic Product per capita is the most synthetic macroeconomic indicator. It is often assumed that the value of the Gross Domestic Product per capita shows not only the level of socio-economic development but also the competitiveness of a region.[2] Gross Value Added is useful to analyze the economic structure of sub-regions.

The time range of the research is 2004–2015. The beginning of this scope is determined by the date of accession to the EU and the end — statistical data availability during the studies. In the case of Gross Value Added and number of employees the time range ends in 2014 because of statistical data availability during the studies. The source of data is the European Statistical Office Eurostat.

1 Convergence at sub-regional level — literature review

The research on diversification of socio-economic development within the voivodships are very rare. Herbst and Wójcik investigated the convergence processes in the years 1995–2006 in Polish sub-regions, according to the old division into 44 such units. The regional variation in the level of income per capita increased in the period 1995–2006, which means that there was divergence (in the sense of absolute) regional economies. Conclusions from that research are that the advantage of fast-growing regions came either from better natural resources or from existing infrastructure for their processing, or from agglomeration effects. Differences in the level of income between regions with large cities and other regions deepened especially during the periods of dynamic growth of the Polish economy in 1995–1998 and 2002–2006. At the same time, the spatial effects exerted by large agglomerations on neighboring regions are rather weak. Warsaw is the only metropolitan area whose rapid growth rate seems to have a significant positive impact on neighboring regions during the period considered (Herbst and Wójcik 2012, 190–194).

Research on NUTS 3 level within Lubelskie Voivodship was conducted by Kowerski, Bielak, Długosz, and Poninkiewicz. For sub-regions of Lubelskie Voivodship in the years 2000–2007 beta-convergence with a 2,1% average yearly rate of regions converging was observed.[3] The existence of the sigma-convergence was also confirmed. For the years 2007–2012 there appeared beta-divergence with a 5,4% yearly rate of regions diverging. The study confirms the existence of sigma-divergence in the analyzed period of time. What is more, it is visible that the rate of sub-regions "moving away" after 2007 was two times higher than the rate of them "catching up" in the first subperiod. The metropolitan sub-region of Lublin has been developing faster than other much poorer sub-regions and is characterized by the highest growth rate (Kowerski et al. 2014, 149–152).

A slight convergence was recorded in the Śląskie Voivodship in the years 1995–2008. The dominant role of the strongly urbanized central sub-region is also noticeable in this region. The growth

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2. Competitiveness of Warmia and Mazury…, op. cit., page 21.

3. [In the journal European practice of number notation is followed — for example, 36 333,33 (European style) = 36 333.33 (Canadian style) = 36,333.33 (US and British style). — Ed.]

of other sub-regions is to a large extent a function of the economic development of the central sub-region.[4]

Bogdański's research indicates that the processes of economic growth of sub-regions in Poland were conditioned by the level of their urbanization. On average, the highest levels and the rate of economic growth were characteristic for the sub-regions of the largest urban agglomerations. As the level of urbanization decreased, the dynamics of growth processes declined. The consequence of this was the increase in development disparities, especially between big cities and weakly urbanized areas (Bogdański 2017). These studies lead to similar conclusions: the divergence is recorded in recent years and slightly faster developing of sub-regions, which are the headquarters of the voivodships.

2 Cohesion Policy in Warmińsko-Mazurskie Voivodship

The factor conducive to economic growth is not only access to the Single European Market, but also a cohesion policy. Cohesion Policy plays an important role in the development of the most disadvantaged EU regions. The previous interregional income redistribution function stepped aside to the concentration on creating the basis for long-term sustainable development in the disadvantaged regions of the EU. Long-term orientation of the policy refers to both the overall and to the more specific aims of this policy. The overall aim of Cohesion Policy is to reduce disparities in economic development and employment, thereby equalizing opportunities between the most advanced and the most disadvantaged areas of the EU. Since 2000, the specific objectives have been strictly linked to EU development strategies. This means that Cohesion Policy has become the main pro-development instrument throughout the EU, playing a key role in delivering the strategic objectives included in the EU ten year development plans: previously the Lisbon Strategy, and currently the Europe 2020 Strategy. Furthermore, Cohesion Policy is implemented in a seven-year financial perspective, allowing interventions to be planned within a stable, multi-annual framework, which is essential for the realization of major investments (Wojtowicz and Olechnicka 2016, 25). EU Structural Funds help to raise investment levels and are estimated to have boosted long-term GDP levels (Panukhnyk 2016, 64).

At the beginning of Poland's membership in European Union, Dziemianowicz and Szlachta wrote: "The thesis about the unifying role of Poland in Europe is untrue, as our country is characterized by an exceptionally low level of territorial (spatial) cohesion compared to other European countries. The analyses conducted in the context of NUTS 2 regions indicated that the most peripheral voivodship in Poland is Warmińsko-Mazurskie, and out of 45 Polish NUTS 3 type sub-regions, the Ełcki sub-region has the worst location, whereas the situation of the Olsztyński sub-region is only slightly better. This proves that the basic barrier to the region's social and economic development is its disastrous territorial (spatial) accessibility in the Warmińsko-Mazurskie Voivodship compared to Poland and the European Union, which has a negative impact on the general level of competitiveness."[5]

Warmia and Mazury is a peripheral region, one of the poorest in Poland. The urban network is less developed compared to other Polish regions. The transport infrastructure is underdeveloped. Heffner and Gibas (2017, 105) estimated the impact of the functional center and the strength of its relationship with the communes. They concluded only 52,6% of the communes of the region belong to the direct impact zone of Olsztyn, the capital of the Warmińsko-Mazurskie Voivodship. Ten communes of Elbląski sub-region are within the direct impact of Gdańsk. Some communes in the south-west part of Elbląski sub-region are within the direct impact of Toruń (Heffner and Gibas 2017, 98–105).

In general, regional structural policy of any country is determined by the following conditions: the region's economic potential, level of regional balance, the region's geopolitical and geo-economic

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4. See: Społeczne, gospodarcze i polityczne uwarunkowania i konsekwencje zróżnicowanego tempa wzrostu gospodarczego subregionów województwa śląskiego. By T. Kupiec, Projekt pn. Wyzwania zrównoważonego użytkowania terenu na przykładzie województwa śląskiego — scenariusze 2050, Zadanie 3, Katowice, kwiecień 2011, [@:] http://www.scenariuszeslask2050.pl/uploads/kropr/Scenariusze_2050_opracowanie_Tomasz_KUPIEC_web.pdf.

5. See: Competitiveness of Warmia and Mazury…, op. cit., page 8.

position, internal and external factors which influence the trend of transformation of the economic structure in regions, challenges caused by globalization and regionalization, and the institutional framework for regional economic restructuring (Kowalski 2008).

The regional operational programme for the Warmińsko-Mazurskie Voivodship in Poland for the period 2007–2013 involved Community support within the framework of the "Convergence" objective. The total budget for the programme was EUR 1,2 billion and Community investment through the European Regional Development Fund (ERDF) amounted to EUR 1,03 billion (approximately 1,6% of the total EU money spent in Poland under Cohesion policy 2007–2013). The successor of this programme is the regional operational programme for Warmińsko-Mazurskie Voivodship 2014–2020 and partially constitutes a continuation of the directions of support. It focuses on the economy of the region, training of human resources, labor market integration, improving access to public services, breaking energy exclusion of the region, the natural environment, increasing the cohesion of the transport system, urban revitalization and decreasing poverty in the region. This programme is financed from the European Regional Development Fund EUR 1,24 billion and the European Social Fund EUR 486 million. The total allocation of EU funds equals to EUR 1,73 billion.[6]

The Warmińsko-Mazurskie Voivodship is divided into three areas of NUTS 3 type (Elbląski, Olsztyński and Ełcki sub-regions). The largest sub-region of this voivodship is Olsztyński 10 330 km^2 and population 619 thousand persons. Sub-region Elbląski area is 7 334 km^2 and 532 thousand persons. The smallest, Ełcki area is only 6 347 km^2 and 291 thousand persons. Most of the EU funds were allocated to projects in the Olsztyński sub-region (approximately 43% of all contracted EU funds in 2015). Other sub-regions with the largest allocation of EU funds for the implemented projects are Elbląski (approximately 36%) and Ełcki (approximately 21%).[7]

3 Diversity and changes of economic structure

The sectors the Warmińsko-Mazurskie Voivodship specializes in include general agriculture and non-market services, as their productivity is competitive on a national scale.[8] The economic structure is analyzed with the data of the Gross Value Added (GVA). The contribution to creating the Gross Value Added of the region by individual sub-regions is as follows: Olsztyński 48,5%, Elbląski 34,3%, Ełcki 16,2%. The shares of sectors—NACE Rev. 2 in creating the Gross Value Added of the whole region and individual sub-regions are presented in table 1 based on Eurostat publication Gross value added at basic prices by NUTS 3 regions by sector—NACE Rev. 2. The sector called "trade and communication" included wholesale and retail trade; transport; accommodation and food service activities; information and communication. The public services category includes: Public administration and defense; compulsory social security; education; human health and social work activities; arts, entertainment and recreation, repair of household goods and other services; financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities are called "professional activities."

In all the studied sub-regions the share of agriculture, trade and communication, and professional activities decreased in GVA. In all three sub-regions the share of industry, construction, and public administration increased in GVA.

To examine the convergence of sub-region economies, the distance from the pattern was estimated. The sectoral structure of the voivodship's economy as a whole was adopted as the reference structure. The sum of absolute deviations of sector shares from the reference structure was calculated. The index calculated this way decreased between 2004 and 2014 in all sub-regions: the ratio

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6. See: Sprawozdanie roczne za lata 2014–2015 z wdrażania Regionalnego Programu Operacyjnego Województwa Warmińsko-Mazurskiego na lata 2014–2020. Załącznik nr 1 do Uchwały nr 110 Komitetu Monitorującego Regionalny Program Operacyjny Województwa Warmińsko-Mazurskiego z dnia 25 maja 2016 r. [@:] http://rpo.warmia .mazury.pl/plik/2002/sprawozdanie-roczne-za-lata-2014%E2%80%932015-z-wdrazania-regionalnego-programu -operacyjnego-wojewodztwa-warminsko-mazurskiego-na-lata-2014%E2%80%932020.

7. Ibid.

8. See: Competitiveness of Warmia and Mazury…, op. cit., page 22.

Tab. 1. Share of Gross Value Added by sub-regions NUTS 3 (in %)

| | NUTS 2 region | | NUTS 3 sub-regions | | | | | |
| | Warmińsko-Mazurskie | | Elbląski | | Olsztyński | | Ełcki | |
Sector	2004	2014	2004	2014	2004	2014	2004	2014
Agriculture, forestry and fishing	6,9	6,2	6,7	6,0	6,0	5,3	10,3	9,1
Industry	24,5	26,4	28,9	29,6	23,0	25,0	19,3	23,6
Construction	6,4	7,5	6,4	7,9	6,2	7,2	6,8	7,6
Trade and communication	26,0	24,1	23,8	23,2	27,8	25,4	25,6	22,5
Professional activities	14,5	13,9	13,8	12,8	14,9	14,8	15,2	13,6
Public administration	21,6	21,9	20,4	20,5	22,1	22,3	22,8	23,6

Source: Own study based on data published by Eurostat

declined from 8,7 to 7,2 for Elbląski sub-region, from 5,3 to 5,2 for Olsztyński, and from 11,3 to 9,4 for Ełcki. The cohesion of economic structures of sub-regions is growing. The conclusion this is that the real convergence is occurring. The economic structure of the Ełcki sub-region still differs the most from the pattern, but disparities in this dimension decreased.

4 Growth and development of sub-regions Ełcki, Elbląski, Olsztyński

The sub-regions' GDP per capita growth rate was very similar to each other. In 2015 the GDP per capita at current market prices (adjusted in the purchasing power standard) was higher compared to 2004 year by 65,4% in Elbląski (a growth from EUR 8 100 to EUR 13 400), Olsztyński 63,9% (from EUR 9 700 to EUR 15 900 per capita), Ełcki 63,8% (from EUR 6 900 to EUR 11 300 per capita). The average annual growth rate at 5,8%–5,9% seems to be high. But Poland as a whole developed more rapidly, during the period considered GDP per capita rose 75,2%, which is 6,8% annual average.

GDP per capita in all sub-region economies rose strongly in the considered years relative to the EU average. Elbląski GDP per capita rose from 36% of the EU-28 average in 2004 to 46% in 2015, an increase of 10 percentage points, while Olsztyński GDP per capita rose by a more modest 12 percentage points from 43% to 55%. Unfortunately, Ełcki GDP per capita rose by 8 percentage points from 31 to 39 of the EU-28 average. The catching-up process with the EU average takes place, but relative gap between those sub-regions grows simultaneously. The gap in GDP as percent of EU average between Olszyński and Elbląski grew from 7 percentage points in year 2004 to 9 percentage points in 2015. The gap between Olsztyński and Ełcki sub-region increased from 12 percentage points in year 2004 to 16 percentage points in 2015. The gap between Elbląski and Ełcki sub-region grew from 5 percentage points to 7 percent points.

The quantity of employed persons grew significantly. In Elbląski sub-region from 166,6 thousand persons in year 2004 to 187,1 in year 2014. It is 20,5 thousand more jobs, so the relative increase was 12,3 percent in 10 years. In Olsztyński sub-region the number of employees grew from 214,8 thousand in 2004 to 243,3 thousand in 2014. It is 28,5 thousand more jobs. The relative increase was 13,3%, so higher than in Elbląski sub-region. In Ełcki sub-region growth of employment was from 80,9 thousand to 92,8 thousand persons during the same period. The increment of 11,9 thousand employees signifies a relative increase of 14,7 percent. So the highest relative increase of jobs is noticed in Ełcki sub-region. On this basis, the policy of supporting employment growth is positively assessed.

5 Sigma convergence

Economic convergence between countries and regions can be measured by relative developments in nominal income per capita adjusted for relative changes in price levels. This paper mainly focuses on developments in GDP per capita adjusted for changes in the price level using Eurostat's purchasing power standard (PPS). Sigma convergence occurs when the income diversification between

economies decreases over time. The basic measure of this diversity are the standard deviation and coefficient of variation of GDP per capita. A necessary condition, but not sufficient, to achieve convergence sigma is the occurrence of beta convergence (Bogdański 2017, 43; Próchniak 2004, 28).

The sigma convergence was researched between all EU sub-regions NUTS 3 level. As a measure GDP per capita was used adjusted in the purchasing power standard (PPS). Both standard deviation and coefficient of variation grew in the period 2004–2015. From this conclusion, sigma convergence did not occur. Not only that, we can conclude about the growing divergence of sub-regions throughout the European Union.

The diversification of sub-regions within the Warmińsko-Mazurskie Voivodship is also growing. The standard deviation of GDP per inhabitant increased rapidly. But there was a rapid increase in absolute value of GDP. Analyzing the changes in the coefficient of variation, we note a sigma
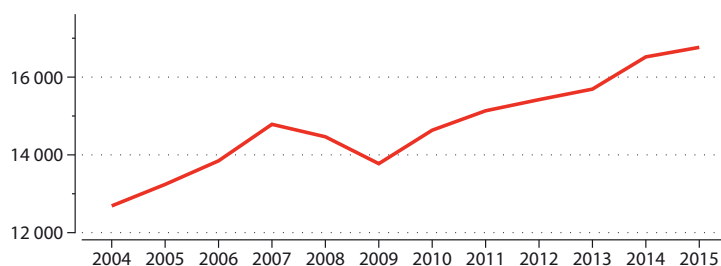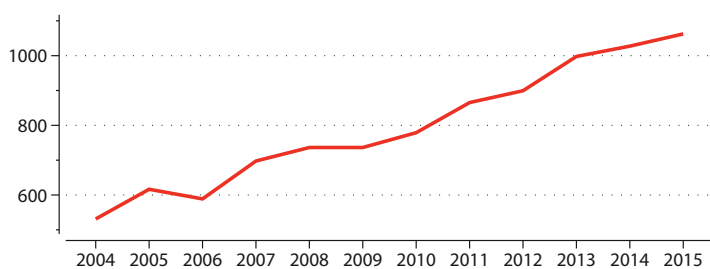

Fig. 1. Standard deviation GDP per capita purchasing power parity, all EU sub-regions NUTS 3

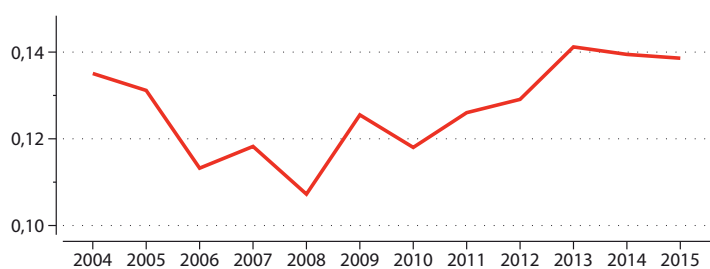*Source:* Own study based on data published by Eurostat
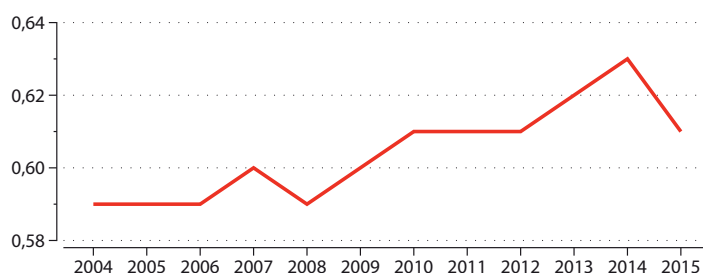
Fig. 2. Coefficient of variation GDP per capita purchasing power parity, all EU sub-regions NUTS 3

Source: Own study based on data published by Eurostat

Fig. 3. Standard deviation GDP per capita, sub-regions of Warmińsko-Mazurskie Voivodship

Source: Own study based on data published by Eurostat

Fig. 4. Coefficient of variation GDP per capita, sub-regions of Warmińsko-Mazurskie Voivodship

Source: Own study based on data published by Eurostat

convergence till year 2008. From year 2008 the coefficient of variation rises, the divergence between investigated sub-regions increases. In conclusion, based on the evolution of GDP per capita in the years 2004–2014 for the three sub-regions (at NUTS 3 level) of Warmińsko-Mazurskie Voivodship, it was determined a process of convergence between them could not be observed.

6 Changes in position in NUTS 3 ranking

The current NUTS 2016 classification is valid from 1 January 2018 and lists 133 regions at NUTS 1, 311 regions at NUTS 2, and 1 373 regions at NUTS 3 level. The NUTS classification, valid from 1 January 2015 till end of year 2017, lists 98 regions at NUTS 1, 276 regions at NUTS 2, and 1 342 regions at NUTS 3 level. For the studied period 2004–2015 Eurostat provides data for 1 342 sub-regions at the NUTS 3 level, for this reason we examine the position of the Elbląski, Olsztyński and Ełcki in the GDP ranking against 1 342 EU sub-regions (tab. 2) The measure used is GDP adjusted in the purchasing power standard (PPS) per inhabitant in percentage of the EU average.

Tab. 2. Position in GDP per capita in percentage of the EU average in ranking against all 1 742 EU sub-regions

Sub-region	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Elbląski	1252	1255	1262	1265	1272	1251	1248	1251	1250	1249	1249	1241
Olsztyński	1199	1204	1214	1217	1221	1205	1197	1176	1174	1164	1160	1157
Ełcki	1290	1289	1287	1293	1298	1291	1283	1286	1288	1289	1289	1290

Source: Own study based on data published by Eurostat

Ełcki remained at the same position, during the study period its best rank was in the year 2010 (1 283th position), and the worst in 2008 (1298th position). Elbląski from 2004 to 2008 slowly retreated from 1252th place to 1272th position. After the year 2008 its rank improved, but the position change is insignificant. Olsztyński started to slowly improve its position after the year 2008. On this basis, it can be concluded that this sub-region endured the financial crisis relatively well. The study of the effect of the financial crisis on the economy of the European sub-regions is beyond the scope of this paper. The improvement of the position in the ranking by 57 places is small but noticeable. Only Olsztyński sub-region managed to leave the last decile, Elbląski and Ełcki are still in the tenth decile. No progress in the ranking means that the pace of catching up is too slow.

Conclusions

Warmińsko-Mazurskie Voivodship is one of the poorest and most peripheral regions. The region is internally diverse at the sub-regional NUTS 3 level. The highest level of GDP per capita is in Olsztyński sub-region, and the lowest in Ełcki sub-region. The results are inconclusive, we did not get an answer to the question of whether there is any convergence or divergence at the level of NUTS3 sub-regions within Warmińsko-Mazurskie Voivodship. The convergence of economic structures of sub-regions is growing. The economic structure changes were measured by changes of participation of Gross Value Added by sectors. The disparities of shares of Gross Value Added by NACE-sectors in sub-regional economies decreased. But a sigma convergence of GDP per capita between sub-regions of Warmińsko-Mazurskie Voivodship was not observed.

Ełcki, Elbląski, and Olsztyński sub-regions reduced disparities in GDP per capita level in relation to the European Union. During these twelve years GDP per capita in percentage of the EU average increased considerably. There was an increase from 32% to 39% of the EU average in Ełcki sub-region, from 36% to 46% in Elbląski, and from 43% to 55% in Olsztyński. On other side, sigma convergence between all European sub-regions did not occur. In the ranking of all EU NUTS 3 sub-regions only Olsztyński sub-region improved its position. The stable rank of Elbląski and Ełcki means that despite the GDP growth they remain disadvantaged sub-regions.

An optimistic result is the fact that in all three sub-regions the number of people working has increased. Changes in this number during the study period show stable growth. The highest rate of

growth of employment was in the poorest Ełcki sub-region. On this basis, the policy of supporting employment growth and membership in the European Union is positively assessed.

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