EU 'DEEP' PERIPHERY: A CASE STUDY OF MOUNTAIN BORDERLANDS IN BULGARIA

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Key-words: regional development policy, EU deep periphery, mountains, borders.

Abstract. Geographic research and constant monitoring of EU periphery and its dynamics are necessary to identify and outline priority areas for regional development policy. This work proposes that "deep" periphery areas form where peripheries of a different geographic nature (physical, economic, political) and scale overlap. The investigation applies GIS-aided mapping and comparative scale analysis to the case study of Bulgaria to identify "deep" periphery areas and affirm that they are disproportionally situated in the mountain regions along the EU external borders. These study results suggest special regional development policy attention to such areas, among which adoption of a Mountain Sustainable Development Strategy for all mountains within the EU geographic space, and, in particular, a Southeast European Convention on Sustainable Development of Mountain Regions.

1. INTRODUCTION

Urban areas are the largest geographic concentrations of human habitation, political, and socio-economic clout, while mountains are the most sizable part of human geography land periphery -27% of the land area, according to the UN Food and Agriculture Organization (2011). Continuing concentration of population in large cities makes the peripheral characteristics of mountain areas ever more pronounced. At the same time, this tendency engenders a number of diverse incongruities in the geography of human societies and raises the need for pertinent regional development policies.

This research continues to explore the relevance of the core-periphery model to human geography with particular focus on the periphery of the European Union (EU). Its ultimate goal, in respect to the EU policy-making, is to suggest that the Union needs a special regional development strategy to recognize and prioritize the "deep" periphery areas, where peripheral characteristics are most intensive. This goal presupposes the resolution of several tasks. First, the investigation should prove the existence and provide an explanation for the formation of "deep" periphery areas. Second, it should confirm that the "peripheries' overlap" paradigm could serve as a tool for the identification of "deep" peripheries and provide information on their structure and characteristics. Third, the investigation will employ the case-study of Bulgaria to present further evidence in support of the argument that mountain areas, especially those situated along its EU South-Eastern external borders should be prioritized in regional development policy-making.

The study methodology will apply GIS-aided map overlays and comparative scale analysis at five geographic scales (NUTS 0 to LAU 1). The economic and the political factors will be analyzed in a comparative perspective on all scales. Different aspects of the political factor will be added to the analysis, like distance from the EU, state, regional, and local cores, and internal and external border location. Physical geography peripheries (e.g. mountain areas, landlocked areas, and land versus sea borders) will also be used as possible periphery determinants. For reasons of volume and space mainly, but also for its own diverse peripheral characteristics, the Bulgaria case-study has been

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selected. The "peripheries' overlap" paradigm will be used as conceptualization of the formation and structure of the "deep" periphery areas. This methodology enables better territorial targeting of development policy measures and should therefore be of significant value to the practice of regional planning.

2. MOUNTAINS AS "OVERLAP OF PERIPHERIES" AREAS

Mountains, as well as a number of other specific physical geographic features, often serve as political boundaries of countries and/or their internal administrative territorial units. With the increase of altitude, many other physical and human geographic characteristics transform to render mountain areas progressively peripheral in respect to most aspects of human life (Koulov, 2013). Resources are relatively less accessible, while some features, like soil and climate, acquire qualities which make them less favorable for human use. At the same time, mountain areas are disproportionally rich in some resources, like clean water and air, water and wind energy, forests, wild animals, natural and cultural diversity, scenery and a multitude of other natural assets for recreation, tourism, and sports.

Due to altitude-induced transformations, mountain areas are generally sparsely inhabited and lack large urban areas, economic, financial and state-level political centers. Thus, only about 24% of the 194 state capital cities of the world are situated above 600 m a.s.l. In Europe, in particular, such capitals are real exceptions: Madrid altitude (582 to 667 m elevation above the sea) is very close and the very small Andorra la Vella (population 22,256), the political centre of the landlocked microstate of Andorra is located at 1,023 m (Cybriwsky, 2013).

The local population groups in mountain areas are generally more geographically and socially isolated also from one to another. Compared to the rest of the country, they are characterized by a relatively lower standard of living, higher rates of unemployment, and lower access to social services. In parallel, higher elevation areas are more environmentally vulnerable to both natural and anthropogenic hazards (Nikolova, 2001), among which depletion of resources, deforestation, biodiversity loss, poaching, landslides, and forest fires. A significant discrepancy persists between the higher needs for resource protection at global and national scale, and the socio-economic development goals of the local populations (Koulov, 2013). In such areas the economic activity is less diverse, the infrastructure less developed and more capital intensive, while people are generally more dependent on the local resources. In short, the drawbacks for human development in mountainous areas are generally more significant than the benefits, which, in concert with other factors, like border location, foster the peripheralization of such areas.

In principle, peripherality is not exclusive to mountain areas, nor should they be necessarily peripheral in respect to many human activities. However, the comparative analysis of altitude-induced transformations of the different geographic characteristics (e.g., economic, political, social, cultural, environmental) and the increasing peripheralization of mountainous areas from local to global scale leads to the conclusion that, in such areas, different peripheral characteristics often overlap each other.

Koulov (2013) terms the areas of geographic space, where peripheries of a different nature (physical, economic, political, etc.) and geographic scale coincide, "overlap of peripheries" areas. The proposition here is that: a/ "deep", a.k.a. more intensive, peripheries form in the areas where peripheries overlap, and b/ the overlap of peripheries paradigm could serve as a tool for the identification of such "deep" peripheries and provide information on their structure and magnitude. Such a tool would provide significant insights into the development status and potential of certain areas and, thus, inform and improve regional policy planning and decision-making.

3. EU CORE AND PERIPHERIES: A GEOGRAPHIC SCALE ANALYSIS

The goals of this section are to identify the location and outline the scope of the current EU economic core, as well as its peripheries, and bring evidence in support of the proposition that "deep" peripheries form in the areas where peripheries overlap. For these purposes, the study applies GIS-aided mapping and comparative scale analysis to four geographic scales – from NUTS 0 to NUTS 3 – as defined by the 2013 Eurostat Nomenclature of Territorial Units for Statistics (Eurostat 2015, a). The description of the present economic core of the EU serves as a point of reference for the exploration of its periphery.

A/ EU Core

In his studies of economic development after the Second World War, Brunet (1989) has developed the concept of a West European "backbone", divided Europe into "active" and "passive" areas, and referred to an urban corridor of industry, services, and excellent transport infrastructure (Brunet 1989). This region continues to attract the main offices of many multinational corporations and important international organizations, including EU and NATO. In 2014, over 75% of the EU population lived in urban areas (World Bank 2014) and the largest of them are still concentrated in and around the so-called European Blue Banana (2011), or European Megalopolis, a discontinuous banana-shaped corridor in Western Europe, stretching from Northwest England through Benelux and Western Germany to Northern Italy, with a population of around 111 million (Brunet 1989). Hospers (2003) calls the Blue Banana one of the world's highest concentrations of people, money and industry.

This research uses the Purchasing Power Standard (PPS), which makes possible the comparison of purchasing power per inhabitant across the regions of EU Member States that use different currencies and where price levels are different (Eurostat Regional... 2014, 120). In 2011, GDP in the EU–28 was valued at 12,712 billion euro at current market prices, which equated to an average level of 25 100 PPS per inhabitant. The comparative analysis of the 2011 data at the NUTS 0, 1, and 2 scales (Figs 1, 2, and 3) exhibits a noteworthy difference in the shape of the EU core of "rich" regions, characterized by the above EU–28 average level of 25 100 PPS per inhabitant (Credit Suisse... 2013, 17). In the last 20 years, EU core has spread somewhat towards the south to include Northern and part of Central Italy and South-Eastern France. A much more sizeable shift has taken place in the northern and north-eastern direction, where it currently comprises EU-candidate Iceland and EFTA-member Norway which can also be considered parts of the economic geography of the EU core, Southern Ireland, North-Eastern United Kingdom continues through Sweden and Southern Finland to embrace Denmark, West and South Germany, the Netherlands, Northern Belgium, Luxembourg, and Austria. Isolated parts of the core encompass also of parts of Southern United Kingdom, North-central France, and North and Central Spain, which are mostly state capital regions. EFTA-member Switzerland is also a part of the core (Fig. 3).

B/ EU Peripheries

In 2014, the EU produced an estimated Gross Domestic Product (GDP) of 18.124 trillion US dollars, which represents over 20% of the world GDP in terms of Purchasing Power Parity, larger than any country (World Economic Outlook: Legacies, Clouds, Uncertainties (2014), International Monetary Fund). Besides that, in 2013, the EU owned the largest net wealth among the world countries, estimated to equal 27% of the 241 trillion US dollars global net wealth. Even on the scale of the individual EU states (NUTS 0 regions), however, very great differences exist in the GDP per capita indicators: they range from Luxembourg (US$107,480) and Sweden (US$59,112) to Romania (US$9,071) and Bulgaria (US$7,161) (Fig. 1). In terms of total net wealth per capita, the spread is

significantly larger – from US$ 241,695 (Luxembourg) and US$232,106 (Sweden) to US$11,191 (Romania) and US$13,693 (Bulgaria) (Credit Suisse... 2013, 17).

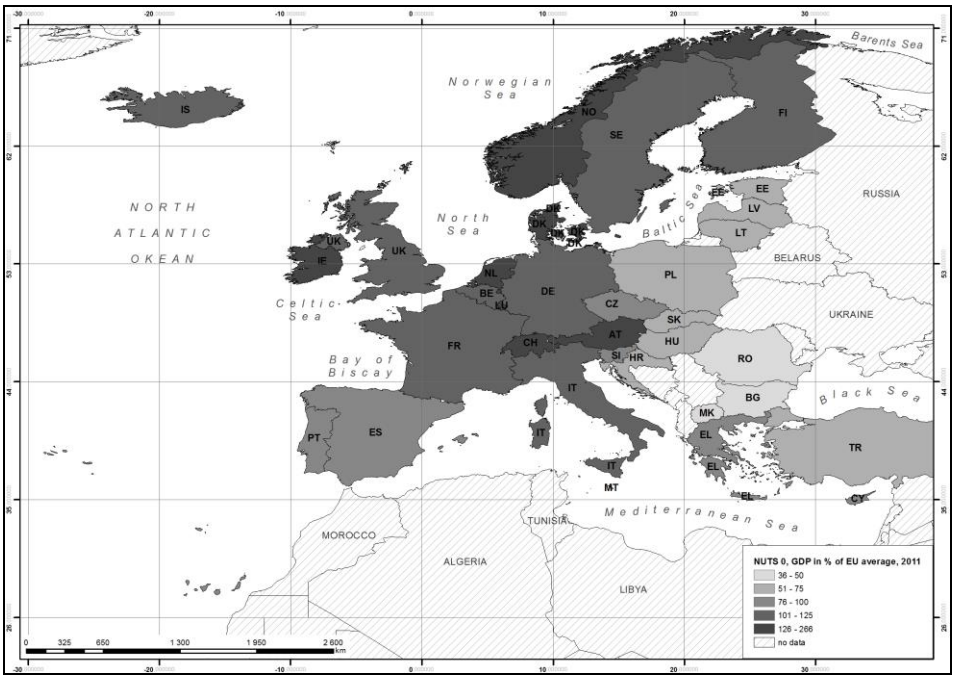

Fig. 1 – Gross domestic product (GDP) per inhabitant in purchasing power standard (PPS) by country (NUTS 0 EU regions) for 2011 (in percent of the EU–28 average, EU–28 = 100).

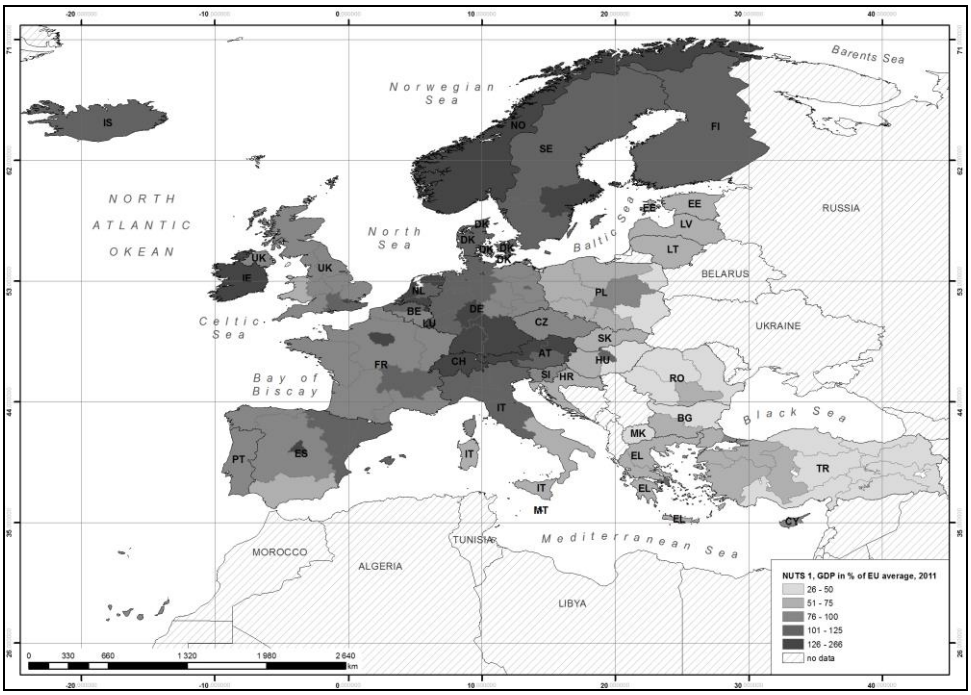

Fig. 2 – Gross domestic product (GDP) per inhabitant in purchasing power standard (PPS) by NUTS 1 regions of the EU for 2011 (in percent of the EU–28 average, EU–28 = 100).

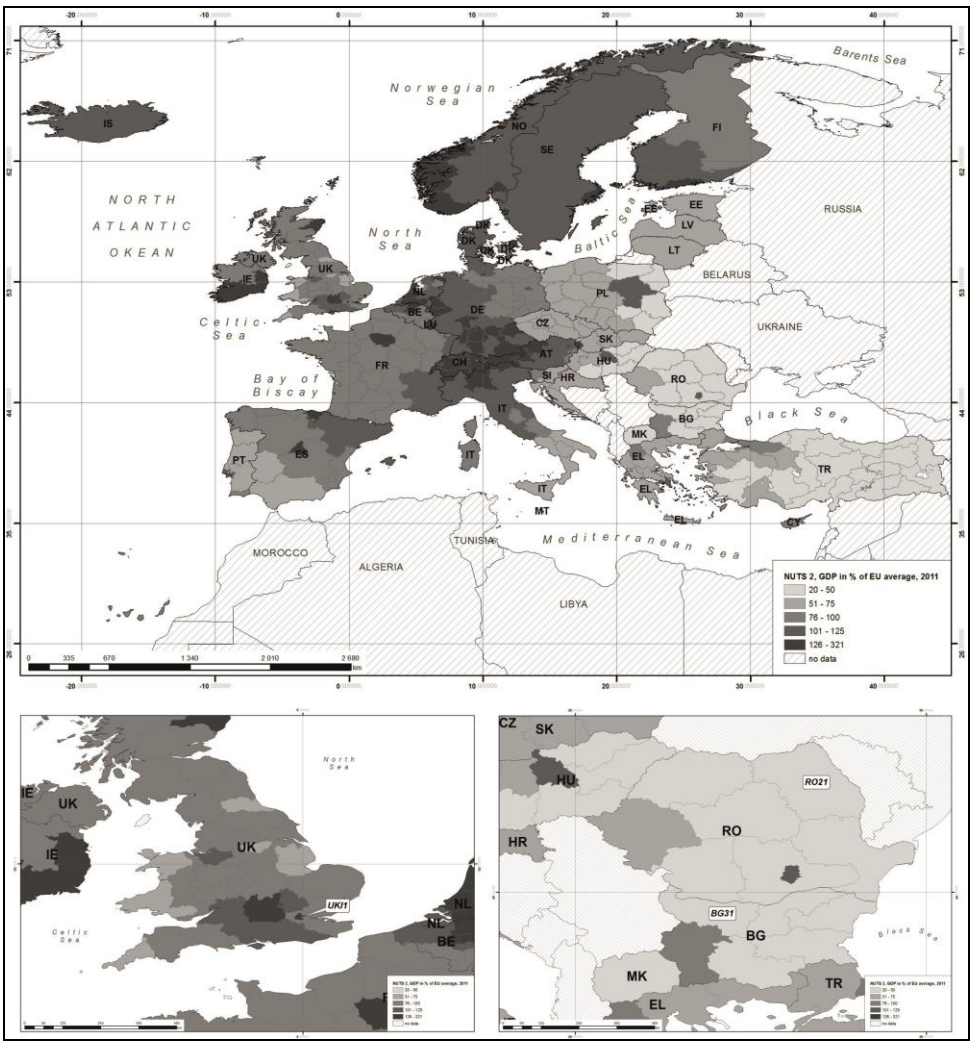

Fig. 3 – Gross domestic product (GDP) per inhabitant in purchasing power standard (PPS) by NUTS 2 regions of the EU for 2011 (in percent of the EU–28 average, EU–28 = 100).

The comparative analysis of 2011 economic data at NUTS 0 through NUTS 2 scales provides even stronger support to the observation of large disproportions in EU regional development (Figs 1 through 3). The analysis also shows that, similar to the identification of EU core, the NUTS 2 scale provides the most detailed boundaries of EU periphery. Another similarity between core and periphery is the significantly higher level of development of the capital and the highly urbanized regions. One of the reason for this phenomenon is the fact that the GDP per inhabitant levels in these regions are strongly influenced by commuter flows, which sustain much higher economic activity than that which the resident population could normally achieve (Eurostat Regional... 2014, 120). Notwithstanding the active role of demographic, economic, historical, social, and other factors, the political geographic position of the capital and highly urbanized regions invariably dominates the drivers for their formation as development “hot points”.

Thus, except for the capital regions, all NUTS 2 regions in all the eleven EU-Member States of Central and Eastern Europe (Estonia, Latvia, Lithuania, Poland, the Czech Republic, Slovakia, Hungary, Slovenia, Croatia, Romania, and Bulgaria) fall into the category of below 75% of the EU–28 average level of GDP in PPS per inhabitant (Eurostat 2015 b). In the 2007–2013 planning period, the

EU regional development policy promoted development in the member states and regions in that category under its Convergence Objective (Regional Policy). Together with the same category regions of Southern Europe (most of Greece and Portugal, Southern Italy, and Southern Spain) and parts of Central and South-Western Britain, the Central and Eastern Europe NUTS 2 regions define the vast economic periphery of the EU, which acts as a counterpoint to the relatively "rich" EU core (Fig. 3).

The difference between the richest and poorest of the 271 EU regions at the NUTS 2 scale is larger, in comparison with the country (NUTS 0) scale. In 2011, it ranged from 29% of the EU–28 average GDP (RO21 Nord-East in Romania and BG31 Severozapaden in Bulgaria) to 321% of the average (UKI1 Inner London in the United Kingdom) (Fig. 3). At the high end, UKI1 Inner London has 80,400 PPS per inhabitant, while each of the poorest regions – BG31 Severozapaden and RO21 Nord-East – only 7 200 PPS per inhabitant (Eurostat 2015 b). The purchasing power standard per inhabitant of the richest region for the year 2011 was more than 11 times higher than that of the poorest.

A total of 76 NUTS 2 regions composed the EU periphery in 2011 (Fig. 3). A comparison of the economic and political geography information at the three NUTS scales, however, offers ample evidence that, due to peripheries' overlap, a "deep" periphery forms in the areas that are peripheral at all of the NUTS scales (Figs 1 through 3). Over a quarter (20) of the total number of EU peripheral regions record average GDP per inhabitant of less than 50% of the EU–28 average (Eurostat Regional... 2014, 122). Moreover, all of the deep periphery regions are concentrated in only four countries of Central and Eastern Europe. In addition to Hungary and Poland, particularly notable for the majority of their populations living in such conditions, are Bulgaria and Romania with over 75% of their NUTS 2 regions – the basic regions for application of regional policies – literary "falling" into that category. This special "deeper" part of the EU periphery deserves the explicit attention of the EU-level regional development decision-makers.

4. EU'S "DEEP" PERIPHERY: THE CASE-STUDY OF BULGARIA

The main task of this section is to further investigate the formation of "deep" periphery in the regions of "peripheries' overlap". For the purpose of further testing this paradigm, first, the same methods – GIS-aided mapping and comparative scale analysis – are applied at the lower – NUTS 3 and LAU 1 – territorial levels. Second, additional aspects of the political peripheries (EU's external border-areas) and a physically challenging type of periphery (mountain areas) are added as objects of the analysis. Reasons of volume and space limit this level of the investigation to the case-study of Bulgaria. The selection is based on the fact that, with the exception of its state capital region, this EU Member State has, for the seven years since its accession, invariably partaken in EU's "deep" periphery.

A/ Economic and Political Peripheries

Between 2007 and 2011, Bulgaria's economic performance had consistently placed the country (NUTS 0 scale) at the bottom of the group of EU Member States in terms of purchasing power standard per inhabitant (in 2011 – 47 percent of the average EU–28 GDP). Both NUTS 1 regions of Bulgaria also belong to the periphery. In 2011, for example, they produced less than 60% of EU's average GDP (PPS) (Fig. 4). Furthermore, the regional imbalance is very significant: the region that contains the state capital produced 1.7 times larger GDP per inhabitant in current market prices than the remaining region (BG4 Yugozapadna i yuzhna tsentralna – 6,700 euro versus BG3 Severna i yugoiztochna – 3,900 euro] (Eurostat 2015 b). At that scale, the capital region (BG4 Yugozapadna i yuzhna tsentralna) is a part of EU's periphery, while the other region, belongs to the "deep" periphery category of less than 50% of the average EU–28 GDP (Fig. 4).

At the lower NUTS 2 scale, the situation is very similar: all Bulgarian regions, except for the one that contains the capital (BG41 Yugozapaden -78%), rank significantly lower than even the deep periphery threshold – below 38% of the EU–28 average GDP (PPS). The regional imbalances substantially increase at that territorial level (Fig. 5). Compared to the “average” EU inhabitant, a person from Bulgaria’s poorest NUTS 2 region (BG31 Severozapaden) had, in 2011, an almost eight times smaller purchasing power. The difference with the inhabitant of the Bulgarian capital is also quite significant – almost 4 times.

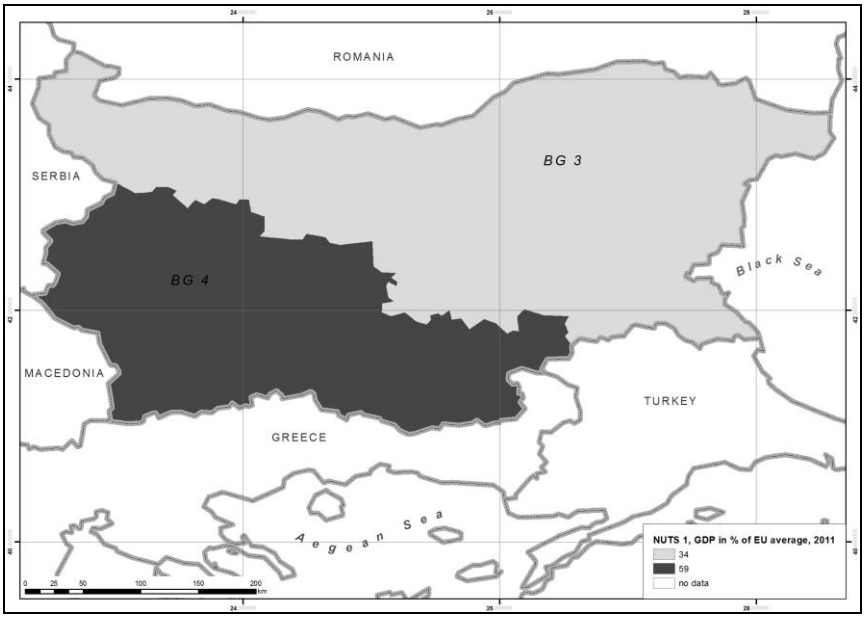

Fig. 4 – Gross domestic product (GDP) per inhabitant in purchasing power standard (PPS) by NUTS 1 regions of Bulgaria for 2011 (in percent of the EU–28 average, EU–28 = 100).

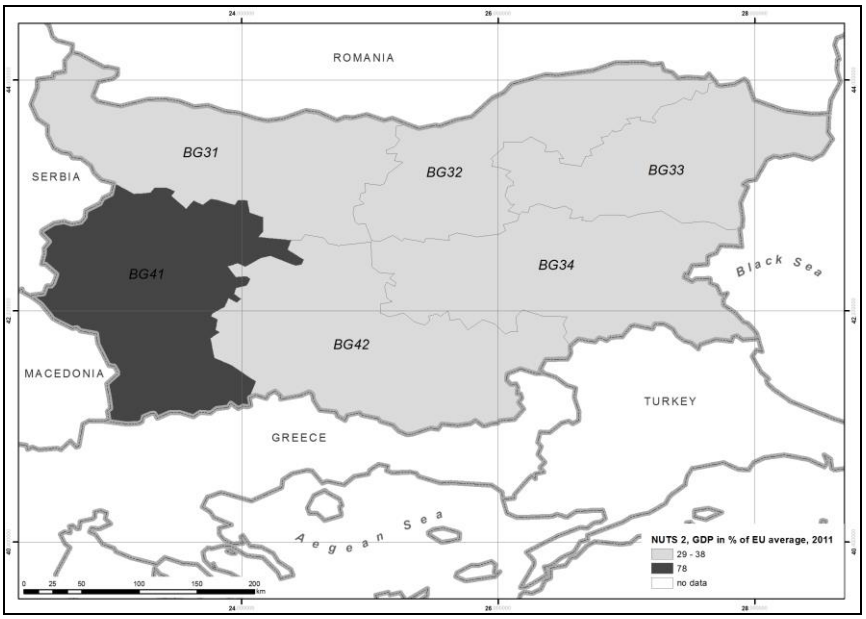

Fig. 5 – Gross domestic product (GDP) per inhabitant in purchasing power standard (PPS) by NUTS 2 regions of Bulgaria for 2011 (in percent of the EU–28 average, EU–28 = 100).

At the NUTS 3 level, the regional purchasing power discrepancy between the state capital and all the other regions in Bulgaria becomes dramatic. The capital region – BG411 Sofia City – was at the very top of the economic pyramid with GDP (PPS) per inhabitant in 2011 more than twice larger than the next region – BG412 Sofia Region – which is, in fact, its own hinterland (106% versus 52% of the EU–28 average GDP per inhabitant in PPS) (Fig. 6). No other region at that territorial level reached even 50% of EU's average per inhabitant.

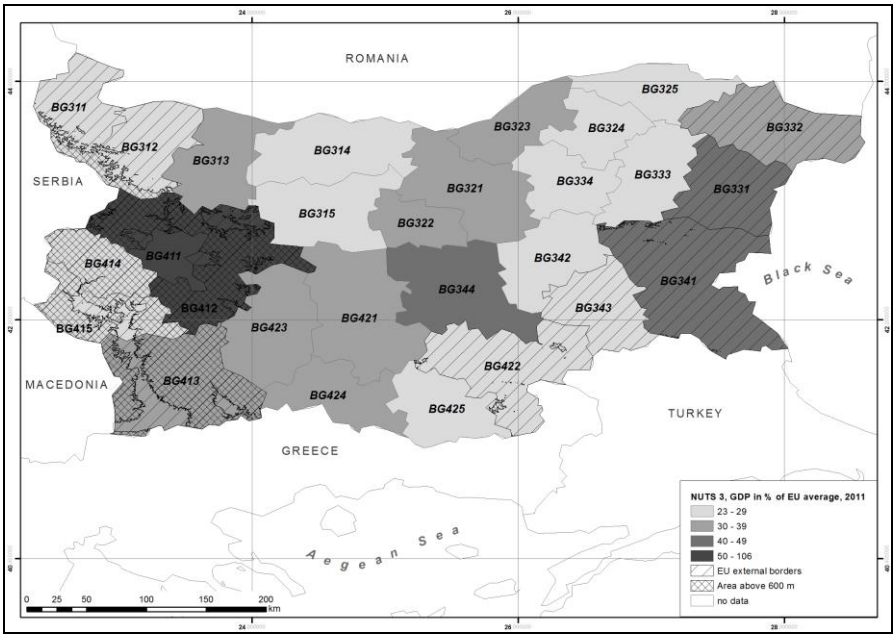

Fig. 6 – Gross domestic product (GDP), in purchasing power standard (PPS) per inhabitant in the border regions of Bulgaria that are also at the external boundaries of the EU, by NUTS 3 region areas above 600 m above sea level, 2011 (in percentage of the EU–28 average, EU–28 = 100).

The remaining NUTS 3 regions form Bulgaria's own deep periphery. The economic "powerhouses" (in PPS) at that scale of "small regions for specific diagnoses" (Eurostat 2015, a) are BG331 Varna (47% of the EU–28 average GDP per inhabitant), BG344 Stara Zagora (46%), and BG 341 Burgas (42%). The number of regions in the lower category – "30 to 39% of EU's average GDP (PPS) per inhabitant in 2011 – grows to nine: BG 421 Plovdiv and BG 313 Vratsa (38% each), BG322 Gabrovo (37%), BG323 Ruse (35%), BG332 Dobrich (31%), and BG413 Blagoevgrad, BG321 Veliko Tarnovo, BG423 Pazardzhik, BG424 Smolyan (30% each). The largest number – fourteen – of regions with very close indicator values build the bottom of Bulgaria's NUTS 3 regional economic power pyramid: BG324 Razgrad and BG315 Lovech (29% each), BG414 Pernik, BG334 Targovishte, and BG333 Shumen (28% each), BG343 Yambol (27%), BG314 Pleven and BG442 Haskovo (26% each), BG312 Montana and BG415 Kyustendil (25% each), and, at the lowest level, BG311 Vidin, BG325 Silistra, BG342 Sliven, and BG425 Kardzhali (23% each).

The location analysis of the Bulgarian NUTS 3 regions from the lowest economic category [23 to 29% of EU's average GDP (PPS) per inhabitant in 2011] also confirms the veracity of the overlap of peripheries paradigm. The majority of the economically least developed regions also constitute parts of that country's political geographic periphery, while the remaining regions in this category possess common borders with them (Fig. 6).

B/ EU External Borders Peripheries in Bulgaria

In an attempt to pinpoint and outline some of EU's "deep" periphery, i.e., the most vulnerable areas where peripheral qualities are most intensive, this research analyzes the overlap of economic and political peripheries at NUTS 3 level in the Bulgarian part of EU's external borders. The premise here is that, due to their distance from both the EU and the Bulgarian core regions, the border regions are disadvantaged and more susceptible to outside, unplanned, sometimes negative, influences. Often, such regions do not contain sizeable political centers, especially such of higher rank and key significance to the core. This section focuses on EU's external borders only and the case-study of Bulgaria offers both land and sea examples in this respect.

The Bulgarian part of EU's external border consists of two sections: A/ eastern and south-eastern, along the Black Sea and the border with Turkey, and B/ western, along the boundary with Serbia and Macedonia. Five NUTS 3 regions make up the eastern and south-eastern section of EU's periphery in Bulgaria, while the western section comprises six regions of this scale. Generally, the regions with access to the sea have a relatively higher purchasing power standard per inhabitant (30 to 49% of the EU–28 average GDP per inhabitant) than the landlocked western and southern regions (23 to 27%) (Fig. 6). Next to the capital regions (BG412 City of Sofia and BG412 Sofia Region), the Black Sea proves to be the single most important geographic factor for Bulgaria's economic development, more salient even than the size of the urban population factor, for example. The opportunities offered by the coastline, in terms of transportation, tourism and other sea resources-related activities, as well as the location of two NUTS 3 regional centers (BG331 Varna and BG341 Burgas), significantly augment the comparative political and economic position of the easternmost part of EU's periphery. As a result, while the three regions with sea access in the Bulgarian section (BG331 Varna, BG341 Burgas and BG322 Dobrich) still fall into the EU "deep" periphery category at this time, and their EU external border location is politically sensitive, they do not belong to the least-developed periphery.

The two southern regions, situated along the border with Turkey (BG343 Yambol and BG422 Haskovo), and the regions along the western Bulgarian section of EU's border exhibit the highest regional development needs at the NUTS 3 scale in the country. In 2011, the landlocked regions along the border with Turkey and the vast majority of the western EU border regions (BG311 Vidin, BG312 Montana, BG415 Kyustendil, BG414 Pernik, and BG413 Blagoevgrad) had the lowest purchasing power standard per inhabitant in the EU (23 to 30%) and constituted the best testimony of the deepest periphery (at the NUTS 3 scale), at the EU external borders (Fig. 6). Even the relative transport geography proximity of the Istanbul Megalopolis to the two southern regions has not proved to be a notable beneficial factor so far. The quite logical exception from this group of regions is the region surrounding the state capital. In terms of purchasing power standard per inhabitant in percent of the average EU–28 GDP, BG412 Sofia Region is just above the arbitrary 50% of the average EU–28 GDP deep periphery threshold. Additional and more detailed investigation should be carried out at the lower (LAU 1 and LAU 2) local scales that should include areas in Serbia and Macedonia in order to better understand the extent of the capital city's influence in the direction of the nearest state border.

While this investigation goal is to identify the most urgent regional development priority areas, it is important to note that the comparative analysis accurately exemplifies that Bulgaria's "deep" periphery at NUTS 3 scale is not located only in the proximity of borders. Its presence in other parts of the country demonstrates that neither the influence of borders in general, nor even the external EU border necessarily feature as sole determining factors in that respect. Naturally, real life situations depend on the unique and dynamic mix of factors, which is why regular monitoring at all territorial levels is necessary to secure an accurate understanding of the real state of affairs at a particular moment in time.

C/ Physical Geography (Mountain) Peripheries

Physical geographic types of periphery, and particularly mountainous areas, also plays a role in the formation of the deep periphery along the Bulgarian sections of the external EU borders at the NUTS 3 scale. To further understand the overall structure of the deep periphery, as well as to identify and describe its elements, specific to Bulgaria, this section first adds the mountainous periphery to the GIS-aided comparative analysis of the overlap of economic and political peripheries. Second, for the above reasons, this section also includes the local scale (LAU 1), which will make possible a more detailed definition of the deep periphery areas.

In their discussion of the regulatory framework of mountain areas development in Bulgaria, Koulov *et al.* (2015) point out the absence of a universally accepted definition of mountain, the differences in the world and Bulgarian scientific opinions on the height of the lowest contour of the mountain hypsometric belt, as well as the additional criteria to be used for mountain definition purposes. Since most regional development documents and many scientists in this country accept the 600 m above sea level elevation threshold, this investigation is also using it for its purposes.

The results of the GIS-supported mapping analysis show that almost all of the eastern/south-eastern section of EU's external border periphery in Bulgaria is situated below the 600 m contour line. Very small sized mountain areas – under 2% of the region's territory (National Statistical Institute) – are identified in the BG341 Burgas and BG422 Haskovo NUTS 3 regions, which necessitates taking the investigation to the local (LAU 1) scale to establish the real relevance of the respective mountain areas for the purposes of this study (Fig. 6). This stipulation is of even greater importance as far as the western section of EU's external border is concerned, albeit for different reasons. In this border section, mountainous areas largely prevail (77 to 100% of their territory is above 600 m above the sea) (National Statistical Institute) in four of the six NUTS 3 regions (BG413 Blagoevgrad, BG415 Kyustendil, BG412 Sofia Region, and BG414 Pernik) (Fig. 6). In order to accurately identify and outline only the "lowest" level periphery with highest regional development needs, the study focuses only on the mountainous local (LAU 1) level territorial units, which possess border sections that coincide with the state and EU external borders.

The shape of the region that surrounds the capital (BG411 Sofia City) is another reason that supports local level research. Mountain areas in this region extend so far away from the state border line that many local units cannot really qualify as a bona fide border periphery (Fig. 6). The proximity of the capital city – the largest political and economic urban area in Bulgaria – also adds indisputable evidence in favour of the need to take such studies to the local scale. In the case of the mountain areas of the much smaller-sized (11 to 15% of the total area, National Statistical Institute) northwestern regions (BG311 Vidin and BG312 Montana), the local scale of analysis allows also the evaluation of the economic impact of their location in respect to EU's external border.

The GIS-aided comparative scale analysis identifies 20 LAU 1 regions that are located at the EU external border and contain areas higher than 600 m above the sea level. Sixteen of them (VID25 Makresh, VID01 Belogradchik, VID37 Chuprene, MON36 Chiprovtsi, MON14 Georgi Damyanovo, SFO09 Godech, SFO16 Dragoman, PER51 Tran, KNL50 Treklyano, KNL29 Kyustendil, KNL31 Nevestino, BLG03 Blagoevgrad, BLG44 Simitli, BLG28 Kresna, BLG49 Strumyani, and BLG33 Petrich) are situated along the border's western section, while four (BGS12 Malko Tarnovo, BGS06 Sredets, HKV32 Topolovgrad, and HKV28 Svilengrad) – along its south-eastern part (Fig. 7).

The south-eastern regions will not be classified as mountainous for regional development purposes, since a really small share of their territory (less than 3%) (National Statistical Institute) is located at over 600 m above sea level. As far as most of the regions along the western EU external border section are concerned, namely VID37 Chuprene, MON36 Chiprovtsi, MON14 Georgi Damyanovo, SFO09 Godech, SFO16 Dragoman, PER51 Tran, KNL50 Treklyano, KNL29 Kyustendil, KNL31 Nevestino, BLG03 Blagoevgrad, BLG44 Simitli, BLG28 Kresna, BLG49 Strumyani, and

BLG33 Petrich, at least 40% of their territory is situated over the 600 m above sea level threshold (National Statistical Institute) (Fig. 7). Two regions along that section – VID01 Belogradchik, VID25 Makresh – possess shares of the area with mountainous characteristics of 32% and 12% respectively, but that situation still limits access to some of their resources and increases the costs of their utilization.

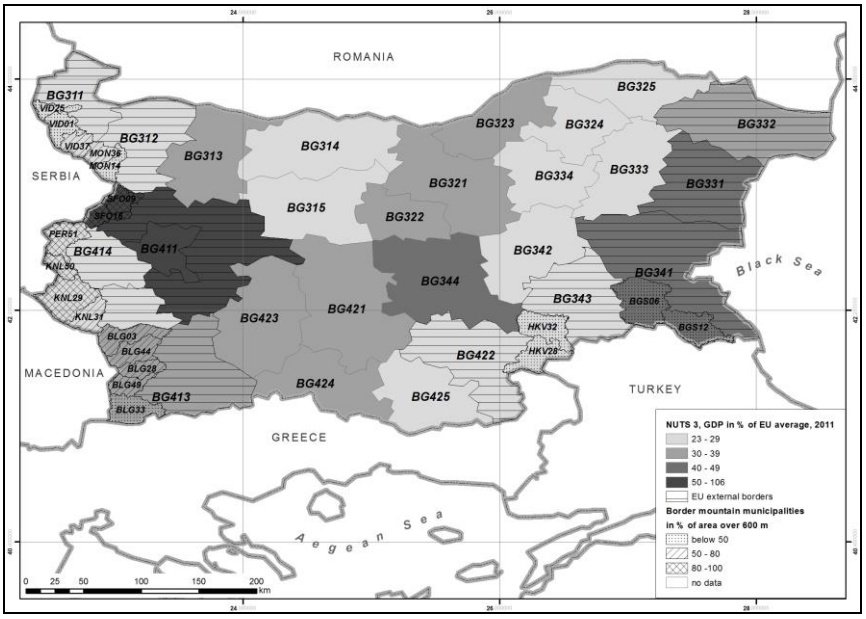

Fig. 7 – Gross domestic product (GDP), in purchasing power standard (PPS) per inhabitant in the border regions of Bulgaria that are also at the external boundaries of the EU, by NUTS 3 and LAU 1 mountain regions, 2011 (in percentage of the EU–28 average, EU–28 = 100).

The analysis results of the characteristics and structure of the peripheries' overlap areas along the western Bulgarian section of EU's external border identifies sixteen municipalities which are parts of EU's "deepest" periphery, in terms of their location, altitude, and level of economic development. Taking this analysis even further, to the LAU 2 territorial level, as well as widening its geographic scope to the rest of EU's deep periphery (e.g., Romania, Hungary, and Poland), would provide even better opportunities to assess the efficiency of the "peripheries' overlap" paradigm to support research, as well as EU and national regional development planning and decision-making. In the case of Bulgaria, the GIS-aided comparative analysis of different periphery aspects and scales proved its ability to identify and delineate deep periphery areas – regions that are in greatest need of development assistance. This approach enables better territorial targeting of development policy measures and is, therefore, of significant value to the practice of regional planning.

5. CONCLUSION

This study draws attention to the periphery of the European Union, which, during the 2007–2013 period, EU regional development policy targeted for development promotion under its Convergence Objective. This policy addressed all Member States and regions with purchasing power standard below 75% of the EU–28 average level of GDP per inhabitant on an equal basis, while the purchasing power standard in some of them figured below 50% in 2011. This investigation supports the proposition that "deep" peripheries, i.e., areas where peripheral qualities are most intensive, form in the areas where multiple peripheries of a different nature and scale overlap. Their identification should improve priority setting in EU regional policy planning and decision-making.

In view of the above, the investigation has identified the location and outlined the territorial scope of the contemporary EU core, as well as its peripheries. It concludes that EU's economic core has expanded in the last 25 years mainly to the northeast, while the Southeast and East European Member States contain the most sizeable parts of EU's deep periphery (20 NUTS 2 regions). Most of these states and regions are located along EU's politically most sensitive external borders.

Altitude, border location and other physical and human geography factors foster peripheralization of land areas. GIS-aided mapping and comparative scale analysis of economic, political and physical geography data across five scales (NUTS 0 through LAU 1) have proven to be efficient methods for the identification of deep periphery areas, which deserve the explicit attention of EU-level regional development decision-makers. The location analysis of the Bulgarian NUTS 3 regions from the lowest economic category [23 to 29% of EU's average GDP (PPS) per inhabitant in 2011] has also confirmed the veracity of the peripheries' overlap paradigm.

Mountain areas make up large and increasing parts of EU's periphery, especially in South-Eastern Europe. As such, they should become priority objects of EU regional development policy. Instead of supporting separate conventions for sustainable mountain development, the EU and the respective Member States should design a Mountain Regions Framework Strategy that relates to all mountains within the European geographic space. Such a document should motivate and support Member States to join the existing regional conventions for sustainable development of mountain areas (e.g., the Alpine Convention, the Carpathian Convention), and/or form new, area specific, agreements. The results from this investigation prioritize the foundation of a Southeast European Convention on Integrated Sustainable Development of Mountain Regions, which should incorporate at least the EU Member States that currently are not parties to a mountain convention, i.e., Bulgaria, Croatia, and Greece.

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REFERENCES

Brunet, R. (1989), *Les villes europeénnes: Rapport pour la DATAR*. Montpellier: RECLUS.

Hospers, G. (2003), *Beyond the Blue Banana? Structural Change in Europe's Geo-Economy*. Intereconomics, **2**, pp. 76–85.

Koulov, B., Nikolova, Mariana, Zhelezov, G. (2015), *Mountain Development Policies in Bulgaria: Practices and Challenges*, Koulov, B. and Zhelezov, G. (eds.), Sustainable Mountain Regions: Challenges and Perspectives in Southeastern Europe. Dordrecht: Springer (in print).

Koulov, B. (2013), *Mountains between Sustainability and Development: Managing Sustainable Development in Mountain Areas*. Ankara University, Journal of Environmental Sciences, **5**:1, pp. 87–93.

Nikolova, Mariana (2001), *Natural Hazards in Bulgaria*, Problems of Geography, **1–2**, Sofia: Prof. Marin Drinov, Publishing House of the Bulgarian Academy of Sciences.

Credit Suisse Global Wealth Databook (2013), http://www.international-adviser.com/ia/media/Media/, accessed on 11.01.2015.

European Blue Banana (2011), http://www.Eu-partner.com, accessed on 02. 01. 2015.

Eurostat, http://ec.europa.eu/eurostat/web/nuts/overview, accessed on 11.01.2015 a.

Eurostat, http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do, accessed on 11.01.2015 b.

Eurostat Regional Yearbook (2014), Luxembourg: Publications Office of the European Union.

National Statistical Institute, Bulgaria, http://www.nsi.bg/nrnm/, accessed on 11.01.2015.

The World Bank (2014), http://data.worldbank.org/topic/urban-development, accessed on 11.01.2015.

Regional Policy – Inforegio, http://ec.europa.eu/regional_policy/archive/policy/object/index_en.htm, accessed on 05. 08. 2015.

UN Food and Agriculture Organization (2011), http://www.fao.org/forestry/28810/en/, accessed on 04. 09. 2012.

Cybriwsky, R. A. (2013), *Capital Cities around the World: An Encyclopedia of Geography, History, and Culture*, ABC–CLIO, Oxford.

World Economic Outlook: Legacies, Clouds, Uncertainties (2014), International Monetary Fund, http://www.imf.org/external/pubs/ft/weo/2014/02/pdf/text.pdf accessed on 13.01.2015

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