

# Where Do Cohesion Policy Funds Flow and Do They Have any Impact? The Polish Lesson

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## Abstract

*This article sums up the results of analyses of the differences of scale and structure of investments partly financed by EU funds and evaluates their compliance with the needs of the nodes of development and development peripheries in Poland, the largest, new, post-socialist EU Member State. The analysis evaluates how development factors correspond to the directions of intervention of regional policies related to their creation and enhancement. Their added value stems from a comprehensive analysis of the relations between developmental differences, the unique factors determined by different territorial capitals and the directions of interventions of development policy in Poland.*

**Keywords:** nodes of development, development peripheries, factors of socio-economic growth, territorial capital, EU funds, cohesion policy, Poland

## Introduction

Processes of socio-economic development vary by nature depending on their location and lead to the development of nodes of development and development peripheries. This stems from variations in development factors, which occur with different intensities or impacts on given locations. Nevertheless, attempts at accounting for the processes of growth and development in economic terms have been for decades based on theories that assume homogeneity of space. As these theories have evolved, factors seen as significant for growth have changed. Initially, these were classical factors such as land, capital and labor and their quantitative features were stressed in texts by researchers such as A. Smith and D. Ricardo. They were hence adjusted to the needs of neo-classical development models and extended by factors related to technological progress (Borts and Stein 1964; Richardson 1973; Solow 1956). Subsequently, they evolved incorporating new factors that took into account the new categories of capital, stressing their qualitative aspects, including human and social capital (Lucas 1988; Romer 1986, 1990, 1994) and institutional capital (Amin 1999; Williamson 1981). The interpretation of their impact has also evolved, from the initial domination of the exogenic approach to the currently stressed endogenic approach (Leon-Ledesma and Thirlwall 2002; Molle and Cappellin 1988; Porter 1990; Porter 2000; Romer 1990). These reflections were accompanied by concepts of location developed by economists, geographers and finally regional scientists, but were not included within the mainstream of economics (Boudeville 1964, 1972; Friedmann 1967; Friedmann and Alonso 1964; Isard 1960; Marshall 1930; Paelinck 1965; Perroux 1955). Although the significance of territorial matters was raised by multiple authors, because of the difficulties of taking them into account in free-competition models and due to the increase of importance of intangible advantages, including multifaceted proximity, they were not commonly recognized. The situation changed with the introduction and dissemination of the concept of New Economic Geography, which stressed the need to take into account spatial factors in the explication of present-day processes of socio-economic growth leading to major variations

in different spatial arrangements (Krugman 1991; Krugman 1995). Texts by Paul Krugman and his followers ushered in a new era of use of location theory in investigations of economic processes (*Reshaping Economic...* 2009). The critique of his concepts, indicating the reevaluation of the importance of the enterprise sector and a simultaneous exception to the significance of location-determined social processes, opened up an extensive debate on the importance of territorial capital in development processes (Camagni 2008; Capello 1999).<sup>1</sup> The above tendencies also influenced the reorientation of the preferred approaches to the programming and implementation of EU regional policy, especially with respect to the place-based policy and pursuit of territorial cohesion conducive to economic and social convergence with the use of various territorial capitals (Barca 2009; Barca, McCann, and Rodríguez-Pose 2012; Faludi 2006; Mccann and Varga 2015; Partridge et al. 2015). This leads to a conclusion that, as Villaverde observes “space plays a significant role in the process of economic growth and convergence” (2006, 131). As a consequence of the regularities indicated, efficient intervention in nodes of development and development peripheries to bridge the gap between them calls for factoring in characteristic development indicators which strengthen their endogenic growth and create conditions for flows mutually strengthening their potentials. It is precisely the recognition of those factors and the choice of intervention directions that condition the efficacy of actions taken up by regional policies, which according to Rodríguez-Pose, were significantly location-based in 2013. Unfortunately, the earlier effects of programming the intervention of structural funds did not always bring about the expected results (Maynou et al. 2014; Rodríguez-Pose and Garcilazo 2015; Spilanis, Kizos, and Giordano 2013). This shows the need for evaluating earlier actions and indicating new, more efficient solutions (Bachtler and Ferry 2015; Brandsma and Kancs 2015).

The aim of our analysis is evaluate the scale and structure of EU-financed investment with respect to its compatibility with the needs of nodes of development and development peripheries in Poland. In line with the assumptions of a place-based policy, it identifies the characteristics of needs of development factors related to various territorial capitals of the areas under scrutiny. Furthermore, it evaluates compatibility with those factors of directions of intervention of regional policy related to their creation and strengthening. The choice of Poland as an area of research is justified and arises from a variety of factors. Firstly, during the political-economic transformation Poland carried out an administrative reform aiming at devolving development policy, creating self-government structures at the local and regional level, with programme and implement development actions (Blazyca, Heffner, and Helinska-Hughes 2002; Kołodko 2009; Kulesza 2002). Secondly, since its accession through the current perspective of 2014–2020, Poland has been the largest beneficiary of the European cohesion policy, with a complex structure of high-budget operational programmes.<sup>2</sup> The implementation of these programmes is marked, however, by a significant spatial variation, caused by socio-economic factors as well as institutional and political limitations (Churski and Stryjakiewicz 2014).<sup>3</sup> Thirdly, Poland has recently introduced a number of initiatives aiming at strengthening the territorial aspect of development policy—for example “National Strategy of Regional Development 2010–2020”<sup>4</sup> or “The Concept of National Spatial Development 2030”<sup>5</sup> (Gorzela, Bachtler, and Smętkowski 2010; Szlachta and Zaucha 2012). Thus Poland, a member of the Visegrad Group, is seen as a “testing ground” of various instruments of development policy both in European and global contexts (Bockman and Eyal 2002). The unique conditions of the largest new, post-socialist, European Union Member State justify its perception as a veritable

1. For more on the subject of the significance of territorial capital linked to spatial differentiation of contemporary development processes—see for example: Barca (2009), Böhme et al. (2008), Camagni (2008), Capello (2014b), Zaucha (2014), Zaucha and Komornicki (2015), Zaucha et al. (2014), and “Place-Based Territorially Sensitive and Integrated Approach by Jacek Zaucha and Dariusz Świątek.” Ministry of Regional Development, Warsaw 2013, [@:] [https://www.stfk.no/Documents/Nering/Kysten%20er%20klar/Report\\_place-based\\_approach\\_29\\_03\\_2013.pdf](https://www.stfk.no/Documents/Nering/Kysten%20er%20klar/Report_place-based_approach_29_03_2013.pdf).

2. See: Poland Partnership Agreement and Operational Programmes for 2014–2020. [@:] <http://ec.europa.eu/esf/main.jsp?catId=576&langId=en>.

3. For more on the subject of institutional and political conditions of differences in the absorption of EU funds see for example: Bodenstern and Kemmerling (2012), Dellmuth and Stoffel (2012).

4. See: Krajowa Strategia Rozwoju Regionalnego 2010–2020: regiony, miasta, obszary wiejskie.

5. See: Koncepcja przestrzennego zagospodarowania kraju 2030.

laboratory of European regional policy (Gorzalak, Goh, and Fazekas 2012; Jakubowska, Kukliński, and Żuber 2008). The results obtained are therefore a significant supplementation of research on the directions of development aiming at the convergence of the countries of Central and Eastern Europe (e.g., Bradley 2006; Cuaresma, Doppelhofer, and Feldkircher 2014). Their added value stems from a comprehensive analysis of the relations between developmental differences, the unique factors determined by different place capitals and the directions of interventions of the development policy in the biggest new European Union Member State. The study is composed of three principal stages. In stage one, the *z*-score index and all the available statistics at LAU 1 level (of counties in Poland) will be applied to identify the spatial arrangement of the nodes of development and development peripheries at the subregional level in Poland. In stage two, based on the analysis of over 88 500 projects in the two classes of spatial units selected, the level and structure of EU funds absorption in the period 2004–2010 will be defined, both in total and disaggregated by the analyzed aspects of socio-economic growth. Finally, in the third stage of the study the level of adjustment of the amounts and structure of the EU funds obtained for the identified development factors will be analyzed, taking into account the needs arising from divergent territorial capitals of the nodes of development and development peripheries. The analysis is based on regressive modelling.

The study focuses on nodes of development (83 units) and development peripheries (126 units) determined by means of the cluster analysis method carried out on the basis of the *z*-score index value for the period 2000–2010 at the level of counties (LAU 1). The scope of the analysis is determined first of all by the availability of statistics. The research uses all the statistics made available by Poland's Office for National Statistics within Local Data Banks. Analysis applies to the years 2000–2010.

## **1 Nodes of development and development peripheries by counties vs. disparities in developmental processes in Poland in the period 2000–2010**

Analysis of developmental disparities in the socio-economic sphere may be based on the identification of two area classes: nodes of development and development peripheries. Nodes of development are nodes of concentration of developmental effects in the field of economics. Their special significance for the general level of regional development is clear in the new approach to the cohesion policy (Dijkstra 2014). It is assumed that in light of the inadequate efficiency of the earlier convergence approach, the intervention of the European cohesion policy should be based on the reorientation of goals from bridging the gaps towards benefiting from the existing divergence—e.g., during the formation of functional links of nodes of development with their surrounding environment, use of unique endogenous resources of each area and policy coordination are meant to enhance the efficiency of territorial intervention (e.g., *Growing Unequal?...* 2008; *Reshaping Economic... Regional Development...* 2010; Barca 2009; Barca, McCann, and Rodriguez-Pose 2012; Dijkstra 2014; Nathan 2015; Partridge et al. 2015). Given that most nodes of development are urban areas and areas of urban agglomerations and that the existing tendencies result in the concentration in these areas of the vast majority of inhabitants of European regions, urban policy becomes of paramount importance for the efficacy of the cohesion policy (Roy 2009).<sup>6</sup> This policy should not be limited solely to enhancing economic competitiveness and the living conditions and standards of citizens. It should moreover increase the functional links and scope of impact of cities on the surrounding areas, in line with the growth factors unique for those areas (Bański 2010; Musterd and Gritsai 2013; Rodriguez-Pose and Crescenzi 2008). This is all the more important in a situation where these areas are not free from internal development problems and are not resistant to crises (*The Urban and Regional...* 2013; McCann 2015).

Development peripheries take up most of the economic space of the present-day world. Their incidence, in keeping with the aforementioned regularities, is independent of the level of economic development of a particular continent, country or region. The areas differ as to the length of distance defined on the scale of socio-economic development. Some, especially those of poor geographic

6. See also: Legislation 2014–2020 in Official Journal of the European Union, L 347, 20 December 2013.

accessibility, are subject to deepening stagnation, which results in permanent exclusion. Most development peripheries are rural areas, which in the case of Europe, despite the Common Agricultural Policy and the big intervention of regional policy, are incapable of reaching a development level comparable to that of nodes of development. According to the new approach to the cohesion policy, it no longer has the utopian goal of equity in development, based on the assumptions of the convergence theory, but rather aims to support actions assuring a level of politically and socially acceptable differentiation (Faludi 2006; Molle 2007). As a consequence, this shifts the fundamental dilemma of regional policy from equity to efficiency, at the same time reorienting the theoretical assumptions, development approach, intervention strategy and its content-related and geographic concentration, the tools used and the principal entities implementing this strategy (Dijkstra 2014). In this context, of special significance for development peripheries is the creation and enhancement of factors conducive to the spillover of growth effects from the areas of their polarization to the surrounding areas, including the peripheries (Braghina, Peptenatu, and Draghici 2008; Hidle, Farsund, and Lysgard 2009; Spolaore and Wacziarg 2009; Villaverde 2006). The above factors should on the one hand trigger the spillover effects created by the areas of its polarization and made possible by adequate technical and social infrastructure. On the other hand, they should trigger the effects of development absorption by the surrounding areas, determined by the degree of their openness, adaptation potential and endogenous resources, the latter being especially important from the perspective of the new theory of polarized development (Christofakis and Papadaskalopoulos 2011; Guastella and Timpano 2010; Krugman 1991; Krugman 1995; Lucas 1988; Romer 1986, 1990, 1994). The factors should assure a multifunctional development of these areas and moreover enhance their access to jobs and non-primary services, which as a consequence will ensure higher living standards of their inhabitants (Knowles, Shaw, and Docherty 2008; Spiekermann and Neubauer 2002; Torre and Wallet 2015; Vickerman, Spiekermann, and Wegener 1999). A full use of endogenous resources and better accessibility should limit risks arising from stagnation and population outflow, which will allow the treatment of less economically developed areas as ascending peripheries (Asheim, Moodysson, and Todtling 2011; Keeble et al. 1999; Keeble and Wilkinson 1999). Creating and strengthening growth factors in development peripheries should eliminate the negative consequences connected with, for example, technological dependence, human capital drain and “scouring away” of these areas, resulting in depopulation and permanent recession, and should classify them as descending peripheries (Corrado, Martin, and Weeks 2005; Kamps, Leiner-Killinger, and Martin 2009; Meijers, Waterhout, and Zonneveld 2007).

The identification of the incidence of nodes of development and development peripheries in Polish counties was based on the analysis of the state and changes in the process of socio-economic development in the period 2000–2010. For Poland, the period under scrutiny is of prime importance in economic, social and political terms. It covers many years of intense preparations for entry into the European Union (2000–2004) and the first six post-accession years (2004–2010), during which Poland was given the opportunity to make full use of EU resources. As a consequence, the time framework adopted in the study helps capture the significant changes taking place at the level of socio-economic development in Poland as of EU accession and on this basis identifies nodes of development and development peripheries. The present analysis focused on the following five aspects:

- population and settlement
- the labor market and the economy structure
- the technical infrastructure and spatial accessibility
- financial situation and level of affluence
- innovative economy and business environment

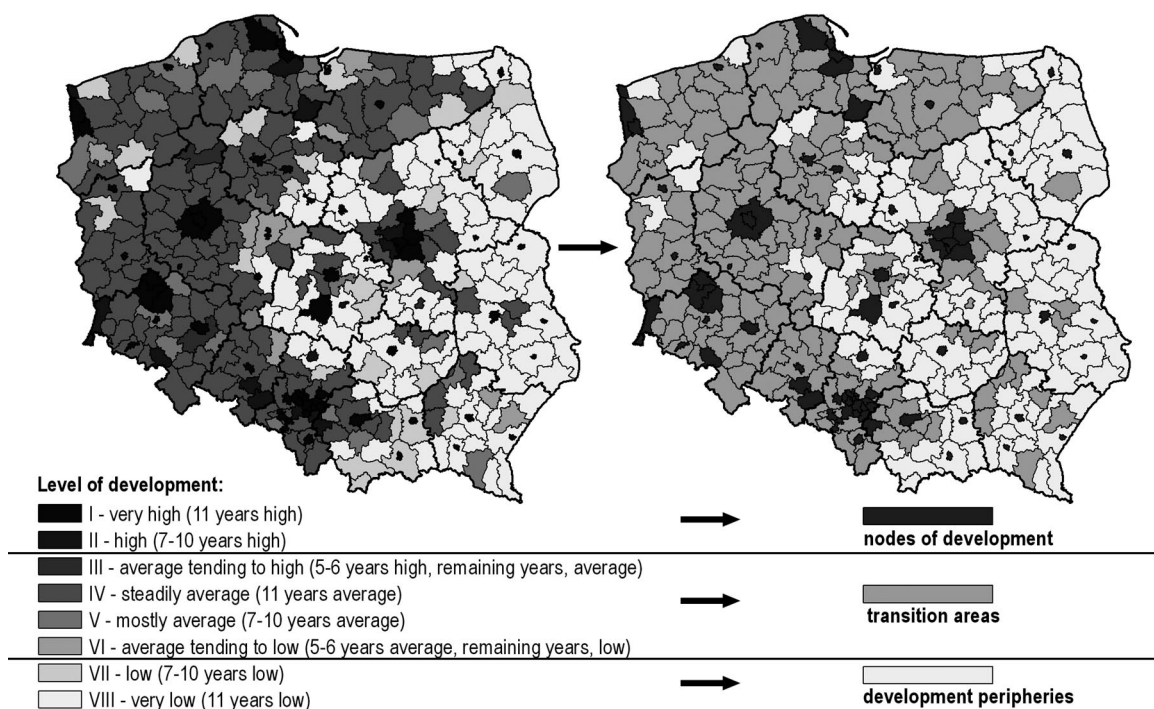
and in its holistic approach addressing the above aspects jointly. Each aspect was defined in terms of measures of socio-economic growth in the form of indicators of intensity, structure and dynamics obtained on the basis of data available in official public statistics (Appendix 1 contains a detailed list of the above indicators). To identify nodes of development and development peripheries, the research used the  $z$ -score index<sup>7</sup> and cluster analysis conducted by means of the  $k$ -means

7. An arithmetic average of standardised indicators, which showed no statistical or merit-related co-dependence (correlation analysis).



algorithm (Dymnicki and Henry 2011; Kronthaler 2003; Morrison 1990; Smith 1972; Tryon 1939). The  $z$ -score index was used to linearly arrange counties on the scale of socio-economic development (on the basis of all available indicators). In turn, the cluster analysis (carried out on the basis of  $z$ -score index values) was used to divide the set of all counties into three clusters,<sup>8</sup> or area types (i.e., those of high – average – low development). The algorithm was carried out for all the 11 observations from the period 2000–2010. The procedure resulted in the classification of counties on account of their level of socio-economic development during each of the 11 observation years. The analysis of spatial disparities in growth-type counties in a holistic approach allowed their classification according to the criterion of variance of inclusion in a particular class of socio-economic development. Therefore, a classification of units was carried out, based on the model presented in figure 1. The classification was based on the length of time a given unit remained in one of the following three classes: those of high – average – low development during the period of 2000–2010 under analysis in a holistic approach to the process of socio-economic development. It was assumed that the group of nodes of development would include counties identified as class I—very high development level (11 years in the high development level group) and as class II—high development areas (7–10 years in the high development group), while the group of development peripheries will consist of counties belonging to class VIII—very low development level (11 years in the low development group) to class VII—low development level (7–10 years in the low development group).

Nodes of development are places of relatively high development level. They exhibit positive demographic tendencies and a high quality of human capital, additionally stimulated by premium education services. The labor market of these areas offers highly diversified jobs and a high level of enterprise, resulting in the highest self-employment rates. The revenues generated assure a good financial standing to businesses and are conducive to assuring the inhabitants a high standard of living. In turn, development peripheries are counties of the relatively lowest growth rate as



**Fig. 1.** Spatial distribution of nodes of development and development peripheries by counties in Poland

8. Cluster analysis by means of the  $k$ -means algorithm—a non-hierarchical method for classifying spatial units (counties in this case) arranged on the scale of levels of socio-economic development. The algorithm of this method shows the identification of  $k$ -classes characterised by the maximum inner homogeneity in terms of variable values used in the analysis, with a simultaneous maximalisation of the level of their inter-class differentiation. The  $k$ -means method minimises the variations within a group.

confirmed by low values of growth factors. They exhibit negative demographic tendencies and simultaneously a relatively low quality of human capital, very often subject to drain by nodes of development. The labor market of these areas often exhibits the features of a monofunctional market and is affected by high unemployment. Due to the relatively low quality of human capital and widespread deficiencies in infrastructure, the economy of development peripheries exhibit poor potential for generating innovation and low flexibility, reflected in its structure. This situation is accountable for a competitive disadvantage, poor financial standing of businesses and low living standards of inhabitants.

The set of counties belonging to the class of nodes of development defined in the above manner equals 83 (i.e., 22% of their overall number). Within the structure of this set, 69 counties (18,2%) are classified in the holistic approach of socio-economic development as areas of very high development (class I).<sup>9</sup> Furthermore, 14 counties (3,7%) have at least been classified seven times as high development areas (class II) (fig. 1). In functional and spatial terms, the areas include: 18 boroughs—urban areas of national significance; 7 land counties, being metropolitan areas of these centers; 44 boroughs or land counties, within which there are urban centers of regional and sub-regional significance; 14 boroughs or land counties, within which there are major enterprises and whose monofunctional economy is in many respects connected with the mining industry based on local natural resources. The spatial distribution of nodes of development and their functional and geographic structure suggest that despite the relatively high level of socio-economic development in a holistic approach, they do not make up a homogeneous group. Nodes of development can be found in each region, their occurrence being determined by the incidence of counties with the above functions. Therefore, in regions of Eastern Poland with no counties abundant in natural resources, nodes of development are limited to counties with capitals in regional and sub-regional centers, which due to their relative economic weakness, do not impact their immediate environment and do not make up larger spatial clusters. The situation appears different in the rest of the country. In this case, the nodes of development around Poland's biggest cities of Warszawa, Kraków, Łódź, Wrocław, Poznań, Gdańsk, etc. include both boroughs of the biggest metropolises and the surrounding agglomeration counties. This layout is supplemented by nodes of development based on industry and resource counties, which in the majority of cases, apart from the Upper Silesian Conurbation and Lubin and Głogów Area, occur in isolation and do not form spatial clusters. These include the county of Zgorzelec—the Bogatynia mine and Turów Power Plant, the county of Police—POLICE S.A., chemical works—Azoty Group, the county of Kwidzyn—International Paper Kwidzyn, the county of Koźnice—ENEA Wytwarzanie S.A. power plant, etc.

The set of counties included in the class of development peripheries consists of 126 counties (i.e., 33,2% of the total number of units, inhabited by 24% of Poland's population). The set comprises 99 counties (26,1%) classified in the holistic approach to socio-economic development as areas of very low development (class VIII) and 27 counties (7,1%) which have been classified at least seven times as low development areas (class VII) (fig. 1). The spatial distribution of development peripheries and their functional and spatial structure indicate that despite the relatively lowest level of socio-economic development in a holistic approach, like nodes of development, they do not constitute a homogeneous group. A significant concentration of development peripheries can be found mainly in the eastern and central part of the country. However, while in the Podlaskie, Lubelskie, and Świętokrzyskie voivodships, the development peripheries make up almost the entire regions (without the regional and sub-regional centers), in the Mazowieckie, Kujawsko-Pomorskie, Łódzkie, and Małopolskie voivodships—development peripheries—although relatively numerous, are located far from the economic core of the regions, most often along their borders. Similarly (geographically) “peripheral” is the location of the few development peripheries in the western Zachodniopomorskie, Lubuskie, Śląskie, and Wielkopolskie voivodships. No development peripheries are found in three voivodships, namely Pomorskie, Dolnośląskie and Opolskie, whose counties demonstrate at least an average socio-economic situation relative to the other units in Poland. The counties included in

9. [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.]

development peripheries show as a rule a dominance of agricultural functions, although they are diversified as to their functional structure. Areas where so-called “social agriculture” dominates, mostly of peripheral location within regions, are especially disadvantaged. Occasionally, areas with a dominant forestry function (e.g., Sulęciński, Augustowski, and Hajnowski counties) are classified as development peripheries, as are those of special environmental value with a dominance of tourist and recreation functions (e.g., Tatrzanski, Bieszczadzki, Suwalski, Sejneński). The most prosperous among the selected development peripheries are counties which can be classified according to their functional typology as urbanized areas or multi-functional transition areas, constituting respectively the outer and inner parts of suburban zones of mixed functions and a significant residential function. These areas are located mainly in Eastern Poland, relatively close to regional growth centers or major urban centers (e.g., Rzeszowski, Łańcucki, Lubelski, Włocławski, Płocki, and Częstochowski). It should be stressed, however, that despite their proximity to nodes of development, including current and former voivodship capitals, they remain in the class of development peripheries.

## 2 Scale and structure of EU funds absorption in Polish counties with special emphasis on nodes of development and development peripheries

Analysis of the scope and structure of EU-financed investment was conducted in all counties and in selected nodes of development and development peripheries. This analysis was composed of the following steps: examination of the projects implemented with the use of EU funds in the period under analysis, when Poland was able to use EU funds (i.e., in the years 2004–2010);<sup>10</sup> identification of the spatial distribution of the number and value of projects; determination of the investment structure by the five aspects of the socio-economic development process analyzed; and the isolation and systematization of the investment implemented in selected nodes of development (83 counties) and development peripheries (126 counties).

In light of the study assumptions, the analysis covered a set of 88 500 projects with a total value of EUR 21,9 billion (tab. 1). In the total number of projects carried out by the end of 2010, there is a marked majority of investments implemented in the programming period of 2007–2013; in terms of their value, however, the participation of projects of this period is only at the level of circa 30%. This was caused by the relatively low advancement of implementation of the 2007–2013 NSRF by the end of 2010.

Identification of the spatial allocation of funds within counties called for the determination of the location and scope of each investment taken into account in the study. It was assumed that in the case where the investment was implemented at the central or regional level, the allocation of funds by particular counties (i.e., national or regional) should correspond to the ratio arising from the number of their residents. This helped obtain a spatial distribution of values of EU funds obtained within the intervention of analyzed operational programmes, whose per capita differentiation is shown in figure 2. Interestingly, only in 35% of cases is there an “excess” of the funds obtained relative to the number of residents ( $LQ > 1$ ).<sup>11</sup> A relative excess in this respect can be identified in 54% of counties constituting nodes of development and only 31% counties being development peripheries.

The structure of cohesion policy expenditure in all Polish counties in the period under consideration, in terms of aspects of socio-economic development analyzed, was as follows: EUR 3,7 billion (i.e., 17% of the funds, was allocated to population and settlement), EUR 2,2 billion (i.e., 10% of

10. Since projects of the 2004–2006 perspective were fully settled only in 2009, it was hard to indicate a caesura between the financing periods. To assume 2006 as the dividing line would have been an erroneous simplification. Besides, what is significant in the study is the full six-year period of EU funds absorption rather than the differences between the two perspectives, of markedly different scales.

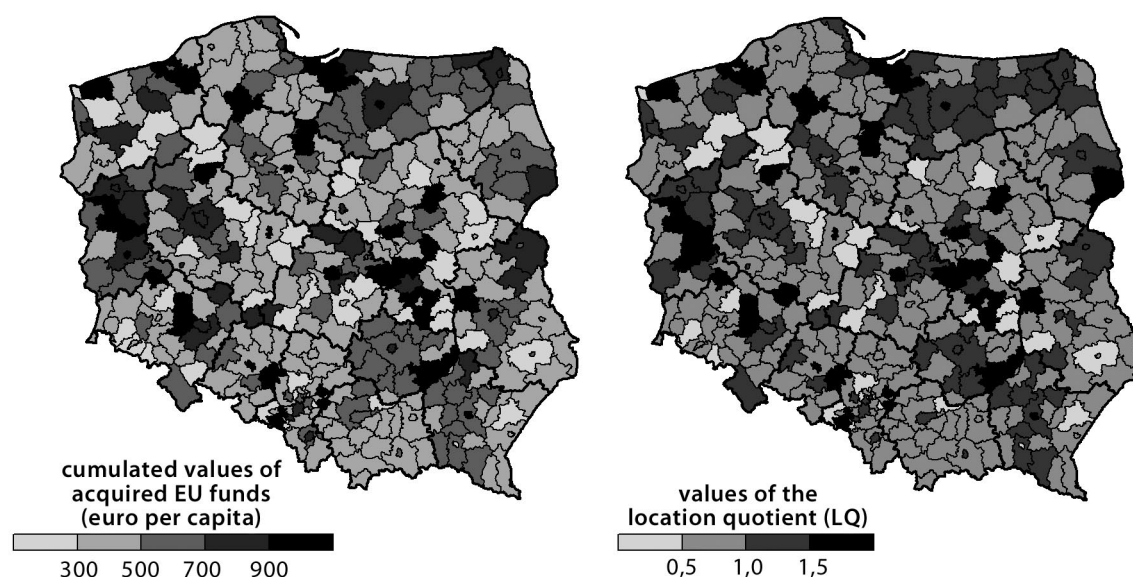
11. Location quotient (LQ) measures the concentration level of a given feature in a particular spatial unit (in % of the total value of a given feature) relative to the concentration level of population in a particular spatial unit (in % of the total population).  $LQ = 1$  means that a given spatial unit has the same level of a feature relative to the total population of this spatial unit. It is assumed that  $LQ > 1,25$  testifies to the concentration of a particular feature in a particular spatial unit.

**Tab. 1.** Analyzed scope of structural intervention of the cohesion policy in Poland within operational programmes in the years 2004–2010

Operational programme	Total value (EUR)	Number of projects
Infrastructure and Environment . . . . .	245 495 838	282
Innovative Economy . . . . .	772 452 423	3 512
Human Capital . . . . .	1 086 176 808	28 903
Development of Eastern Poland . . . . .	41 016 212	10
Regional Operational Programmes . . . . .	4 741 416 465	11 149
Programming Period 2007–2013 <sup>a</sup>	6 886 557 746	48 856
Human Resources Development . . . . .	2 032 456 948	8 997
Transport . . . . .	2 447 962 111	1 872
Increase of Economic Competitiveness . . . . .	4 993 264 024	17 930
Integrated Operational Programme of Regional Development	5 553 316 101	15 927
Programming Period 2004–2006	15 026 999 183	44 726
Total	21 913 556 929	88 582

Source: Authors' own calculations based on data from the Ministry of Regional Development as of 2010.12.31.

<sup>a</sup> For the sake of comparison, the level of contracting funds in the operational programmes of the 2007-2013 NSRF was in June 2011 as follows: OPIE 14%, OPIEcon 19%, OPHC 33%, DEP 21%, ROP 33%—see: Sprawozdanie z realizacji w 2010 r. Narodowych Strategicznych Ram Odniesienia na lata 2007-2013, stan na 12.06.2011. Ministerstwo Rozwoju Regionalnego.

**Fig. 2.** Spatial incidence of cumulated per capita values of EU funds and values of the location quotient (LQ) by counties in the period 2004–2010

Source: Authors' own calculations based on Ministry of Regional Development statistics, as of 2010.12.31.

the funds, was allocated to support the labor market and the economy structure), EUR 6,7 billion (i.e., 30% of the funds, went to the technical infrastructure and spatial accessibility), EUR 7,0 billion (i.e., 32% of the funds, was allocated to improve financial situation and level of affluence), EUR 2,3 billion (i.e., 11% of the funds, was earmarked for innovative economy and business environment) (tab. 2). The results obtained indicate that the biggest concentration of structural funds made available under interventions of the operational programmes of Poland's cohesion policy in the period 2004–2010 was connected at the level of counties with actions developing and enhancing growth factors linked to the financial situation and level of affluence and the technical infrastructure and spatial accessibility.

It is extremely interesting to observe the scale of EU structural funding in the selected nodes of development and development peripheries.



**Tab. 2.** Scale and structure of cohesion policy interventions in nodes of development and development peripheries in Poland in the period 2004–2010

Aspect	EU funds in total					EU funds per capita				
	Nodes of development			Development peripheries		Nodes of development			Development peripheries	
	billion EUR	billion EUR	PL=100	billion EUR	PL=100	EUR	EUR	PL=100	EUR	PL=100
Population	3,7	1,4	37,2	0,9	25,0	96,0	92,9	96,8	102,5	106,8
Labor market	2,2	0,9	39,7	0,5	22,8	56,6	59,6	105,3	55,3	97,8
Technical infrastructure	6,7	3,3	48,9	1,4	21,0	175,8	227,3	129,2	157,6	89,7
Financial situation	7,0	3,1	43,5	1,2	16,9	184,1	209,3	113,7	133,1	72,4
Innovative economy	2,3	1,4	59,5	0,3	14,9	61,1	94,7	154,9	38,9	63,6
Total	21,9	9,9	45,1	4,4	19,9	573,7	683,8	119,2	487,3	85,0

Source: Own calculations based on Ministry of Regional Development statistics, as of December 2010

Against this background, the 83 selected nodes of development, constituting 22% of all Polish counties, implemented circa 45% of overall investment in the total amount of circa EUR 9,9 billion. Although these counties are places with marked population concentrations, they exhibit high, above national average, values of per capita indicators. The investment level in nodes of development was 19% higher than the national average, which suggests that the actual activity of beneficiaries of the cohesion policy of the equity model diverges from its expected concentration in economically weak areas. The structure of funds acquired by nodes of development is similar to the national structure, however, with the dominant position of outlays for the technical infrastructure and spatial accessibility, for which as much as EUR 3,3 billion was allocated in these areas (i.e., 49% of the total amount of resources earmarked for this purpose nationwide) (tab. 2). These also rank first in the structure of investments implemented exclusively in nodes of development, constituting 33% of the total value of the investments. Other significant avenues of intervention of operational programmes in the timeframe under analysis in nodes of development in Poland were activities supporting the financial situation and level of affluence and investment in innovative economy and business environment, which may be linked with an above-average concentration of this kind of economic activity and a better financial standing of businesses in these areas. Of importance here is probably also a higher motivation of entities operating in nodes of development to launch investment processes and apply for EU funds in competitive procedures. On the one hand, this stems from a higher competition level, and on the other it may be the result of agglomeration effects. Investment in the aspect of innovative economy and business environment ranks first in the per capita investments structure in nodes of development. However, given that this aspect is identified only by means of the three indicators available in public statistics, the result obtained should be interpreted with substantial caution, taking into account the subsequent growth factors in terms of their per capita fund allocations, which are, as in the absolute approach, the technical infrastructure and spatial accessibility and financial situation and level of affluence.

In turn, the 126 counties identified in the study as development peripheries—i.e., 33% of all counties in Poland, implemented circa 20% of total investments, whose value was circa EUR 4,4 billion. These counties, places of potential concentration of the structural problems of socio-economic development, demonstrate lower than the national average per capita indicators of the cohesion policy intervention. Investment levels in development peripheries were 15% lower than the national average, which bears out the above indicated consistent lack of compliance of the actual activity of beneficiaries of the cohesion policy of equity with its expected concentration in economically weaker areas. The structure of funds acquired by development peripheries in absolute terms, as in the case of nodes of development, does not differ dramatically from the national structure, with the dominant position of allocations for the technical infrastructure and spatial accessibility, to which was allocated in these areas the amount of EUR 1,4 billion, being however only 21% of the total amount of resources earmarked for this purpose nationwide (tab. 2). This does not change the fact

that these outlays rank first in the structure of the cohesion policy funds invested in development peripheries (32,1%). Other important directions of intervention of operational programmes in the period under consideration in peripheries in Poland were also actions supporting population and settlement and the labor market and the economy structure. In relative terms, ranking first in the structure of investments implemented in development peripheries were investments in the aspect of population and settlement, the only ones to exceed average per capita fund allocations in Poland.

### 3 Socio-economic development factors vs. the scale and structure of EU funds absorption in nodes of development and development peripheries in Poland

The answer to the question concerning factors determining socio-economic growth in Polish counties is very difficult, first and foremost due to their diversification. A relevant debate was initiated by the publication of Perdał and Hauke (2014). Taking into account divergent territorial capitals of the areas under consideration, the authors pointed out slightly different groups of factors of socio-economic growth in three area types. The results of this research helped identify the following major factors of socio-economic growth:

- areas of high development level: economic structure, municipal infrastructure, road infrastructure, county financial status
- areas of average development level: economic burden, municipal infrastructure, county financial status, level of development of services for business
- areas of low development level: change in population numbers, municipal infrastructure, road infrastructure, county financial status, level of development of services for business

As observed by Perdał and Hauke (2014), the explanatory power of regressive models relative to growth factors in nodes of development is lower than that of development peripheries. This stems in large measure from a far greater inner diversification of these area types, divergent conditions and territorial capitals, and therefore a wider and more diversified array of growth factors of these areas, which cannot be generalized.

Identified at an earlier stage of the research procedure, the highest EU fund allocations in nodes of development for the technical infrastructure and spatial accessibility treated as drivers of change of the analyzed aspects of socio-economic development help us to put forth a hypothesis concerning a correlation between fund allocations for the technical infrastructure and spatial accessibility (EUR per capita) and the dynamics of development of the analyzed aspects of socio-economic development.<sup>12</sup> The above hypothesis was verified in two stages. Stage one was dedicated to the examination of the level of correlation between the amount of EU fund allocations for the technical infrastructure and spatial accessibility and the growth dynamics in the analyzed aspects of socio-economic development. Stage two consisted of creating simple linear regressive models which also described this correlation. Correlation analysis confirmed the incidence of a (statistically significant) correlation solely between the allocation amounts for the technical infrastructure and spatial accessibility and financial situation and level of affluence ( $r = 0,43$ ;  $p < 0,001$ ). This correlation was confirmed by using regressive modelling, which proved the statistical significance of the model describing the impact of EU fund allocations for the technical infrastructure and spatial accessibility ( $X_{TI}$ ) on the dynamics of change of the financial situation and level of affluence ( $Y_{FS}$ ) in nodes of development

$$(1) \quad Y_{FS} = 103,82 + 0,01X_{TI},$$

where:

$Y_{FS}$ —dynamic of changes of the financial situation and level of affluence,

$X_{TI}$ —EU funds outlays for the technical infrastructure and spatial accessibility,

$R^2 = 0,18$ ,

12. The growth dynamics in individual aspects was computed for the timeframe of 2006–2010 in relative terms, i.e. in reference to the preceding rather than the base year. A geometrical average was computed for each geographic unit (5th root of the product of dynamics values over five years). The dynamics indicator is the arithmetic average of the geometrical averages.

$F(1,81) = 18,75$  at  $p < 0,0001$ ,  
estimated standard variation  $Se = 4,361$ .

A relatively low value of the determination indicator means that the analyzed variability is explained in only circa 20%. It is therefore to be concluded that the dynamics of change of the financial situation and level of affluence in nodes of development is enhanced by factors other than EU fund allocations for the technical infrastructure and spatial accessibility, which are not factored into the properties model. To recognize the full impact of EU fund allocations on the financial situation and level of affluence ( $Y_{FS}$ ) in nodes of development in regressive modelling (multiple stepwise forward regression), the scale of EU fund allocations in the remaining aspects of socio-economic development was taken into account

$$(2) \quad Y_{FS} = 102,05 + 0,006X_{TI} + 0,016X_{IE} ,$$

where:

$Y_{FS}$ —dynamic of changes of the financial situation and level of affluence,

$X_{TI}$ —EU funds absorption for the technical infrastructure and spatial accessibility,

$X_{IE}$ —EU funds absorption for the innovative economy and business environment,

$R^2 = 0,34$ ,

$F(5,77) = 9,54$  at  $p < 0,0001$ , estimated standard variation  $Se=3,900$ .

The results confirm the significance of the impact of infrastructure allocations on strengthening the financial situation and level of affluence in the nodes of development analyzed. This confirms the regularities identified also in the course of other research, showing that infrastructure investments yield a high return in the form of development effects, which are at the same time higher in nodes of development than in development peripheries (Canning and Bennathan 2004; Crafts 2009; Kessides 1993). It should be stressed that a higher value of the corrected determination indicator in the model shows its better adjustment than in the case of isolating solely the infrastructure allocations, but continues to demonstrate the incidence of properties impacting the dynamics of the financial situation and level of affluence, not taken into account in the model. The results obtained justify a conclusion that EU fund allocations for individual aspects (factors) of socio-economic development are not the only drivers of dynamic growth of the financial situation and level of affluence in these areas, and thus indicate that they should not be treated as a kind of remedy, or the cornerstone of development policy.

Proceeding as before in the case of nodes of development, the highest—earlier identified in development peripheries—EU fund allocations for population and settlement treated as drivers of change of the analyzed aspects of socio-economic development help put forth a hypothesis of the existence of a correlation between the fund allocations for population and settlement (euro per capita) and the growth dynamics of the analyzed aspects of socio-economic development.<sup>13</sup> The above hypothesis was verified in two stages, as in the case of nodes of development. Stage one was dedicated to the examination of the level of correlation between the amounts of EU fund allocations for population and settlement and the growth dynamics in the analyzed aspects of socio-economic development. Stage two consisted of creating simple linear regressive models which also described this correlation. Correlation analysis confirmed the existence of a (statistically significant) correlation solely between the amount of EU fund allocations for population and settlement and the technical infrastructure and spatial accessibility ( $r = -0,260$ ;  $p < 0,05$ ). The above correlation is borne out by the subsequent results, which showed the statistical significance of the model describing the impact of EU fund allocations for population and settlement on the dynamics of change in the technical infrastructure and spatial accessibility in development peripheries

$$(3) \quad Y_{TI} = 104,05 - 0,01X_{PS} ,$$

where:

13. The growth dynamics in individual aspects was computed for the timeframe of 2006–2010 in relative terms (i.e., in reference to the preceding rather than the base year). A geometrical average was computed for each geographic unit (5th root of the product of dynamics values over five years). The dynamics indicator is the arithmetical average of the geometrical averages.

$Y_{TI}$ —dynamic of changes of the financial situation and level of affluence,

$X_{PS}$ —EU funds absorption for the population and settlement,

$R^2 = 0,07$ ,

$F(1,124) = 9,04$  at  $p < 0,0032$ , estimated standard variation  $Se = 2,112$ .

The results confirm the significance of allocations for population and settlement for enhancing the technical infrastructure and spatial accessibility in analyzed development peripheries. Regrettably, as in the preceding equation, the very low value of the determination indicator shows its low adjustment and continues to indicate that the equation fails to take into account significant properties impacting the dynamics of change in the technical infrastructure and spatial accessibility. The results obtained confirm the above regularity, indicated with respect to nodes of development, which shows that EU fund allocations for specific aspects (factors) of socio-economic development should not be treated as the sole and most important driver of growth dynamics (in this case of the technical infrastructure and spatial accessibility in development peripheries).

## Conclusions and recommendations

The results obtained confirmed the indications of earlier relevant publications—i.e., the impact of territorial capital on the differentiation of developmental processes and the scale of regional policy funds absorption supporting socio-economic convergence (Barca 2009; Böhme et al. 2008; Camagni 2008; Capello 1999, 2014b; Villaverde 2006). The added value of the results presented here is in drawing attention to the unique features of these correlations, which apart from general trends indicated by other authors (McCann and Varga 2015; Partridge et al. 2015; Rodriguez-Pose 2013), relate specifically to regions of new Member States, whose economies and societies had to operate in centrally planned economies for decades. The results obtained for Poland, in line with the assumption of Bockman and Eyal (2002) on the needs of testing economic knowledge in the conditions of post-socialist countries, are the basis for putting forth cognitively significant recommendations on programming and implementation of European regional policy.

Nodes of development significantly concentrate within their limits the absorption of EU funds. Only 83 counties (22% of the total number in Poland), constituting nodes of development, received in the period 2004–2010 as much as 45% of the total allocation of EU funds, 119% of the national per capita average. Importantly, areas of the highest development rather than those with the highest deficits received the biggest funding. This proves a higher competitiveness of areas of the highest development level in competitive procedures, which confirms their privileged position in less developed regions of the European Union, with the maximum access to support resources. It should be stressed that nodes of development obtained substantial parts of allocations in the structure of all the analyzed component aspects of the growth process, which is conditioned not so much by their objective needs but by their financial potential to provide their own contribution and so-called scale effects connected with the concentration within their limits of substantial investments in infrastructure. The biggest participation levels of these areas in the total amount of allocations for a given aspect are identified for the technical infrastructure and spatial accessibility (49% of the total allocation, 129% of the average per capita in the country) and innovative economy and business environment (59% of the total allocation, 155% of the average per capita in the country). Against this background, development peripheries inadequately absorb EU funds. The 126 counties classified in the analysis as development peripheries, 26% of the total number of counties in Poland, acquired in the years 2004–2010 a relatively small amount of EU funds in absolute terms (20% of the total allocation) and per capita (85% of the national average). However, it should be stressed that development peripheries encountered diverse barriers in access to EU funds. The main barrier is their lower competitive advantage in competition procedures, which stems from, for example, lower investment efficiency indicators (low population density), excessive own financial contribution whose level exceeds the potential of the local budgets of these areas, as well as inadequate human resources of local administration, an absence of comprehensive solutions supporting this category of areas in obtaining development support in line with objectively and



economically justified needs. As a consequence, development peripheries received far lower allocations within all the analyzed component aspects of the development process. The biggest participation of these areas in the total value of allocation in a given aspect is in the case of population and settlement (25% of the total allocation, 107% of the average per capita in the country), and labor market and economy structure (23% of the total allocation, 98% of the average per capita in the country). A large number of projects implemented in these aspects did not show, however, a major development impact such as the creation of new jobs. They are mainly projects in the field of social infrastructure that enhance living standard and conditions, in many cases dangerously increasing the scale of overheads of very limited local budgets.

The above regularities in the allocation of EU funds absorption within nodes of development and developmental peripheries confirm the low efficacy of Poland's implementation of the equity regional policy model, observed across the European Union by such authors as Petrakos et al. (Petrakos, Kallioras, and Anagnostou 2011) and Cuaresma et al. (Cuaresma, Doppelhofer, and Feldkircher 2014). As indicated before, the support of EU funds in Poland concentrates in development nodes, including the biggest cities. It should be borne in mind, however, that the concentration of funds in nodes of development assures a higher return on investment than in the case of their implementation in economically weaker areas, which with the adequate direction of intervention (place-based policy) may improve its efficiency (Barca 2009; Barca, McCann, and Rodriguez-Pose 2012). Therefore, the tendencies observed should be used during the implementation of intervention actions and their programming in future periods.

That investments of substantial resources in technical infrastructure in nodes of development and development peripheries does not change their relative development position in the set of analyzed units should be viewed as a negative development. Still, improving infrastructure quality, especially in development nodes, leads to other phenomena, i.e. the improved living conditions and standards of the population in nodes of development, which eliminates unwelcome "side effects" of growth processes in these areas (including increased transportation congestion), having a positive effect on the situation in the remaining analyzed aspects in the timeframe under analysis. This correlation is confirmed by the verification of the general impact of technical infrastructure as a factor determining the dynamics of development in all the analyzed aspects of the process of socio-economic development (Perdał and Hauke 2014). However, it should be remembered that the explanatory power of the regressive models presented here is limited, which indicates the multiple aspects of development processes and an absence of a clear and conclusive role in them of EU funds. This indicates the need for further pursuits of an optimal direction of financial streams of the development policy.

Finally, attention should be drawn to a serious threat identified in connection with the absorption of development policy resources in new Member States. Within a relatively short time under analysis, investment impetuses coupled with investment, especially in technical infrastructure (mainly in nodes of development), first of all enhance the dynamics of their financial standing and affluence level of these areas, which should be treated as the direct effect of supply-driven intervention (Bachtler and Gorzelak 2007; Begg 2010). A continued concentration of EU structural funds on financing projects of extending and modernising technical infrastructure and a simultaneous significantly lower level of intervention in the other development aspects, especially in innovation and knowledge-based economy, as pointed out in the comprehensive debate in relevant literature (e.g. Barca, McCann, and Rodriguez-Pose 2012; Capello 2014a, 2014b; Farole, Rodriguez-Pose, and Storper 2011; Fitjar and Rodriguez-Pose 2014), delays the chance of achieving direct effects of supply-driven intervention. In addition, it increases the risk of excessive investment in infrastructure, which leads as it seems in many cases to inadequately evaluated benefits of its use in the future.

## References

- AMIN, A. 1999. "An Institutionalist Perspective on Regional Economic Development." *International Journal of Urban and Regional Research* no. 23 (2):365–378. doi: 10.1111/1468-2427.00201.
- ASHEIM, B.T., J. MOODYSSON, and F. TODTLING. 2011. "Constructing Regional Advantage: Towards State-of-the-Art Regional Innovation System Policies in Europe? Introduction." *European Planning Studies* no. 19 (7):1133–1139. doi: 10.1080/09654313.2011.573127.
- BACHTLER, J., and M. FERRY. 2015. "Conditionalities and the Performance of European Structural Funds: A Principal-Agent Analysis of Control Mechanisms in European Union Cohesion Policy." *Regional Studies* no. 49 (8):1258–1273. doi: 10.1080/00343404.2013.821572.
- BACHTLER, J.F., and G. GORZELAK. 2007. "Reforming EU Cohesion Policy: a Reappraisal of the Performance of the Structural Funds." *Policy Studies* no. 28 (4):309–326. doi: 10.1080/01442870701640682.
- BAŃSKI, J. 2010. "Dilemmas for Regional Development in the Concepts Seeking to Develop Poland's Spatial Structure." *Regional Studies* no. 44 (5):535–549. doi: 10.1080/00343400902926375.
- BARCA, F. 2009. An Agenda for a Reformed Cohesion Policy. A Place-Based Approach to Meeting European Union Challenges and Expectations.
- BARCA, F., P. MCCANN, and A. RODRIGUEZ-POSE. 2012. "The Case for Regional Development Intervention: Place-Based Versus Place-Neutral Approaches." *Journal of Regional Science* no. 52 (1):134–152. doi: 10.1111/j.1467-9787.2011.00756.x.
- BEGG, I. 2010. "Cohesion or Confusion: A Policy Searching for Objectives." *Journal of European Integration* no. 32 (1):77–96. doi: 10.1080/07036330903375115.
- BLAZYCA, G., K. HEFFNER, and E. HELINSKA-HUGHES. 2002. "Poland—Can Regional Policy Meet the Challenge of Regional Problems?" *European Urban and Regional Studies* no. 9 (3): 263–276. doi: 10.1177/0967642002009003037.
- BOCKMAN, J., AND G. EYAL. 2002. "Eastern Europe as a Laboratory for Economic Knowledge: the Transnational Toots of Neoliberalism." *American Journal of Sociology* no. 108 (2):310–352. doi: 10.1086/344411.
- BODENSTEIN, T., and A. KEMMERLING. 2012. "Ripples in a Rising Tide: Why Some EU Regions Receive More Structural Funds than Others." *European Integration Online Papers-Eiop* no. 16 (1):1–29. doi: 10.1695/2011007.
- BÖHME, K., T.W. ESER, F. GASKELL, and E. GUSTEDT. 2008. "The Territorial Cohesion Principles. Position Paper to the EU Green Paper on Territorial Cohesion." *Positionspapier aus der ARL* (78):1–10.
- BORTS, G.H., and J.L. STEIN. 1964. *Economic Growth in a Free Market*. New York: Columbia University Press.
- BOUDEVILLE, J.-R. 1964. *Note sur l'intégration des espaces économiques, L*. Institut de science économique appliquée.
- . 1972. *Aménagement du territoire et polarisation*. Paris: M.-T. Génin.
- BRADLEY, J. 2006. "Evaluating the Impact of European Union Cohesion Policy in Less-Developed Countries and Regions." *Regional Studies* no. 40 (2):189–199. doi: 10.1080/00343400600600512.
- BRAGHINA, C., D. PEPTENATU, and C. DRAGHICI. 2008. "The Function of Polycentric Development in the Refinement of Weakly Polarized Areas." *Geographica Timisiensis* no. 17 (1–2):45–53.
- BRANDSMA, A., and D. KANCS. 2015. "RHOMOLO: A Dynamic General Equilibrium Modelling Approach to the Evaluation of the European Union's R&D Policies." *Regional Studies* no. 49 (8): 1340–1359. doi: 10.1080/00343404.2015.1034665.
- CAMAGNI, R. 2008. "Towards a Concept of Territorial Capital." In *Modelling Regional Scenarios for the Enlarged Europe. European Competitiveness and Global Strategies*, edited by R. Capello, R. Camagni, B. Chizzolini and U. Fratesi, 29–45. Berlin: Springer.
- CANNING, D., and E. BENNATHAN. 2004. The Rate of Return to Transportation Infrastructure. [http://www.econrsa.org/wkshops/papers/infrastructure\\_canning.pdf](http://www.econrsa.org/wkshops/papers/infrastructure_canning.pdf).
- CAPELLO, R. 1999. "Spatial Transfer of Knowledge in High Technology Milieux: Learning versus Collective Learning Processes." *Regional Studies* no. 33 (4):353–365. doi: 10.1080/00343409950081211.
- . 2014a. "Proximity and Regional Innovation Processes: Is There Space for New Reflections?" In *Regional Development and Proximity Relations*, edited by A. Torre and F. Wallet, 163–194. Cheltenham: Edward Elgar.

- . 2014b. *Regional Economics, Routledge Advanced Texts in Economics and Finance*. London: Routledge.
- CHRISTOFAKIS, M., and A. PAPADASKALOPOULOS. 2011. "The Growth Poles Strategy in Regional Planning: the Recent Experience of Greece." *Theoretical and Empirical Researches in Urban Management* no. 6 (2):5–20.
- CHURSKI, P., and T. STRYJAKIEWICZ. eds. 2014. *Poznań—an Attempt to Assess Changes During 10 Years of Membership in the European Union*. Poznań: Bogucki Wydawnictwo Naukowe.
- CORRADO, L., R. MARTIN, and M. WEEKS. 2005. "Identifying and Interpreting Regional Convergence Clusters Across Europe." *Economic Journal* no. 115 (502):C133–C160. doi: 10.1111/j.0013-0133.2005.00984.x.
- CRAFTS, N. 2009. "Transport Infrastructure Investment: Implications for Growth and Productivity." *Oxford Review of Economic Policy* no. 25 (3):327–343. doi: 10.1093/oxrep/grp021.
- CUARESMA, J.C., G. DOPPELHOFER, and M. FELDKIRCHER. 2014. "The Determinants of Economic Growth in European Regions." *Regional Studies* no. 48 (1):44–67. doi: 10.1080/00343404.2012.678824.
- DELLMUTH, L.M., and M.F. STOFFEL. 2012. "Distributive Politics and Intergovernmental Transfers: the Local Allocation of European Union Structural Funds." *European Union Politics* no. 13 (3):413–433. doi: 10.1177/1465116512440511.
- DIJKSTRA, L. ed. 2014. *Investment for Jobs and Growth. Promoting Development and Good Governance in EU Regions and Cities. Sixth Report on Economic, Social and Territorial Cohesion*. Brussels: European Commission.
- DYMNICKI, A.B., and D.B. HENRY. 2011. "Use of Clustering Methods to Understand More about the Case." *Methodological Innovations* no. 6 (2):6–26. doi: 10.4256/mio.2010.0033.
- FALUDI, A. 2006. "From European Spatial Development to Territorial Cohesion Policy." *Regional Studies* no. 40 (6):667–678. doi: 10.1080/00343400600868937.
- FAROLE, T., A. RODRIGUEZ-POSE, and M. STORPER. 2011. "Human Geography and the Institutions that Underlie Economic Growth." *Progress in Human Geography* no. 35 (1):58–80. doi: 10.1177/0309132510372005.
- FITJAR, R.D., and A. RODRÍGUEZ-POSE. 2014. "When Local Interaction Does Not Suffice: Sources of Firm Innovation in Urban Norway." In *Regional Development and Proximity Relations*, edited by A. Torre and F. Wallet, 195–225. Cheltenham: Edward Elgar.
- FRIEDMANN, J. 1967. A General Theory of Polarized Development. In *Urban and Regional Advisory Program in Chile. Santo Domingo 504, Of. 81*. Santiago, Chile: The Ford Foundation.
- FRIEDMANN, J., and W. ALONSO. eds. 1964. *Regional Development and Planning. A Reader*. Cambridge, Mass: M.I.T. Press.
- GORZELAK, G., J. BACHTLER, and M. SMĘTKOWSKI. eds. 2010. *Regional Development in Central and Eastern Europe: Development Processes and Policy Challenges, Routledge Contemporary Russia and Eastern Europe Series*. Abingdon, Oxon, England – New York: Routledge.
- GORZELAK, G., C.-C. GOH, and K. FAZEKAS. 2012. *Adaptability and Change. The Regional Dimensions in Central and Eastern Europe*. Warszawa: Wydawnictwo Naukowe Scholar.
- Growing Unequal? Income Distribution and Poverty in OECD Countries*. 2008. Paris: Organisation for Economic Co-operation and Development.
- GUASTELLA, G., and F. TIMPANO. 2010. "Spillover Diffusion and Regional Convergence: A Gravity Approach." *Regional Science Inquiry Journal* no. 2 (2):71–82.
- HIDLE, K., A.A. FARSUND, and H.K. LYSGARD. 2009. "Urban-Rural Flows and the Meaning of Borders Functional and Symbolic Integration in Norwegian City-Regions." *European Urban and Regional Studies* no. 16 (4):409–421. doi: 10.1177/0969776409340863.
- ISARD, W. 1960. *Methods of Regional Analysis. An Introduction to Regional Science, Regional science studies*. Cambridge: Technology Press of the MIT; Wiley.
- JAKUBOWSKA, P., A. KUKLIŃSKI, and P. ŻUBER. eds. 2008. *Problematyka przyszłości regionów. W poszukiwaniu nowego paradygmatu, Forum Rozwoju Regionalnego i Polityki Regionalnej Regio Forum*. Warszawa: Ministerstwo Rozwoju Regionalnego.
- KAMPS, C., N. LEINER-KILLINGER, and R. MARTIN. 2009. "The Cyclical Impact of EU Cohesion Policy in Fast Growing EU Countries." *Intereconomics* no. 44 (1):23–29. doi: 10.1007/s10272-009-0274-2.
- KEEBLE, D., C. LAWSON, B. MOORE, and F. WILKINSON. 1999. "Collective Learning Processes, Networking and 'Institutional Thickness' in the Cambridge Region." *Regional Studies* no. 33 (4): 319–332. doi: 10.1080/713693557.

- KEEBLE, D., and F. WILKINSON. 1999. "Collective Learning and Knowledge Development in the Evolution of Regional Clusters of High Technology SMEs in Europe." *Regional Studies* no. 33 (4):295–303.
- KESSIDES, C. 1993. *The Contributions of Infrastructure to Economic Development: a Review of Experience and Policy Implications, World Bank discussion papers*. Washington, D.C.: World Bank.
- KNOWLES, R.D., J. SHAW, AND I. DOCHERTY. eds. 2008. *Transport Geographies. Mobilities, Flows, and Spaces*. Malden, MA: Blackwell Pub.
- KOŁODKO, G.W. 2009. "A Two-thirds Rate of Success. Polish Transformation and Economic Development, 1989–2008." *WIDER Working Paper (Research Paper)* (14):1–26.
- Koncepcja przestrzennego zagospodarowania kraju 2030. 2012. edited by Departament Koordynacji Polityki Strukturalnej. Warszawa: Ministerstwo Rozwoju Regionalnego.
- Krajowa Strategia Rozwoju Regionalnego 2010–2020: regiony, miasta, obszary wiejskie. 2010. Warszawa: Ministerstwo Rozwoju Regionalnego.
- KRONTHALER, F. 2003. "A Study of the Competitiveness of Regions based on a Cluster Analysis: The Example of East Germany." *Halle Institute for Economic Research Discussion Papers* (179):1–22.
- KRUGMAN, P. 1991. "Increasing Returns and Economic-Geography." *Journal of Political Economy* no. 99 (3):483–499. doi: 10.1086/261763.
- KRUGMAN, P.R. 1995. *Development, Geography, and Economic Theory, The Ohlin lectures*. Cambridge, Mass.: MIT Press.
- KULESZA, M. 2002. "Methods and Techniques of Managing Decentralization Reforms in CEE Countries: the Polish Experience." In *Mastering Decentralization and Public Administration Reforms in Central and Eastern Europe*, edited by G. Péteri, 189–214. Budapest: Open Society Institute; Local Government and Public Service Reform Initiative.
- LEON-LEDESMA, M.A., and A.P. THIRLWALL. 2002. "The Endogeneity of the Natural Rate of Growth." *Cambridge Journal of Economics* no. 26 (4):441–459. doi: 10.1093/cje/26.4.441.
- LUCAS, R.E. 1988. "On the Mechanics of Economic-Development." *Journal of Monetary Economics* no. 22 (1):3–42. doi: 10.1016/0304–3932(88)90168–7.
- MARSHALL, A. 1930. *Principles of Economics. An Introductory Volume*. 8th ed. London: Macmillan.
- MAYNOU, L., M. SAEZ, A. KYRIACOU, and J. BACARIA. 2014. "The Impact of Structural and Cohesion Funds on Eurozone Convergence, 1990–2010." *Regional Studies* no. 50 (7):1127–1139. doi: 10.1080/00343404.2014.965137.
- MCCANN, P. 2015. *The Regional and Urban Policy of the European Union. Cohesion, Results-Oriented and Smart Specialisation, New horizons in regional science*. Cheltenham, UK: Edward Elgar Publishing.
- MCCANN, P., and A. VARGA. 2015. "The Reforms to the Regional and Urban Policy of the European Union: EU Cohesion Policy." *Regional Studies* no. 49 (8):1255–1257. doi: 10.1080/00343404.2015.1048976.
- MEIJERS, E.J., B. WATERHOUT, and W.A.M. ZONNEVELD. 2007. "Closing the Gap: Territorial Cohesion through Polycentric Development." *European Journal of Spatial Development* (24):1–24.
- MOLLE, W. 2007. *European Cohesion Policy, Regions and cities*. London – New York: Routledge.
- MOLLE, W., and R. CAPPELLIN. eds. 1988. *Regional Impact of Community Policies in Europe*. Aldershot, Hants, England; Brookfield, Vt., USA: Avebury.
- MORRISON, D.F. 1990. *Multivariate Statistical Methods*. 3rd ed., McGraw-Hill series in probability and statistics. New York: McGraw-Hill.
- MUSTERD, S., and O. GRITSAI. 2013. "The Creative Knowledge City in Europe: Structural Conditions and Urban Policy Strategies for Competitive Cities." *European Urban and Regional Studies* no. 20 (3):343–359. doi: 10.1177/0969776412439199.
- NATHAN, M. 2015. "After Florida: Towards an Economics of Diversity." *European Urban and Regional Studies* no. 22 (1):3–19. doi: 10.1177/0969776412463371.
- PAELINCK, J. 1965. "La théorie du développement régional polarisé." *Cahiers de L'Institut de Science Economique Appliquée, serie L* (15):5–47.
- PARTRIDGE, M.D., D.S. RICKMAN, M.R. OLFERT, and Y. TAN. 2015. "When Spatial Equilibrium Fails: Is Place-Based Policy Second Best?" *Regional Studies* no. 49 (8):1303–1325. doi: 10.1080/00343404.2013.837999.



- PERDAL, R., and J. HAUKE. 2014. "Areas of Economic Growth and Stagnation in Poland. Growth Factors." In *The Social and Economic Growth vs. the Emergence of Economic Growth and Stagnation Areas*, edited by P. Churski, 43–61. Poznań: Bogucki Wydawnictwo Naukowe.
- PERROUX, F. 1955. "Note sur la nation de 'pole de croissance'." *Cahiers de L'Institut de Science Economique Appliquée, series D* (8):307–320.
- PETRAKOS, G., D. KALLIORAS, and A. ANAGNOSTOU. 2011. "Regional Convergence and Growth in Europe: Understanding Patterns and Determinants." *European Urban and Regional Studies* no. 18 (4):375–391. doi: 10.1177/0969776411407809.
- PORTER, M.E. 1990. *The Competitive Advantage of Nations*. New York: Free Press.
- PORTER, M.E. 2000. "Location, Competition, and Economic Development: Local Clusters in a Global Economy." *Economic Development Quarterly* no. 14 (1):15–34. doi: 10.1177/089124240001400105.
- Regional Development Policies in OECD Countries*. 2010. Paris: OECD Publishing.
- Reshaping Economic Geography*. 2009. World Development Report. Washington, D.C.: World Bank.
- RICHARDSON, H.W. 1973. *Regional Growth Theory*. London: Macmillan.
- RODRIGUEZ-POSE, A. 2013. "Do Institutions Matter for Regional Development?" *Regional Studies* no. 47 (7):1034–1047. doi: 10.1080/00343404.2012.748978.
- RODRIGUEZ-POSE, A., and R. CRESCENZI. 2008. "Research and Development, Spillovers, Innovation Systems, and the Genesis of Regional Growth in Europe." *Regional Studies* no. 42 (1): 51–67. doi: 10.1080/00343400701654186.
- RODRIGUEZ-POSE, A., and E. GARCILAZO. 2015. "Quality of Government and the Returns of Investment: Examining the Impact of Cohesion Expenditure in European Regions." *Regional Studies* no. 49 (8):1274–1290. doi: 10.1080/00343404.2015.1007933.
- ROMER, P.M. 1986. "Increasing Returns and Long-Run Growth." *Journal of Political Economy* no. 94 (5):1002–1037. doi: 10.1086/261420.
- . 1990. "Endogenous Technological-Change." *Journal of Political Economy* no. 98 (5):S71–S102. doi: 10.1086/261725.
- . 1994. "The Origins of Endogenous Growth." *Journal of Economic Perspectives* no. 8 (1): 3–22.
- ROY, A. 2009. "The 21st-Century Metropolis: New Geographies of Theory." *Regional Studies* no. 43 (6):819–830. doi: 10.1080/00343400701809665.
- SMITH, D.M. 1972. "Geography and Social Indicators." *South African Geographical Journal* no. 54 (1):43–57. doi: 10.1080/03736245.1972.10559497.
- SOLOW, R.M. 1956. "A Contribution to the Theory of Economic-Growth." *Quarterly Journal of Economics* no. 70 (1):65–94. doi: 10.2307/1884513.
- SPIEKERMANN, K., and J. NEUBAUER. 2002. "European Accessibility and Peripherality: Concepts, Models and Indicators." *Nordregio Working Paper* (9):1–43.
- SPILANIS, I., T. KIZOS, and B. GIORDANO. 2013. "The Effectiveness of European Regional Development Fund Projects in Greece: Views from Planners, Management Staff and Beneficiaries." *European Urban and Regional Studies* no. 23 (2):182–197. doi: 10.1177/0969776413498761.
- SPOLAORE, E., and R. WACZIARG. 2009. "The Diffusion of Development." *Quarterly Journal of Economics* no. 124 (2):469–529.
- SZLACHTA, J., and J. ZAUCHA. 2012. "For an Enhanced Territorial Dimension of the Cohesion Policy in Poland in the 2014–2020 Period." *Institute for Development Working Paper* (3):1–26.
- TORRE, A., and F. WALLET. 2015. "Towards New Paths for Regional and Territorial Development in Rural Areas." *European Planning Studies* no. 23 (4):650–677. doi: 10.1080/09654313.2014.945812.
- TRYON, R.C. 1939. *Cluster Analysis; Correlation Profile and Orthometric (Factor) Analysis for the Isolation of Unities in Mind and Personality*. Ann Arbor, Mich.: Edwards Brother, inc., Lithographers and Publishers.
- The Urban and Regional Dimension of the Crisis. Eighth Progress Report on Economic, Social and Territorial Cohesion*. 2013. European Commission.
- VICKERMAN, R., K. SPIEKERMANN, and M. WEGENER. 1999. "Accessibility and Economic Development in Europe." *Regional Studies* no. 33 (1):1–15.
- VILLAVERDE, J. 2006. "A New Look to Convergence in Spain — a Spatial Econometric Approach." *European Urban and Regional Studies* no. 13 (2):131–141. doi: 10.1177/0969776406062556.

- WILLIAMSON, O.E. 1981. "The Economics of Organization—the Transaction Cost Approach." *American Journal of Sociology* no. 87 (3):548–577. doi: 10.1086/227496.
- ZAUCHA, J. 2014. "Evolution, Essence and Measurement of Territorial Cohesion" [Geneza, istota i pomiar spójności terytorialnej, article in Polish]. *Institute for Development Working Papers* no. 001/2014 (012) ver. 1:1–65.
- ZAUCHA, J., and T. KOMORNICKI. 2015. "The Concept of Territorial Cohesion as Understood and Practiced by Polish Regions." *Institute for Development Working Paper* (2):1–20.
- ZAUCHA, J., T. KOMORNICKI, K. BÖHME, D. ŚWIĄTEK, and P. ŻUBER. 2014. "Territorial Keys for Bringing Closer the Territorial Agenda of the EU and Europe 2020." *European Planning Studies* no. 22 (2):246–267. doi: 10.1080/09654313.2012.722976.