COMPETITIVENESS OF SUBURBAN REGIONS – CURRENT SITUATION AND OPPORTUNITIES FOR GROWTH

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Abstract:
Peripheral regions, analysed both in a country and community, are the subject of a particular interest to various groups, such as: researchers, investors, politicians etc. If regions are properly managed, they can contribute not only to the economic growth but also decide about comparative advantages of the whole country. The article attempts to answer the question of the level of competitiveness and growth potential of the outermost regions in European Union. Additional goals are: definition of terms: "peripheral", "competitiveness", the classification of competitiveness evaluation methods, analysis of the competitiveness of the EU peripheral regions - using selected models, characteristics of selected regions – an analysis of an example of the peripheral positive influence on the developing regions, conclusions and recommendations.

Keywords: peripheral region, border region, competitiveness, growth, European Union

1. THE CONCEPT OF PERIPHERAL REGIONS

1.1. Peripheral region – competitiveness and the economic growth

Analysis of the peripheral region ("outermost region") or even – peripheral phenomenon – seems to require an answer to the question: what do we understand by the concept? The literature does not provide an accurate definition of the "peripheral region". More frequently, it appears that the researchers focus on the characteristics that the region considered as a „peripheral" should demonstrate. A summary of the characteristics – according to the author of classification – are shown in table 1.

Table 1: Selected characteristic of peripheral region with the author of the classification

No.	Characteristics	Author
1.	population, employment, services, housing conditions and facilities	Turnock D. (2006)
2.	access to other markets, spatial dispersion of economic activity, the amount of revenue, the level of unemployment of young people, the level of investments and education, GDP per capita	Baldwin R., Wyplosz Ch.(2009)
3.	GDP per capita, the structure of the exports, the political system, the institutional facilities for business, volume production for exports	Myant M., Drahokoupil J.(2011)
4.	the wealth of natural resources – impeded their operation, the migration of human resources, restricted access communications under-developed transport network, local public-private services provided in the general interest	Davies S., Michie R. (2011)

Source: own elaboration

To sum up, these characteristics can be divided into several groups, such as: economic (GDP, GDP per capita, foreign trade, volume of production), spatial (various types of distance – physical, commercial, structure and different type of spatial dispersion), social and institutional (housing, employment, education). It can be noticed that aspects, such as: political (local authorities) and business (facilities and difficulties for small and medium-sized enterprises) are not mentioned frequently.

In this particular case of the competitiveness, the literature demonstrates mainly those factors which determine the competitiveness area. This is due to the fact that the definitions of "competitiveness" are also not precise. Table 2 contains selected classifications of the competitiveness factors along with their authors.

Table 2: Summary of the factors taken into account under the definition of „competitiveness"

No.	Factors which were taken into account	Author/source
1.	economy: the domestic economy, international trade, international investments, employment, prices effectiveness of government: public finances, fiscal policy, the institutional framework, the legislation of company, social framework. the efficiency of activity: productivity, the labour market, finance, management practices, attitudes and values infrastructure: basic infrastructure, technical infrastructure, scientific infrastructure, health and environment, education	World Competitiveness Yearbook [1]
2.	global competitiveness index: institutions, infrastructure, the macroeconomic environment, health and basic education, higher education and training, goods market efficiency, efficiency of the labour market, the development of the financial market, readiness of technology, the size of the market, innovation	The Global Competitiveness Report 2014 – 2015[2]
3.	„competitiveness is the yardstick of advantages or disadvantages of a country in selling their products at international markets "	OECD[3]

Source: own elaboration

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[1] Given a set of factors, only the grouping "under - factors " have been taken into account. The complete list is available at: http://www.imd.org/uupload/imd.website/wcc/All_criteria_list.pdf.

[2] Based on: http://www.weforum.org/reports/global-competitiveness-report-2014-2015.

[3] Based on: http://stats.oecd.org/glossary/detail.asp?ID=399.

The analysis of competitiveness in terms of economic growth seems to require a clear clarification of the concept which Mankiew G. and Taylor M. define as "an increase of the quantities of goods and services offered in a specific unit of time" (Mankiew, Taylor, 2011). On the other hand Burda M. and Wyplosz Ch. define the economic growth as economy's productivity usually measured by GDP per capita (Burda, Wypłosz, 2009). These are only a few of the many possible definitions of "economic growth". For the purposes of this article, the main measure of economic growth is assumed to be GDP per capita.

1.2. Competitiveness of the region – methodology

In the subject literature there appear numerous methods allowing investigation of region competitiveness. Some of them are based on the construction of a specified numerical indicator (the econometric model index), i.e.: models based on decomposition of elements, i.e.: model of the pyramid of competitiveness, competitiveness trees model, competitiveness hat model, or the Porter's model.

 The subsequent method refers to the creation a specific index, hence, the main indexes include: The Growth Competitiveness Index – GCI, The Global Competitiveness Index – Global CI and The Business Competitiveness Index – BCI.

In the article, the author uses two of the methods presented above: the pyramid of competitiveness model and the competitiveness tree model. The main criterion taken into account during the selection is the fact that these models appear to be very original and innovation ones.

Competitiveness Pyramid Model

The model is said to be developed in 1997 by the European Commission. It divides factors into: sources, which constitute the visible manifestations of competitiveness and the results which – in many cases – are hard to investigate. The base of the pyramid consists of such fundamentals of competitiveness as: technical infrastructure, basic infrastructure, social infrastructure and the institutional one. These factors are influenced by: the research and technological development, development of SMEs, the growth of foreign institutions, human capital and other institutions. All of the aspects appear to impact the economic growth of a region significantly. The competitiveness pyramid model has been presented in diagram below.

Figure 1: The pyramid model - schematic representation of region's competitiveness
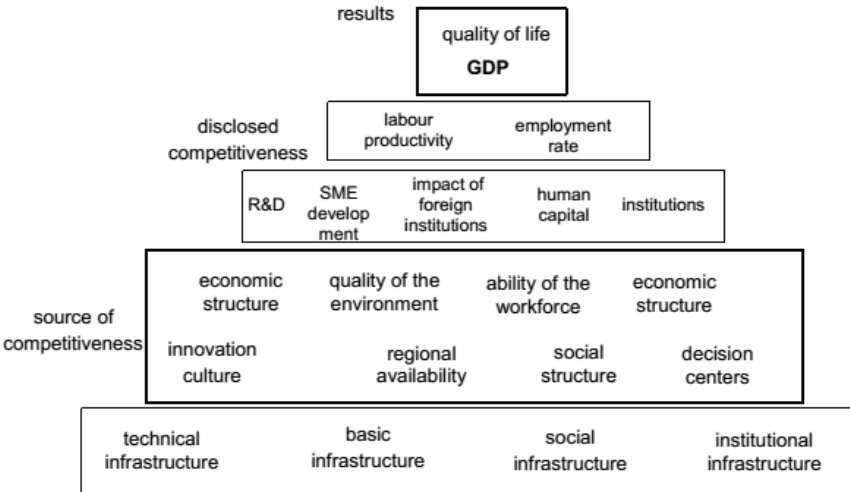
Source: own elaboration based on: the regions' competitiveness assessing methods resulting from the potential of R + D + I (innovation, new knowledge) in the context of smart specialization, the National Foresight Programme - implementation of the results. (2013), Katowice, GIG, p. 8.

Competitiveness Tree Model

Very similar structure to the one presented above can be found in the model proposed by ECORYS-NEI (Bulu, 2012, p. 45-46). It compares the competitive structure to a tree, where the nutrients, water

and other ingredients are said to be necessary for it to stay alive and to "give back" a raw material and oxygen to the environment. Similarly, the competitiveness adopts: talent, innovation, connectivity and entrepreneurship then turns them into an industrial structure and productivity to finally return it to the environment in the form of: employment and income, profit and investment and taxes and contributions, where all the factors consist on the welfare indicator.

For the aims of this article, and due to the limited amount of data, the competitiveness pyramid model has been used in the further analysis.

2. PERIPHERAL REGION - ANALYSIS OF COMPETITIVENESS

2.1. Description of the research method

The study is based on the outermost regions data for the year 2010. The availability of the data (for the years 2011 - 2014 data - for some regions - is incomplete) is the main selection criterion, whereas, its source is Eurostat – European Commission. The analysis includes information from the leading public statistics institutions of the EU countries (28 countries).

The survey has been conducted in two stages.

First stage: the correlation of factors recognized (in the model) as the competitive ones is being analysed. The regions, interpreted according to the classification of the EU - NUTS 2, are referred to as the subject of the study.

In the second stage: the case of peripheral regions development "positive" scenario is being analysed and the appropriate study is being conducted. Furthermore, characteristics of the following regions are investigated: Alentejo region (Portugal), Eastern voivodeships (Poland), Land Salzburg (Austria) an North Finland - Lapland region (Finland).

In the next step, a detailed analysis of various growth factors of the outermost regions is taken into consideration, with specificities of each of them being explored. The study can also be extended by the additional models, such as: Competitiveness Tree Model or Porter's Model.

2.2. An analysis of the competitiveness indicators in selected peripheral regions of the EU

Only the border regions – the regions where at least a part of one border is the border of the country - have been taken into account with the aim of pre-selection for the further analysis.

Subsequently, referring to the Eurostat data, the indicators containing complete data on the individual characteristics of the region's competitiveness have been assigned. The analysis includes "base" elements, called "sources of competitiveness" and GDP, as the output indicator of competitiveness. Detailed information on each of the groups is presented in the table below.

Table 1: Comparing indicators and source of competitiveness in the competitiveness pyramid model – data 2010 (NUTS 2 regions)

No.	Name of indicator in pyramid model	Data corresponding with indicator
1.	Economic structure (ES)	ES1: The employment rate in the age group 20-64 years [%] ES2: Unemployment rate [%] ES3: Population aged 15 and over by sex and age [1 000] ES4: Economically active population by sex, age and the highest level of education achieved [1 000] ES5: Employment by sex, age and the highest level of education achieved [1 000] ES6: Employment rate by sex and age [%] ES7: Long-term unemployment (12 months or more) [% per 1 000 persons] ES8: The disposable income of households [PPS - based on final consumption per capita]
2.	Innovation culture (IC)	IC1: Human resources in science and technology (HRST) [% of the economically active population] IC2: High-tech patent applications to the EPO by priority year, [the number of applications per million inhabitants] IC3: Total expenditure on R&D [% of GDP] IC4: Academics - all sectors [% of total employment]
3.	Regional availability (RA)	RA1: Networks highways [km] RA 2: Road accident victims
4.	The ability of the workforce (AW)	AW1: Students of all levels of education (ISCED 0-6) [% of total population] AW2: Students in tertiary education (ISCED 5-6) by region [% of the population aged 20-24 years]
5.	Social structure (SS)	SS1: Population density [number of inhabitants per km²] SS2: Population - as at 1 January 2010 SS3: Live births [including] SS4: Deaths [including] SS5: The fertility rate [the number of live births per woman] SS6: The average life expectancy
6.	Quality of the environment (QE)	QE1: Causes of death [mortality rate per 100 000 inhabitants] QE2: Municipal waste [in thousands tons]
7.	Decision canters (DC)	DC1: The local government sector expenditure - total government expenditure [% of GDP] DC 2: Public Services - total government expenditure [% of GDP] DC 3: Executive and legislative organs, financial and fiscal institutions, foreign entities - total government expenditure [% of GDP] DC 4: Local government - total government expenditure [% of GDP]
8.	Gross domestic product (GDP)	GDP: Gross domestic product (GDP) at current market prices [EUR]

Source: own elaboration based on: http://ec.europa.eu/eurostat/data/database

In the following steps of the study, the correlation between individual parameters has been calculated and the parameters containing "similar information" (the ones with a high rate of correlation) have been removed. The results of the calculations are shown below.

Table 4: The correlation of indicators of economic structure (ES) - after correction (removal ES_4 and ES_6)

	ES_1	ES_2	ES_3	ES_5	ES_7	ES_8
ES_1	1,0000					
ES_2	-0,7100	1,0000				
ES_3	-0,1711	0,1154	1,0000			
ES_5	0,0369	-0,0659	0,6993	1,0000		
ES_7	-0,5527	0,3876	0,0160	-0,0283	1,0000	
ES_8	0,5608	-0,4266	0,0470	0,1894	-0,2278	1,0000

Source: own elaboration based on: http://ec.europa.eu/eurostat/data/database

Table 5: Correlation of indicators - Innovation culture (IC) - after correction (removal IC_4)

	IC_1	IC_2	IC_3
IC_1	1		
IC_2	0,503623	1	
IC_3	0,582766	0,548308	1

Source: own elaboration based on: http://ec.europa.eu/eurostat/data/database

Table 6: Correlation of indicators - Social Structure (SS) - after correction (removal SS_2 and SS_4)

	SS_1	SS_3	SS_5	SS_6
SS_1	1,0000			
SS_3	0,0113	1,0000		
SS_5	0,1830	-0,0038	1,0000	
SS_6	0,0673	0,0824	0,2464	1,0000

Source: own elaboration based on: http://ec.europa.eu/eurostat/data/database

Table 2: Correlation of indicators - Regional Availability (RA)

	RA_1	RA_2
RA_1	1,0000	
RA_2	0,5377	1,0000

Source: own elaboration based on: http://ec.europa.eu/eurostat/data/database

Table 3: Correlation of indicators - Ability of workforce (AW)

	AW_1	AW_2
AW_1	1,0000	
AW_2	0,3213	1,0000

Source: own elaboration based on: http://ec.europa.eu/eurostat/data/database

Table 4: Correlation of indicators - quality of the environment (QE)

	QE_1	QE_2
QE_1	1,0000	
QE_2	-0,1669	1,0000

Source: own elaboration based on: http://ec.europa.eu/eurostat/data/database

Table 5: Correlation ratios group - decision centres (DC)

	DC_1	DC_2	DC_3	DC_4
DC_1	1,0000			
DC_2	0,4097	1,0000		
DC_3	-0,4372	-0,1569	1,0000	
DC_4	0,3114	0,3533	-0,2255	1,0000

Source: own elaboration based on: http://ec.europa.eu/eurostat/data/database

Subsequently, the collected data has been normalized using the "min – max" method. As a result of the process, all values are contained in the range of 0 to 1. After the calculation of conversion has been conducted the correlation indicators of all groups have appeared to be possible to define. The calculation results are shown in table 11.

The analysis of all indicators of the correlation of competitiveness pyramid model appears to be extremely important, in case of comparing the analysis results with the rate of GDP (Gross Domestic Product). There appears to be a high level of GDP correlation with such indicators as: employment rate (ES_1) 0.576, disposable income of households (ES_8) 0.748, human resources in science and technology (IC_1) 0.667, high-tech patent applications to the EPO by priority year (IC_2) and 0.508 total expenditure on R&D (IC_3) 0.495. These indicators appear as clearly positive correlations to GDP. On the other hand, the unemployment rate (ES_2) -0.387, long-term unemployment (ES_7) -0.409, victims of road traffic accidents (RA_2) -0.275 appear to be negatively correlated with GDP.)

Whereas, population aged 15 and over, characterised by sex and age (ES_3) -0.022 and students of all levels of education (AW_1) 0.006 reveal small correlation (positive and negative).

The research indicates a significant role of "human factors" and their quality (employment, human resources in R&D) in the growth of regions' competitiveness. At the same time, such aspects as the number of the population and its structure have appeared as less important. Moreover, the study proves that the factors included in this model and referred to as "a source of competitiveness" demonstrate varied impact on the competitiveness of the area.

. **Table 11:** Results of the correlation indicators for all groups of factors in competitiveness pyramid model

	ES_1	ES_2	ES_3	ES_5	ES_7	ES_8	IC_1	IC_2	IC_3	RA_1	RA_2	AW_1	AW_2	SS_1	SS_3	SS_5	SS_6	QE_1	QE_2	PKB
ES_1	1,000																			
ES_2	-0,715	1,000																		
ES_3	-0,171	0,125	1,000																	
ES_5	0,037	-0,055	0,699	1,000																
ES_7	-0,558	0,475	0,125	0,117	1,000															
ES_8	0,544	-0,382	0,058	0,188	-0,345	1,000														
IC_1	0,522	-0,301	0,029	0,070	-0,270	0,488	1,000													
IC_2	0,441	-0,313	0,039	0,087	-0,307	0,362	0,505	1,000												
IC_3	0,425	-0,201	0,149	0,160	-0,220	0,375	0,581	0,523	1,000											
RA_1	-0,090	0,260	0,578	0,454	0,074	0,173	0,127	0,050	0,139	1,000										
RA_2	-0,294	0,126	0,813	0,549	0,157	-0,182	-0,230	-0,107	-0,080	0,487	1,000									
AW_1	-0,275	0,201	0,072	0,012	0,016	-0,245	0,026	0,025	-0,027	0,162	0,178	1,000								
AW_2	-0,114	0,071	0,199	0,091	-0,064	-0,135	0,216	0,064	0,155	0,232	0,228	0,782	1,000							
SS_1	-0,144	0,177	0,006	-0,013	0,101	0,043	0,052	0,000	-0,010	-0,069	-0,104	0,042	-0,037	1,000						
SS_3	-0,137	0,127	0,968	0,689	0,088	0,077	0,092	0,096	0,211	0,575	0,767	0,121	0,218	0,016	1,000					
SS_5	0,181	-0,027	-0,129	-0,099	-0,099	0,128	0,250	0,220	0,247	-0,063	-0,190	0,150	-0,040	0,183	0,048	1,000				
SS_6	-0,008	-0,065	0,044	0,059	-0,170	0,119	0,001	0,050	-0,057	0,145	0,066	0,163	0,142	0,055	0,121	0,424	1,000			
QE_1	-0,116	-0,088	-0,010	-0,001	0,113	-0,055	-0,274	-0,039	-0,207	0,016	0,149	0,008	0,014	-0,124	-0,043	-0,117	0,114	1,000		
QE_2	-0,014	-0,154	0,658	0,463	0,138	0,279	0,115	0,128	0,151	0,305	0,495	0,048	0,112	0,026	0,693	0,121	0,087	0,037	1,000	
PKB	0,576	-0,387	-0,022	0,132	-0,409	0,748	0,667	0,508	0,495	0,121	-0,275	0,006	0,053	0,073	0,031	0,296	0,175	-0,295	0,134	1,000

Source: own elaboration based on: http://ec.europa.eu/eurostat/data/database

2.3. Description of selected actions taken to prevent peripherality

Alentejo – "Alentejo Digital" (Portugal)

Alentejo[4] is the largest of Portuguese regions (approx. 31 500 km^2) located on the south of country. The region is rich in many natural resources (sulfur, marble, copper, pyrite) and dominated by the production of cork, wine, and oil, which are an important part of the economy of this area. Alentejo is also characterized by one of the lower levels of employment in Portugal, mainly dominated by industry based on natural resources (a small percentage of expenditure on R&D, low on high-tech with obsolete technology).

The "Alentejo Digital"[5] has been created to improve the high-tech and computerization of the region. The main postulations of the program refer to: building a regional network of information (3 agencies, 47 municipalities), providing the facilities for people to enable their access to computers, enlarge knowledge about the region and help the local authorities to administer them.

In addition, the other initiatives include: development of high-tech industries (automotive, electronics), using the value of nature and the landscape in order to strength the tourism sector and services, lowering the same the unemployment rate (the first quarter of 2014. 16%). The main goal of the programs is to combine the R&D sector with the traditional fields of production, such as: production of wine, cork, decorative stones and modern them.

Eastern voivodeships – "Operational Programme 2014-2020" (Poland)

The "Operational Programme" (Poland) refers to 5 Polish provinces: Lublin, Podlaskie, Świętokrzyskie, Podkarpackie and Warmian-Masurian, which appear to be the subject of a particular interest to the EU regional policy as the area is said to be one of the poorest regions in the EU. The main problems of

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[4] Based on: https://lisbon.trade.gov.pl/pl/regionypt/article/detail,4818,ALENTEJO.html.

[5] Based on: http://webb.ccdra.gov.pt/index.php?option=com_content&view=article&id=338&Itemid=309.

the area are defined as: low productivity and efficiency, low thermal sector dominance in the economy, low level of innovation, infrastructural backwardness, migration of people at working age and aging society.

This area was one of the main beneficiaries of EU founds (under the Operational Programme "Development of Eastern Polish" 2007 - 2013).

In the upcoming funding period, the following aims are being covered:
- using the region's endogenous potential and developing the unfavourable activation of professional and social structure innovation,
- investing in infrastructure and increasing transport accessibility of the region - construction of infrastructure networks.

Land Salzburg – "DEMOCHANGE" (Austria)

An international project called, "DEMOCHANGE - evolving with the needs of our people" provides an interesting example of an action undertaken with the aim of changing the demographic situation of Alps. The main objective of the project is to analyze and diagnose the current state of social infrastructure of the Alps region. It includes such countries as: Germany, Italy, Slovenia, Switzerland and France, with the exception of Austria.

The aim of the project is to prevent such phenomena as:
- immigration habitant of working age and its impact on the social structure of the region,
- difficulties in transportation: low development of public transport, obsolete and faulty rail network,
- lack of an adequate network of services in remote areas, shortage of housing for the young and oldest people,
- unemployment and difficulties in finding a job.

The "DEMOCHANGE" project provides detailed analysis and diagnosis of the current situation. Moreover, it makes possible to identify the main problems and/ as a result, to create an appropriate action model.

Lapland Region – "Northern Periphery and Arctic Programme 2014 – 2020" (Finland)

It is a continuation of the "Northern Periphery Programme 2007-2013"[6] program, which is mainly aimed at the prevention of negative effects of the peripheral location of regions in such countries as: Finland, Ireland, Norway, Sweden and (outside the EU): Iceland and Greenland.

In the years 2014 - 2020, the program will be based on the following priority axes:
1. Using innovation to maintain and develop strong and competitive communities.
2. Promoting entrepreneurship in order to increase the potential of the area - the construction of a competitive advantage.
3. Promotion of renewable and efficient energy.
4. Protection, promotion and development of cultural and natural heritage.

The main aim of the "Northern Periphery Programme and the Arctic" is to prevent such negative phenomena of peripheral areas as: low population density, poor transport accessibility, lack of economic diversification.

The analyzed examples prove that the features of a region that are considered as factors limiting its development can also constitute its competitiveness. An employ of the modern technologies and the unique, for each region, qualities (i.e. out of city centre location, the environment, landscape, animals, natural resources, etc.) may contribute to the growth of the area.

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[6] Based on: Programme Manual, Northern Periphery Programme and the Arctic from 2014 to 2020, Version 2 - January 2015.

3. SUMMARY

The analysis of the statistical data along with the peripheral regions of the EU case studies, allow the following conclusion to be presented:

- increase in the importance of human capital for the region's competitiveness, the main role of the "quality" factor, ie. the level of education, qualifications and skills,
- the technical and institutional infrastructure are less important for the building of the area's competitive advantage,
- the need for change of the human capital structure prevents such phenomena as: depopulation, migration, rising unemployment, negative growth,
- traditional basis of the manufacturing that identifies the region: a combination of traditional and modern approach (income), an industrial basis of the economic growth of the region,
- the use of the region's "natural" competitive advantage (e.g. The vast undeveloped spaces, rich nature robe, traditional forms of management),
- a large role of the correct identification of barriers and the opportunities of the individual growth of the EU regions, which enables the use of every endogenous source as an competitive advantage.

Moreover, the study indicates the difficulties with the accessibility of data on the particular peripheral areas. In many cases, the lack of the basic information or the incompleteness of the information indisposes a proper analyze of the current situation and actions recommendation. Therefore, it appears necessary not only to monitor the rate of growth but also to continuously expand the information base about the outermost regions. In the light of presented evidence, the continuation of a study on the impact of human capital and high technology on the growth of a region, appears extremely important.

REFERENCE LIST

1. Baldwin, R., Wyplosz, Ch. (2009). *The Economics of European Integration*, Third Edition, United Kingdom, McGraw-Hill Higher Education.
2. Bulu, M. (2012*). City Competitiveness and Improving Urban Subsystems: Technologies and Applications*, USA, IGI Global, 45-46.
3. Burda, M., Wyplosz, Ch. (2009). *Macroeconomics, A European Text*, Fifth Edition, New York, Oxford University Press, 523.
4. Davies, S., Michie, R. (2011). *Peripheral Regions: A Marginal Concern*? EoRPA 11/6, United Kingdom, European Policies Research Centre.
5. Han, J., Kamber, M., Pei, J. (2012). *Data Mining, Concepts and Techniques*, USA, Elsevier Inc.,114.
6. Mankiew, GN., Taylor, MP. (2011). *Economics*,United Kingdom, Cengage Learning EMEA, 884.
7. Methods of assessing the competitiveness of regions resulting from the potential of R + D + I (innovation, new knowledge) in the context of smart specialization, the National Foresight Programme - implementation of the results. (2013). Katowice, GIG,8.
8. Myant, M., Drahokoupil, J. (2011). *Transitions Economies: Political Economy in Russia, Eastern Europe, and Central Asia*, USA, John Wiley & Sons, Inc.
9. Programme Manual, Northern Periphery Programme and the Arctic from 2014 to 2020, Version 2 - January 2015.
10. Saez, S., Taglioni, D., Marel, E. et al. (2014). *Services in Trade, A Toolkit for Competitiveness Diagnostics,* Washington , The World Bank Group, 35.
11. Turnock D. (2006). *The Economy of East Central Europe from 1815 to 1989, Stages of transformation in a peripheral region*, London and New York, Routledge Taylor & Francis.