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# Development differences between Central and Eastern European regions by country borders

## Abstract

Current study compares the economic development differences at EU NUTS 2 level of boundary regions of 5 countries: Austria, Slovakia, the Czech Republic, Poland and Hungary. There are several indicators, applicable for testing regional development differences, inter alia the regional GDP, unemployment rate, economic activity, industrial concentration and the rate of R&D. EUROSTAT and official statistical data of individual nations are being used in the analysis. The examined time interval expands from 2004 to present days, changes implemented since the EU expansion are being shown. The purpose of this study is the comparison of the regions in this area. If the developing differences are known, efficient strategies and regional politics can be set up. They can enhance economic development and support and may strengthen the cooperation and cohesion of regions.

**Keywords**: border regions, development differences, NUTS2 regions, R&D.
**JEL Classification**: R11, O18, O30.

## Introduction

This study compares regions next to the boarders of five Central and Eastern European countries, Austria, Slovakia, the Czech Republic, Poland and Hungary. This comparison is made in connection with the rate of development on the level of EU NUTS 2. Cooperation between these areas also has historical relevance, they have an impact on each other from the economic-social point of view and concentration of the automobile industry is common among them. Among entrepreneurs of the regions, cooperation is frequent and European Union

funds also support cross-border projects. This cross-border line is a dynamically improving region that shows industrial concentration in Central and Eastern Europe, which is proved by that in special literature this region is referred to as part of 'Central and European Blue Banana'.

When analyzing regional developmental differences, various indices can be presented, for instance, the situation of regional GDP, unemployment, employment, industrial concentration and proportion of research and development. Usually, data of EUROSTAT is used. The studied period lasts from 2004 until nowadays, changes since the enlargement of the EU are presented. In this study, the following regions are presented: Austria (Burgenland, Niederössterreich, Vienna), Slovakia (Bratislavky region, Západné Slovensko, Stredné Slovensko), The Czech Republic (Jihovychod, Strední Morava, Moravskoslezsko), Poland (Małopolska, Śląsk, Opolskie), Hungary (Nyugat-Dunántúl, Közép-Dunántúl, Közép-Magyarország).

The current study aims at comparing and introducing this area's regions, as via knowing developmental differences, such exact strategies, regional politics can be applied which assist economic development, cooperation and strengthen the regions' cohesion.

**Figure 1.** The investigated regions

## 1. Characteristics and configuration of border regions

This study aims at analyzing areas consisting of determined regions next to the borders. In order to study the chosen area, first of all, characteristics and specificity of the notion of configuration, characteristics of Central European configuration and historic relevance, shaping factors of the investigated area must be understood. According to the traditional understanding, the cross-border area is defined as an area where the existence of borders plays a significant part in connection with economy and society (Hansen 1983). Nowadays, rather that definition should be used that takes into consideration that the restricting role of borders has ceased in the European Union. According to Hardi (2008), we can regard those areas as cross-border which life is influenced by interactions maintained with neighboring areas, connections to cities and transportation, and social and economic characteristics of citizens also have impact on it. However, it highlights that while EU's inner borders ensure the safety of entering, differences in systems (administrative, national, public administration) regulating everyday life exist. Martinez's (1994) model summarizes interaction between border areas and differentiates the following four levels of the relationships: 1) alienated border areas, 2) border areas existing next to each other, 3) border areas mutually cooperating with each other, 4) integrated border areas. Regions investigated by us are situated between the third and fourth level, as relationship between the countries is friendly, cooperative, in more places it can be characterized by very strong stability, however, complete fusion in social and economic way has not happened yet.

In order to describe Europe's configuration, numerous models have been created, which mostly took centrum – periphery as their basis. Szabó (2009) has an overview of different improvement differences in his critic, summarizing work on various configurational figures such as the well-known golden triangle, the blue banana, red octopus and such configurational figures with talking names. One of the most well-known figures is the Blue Banana, the so-called core area of Western-European economic centrum, where GDP per capita is the highest in the region. Afterward, he presents the appearance of Central-European Boomerang (in other sources also named as Central European Blue Banana) as a configurational figure. After the transition Central European economy's improvement has increased, the economy of regions, capital cities which have had high infrastructure started to increase. Zone, which, from the north touches on Gdansk, Poznan, Wroclaw, Prague, Brno, Bratislava, Vienna and Budapest looks like its western partner in form, hence, the parallel. However, according to Cséfalvay (1999), The Blue Banana is far better, the territory's economy is far less improved, it

does not have such traditional roots and its cities do not have such strong connection (Szabó 2009) "Whether Central-Eastern Europe is only the periphery of Western economic centrum (Blue Banana)?" Asks Tagai (2004: 3.) in his study, where he examines Central and Eastern Europe's economic potential. The Central European force-field cannot be individually investigated; taking its wider area into consideration is also possible. The field strength of certain regions is not only characterized by their economic strength but also by their situation, position. Europe's central, core region can be equal to the territory of the Blue Banana, which inner part (central-European part) has extremely high potential (17 billion euro / / above km). Economic potential area continuously decreases from the edge of the core area, country borders significantly part the areas' strength (Tagai 2004).

Central Europe's transition, the ex-socialist countries' accession to the EU created numerous opportunities to weaken the borders' strict parting role. Connection of borders is especially thick in Central and Eastern Europe (Baranyai 2009). These Central European areas have maintained a strong relationship for centuries, their improvement was unimaginable without each other, most countries were part of the Habsburg Empire during the course of history (Tagai 2004).The Slovak-Austrian-Hungarian triple border's area, together with areas of Southern Czech Republic can be regarded as one of Europe's most developed area, first of all, because of central functions of Vienna and Bratislava. Regions situated here had already been centrum regions, developed areas in the Austro-Hungarian Monarchy. The latter two opinions are in opposition with Cséfalvay's (1999) thoughts interpreted through Pál Szabó, which holds that the Austrian--Hungarian-Slovak and Czech, Polish border regions (parts of the so-called Central European Boomerang) are only shadow projections of Europe's central regions and do not have traditional economic relations. Current study holds that viewpoint that the investigated area is a dynamically developed area, its cross--border relations' historical connections are significant, as for the future, it can expect further development and economic stability, which besides the automobile concentration it can thank to the cities.

City regions are important parts of the economy of the investigated border NUTS 2 regions. It can be a further research project to investigate the differences between city regions. The competitiveness of region depends on the cities located in them. Innovation, creativity are key factors of urban competitiveness. However the measure of innovation is difficult, it one of the most important leading factors of economic growth. Inventions and patenting activities effect on their regions not only through institutions and organizations but also through the networks in it. (Girard, Baycan, Nijkamp 2011) Several studies investigate innovation with quantitative indicators like number of patents, the amount of R&D

expenditures, the number of R&D institutions and workplaces, although the qualitative factors, for example, knowledge spillovers are not easy to measure. According to Florida (2005) cities attract the most innovative, highly educated "creative class". Other researchers have proved the fact that inventive activities concentrate in metropolitan areas because they integrate human capital and inventive organizations as an agglomeration (Romer 1990; Lucas 1998; Glaeser 1999).

## 2. Changes in the automobile industry

Central European area's industrial improvement took a big impetus after WW II; before that mostly agricultural production had been done. At the end of the 19th and the beginning of the 20th century, improvement differences revealed during the development of the nation states; the reason is different social-economic characteristics, for instance, the Czech Republic was an industrial center even at the time of the Austro-Hungarian Monarchy. During socialism, industrial employment increased in the whole area, mainly due to heavy industry (Hardi 2012).

In the automobile industry the production of cars was rather low; it mainly started to increase from the 1950s. Automobile production created relationships in the given national economy. Besides specialization appointed by CMEA, nations strove to increase their own opportunities in the market. Production of autobuses was mainly the characteristics of Hungary, but it also appeared in the Czech Republic. Development of car and truck capacities also started in the socialist countries, however, they also proved to be missing products. Nowadays, assembly factors of the automobile industry are concentrated in a given area, in Northern Transdanubia, Western part of Slovak, Central, and Eastern part of the Czech Republic and Southern regions of Poland. The region bears good logistical infrastructure and relations (Hardi 2012).

**Table 1.** Automotive factories in the investigated regions

| Settlements | Regions | Factory | Start of production | Product |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| *Czech Republic (together 11 autobomile factories)* | | | | |
| Koprivnice | Moravskoslezsko | Tatra | 1990 | car, truck |
| Nosovice | Moravskoslezsko | Hyundai Motor Manufacturing | 2008 | car |
| Trebic | Jihovýchod | Tedom Divize Bus | 1990 | bus |
| *Poland (16 autobomile factories)* | | | | |
| Bielsko-Biala | Śląskie | Fiat-GM Powertrain | 1990 | motorgyártás |
| Gliwice | Śląskie | General Motors Manufacturing Polan / Opel Polska | 1998 | car |
| Niepolmice | Małopolskie | MAN Nutzfahrzeuge | 2007 | truck |
| Tychy | Śląskie | Fiat Auto Poland | 1990 | car, motorgyártás |

**Table 1 cont.**

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| *Hungary (4 autobomile factories)* | | | | |
| Esztergom | Central Transdanubian | Magyar Suzuki Zrt | 1991 | car |
| Győr | Western Transdanubian | Audi Hungária Motor Kft | 1993 | car, motorbike |
| Szentgotthárd | Western Transdanubian | General Motors Powertrain – Hungarian Automobile Industry | 1991 | motorbike |
| *Slovakia (altogether three automobile industriea)* | | | | |
| Bratislava | Bratislavský region | Volkswagen Slovakia | 1991 | car |
| Nagyszombat (Trnava) | Západné Slovensko | PCA Slovakia (PSA Peugeot, Citroen) | 2006 | car |
| Zsolna (Zilina) | Stredné Slovensko | Kia Motors Slovakia | 2004 | car, motorbike |
| *Austria (togerther 4 automobile factories)* | | | | |
| Vienna (Wien) | Wien | Opel Wien Gmbh | | car, motorbike |

Source: Based on Dusek (2012, p. 285)

The second figure shows that the concentration of the automobile industry is high in the studied areas, as more automobile companies from certain countries can be found in the given areas. Numerous factories placed their seat to Central and Eastern countries after the transition, but the number of automobile factories has increased after the accession to the EU. Competitiveness of regions with the automobile industry (according to a study based on NUTS 3 level) "generally significantly exceeds regions without automobile industry" (Dusek 2012, p. 288) The unemployment rate is lower in these areas, the capability of making income is higher, economic activity is significant.

## 3. Cross-border cooperation

The EU's background regions can also be regarded as areas of economic, historical and social problems, conflicts. Falling together of the cross-borders and periphery is a specific issue, mainly in underdeveloped areas. However, with enough cooperation, appropriate usage of EU improvement funds, border regions can turn them into mutually advantageous improvements. Baranyai (2009) understands such regions that can do a lot for the closing down of peripheral nature, lessening improvement differences, and strengthening integration as eruption points. Institutional models of cross-border cooperation in Central and Eastern Europe only started to organize after the transition, while in Western Europe this can lead back to the formation of Economic Community. Helping cross-border cooperation is one of the EU's main priorities; it makes the long--term cooperation of the regions possible, which can be an answer to local economic and social problems. However, programs also have hindering factors,

such as the absence of appropriate scope of authority at local level, central governance's role is too significant, absence of professional knowledge – writing tenders, knowledge of cross-border cooperation possibilities) (Pintér 2010). Those regions that expect happiness from EU funds and only aim at actual objectives of development policies, couldn't improve their position. Those regions can be successful which not only concentrate on traditional development policy trends, but also put emphasis on innovation, business services, modern industrial organization, improving human resources (Horváth 2004). Hence, cross-border organizations have a significant role in regional improvements and vanquishing regional inequalities. Interregional organizations have three types (Baranyai 2009):

1. Work community – less integrated, looser organization.
2. Euroregion – wide cooperation which crosses national borders:
   a) model of greater regions – cooperation of regions, provinces, counties, crossing borders (trans-border),
   b) model of smaller regions – cooperation of counties, subregions, and towns.
3. Short-term, project-like cooperation between settlements – ad hoc, casual cooperation

The cooperation that affects more Central European countries, mainly bigger, regional cities is the cross-border initiation, called Centrope (Central European Region). Its main objective is improving regions' competitiveness. Participants: Austria (Vienna, Southern Austria, Burgenland), the Czech Republic (regions of Southern-Morava), Slovakia (Bratislava, regions of Trnava), Hungary (Győr-Moson-Sopron and Vas counties), and other significant cities like (Brno, Eisenstadt, Győr, Sopron, Szombathely, St. Pölten). Centrope's projects aim at supporting the following four areas:

- Knowledge regions: creating an economy based on knowledge, assisting cross--border cooperation between students, researchers, supporting research and development. Main objectives are supporting innovation, helping research cooperation, energy efficient economy, improving mobility, biotechnology, spreading and improving informational and communicational technology.
- Human resources: improving, creating training, creating basis of knowledge and information, helping cross-border cooperation of civil organizations, creating 'mutual labor market".
- Regional integration: creating a transportation and logistics centers, environmentally friendly lead of transportation, supporting maintainable development of cities and administrational merging and harmonizing in order to make regions stronger.
- Culture and tourism: cooperation of touristic networks, creating an identity, promoting cultural products. (Centope Strategy 2013).

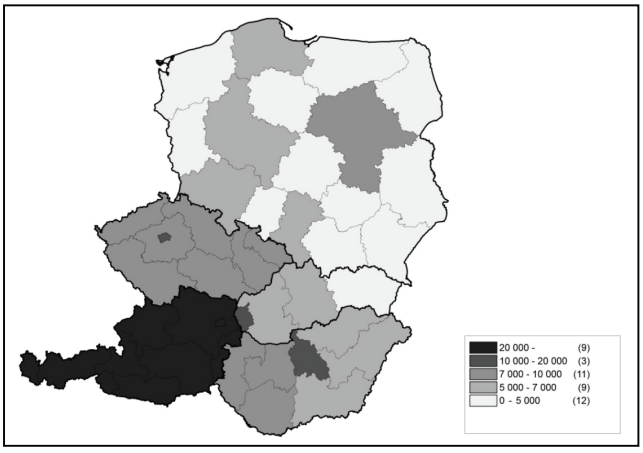
It is clear that Centrope cooperation not only aims at realizing objectives of development policy but also regional integration, creating a mutual identity, an economy based on knowledge besides conserving cultural values and supporting civil cross-border relations.

## 4. Developmental differences

This part represents developmental differences in the investigated areas, after the accession to the EU. It is obvious that the chosen Central-Eastern European countries, among them mainly the ex-socialist countries, transition influenced their economy the most, however, EU accession can be regarded as crucial to their improvement. The region is investigated at the level of NUTS 2, the reason is the accessibility of regional data. On the level of NUTS 3 and on lower levels enough number and type of Eurostat data are not accessible, countries' national statistics shows deficiency and deviation. We do not regard investigation on the level of NUTS 1 good enough either, as it would present regional differences less accurately. The presentation of the investigated areas in itself would be inadequate, hence, we find it important to compare the regions not only to themselves, but also to other parts of the countries where regions are situated.

In order to present regional differences, first of all, change of GDP shall be studied. Values are given in parity of purchasing power in order to avoid comparability and inflation impact. The second graph clearly shows that the most developed regions are in Austria, with GDP higher than 20,000 euro per capita. Regions of capital cities emerge with numbers of 10,000-20,000 euro per capita, which clearly shows the industrial and social concentration.

**Figure 2.** Regional GDP per capita in PPP in 2004

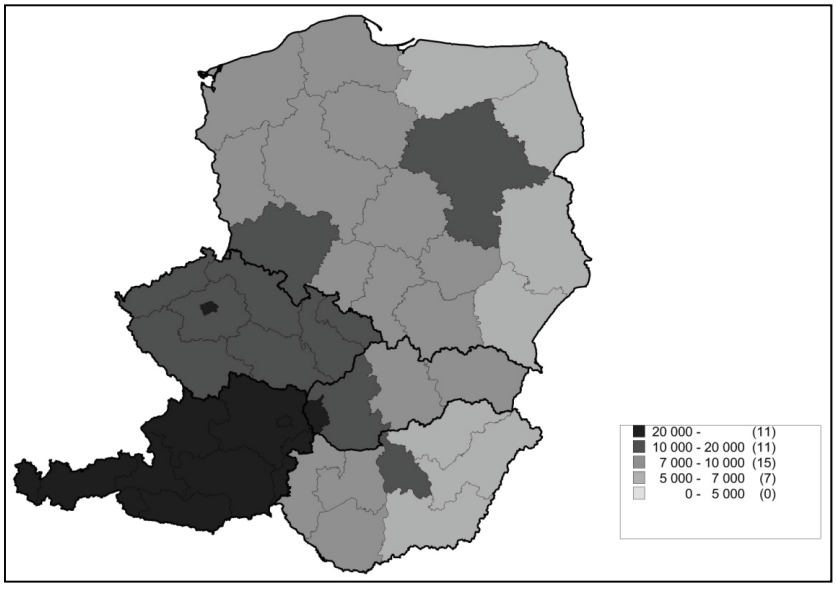



Source: Data based on Eurostat (2013).

The least improved areas are in Poland and the Eastern Slovak Republic. All in all, GDP per capita decreases towards the east while regions of capital cities are exceptions. The interrupting strength of border lines also reflects in the case of the Czech Republic, where regions with similar economic development are parted from the economically stronger Austria, Slovak Republic and Poland.

About the chosen border regions it can be concluded that Austrian ones are far better than other countries, moreover, the region that includes Budapest and Bratislava also emerges from the others. The Czech and the two Hungarian Transdanubian regions have similar numbers of GDP per capita, it is between 7,000-10,000 Euros. The non-capital city Slovak regions and the Polish region (Śląsk)'s development is similar, it is between 5,000-7,000 Euros. The other two Polish regions were the least developed ones in 2004. In the region of Śląsk, the automobile industry is the cause of the development. We investigated changes between 2004 and 2010, based on this, economic situation improved in the region compared to the beginning. In spite of the 2009 economic crisis, GDP per capita is higher everywhere, except Hungary (Fig. 3). Austria further increased its economic productivity, it shows even higher results. Emerge of the regions of capital cities is still significant, Prague, Warsaw and Bratislava also increased its position compared to 2004. The greatest change occurred in Poland and the Slovak Republic, the previously lagging Polish regions developed economically and the most underdeveloped Slovak eastern region also started to catch up.

**Figure 3.** Regional GDP per capita in PPP in 2010 (Euro)




Source: Data based on Eurostat (2013).

A western-eastern periphery can be seen in the economy of the Slovak Republic, Poland, and Hungary, as moving towards the east, GDP per capita decreases (regions of capital cities are exceptions). We can also say about the investigated areas that the Polish regions showed the greatest change, all the border regions' GDP per capita is now between 7 and 10,000 euro. In the Slovak Republic, the area of Bratislava has already reached the 10,000 DPG per capita while its second most developed area (Západné Slovensko) exceeds the 10,000 GDP per capita. The fact that in spite of the economic crisis, more regions' economy could improve can be explained with the introduction of the Slovak euro, increased foreign flow of working capital, boom of the Polish industry and further strengthening of the Czech economy.

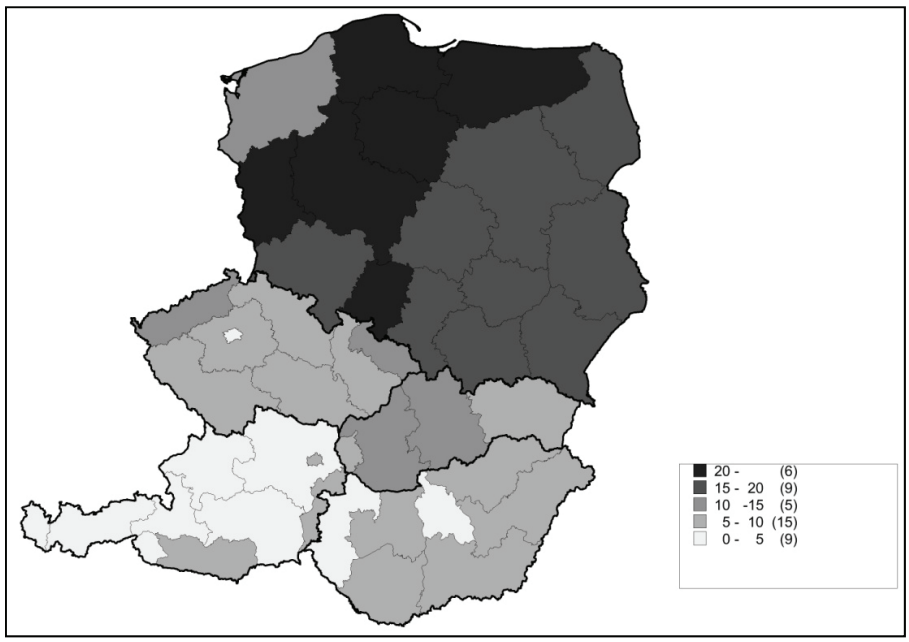
Now, we investigate another important indicator that shows economic advancement, this is being the unemployment rate. We investigate it in connection with the regions, countries than the chosen border areas between 2004 and 2009. Eurostat does not have newer data for more countries after 2009, hence, it is obvious that recession after the economic crisis will be perceivable and boom after 2010-11 and after that cannot be seen in the data.

Unemployment rate showed mixed results in 2004 in Central-Eastern European countries. All in all, the lowest unemployment rate was in Austria, but the number was under 5% in the regions of Western-Transdanubia and Central--Hungary. The region of Prague also emerged with regards to the low unemployment rate. Poland had the highest unemployment rate, it numerous regions it was above 20%. It is interesting that, for instance, a capital city region, Vienna has higher unemployment rate than the neighboring lower Austria. The tendency of unemployment increases towards the north. Border area investigated by us also shows mixed results.

By 2009, a significant change can be seen in the system of unemployment, the biggest change here as well, is also produced by Poland. Thanks to its economic boom, number of work places significantly increased, the unemployment rate was everywhere below 20%.

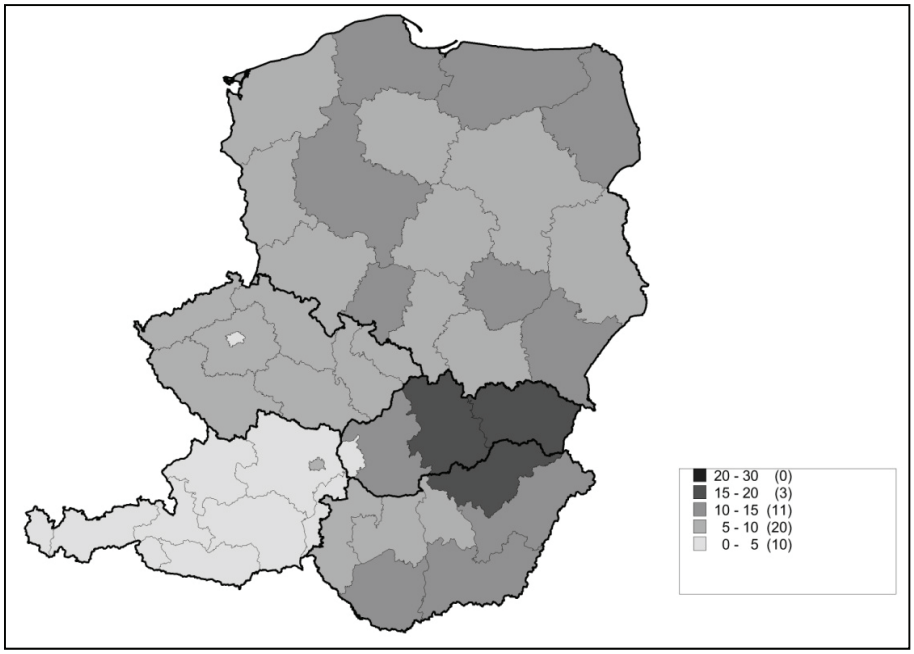
The highest unemployment rate can be seen in the regions of Central-Easter Slovak and Northern Hungary. All in all, in the investigated regions employment is favorable, in Burgenland, Southern Austria, and Bratislava unemployment rate is under 5%, in the investigated regions of Hungary and the Czech Republic it is between 10%-15%, which is not a bad number in the years of the crisis. There are two regions between 10% and 15%, the Polish Opolskie and Western-Slovak (Západné Slovensko). Only Central-Slovak has lower results in the chosen area. The low rate of unemployment can be the result of the automobile industry, with one exception, Burgenland, where first of all agriculture is significant.

**Figure 4.** Unemployment rate in 2004 (%)



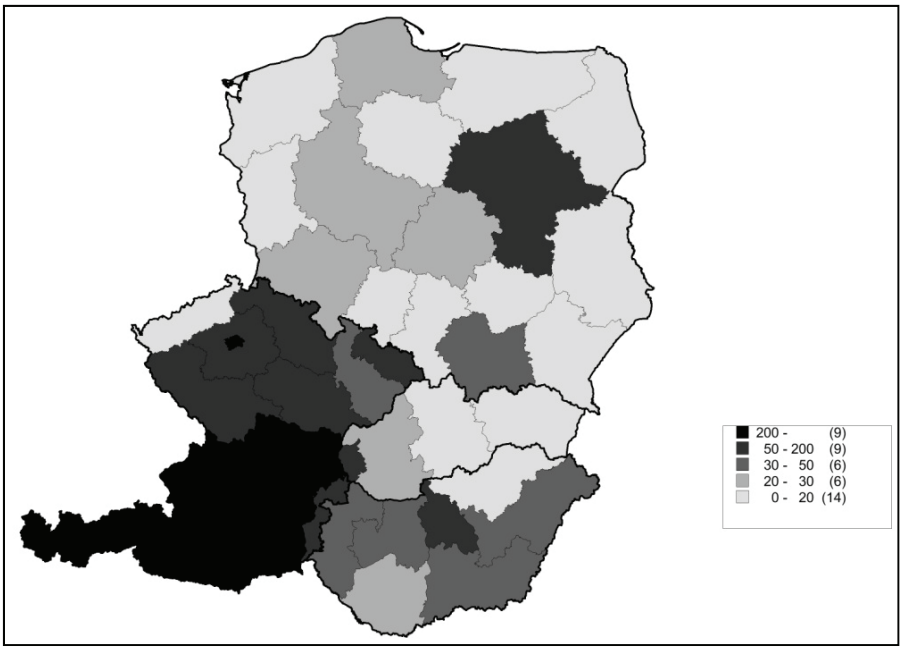

Source: Data based on Eurostat (2013).

**Figure 5.** Unemployment rate in 2009 (%)



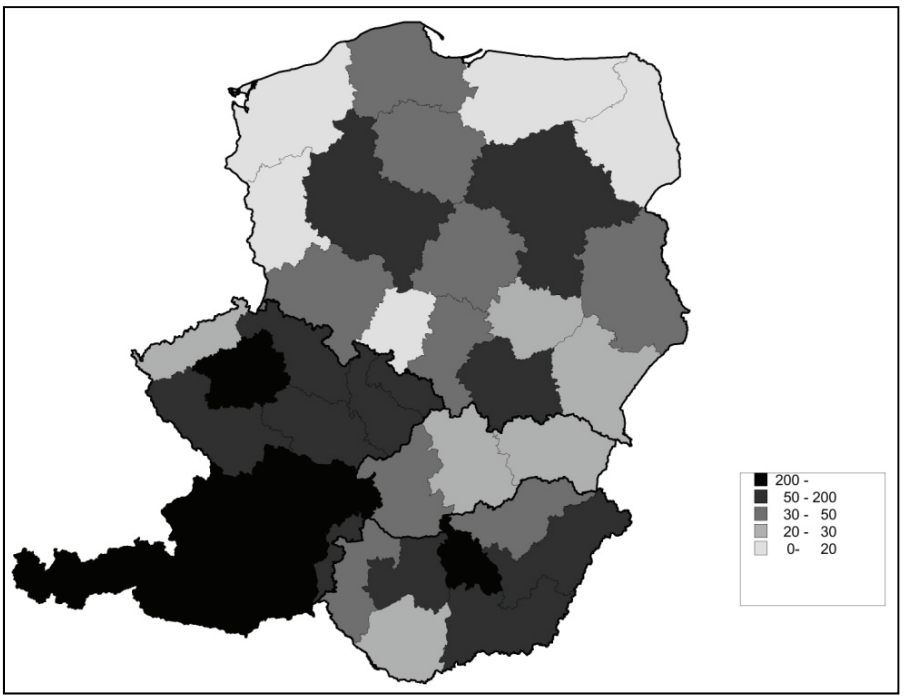

Source: Data based on Eurostat (2013).

**Figure 6.** R&D payment per capita in 2004 (Euro)




Source: Data based on Eurostat (2013).

**Figure 7.** R&D payment per capita in 2009 (Euro)




Source: Data based on Eurostat (2013).

The current study also investigates the amount spent for research and development in the region. The data shows that it is the highest in Austria, in other countries mainly the capital cities' R+D numbers are the strongest. Those regions that have already spent a lot, about 200 euro per capita in 2004, also had high numbers at the end of the studied period. Prague and its region and Bratislava also have more expenses by the end of 2009. In the investigated areas, R+D expenses decreased in the Western Transdanubia, and also in the Czech Republic. Regions with automobile industry should support R+D more; the decrease can be the result of the economic crisis. More cross-border cooperation programs, such as Centrope also supports innovation and research.

## Conclusions

The current study had an overview of the characteristics of border areas, economic indicators, and developmental differences in Central and Eastern Europe. A country's border regions belong to margin areas or a dynamically improving region via their location. In our case, the latter, advantageous situation prevails, as southern Hungary, Eastern Austria, regions of Western Slovak Republic, Eastern Czech Republic and Southern Polish areas are parts of an economically stable, improving area with significant automobile industry. Economically, and socially, numerous cross-border cooperation programs, projects help further integration. EU accession can be regarded as a stage in an investigated area's life. Numerous economic indicators have improved since 2004, GDP per capita, all in all, increased, unemployment decreased. Favorable improvement of employment is mainly the result of the automobile industry, however, the service sector is also significant. Even economy, that was on the top in 2009 could not hinder the areas' improvement in such rate that economic indicators would have been significantly and continuously low. Unfortunately, Hungary mainly stagnates and decreases, while the region of Western Transdanubia and the capital city's concentrated industry cannot compensate this recession back. Besides supporting cross-border cooperation, helping dynamic cities' cooperation and broadening automobile industry's relations, programs helping openness and collaboration should be organized for the society, further improvement and development of regions could be enhanced via this way.

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