Economic Transition and Economic Integration
Regional Effects for Poland

Tomasz Brodzicki*

Economics of European Integration Department
University of Gdansk, Poland

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ABSTRACT: The forthcoming Eastern Enlargement of the European Union is likely to trigger static (short-term) and dynamic (long-term) effects both in the existing as well as future Member States. Due to heterogeneous regional structure of acceding economies the effects will clearly have an asymmetric nature. It applies especially to relatively large and regionally diversified economies as Poland. The experience of the 1990s shows that parallel and mutually interwoven processes of economic transformation and economic integration have led to a significant rise in regional inequalities. A draft analysis of potential effects of the accession to the EU for Polish regions sketched in this paper suggests that the enlargement could lead at least in short to medium run to further deepening of existing regional inequalities.

KEY WORDS: economic integration, economic transition, regional inequalities.
JEL CLASSIFICATION: F15, P27, R11.

* Also affiliated with the Gdansk Institute for Market Economics, Gdansk, Poland.

Correspondence address:
Tomasz Brodzicki
Economics of European Integration Department
University of Gdansk, Faculty of Economics
Ul. Armii Krajowej 119/121
81-824 Sopot
Poland
brodzicki@ibngr.edu.pl
http://gnu.univ.gda.pl/~keie/tb_en.htm

1. Introduction

More than a decade has passed since the outset of economic transformation in Poland as well as other Central and Eastern European States. The whole region has been considerably transformed and does not resemble the system of centrally planned and mutually dependent socialist economies demoralized by pervasive inefficiencies and shortages. The transformation process is well advanced, however, not complete – some structural inefficiencies still endure. It seems reasonable, on the other hand, that economic transformation is a continuous process not restricted only to the transition of former centrally planed economies to functioning market economies[1]. As general framework conditions evolve continuously, all economies find themselves in a state of dynamic transition and as a result undergo necessary adjustments marked by shifts in their comparative advantages, evolving sectoral and regional structures and altering patterns of economic development.

The process of economic transition in CEECs in many respects is an unprecedented one. It required adoption of fundamental reform strategies incorporating micro-liberalization, macro-stabilization, significant structural adjustments and establishment of new market institutions. According to Gomułka (2000), we may distinguish three broad reform strategies: shock therapy (applied in East Germany), rapid adjustment or gradual change (e.g. China). Poland as well as the majority of other CEECs followed the rapid adjustment strategy. In Poland it was marked by significant fall in output and hyperinflationary pressures at the outset of market reforms followed by gradual and persistent recovery that endured till the end of the decade[2]. However, the present decline in economic activity in Poland (falling growth rates, rising unemployment levels, crises of public finances) can be attributed to a large extent either to a slow pace of reforms in the second part of the 90s or to a complete lack of reforms in some essential areas of economic policy.

The effects of economic transition have been magnified by effects of a parallel and closely interwoven process of economic integration with western market economies (mainly Members States of the EU). It has to be noted that the process of economic integration of

[1] For instance in the case of some advanced economies we observe a transition to the knowledge-driven stage of economic development.
[2] Poland is generally perceived as one of the most successful transition economies.

Poland with the European Union is already well advanced[3]. The forthcoming enlargement could be therefore recognized as a superior stage of the process.

At the outset of economic transition the issue of economic and social costs was raised. It was generally accepted that the costs of transformation should be widely shared. However, the actual costs and benefits of transformation and integration have proven to be significantly diverse both in their sectoral and spatial (regional) dimensions. In general, regional inequalities in income per capita or unemployment levels have widened considerably. Therefore an important question has to be raised: Will the accession to the European Union result in deepening or diminishing of regional inequalities in Poland? The rest of the paper is devoted to a rough analysis of that issue.

2. Some theoretical considerations

The process of economic integration modifies internal and external environment of an economy at the level of firms, sectors and regions as well as at the aggregated level. Modification of general framework conditions initiates necessary adjustment mechanisms that transform the pre-existing economic structures. Economic integration causes both short-term (or static) as well as long-term (or dynamic) effects.

According to classical theory of economic integration (Viner 1950, Meade 1955), which restricted its analysis to short-term trade effects, the process of economic integration will lead in the majority of cases to a positive outcome in terms of improved general welfare. In short, the positive outcome depends on supremacy of welfare-improving - trade creation effects over welfare-diminishing - trade diversion effects. However, more sophisticated analysis should also take into account long-term or dynamic effects in their temporal, sectoral and regional dimensions.

Owing to significant progress made in economic modeling (for instance of increasing returns to scale or imperfect competition), new models of economic integration try to determine and assess dynamic effects of the process. One of the most characteristic features of new models of economic integration is an incorporation into their framework of both endogenous growth dynamics as well as spatial dimension. The advancement made in this

[3] In order to become conscious of the extent of actual level of market integration with the EU we should for instance take into account the size and structure of Polish trade flows – the EU constitutes around 70 per cent of both Polish exports and imports. According to the statistics of the Polish Agency for Foreign Investment (PAIZ) on the inflow of FDI's, approx. 67 per cent of the total FDI inflow to Poland (till 31 December 2000) originated from the EU.

area of economic modeling and research (new economic geography) allows for improved determination and estimation of potential regional effects (e.g. specialization patterns, rise or fall in regional inequalities).

Probably the most prominent advancement in economic integration modeling in the 1990s could be attributed to models by Baldwin and Forslid (1999), Rivera-Batiz and Romer (1991) as well as Krugman and Venables (1993). Rivera-Batiz and Romer modeled an endogenous integration process in which R&D sector and technology transfer play a major role. Krugman and Venables modeled evolution of localization patterns of industries within an integrated area. Finally, Baldwin and Forslid merged new growth and new economic geography theories to determine potential scenarios of regional economic development within an integrated area with emphasis put on emergence and subsequent evolution of the core as well as peripheral areas.

Recognizing the role neoclassical models have played in understanding of economic integration process, we should remember that they were based on a set of specific assumptions. New models of economic integration which released some of the neoclassical assumptions suggest that positive outcomes of economic integration are not as definite as the standard models had anticipated. As the final outcome depends on many endogenous as well as exogenous factors, many complex scenarios are possible. However, if actual heterogeneity of regional economic structures is taken into account, it seems plausible that asymmetric rather than symmetric effects of economic integration are the rule. In many scenarios economic integration will lead to severely asymmetric outcomes in which positive effects concentrate in some regions of an integrated area (the core) while negative effects accumulate in others (peripheral areas). Therefore, the more heterogeneous regional structure of an economy before an integrated area is created, the greater is the possibility of asymmetric short-term and long-term effects[4].

The forthcoming Eastern Enlargement of the European Union to CEECs is bound to cause significant asymmetric regional effects. It applies especially to relatively large and regionally heterogeneous economies as Poland. This should be considered as a major challenge both to regional and general economic policies in the acceding states as well as at the supranational or Community level.

[4] For example the analysis of short-term effects of NAFTA for Canadian regions by Krueger (1995) proved that the static or short-term trade effects could be highly asymmetric with some regions experiencing dominance of trade-diversion over trade-creation. Hanson (1999) carried out an empirical analysis of industry localization in Mexico proving that within an integrated area significant relocation of economic activity can take place within a relatively short period of time.

3. Transition and integration – effects for Polish NUTS-2 regions

The present regional diversity in Poland is an outcome of many factors. To a large extent it reflects a persistent nature of regional inequalities dating back to the historical partitions of Poland. Furthermore, exogenous framework conditions (abundance/scarcity of natural resources, climatic and geographic conditions, etc.) have predetermined regional specialization patterns and development of economic structures. We should also take into account endogenously and exogenously determined regional adjustment patterns to economic transformation and economic integration initiated in 1989. In order to evaluate potential regional effects of the forthcoming accession to the European Union we have to start by analyzing the present regional diversity in Poland.

The territorial reform introduced in 1999 created 16 regions (voivodships) which correspond to NUTS-2 regions in the European nomenclature[5]. Their emergence was a necessary step in the formulation and introduction of national regional policy – the effectiveness of the policy within the framework of former 49 regions would either be severely constrained or its practical implementation would be impossible. Furthermore, new territorial division will allow for an introduction of common regional and structural policies and subsequent inflow of structural and cohesion funds in the wake of the accession.

As the new voivodships constitute the basis of present and future regional policies it is crucial to analyze the regional diversity within their framework. However, dynamic analysis of regional inequalities in Poland is severely constrained by short-run nature of data that have been gathered in the present framework for only 3 years. In order to allow for more complex analysis, the Main Statistical Office (GUS) has began to process the data gathered before the territorial reform of 1999 and to adjust them to the present regional framework. However, this operation is limited only to main economic indicators and for the time being has been constrained to the period 1995-1999.

The economic growth in Poland in the 1990s was impressive, however, its spatial or regional dimension was not homogenous. Economic transformation and economic integration affected Polish regions asymmetrically. The share of individual voivodships in the generation of aggregated Gross Domestic Product in the period 1995-1999 changed considerably (see

[5] It is important to note that the creation of larger regions caused a significant statistical effect in terms of reduction of observed regional income inequalities at the level of voivodships. The actual income inequalities at the NUTS-3 level persist or have even increased.

Figure 1 and Table 1). Four voivodships increased their share in the generation of aggregated GDP. The most impressive growth was observed in the case of the capital region – mazowieckie as well as wielkopolskie. In the case of other two – pomorskie and małopolskie, we can only speak of preservation of the former position (the rise in the actual share was limited). All other twelve voivodships lost some of their share in the generation of aggregate GDP. The fall was most impressive in the case of three regions: centrally situated kujawsko-pomorskie and two southern regions crippled with dominance of sunset sectors in need of significant restructurization packages (mining, heavy industry, etc.) – śląskie and opolskie (their share decreased by more than 10 per cent).

As the share in the generation of aggregate GDP is significantly biased by varied economic potential, in order to evaluate the regional inequalities in Poland we have to take into account the most prominent indicator of general welfare that is GDP per capita. The regional disparities in terms of GDP per capita are enormous. In 1999 six regions exceeded national average in this respect: mazowieckie, śląskie, wielkopolskie, dolnośląskie, pomorskie and zachodniopomorskie (see Table 2). The lowest GDP per capita levels in relation to national average were observed in eastern and southeastern regions of Poland – lubelskie (69,8 per cent), podlaskie (72,8 per cent) as well as podkarpackie (73,4 per cent). It is important to note that the income gap between the relatively richest and the relatively poorest region grew in the period of five years by approximately two-thirds from 47,4 to 79,5 per cent of national average. We have to remember that the actual income disparities would increase considerably if the analysis took into account smaller administrative divisions and that the income inequalities within individual voivodships would be significant as well. In general, the GDP per capita levels are highest in metropolitan areas of Poland. Rural areas fall behind by a factor of at least 3-4. This applies especially to mazowieckie in which the prominent capitol metropolitan area of Warsaw dominates over drastically poorer rural areas.

Furthermore, it is interesting to note differences in changes of GDP per capita levels relative to national average in the period 1995-1999. Only four regions increased their level of GDP per capita in relation to national average that is: mazowieckie (by approx. 20 per cent), wielkopolskie (by approx. 7,5 per cent), małopolskie and pomorskie (by approx. 1 per cent). All the rest suffered smaller or greater loses. It was especially a case for a relatively prosperous region of śląskie that exceeded the national average by 23 per cent in 1995 and suffered a 10 per cent fall ever since.

After accession to the European Union all Polish NUTS-2 regions or in other words voivodeships will fall within the category of the Objective 1 of common structural policy

(their GDP per capita levels in PPS will be lower than 90% of the EU-15 or EU-26 average). If they are spent efficiently and reasonably, the structural transfers from the common budget will play a significant role in the development in of regional economies in Poland. They will allow for a significant reduction of the development gap in comparison to European standards especially in terms of density and quality of infrastructure. This in turn could stimulate positive external effects with beneficiary results for regional development and induce accelerated convergence.

In order to assess the scale of existing "development gap" we should take a short look at the estimated convergence of Polish regions to the EU's average (EU-15) in terms of GDP per capita (see Table 3). In the period of 1996-1999 we observe a significant absolute convergence at the aggregate level - from 36,2 per cent in 1996 to 39,5 per cent in 1999. However, regional decomposition shows a much more complex picture. As could have been expected, the capital region of mazowieckie shows the highest level of absolute convergence (58,9 per cent of EU-15 average) and four other voivodships exceed 40 per cent benchmark – these are: śląskie, wielkopolskie, dolnośląskie and pomorskie. The lowest levels of absolute convergence are in the regions of lubelskie (27,6 per cent), podlaskie (28,7 per cent) and podkarpackie (29,0 per cent). However, we should remember that unfavorable external and internal conditions have led to a downturn in economic activity since 2000 with apparent negative consequences for the process of economic convergence. In fact if we compare European Commission estimates for 2001 with the estimated level of convergence for 1999 we obtain a loss of approx. 0.3 – 0.8 per cent depending on region. A significant recovery in economic activity is thus a prerequisite for further improvement in the absolute convergence levels. Economic development at rates exceeding 5 per cent per annum is attainable in the medium run but major reforms of internal economic policy have to be introduced in order to regain the lost momentum.

The estimated average speed of convergence of Polish NUTS-2 regions to EU-15 average GDP per capita (denominated in PPS) shows an interesting picture (see Figure 4). In general, the average rate of convergence in the period 1996-1999 exceeded the average levels estimated for European regions – 2 per cent on annual basis (e.g. Sala-i-Martin). Out of 16 NUTS-2 regions 15 showed clear signs of convergence – with opolskie being the only exception and diverging by approx. 1 per cent on annual basis. Five regions exceeded national average in this respect – mazowieckie, łódzkie, wielkopolskie, pomorskie and małopolskie. This impressive results could have allowed for a relatively short period of convergence to EU-

15 or EU-26 average, however, they proved not to be attainable in a longer period of time – they were verified as first signs of economic downturn appeared.

4. Regional effects of accession[6]

It is often stressed that the costs of accession will accumulate in the short to medium run while potential benefits of integration will occur only in the medium to long run. Furthermore, a post-accession shock of unknown magnitude and duration is anticipated. The cost of accession to the European Union will be substantial as necessary adjustments to new framework conditions of both private and public sector will have to take place. It will be a major burden to Polish companies (especially SMEs and sectors in which the presence of foreign competitors has been limited) and a considerable number of them will be forced out of market which in turn will result in rising unemployment levels. Off course the actual costs and benefits of integration will depend on many external factors which, as former enlargements of the European Union showed, may play a dominant role in the general outcome of accession in the medium-run. For instance, if development of global economy is favorable, the post-accession downturn will potentially be of shorter duration or importance. In addition, they depend on the final outcome of the continuing negotiation process which will determine actual terms and conditions of accession. In particular this applies in some sensitive areas like: agriculture (CAP), environment or regional policy (the size of structural and cohesion transfers from the common budget). However, it is obvious that costs and benefits will vary significantly both in sectoral and especially in regional dimensions.

The issue of agriculture in general and the introduction of Common Agricultural Policy in particular is a major problem for Poland. The share of the first sector (defined as agriculture, hunting, forestry and fishing) in total employment exceeds European standards by several times (see Figure 1 and Map 1). The regional diversity in this respect is also significant. The shares vary from comparatively low levels in western and northwestern regions (not exceeding 17 per cent) to dangerously high shares in eastern and especially southeastern regions. For instance, in lubuskie the first sector is responsible for approx. 51 per cent of total employment (!). In general, the majority of Polish farms is not prepared to withstand the competitive pressures bound to arise in the wake of accession. Necessary adjustments will be costly and will take a considerable amount of time. They will clearly have

[6] The size of the paper does not allow for a thorough analysis of potential regional effects of transition. Therefore, the subsequent analysis will be limited only to some important aspects.

an asymmetric spatial distribution and unfortunately are likely to concentrate in the poorest regions of eastern and southeastern Poland. Furthermore, it is likely that the inflow of direct payments from the common budget will be hindered in the first years after accession. According to a recent proposal made by the European Commission, in the first years the amount will not exceed 35 per cent of the amount paid to farmers in the existing member states in the EU. Unemployment levels will rise significantly in the rural areas as an inefficient and inflexible labor market will not be able to absorb bankrupt farmers. This is especially worrisome as according to an analysis by Orłowski (2000), the negative effects of accession on the labor market will arise especially in the eastern regions with the largest share of employment in the first sector. We have to remember that in some parts of the country the unemployment rates have already exceeded 35 per cent!)

Another source of significant adjustment costs with clear regional dimensions will be the costs associated with the introduction of stringent European standards in the area of environmental protection. However, the negotiated derogation period of 12 years will allow to even out budgetary burdens. In order to depict the regional distribution of potential costs of accession, we have used as a proxy statistics on emission of industrial air pollutants (particulates and gases without CO_2) per 1 km^2 of total area in tons in 1999 (see Map 2). Nonetheless, we have to remember that the actual picture would become more complex if we took into account other forms of environmental pollution (e.g. of soil or water). The regional dimension of environmental policy is therefore of prime importance – various regions will have to carry significantly different costs of adjustment in that area. Off course it will be partially covered in the framework of public and common finances but considerable cost will have to be covered by the private sector. However, investments in the area of environmental protection will increase general welfare in the long run due to positive external effects.

Due to expected asymmetric nature, the regional aspects of accession seem to be extremely important. Therefore, the issue of regional policy in general as well as regional dimension of all other sectoral and horizontal policies has a lot of significance. It is plausible that accession to the EU will affect various regions asymmetrically and that in the short to medium run the regional inequalities in Poland will increase. The scale of the rise in regional inequalities will depend to a large extent on the effectiveness of regional policy. However, experiences within that area of economic policy in Poland are rather negative. The policy did not manage to spur regional cohesion in the 1990s and did not withstand pressures created by parallel processes of economic transition and integration. However, the territorial reform of 1999 should allow for a successful introduction of a more effective policy in the medium run.

All Polish regions will be eligible to aid from the common budget under Objective 1. However, in the first years after accession the absorptive capacity of Polish regions will be limited (some estimates place it at the level of 35-50 per cent depending on region). First of all, the limited absorptive capacity will be caused by inflexible bureaucratic mechanisms as well as lack of experience in practical management and implementation of European projects. Furthermore, it will lay in a complete lack or severely limited access to adequately trained human resources. The performance in the absorptive capacity levels will improve with time – we are likely to observe a "learning process" in central, regional and local administration which will take at least 3 to 5 years. Last but not least, the limited absorptive is bound to be caused by inadequate capacity of some regions to generate obligatory co-financing contributions. At present projects implemented under common structural funds require at least a 25 per cent own contribution. Therefore, we have to note that only the wealthiest Polish regions would be able to independently generate the required own input and thus obtain structural transfers from the common budget. In that case the regional inequalities could in fact increase which would be contrary to the logic and fundamental objectives of common structural and regional policy. Thus the obligatory financial contribution to common projects will have to originate from the central budget. This seems to be sole satisfactory solution. However, it will have negative effects either in the form of access budget deficits or halting of investment projects in other areas. In the second case we could speak of "crowding out" effect of common structural policy. This yet unresolved dilemma should be considered as one of the most significant problems in the area of post-accession management of regional policy in Poland.

5. Conclusions

The European regional and structural policies have an explicit aim of reducing regional inequalities. However, despite large regional policy expenditures from the common budget, the regional inequalities in the European Union have increased and not decreased in many respects (Puga 2001). In contrast to the enlargement of 1995, the forthcoming Eastern enlargement will constitute a major and in many terms an unprecedented challenge to the regional policy of the European Union – policy that since the Single European Act has aimed at promoting economic and social cohesion. The new union of 26 Member States will not only be relatively poorer in terms of an average income per capita but regional inequalities within its vast borders will escalate. Heterogeneous economic structure will directly or

indirectly influence all common policies. For instance, as the likelihood of negative asymmetric demand or supply shocks will increase, the management of common monetary policy will be negatively affected. Furthermore, the scenario of self-reinforcing core-periphery divide as anticipated by some scenarios of economic integration theory may become the prime concern in the EU with not yet recognized consequences.

The accession to the European Union is bound to cause regionally asymmetric effects. This applies especially to regionally heterogeneous economies. Economic integration is therefore bound to increase existing regional inequalities in Poland that were accentuated in the 1990s by parallel process of economic transformation and integration. Regional inequalities will increase at least in short to medium run. In the long run several scenarios are possible depending on many exogenous and endogenous factors. According to some authors (e.g. Bergs 2001), equalization-oriented regional policy could have negative effects in terms of lost competitiveness and reduced growth rates. Therefore, effects of introduction of common regional policy in the CEECs should be reviewed some years after accession.

Table 1 Share of individual voivodships in the generation of GDP (1995-1999)

Voivodships	1995	1996	1997	1998	1999
dolnośląskie	8,0	8,1	8,0	7,7	7,9
kujawsko-pomorskie	5,4	5,1	4,9	5,0	4,8
lubelskie	4,5	4,4	4,3	4,2	4,0
lubuskie	2,6	2,4	2,4	2,4	2,4
łódzkie	6,4	6,0	6,2	6,1	6,3
małopolskie	7,3	7,4	7,4	7,6	7,4
mazowieckie	16,3	17,6	17,9	19,1	19,6
opolskie	2,8	2,6	2,6	2,5	2,4
podkarpackie	4,2	4,2	4,2	4,2	4,0
podlaskie	2,4	2,5	2,5	2,4	2,3
pomorskie	5,6	5,5	5,5	5,6	5,7
śląskie	15,7	15,2	14,9	14,1	13,9
świętokrzyskie	2,7	2,7	2,6	2,7	2,7
warmińsko-mazurskie	3,0	3,0	3,0	2,9	2,9
wielkopolskie	8,5	8,6	9,0	9,2	9,1
zachodniopomorskie	4,6	4,6	4,5	4,4	4,5
POLAND	100,0	100,0	100,0	100,0	100,0

Source: Own calculations based on GUS.

Table 2 GDP per capita in individual voivodships (average for Poland=100)

Voivodships	1995	1996	1997	1998	1999
dolnośląskie	103,9	104,6	103,3	99,8	102,3
kujawsko-pomorskie	99,6	94,5	91,2	92,2	88,7
lubelskie	77,1	75,6	74,3	72,5	69,8
lubuskie	98,3	92,5	91,7	91,2	90,8
łódzkie	91,3	86,7	89,3	88,6	91,1
małopolskie	88,5	89,3	89,9	91,0	89,4
mazowieckie	124,5	134,6	136,6	146,1	149,3
opolskie	98,7	93,5	91,6	88,3	83,7
podkarpackie	77,4	77,0	77,2	75,9	73,4
podlaskie	75,8	77,5	79,1	76,3	72,8
pomorskie	100,3	97,6	97,4	98,7	101,3
śląskie	123,0	119,9	117,5	111,9	110,4
świętokrzyskie	79,4	78,2	76,9	77,2	78,1
warmińsko-mazurskie	79,7	79,7	78,8	76,7	77,5
wielkopolskie	98,4	100,1	104,5	105,8	105,2
zachodniopomorskie	102,9	102,3	99,8	97,7	100,1
POLAND	100,0	100,0	100,0	100,0	100,0

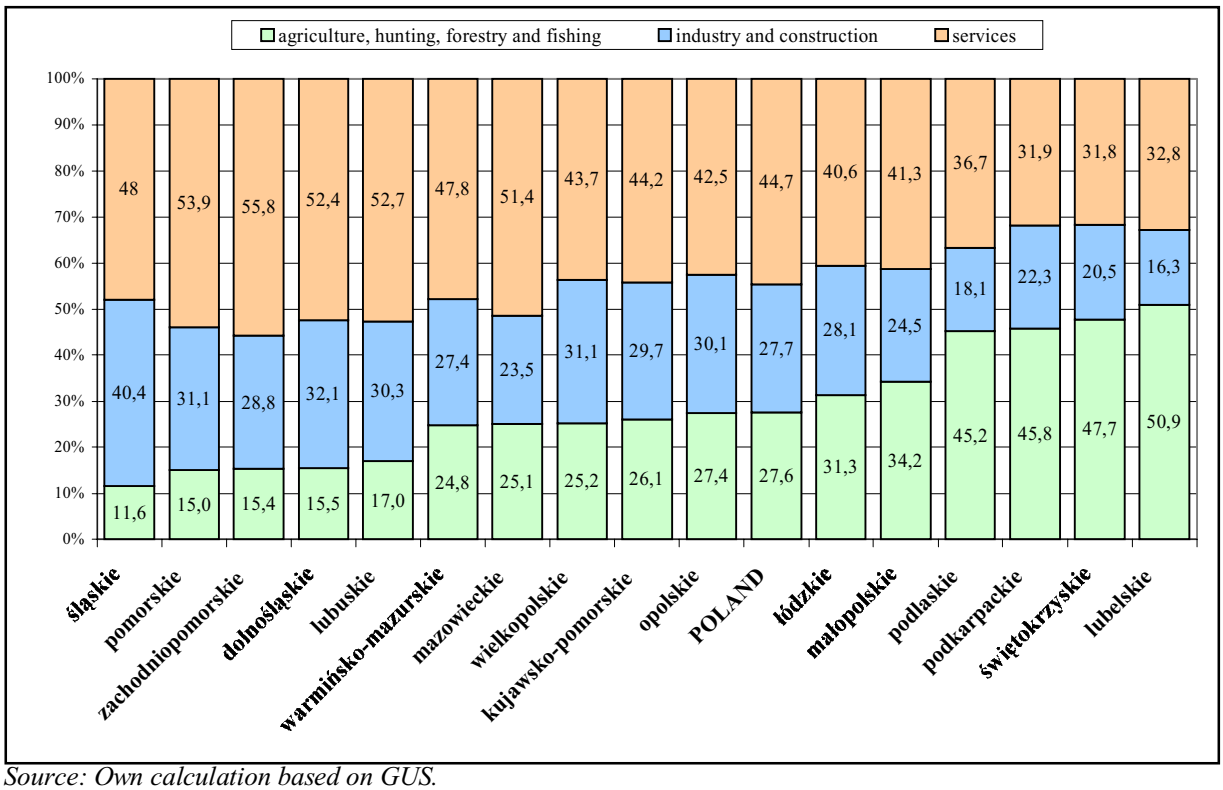
Source: Own calculations based on GUS.

Table 3 GDP per capita in PPS as a percentage of EU-15 average

Voivodships	1996	1997	1998	1999	**UE15=100***	**UE25=100***
dolnośląskie	37,9	39,3	38,4	40,4	**39,8**	**43,8**
kujawsko-pomorskie	34,2	34,8	35,5	35,0	**34,5**	**38,0**
lubelskie	27,4	28,3	27,9	27,6	**27,2**	**29,9**
lubuskie	33,5	34,9	35,1	35,8	**35,3**	**38,9**
łódzkie	31,4	34,0	34,1	36,0	**35,4**	**39,0**
małopolskie	32,3	34,2	35,0	35,3	**34,8**	**38,3**
mazowieckie	48,7	52,0	56,3	58,9	**58,1**	**64,0**
opolskie	33,9	34,9	34,0	33,0	**32,6**	**35,9**
podkarpackie	27,9	29,4	29,2	29,0	**28,6**	**31,5**
podlaskie	28,0	30,1	29,4	28,7	**28,3**	**31,2**
pomorskie	35,3	37,1	38,0	40,0	**39,4**	**43,4**
śląskie	43,4	44,8	43,1	43,6	**42,9**	**47,3**
świętokrzyskie	28,3	29,3	29,7	30,8	**30,4**	**33,5**
warmińsko-mazurskie	28,9	30,0	29,6	30,6	**30,2**	**33,2**
wielkopolskie	36,2	39,8	40,7	41,5	**40,9**	**45,1**
zachodniopomorskie	37,0	38,0	37,6	39,5	**38,9**	**42,9**
POLAND	**36,2**	**38,1**	**38,5**	**39,5**	**-**	**-**

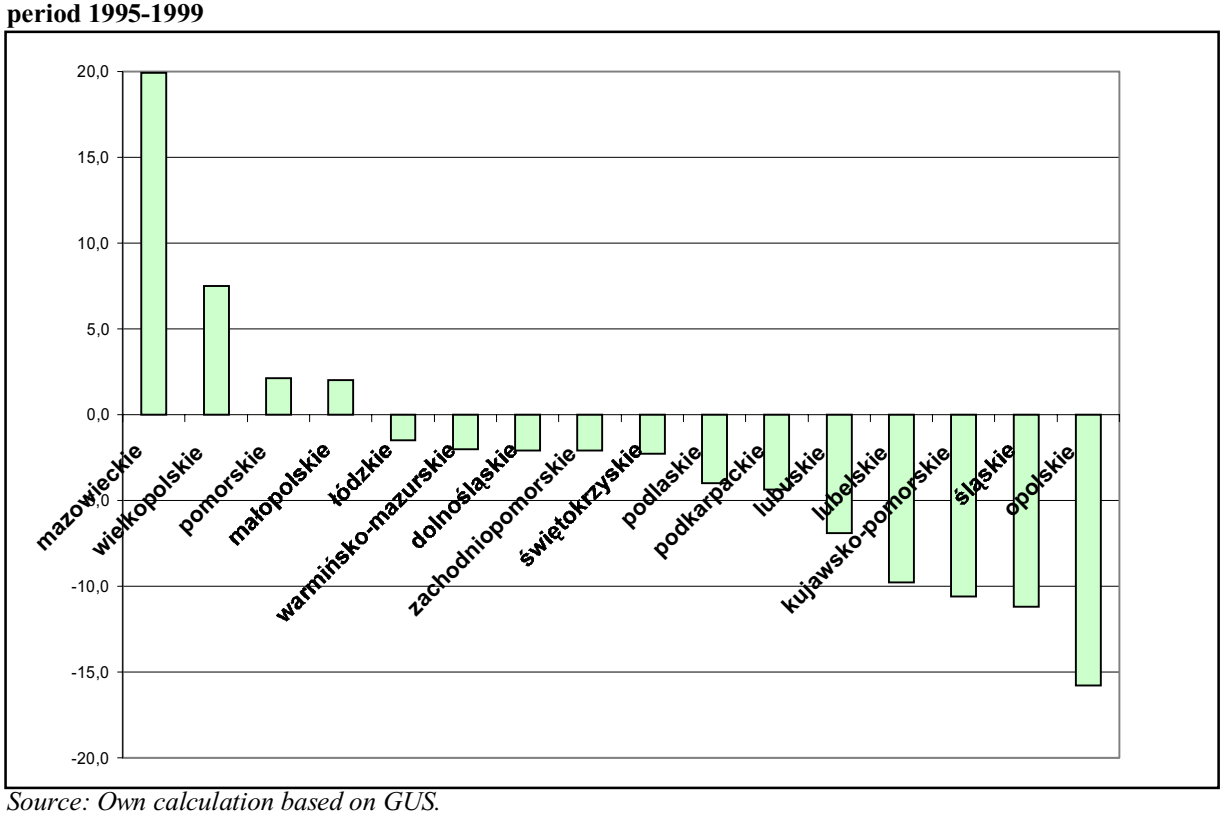
*Source: Own calculations based on GUS and European Commission; *EC 2002 data - Rzeczpospolita Nr29/2002 from 04.02.02.*

Figure 1 Employment structure in Polish regions in 1999



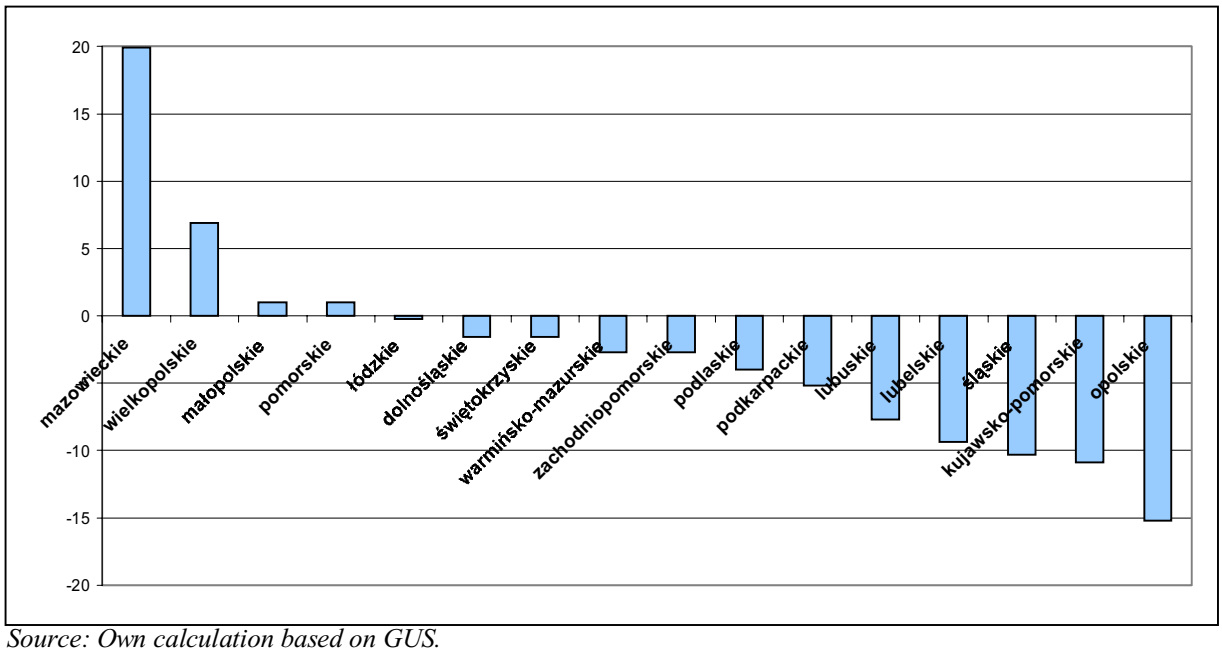
Source: Own calculation based on GUS.

Figure 2 Change in the share of individual voivodships in the generation of aggregated GDP of over the period 1995-1999



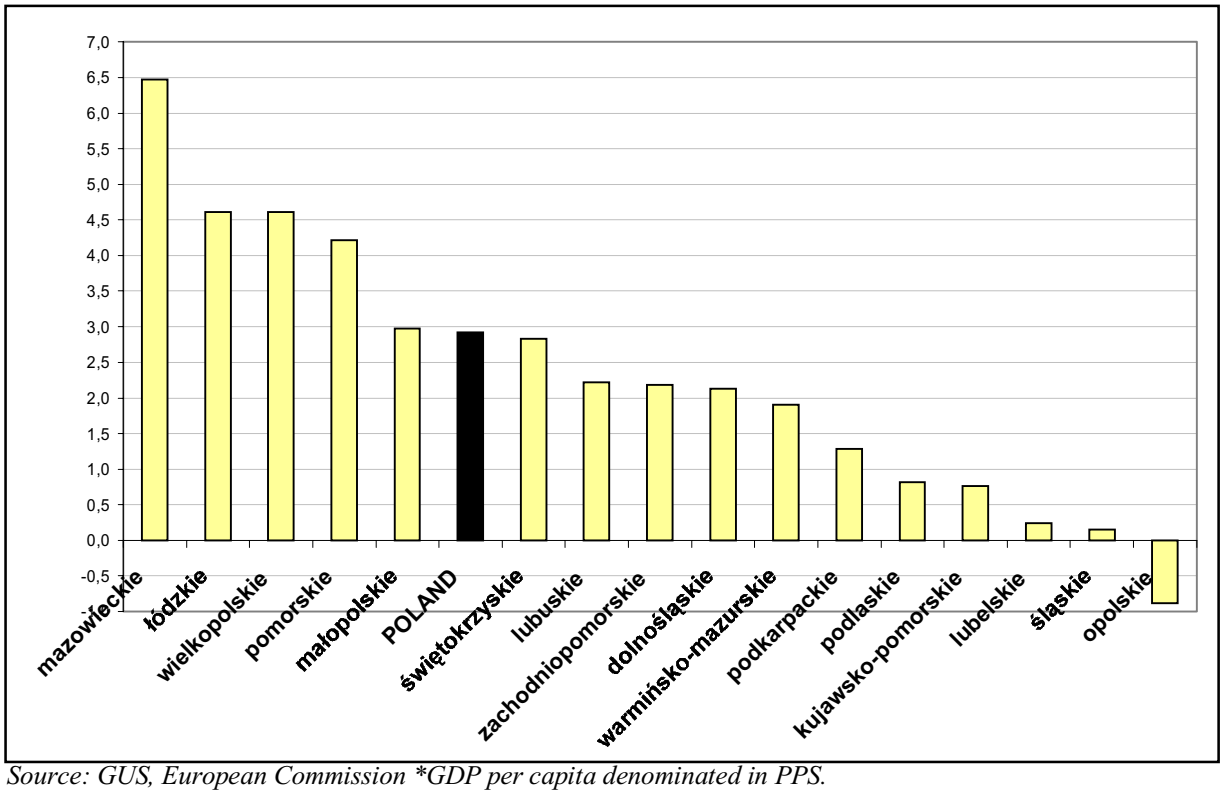
Source: Own calculation based on GUS.

Figure 3 Change in the GDP per capita levels in relation to national average in the period 1995-1999



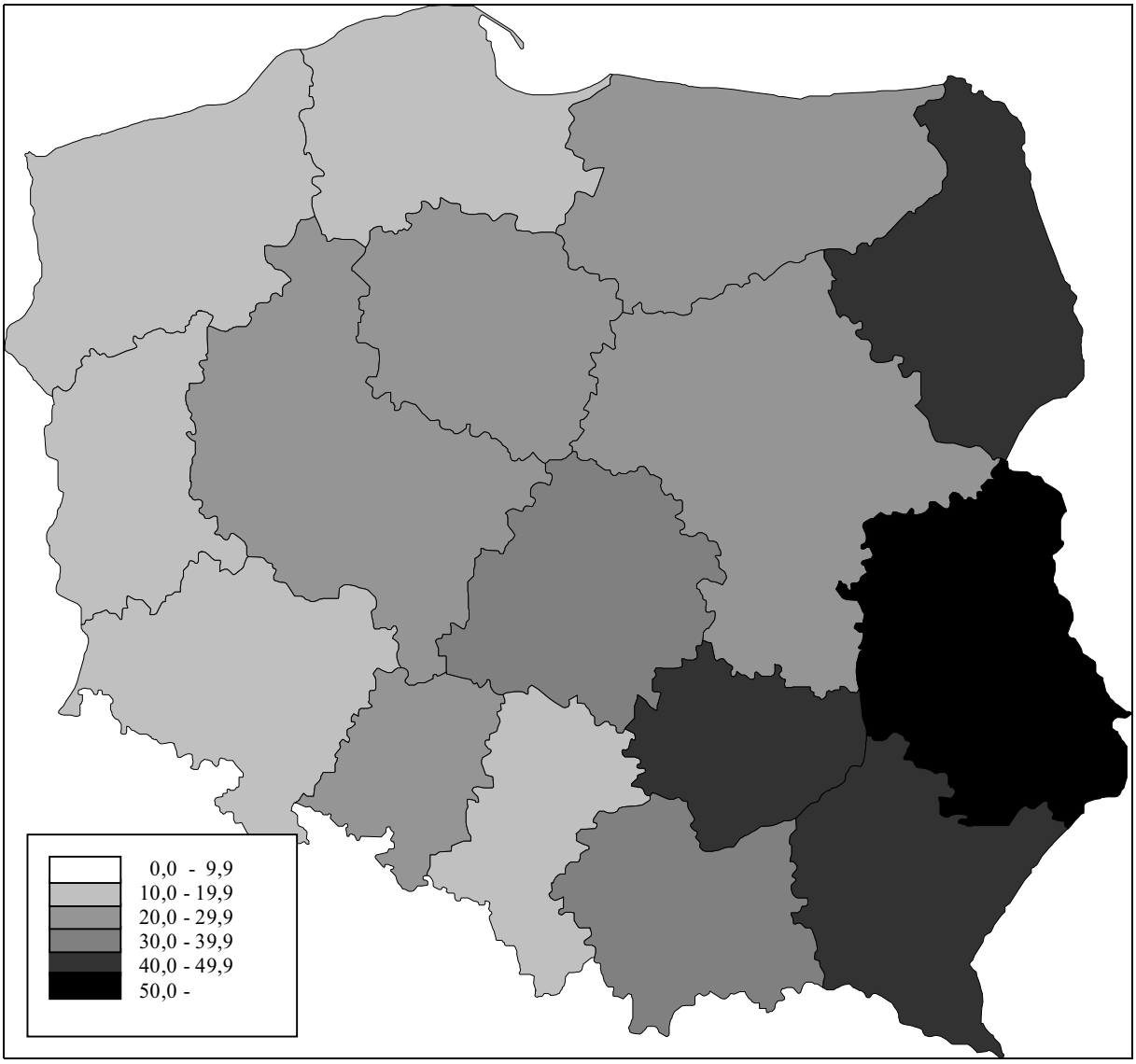
Source: Own calculation based on GUS.

Figure 4 Approximate annual speed of convergence of Polish voivodships to the EU-15 average GDP per capita level in the period 1996-1999*



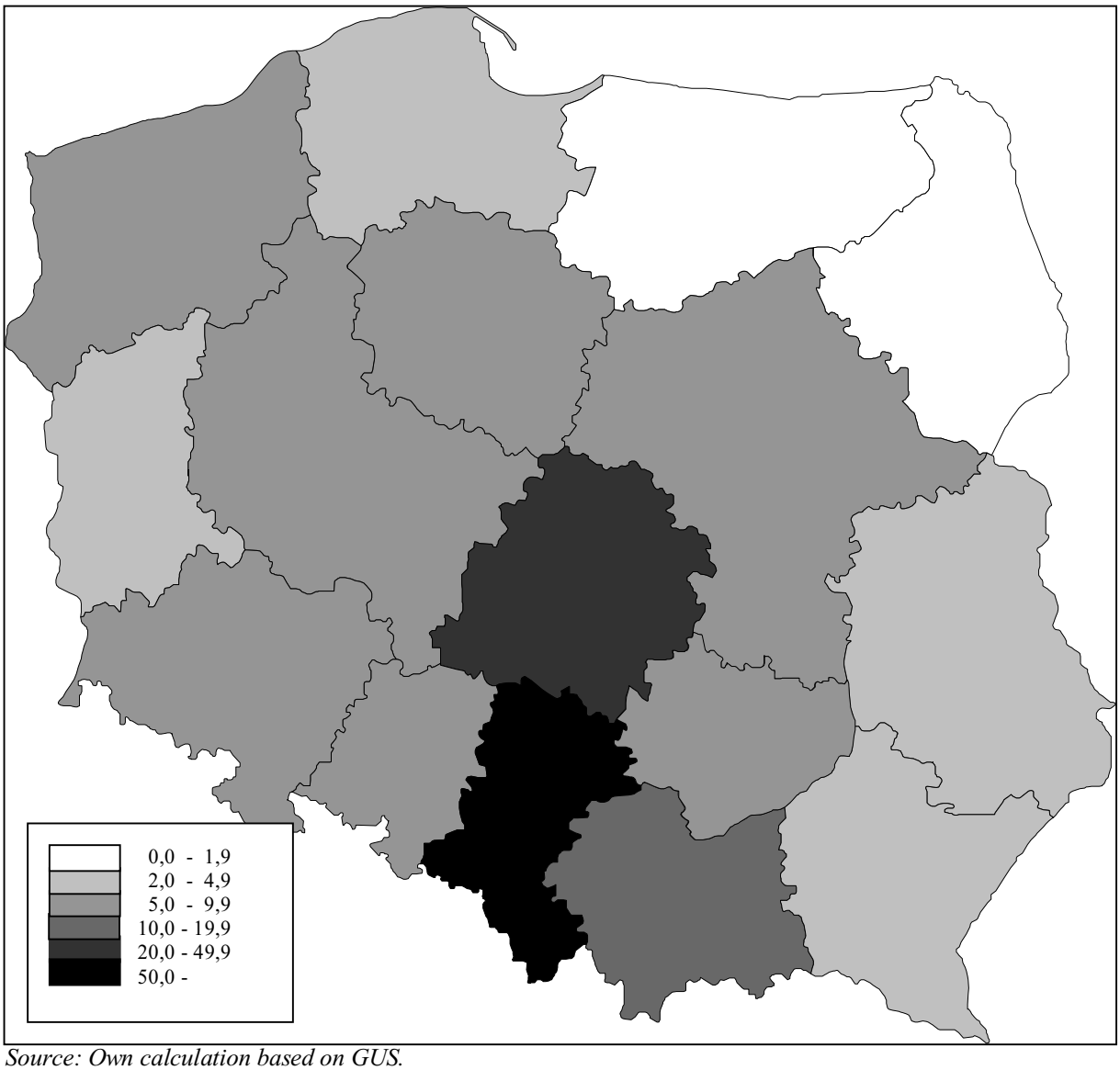
*Source: GUS, European Commission *GDP per capita denominated in PPS.*

Figure 5 Share of the first sector (agriculture, hunting, forestry and fishing) in the total employment in 2000



Source: Own calculation based on GUS.

Figure 6 Emission of industrial air pollutants (particulates and gases without CO_2) per 1 km^2 of total area in tons in 1999



Source: Own calculation based on GUS.

References

Baldwin, R. E. and Forslid, R. (1999) *The Core-Periphery Model and Endogenous Growth: Stabilizing and De-stabilizing Integration*, NBER Working Paper 6899.

Bergs, R. (2001) *EU Regional and Cohesion Policy and Economic Integration of the Accession Countries*, paper presented at the international conference on *Regional Transitions: European Regions and the Challenges of Development, Integration and Enlargement*, convened by the Regional Studies Association, Gdańsk, 15-18 September 2001.

Gomułka, S. (2000) *Macroeconomic Policies and Achievements in Transition Economies, 1989-1999*, paper prepared for presentation at the UN's Economic Commission for Europe Annual Seminar, Geneva, 2 May 2000.

Hanson, G. H. (1998) *North American Integration and Industry Location*, NBER Working Paper 6587.

Krueger, A. O. (1995) *Trade Creation and Trade Diversion under NAFTA*, NBER Working Paper 7509.

Krugman, P. and Venables, A. J. (1993) *Integration, Specialization and Adjustment*, NBER Working Paper 4559.

Meade, J. E. (1955) *The theory of customs unions*, North-Holland, Amsterdam.

Orłowski, W. M. (2000) *Koszty i korzyści z członkostwa w Unii Europejskiej*, CASE, Warsaw.

Orłowski, W. M. (2001) *Polskie regiony na tle wyzwań integracyjnych* in Szomburg, J. (ed.) (2001) *Polityka regionalna państwa pośród uwikłań instytucjonalno-regulacyjnych*, IBnGR, Gdańsk.

Puga, D. (2001) *European regional policies in light of recent location theories*, CEPR Discussion Paper 2767.

Rivera-Batiz, L. A. and Romer, P. M. (1991) Economic Integration and Endogenous Growth, *Quarterly Journal of Economics*, Vol. 106(2), pp. 531-555.

Venables, A. J. (2000) *International trade – regional economic integration*, LSE web page.

Viner, J. (1950) *The Customs Union Issue*, Carnegie Endowment for International Peace.