Sectoral background of urban–rural economic development inequalities in Visegrad Countries

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Abstract

Despite of a long-run convergence process at community level – what is appearing in case of more traditionally determining space parameters such as North–South, West–East or Centre–Periphery as well – significance of urban–rural differences is increasingly being appreciated in recent economic pattern of the European Union. The widening of urban–rural development gap is particularly characteristic of dynamic closing-up East Central Europe where cities have become real engines of the economic growth of their countries being the real winner elements of space structure after transition and EU-accession.

A remarkable divergence can be observable in more rapidly developing, emerging countries where initially only the dynamic centres are able to catch up to the European competition. The eight examined cities of the four Visegrad Countries are at least more than two times more developed as compared to their national average level of per capita GDP while except for these cities it could be hardly found any regions of the examined area over the national average development level.

In the more intensifying interregional competition affected by European integration and globalization the traditionally more wealthier cities became more advantageous position with their agglomeration advantages, developed infrastructure, excellent position in transportation and informational networks, more qualified labour force what means determinant location factors for headquarters of TNCs. While post-socialist cities could join the European city competition resulted intensive tertialisation and turning pale of their former industrial importance while even industry is becoming the most dynamic-generating sector as significant inequality factor among rural regions

Key words: East Central Europe GDP growth urban–rural inequalities sectors

JEL Classification: R11

1 Introduction

At the turn of the millennium one of the most spectacular European economic trends is the rapid economic growth of the cities of East Central European countries. This leads to dual consequences for the European space structure. On one hand the economic inequalities are gradually decreasing between West and East within the city network of the European Union. On the other hand in East Central Europe the urban–rural dichotomy have become more and more determinant factor of the regional processes. Although all of the four Visegrad Countries are

characterized with the West–East development slope, the biggest winners of the transition are the cities instead of the Austrian or German border regions.
This survey would like to answer on one hand what kind of development attributes cities have in East Central Europe, weather is there any connection between the degree of urban–rural development duality and the overall development of a country in static or dynamic sense. The answers try to prove the Williamson's hypothesis. After measuring the urban – rural inequalities, it is a following question what is the role of inequality factor in the overall regional development pattern of the Visegrad Countries. Finally the survey aims to reveal the sectoral background of the development differences between cities and rural regions of the four Visegrad Countries.
This survey considers those settlements as cities, which have over a half million residents. The only one exception is Bratislava, although the number of its population doesn't exceeds this critical limit, the Slovakian capital plays a similar functional role within the space structure of its country like the other East Central European cities. Thus altogether eight cities are examined from the Visegrad Countries, Czech Republic, Hungary and Slovakia are represented by only their capitals, however, in case of polycentric Poland additional four cities (Cracow, Łódź, Poznań and Wrocław) got into the survey beside Warsaw.
Although state of economic development is a complex concept, in this case economic development inequalities are measured only with only one variable, namely the per capita GDP at current market prices in euro. Time series of harmonized GDP at NUTS 3 regional level were available for the period 1995–2004 from the website of Eurostat [1], what defined simultaneously the time frames of the survey. The NUTS3-level database is suitable for comparing the cities, because these cities, expect for Bratislava, form themselves own units of the regional divisions.

2 Cities as outstanding points of the East Central European space structure

2.1 Measuring urban–rural duality

Cities and rural regions of Visegrad Countries aren't affected by the same development impulses at the turn of millennium. It's a general regularity (according to Williamson's hypothesis) that the more developed centres are usually able to take firstly advantage of the opportunity at the initial stage of catching up resulting an increase of regional disparities for a while. [2]
Cities are considered as more developed elements of space structure in all member states of the European Union, however, their economic advantage related to the rural[1] regions surrounding them differs from country to country. For measuring urban–rural duality in economic development urban–rural duality index (D_{ur}) is used according to the following formula:

$$D_{ur} = \frac{\bar{X}_u}{\bar{X}_r}$$

where x_u means the average per capita GDP of cities in a country and x_r means the average per capita GDP of rural regions in a country. The most marked urban–rural dualities are observable from the newly accessed, dynamic closing-up member states of East Central Europe. In case of

[1] In present survey rural regions are considered as the whole complementary territory outside NUTS3 regions of cities. It means that all NUTS3 regions count for rural regions except for the cities. So regions of cities and rural regions cover together the whole surface of the examined four Visegrad Countries.

the whole European Union (with 27 member states) in 2004 per capita GDP of cities was 1.5 times higher than per capita GDP of rural areas, in Visegrad Countries the advantage of cities was 2.5 times.

The uncommon importance of the urban–rural dualism in East Central Europe can be observable not only by that the overall degree of urban–rural dualism is higher in the examined group of countries that the European Union average, but by the rank of the Visegrad Countries in the order of the extent of the urban–rural dualism in individual member states of the European Union. Although among the 27 member states the most significant contrast between cities and rural areas was observable in Latvia[2], the also newly accessed Baltic state is followed by the Visegrad Countries. Per capita GDP of Bratislava was 2.7 times higher than the Slovakian rural average, for Budapest it was 2.6 times, for Prague 2.4 times and the average development level of Polish cities was 2.3 times higher according to the rural average level of their country.

The example of Poland having more than one city gives shows that especially the capitals among the cities have outstanding economic development state from the other regions. This is proved by the relative backwardness of Polish rank in the order in comparison with the other three monocentric East Central European countries. Discounting the other four Polish cities following Warsaw the capital has got more than three times higher per capita GDP in relation to the Polish rural average[3] vale. According to this calculation even Poland shows the most significant urban–rural dualism among the 27 member states of the European Union. In the former socialist bloc the capitals of the Visegrad Countries have the biggest chance to integrate to the European city network, however, some expert [3] adds that Bratislava with its relative smaller size is at some disadvantage compared to its Central European competitors. The advantage of the three capitals of the Visegrad Countries in contradiction to other post socialist capitals is similarly underlined by Bourdeau-Lepage. [4]

2.2 Relationship between economic development and urban–rural duality

According to the Williamson's hypothesis highest, ripe stage of development is characterized with smaller regional inequalities. As it could be seen before in case of urban–rural dualism the highest values characterize especially the underdeveloped, but rapidly closing-up East Central European Countries, while development differences between cities and rural regions are higher in the more developed older member states[4]. Coefficient of Pearson's correlation ($r = -0.7$) calculated between the state of per capita GDP and the urban–rural duality indexes of the EU member states for 2004 give evidence of relationship between economic development level and the urban–rural economic duality, thus Williamson's hypothesis has been verified.

Urban–rural duality is very characteristic in Visegrad Countries not only from static but also from dynamic point of view, what could be observable by the time change of this duality. According to the evidence of time series for the period 1995–2004 the urban–rural duality has strengthened to a higher extent in even those former socialist countries, which had initially higher values, while in case of more developed countries with lower initial value the extent of increase was slower as well. Relying upon these findings it is verifiable that the real winners of the European integration are the cities in East Central Europe.

[2] In 2004 per capita GDP of Rīga was almost three times higher than the Latvian rural average.

[3] In this case rural average includes also the Polish cities without Warsaw.

[4] Among the older member states of the integration Belgium is the one country, where average development level of cities (Brussels) is more than 2 times higher than the average of rural areas.

Therefore in Visegrad Countries divergence can be perceptible usually for the advantage of metropolises, which can get stronger development impulses by the intensified globalization. Although the process of globalization has undoubtedly several deleterious socio-economic and cultural effects, a huge number of publications underline that it is beneficial to the development of a city network [5, 6, 7, 8], of which main winners are the so-called world cities [9] or global cities [10]. The turn of the millennium provides cities with a new kind of possibility, a new chance for development. In a globalizing World success of cities depends on how they can integrate a world-wide city-hierarchy. [11] It is especially marked in case the capitals of Visegrad Countries, but the other cities are getting conspicuous among their neighbouring rural regions too.

The traditionally more developed cities have more advantageous position in the intensified interregional competition by European integration and globalization processes. Cities, especially capitals could easier adapt themselves to the new challenges. Due to their agglomeration advantages, more developed infrastructure, excellent situation in transportation and communication networks and more skilled manpower cities are preferred by multinational companies locating their headquarters to the optimal place. "Centres of firms and regions generate spatial agglomeration processes. The existence of a given spatial agglomeration, or the promoting factors even in themselves mean determinant locating factors." [12] All of this could lead to increase of polarization tendencies in space structure for the benefit of almost exclusively the cities. This progress causes provisionally a break in the structure of urban hierarchy. The question is not only that some cities are able to regenerate or begin to develop rapidly by globalization but also that stages following these cities in urban hierarchy fall considerably behind, decline. Therefore diffusion of growth temporarily doesn't function within urban hierarchy." [13]

The results of another correlation analysis shows that relationship is also strong ($r = 0.7$) between economic growth of countries (measured with change of per capita GDP for the period 1995–2004) and the change of urban–rural duality index (for the same period) in case of 27 member states of the European Union. This process probably already began before the year of 1995 considered as basic year in this survey, because the order of member states was the same in the mid 1990s (although the factual values were smaller than the recent ones).

It is generally true that the more rapidly developing, catching-up countries polarize to a higher extent, because at the beginning of the take-off period in the East Central European countries only the dynamic centres are able to catch up to the European competition, what makes them the winner elements of the space structure after the transition. The rapid economic development punctually, spatially selectively proceeded, while closing-up of the "hinterlands" could succeed just on further stages of development.

The cohesion policy of the European Community, although to a smaller extent then the spontaneous market processes, prefers principally also to cities. Recently more and more attention is given to the so-called trade-off theories [14], opposing the change of convergence at national level to the community level. It is provable that cohesion policy of the European Union hampers the lowering of regional inequalities within poorer countries. For example the expenditures of Cohesion Fund with aiming the closing-up of Spain among other countries were considerably favourable to some cities (Madrid, Barcelona) resulting an increase in inequalities within the countries. "Spain's national growth path in 1980–96 was driven by the particularly rapid growth of some regions with the highest levels of per capita income, particularly Madrid and Cataluña." [15] As only a few cities realize real dynamic, closing-up of the poorer countries

leads to polarization within these peripheries especially in the urban–rural relation. So the community-wide convergence tendency is supplemented with a divergence process within the Visegrad Countries.

2.3 The role of urban–rural inequality in total regional inequalities

Degree of differences between cities and rural regions in a given country does not necessarily mean attend the importance of this type of inequality factor in the development pattern of the country. Sometimes other factors (for example traditional separating lines, west–east or north–south development slope, center–periphery dichotomy, distance from the seacoast) are much more determinant in the regional inequalities. In case of remarkably polarized countries the significant urban–rural inequality might not play important role in the overall regional inequalities, another time a very low degree of urban–rural inequality is able to determine the development pattern of a homogenous country. Thus the concept of urban–rural inequality must be distinguished from its role in regional inequalities.
The role of urban – rural inequality in overall regional inequalities can be empirically defined with a quotient of Hoover indexes (also known as dissimilarity index) calculated at two different levels. One of the Hoover indexes (H) is used for measuring overall economic inequalities at level of NUTS3 regions according to the following formula:

$$H = \frac{\sum_{i=1}^{n} |x_i - f_i|}{2}$$

where n means the number of regions at NUTS3 level (n = 87 for Visegrad Countries), x_i means the share of "i" region of the total GDP of the country and f_i means the share of "i" region of the total population on the country. The other Hoover index (H_{ur}) is used for measuring urban–rural inequalities. The formula of this Hoover index is the same as the previous one, however, the number of territorial units is less (n = 2). One of these units is the aggregate of the eight cities and the other unit is the aggregate of 79 rural NUTS3 regions.
Finally the role (R_{ur}) of urban–rural inequality within the overall regional inequalities can be calculated by definition the Hoover index calculated at urban–rural level (H_{ur}) in relation to the Hoover index calculated at the level of NUTS3 regions (H) according to the following formula:

$$R_{ur} = \frac{H_{ur}}{H}$$

In 2004 the eight cities had a share of 12 percent in the total population of Visegrad Countries, while their share was 26 percent in GDP. This advantage of cities strengthened further for the examined period 1995–2004, because their economic share increased by three points, however, their population share scarcely changed (in fact it decreased to a small extent because of the bad demographic state of cities). The increase of the difference between the GDP and population share is expressed by the time series of the values of Hoover-index calculated at urban–rural level (H_{ur}). These figures grew from 10 percent to 14 percent for the period 1995–2004.
For the same period the regional inequalities among NUTS3 regions of Visegrad Countries grew as well. Value of Hoover-index calculated at level of the 87 NUTS3 regions (H) increased from

29 percent to 34 percent for the period 1995–2004. However, this increase was slower than the increase of Hoover-index values measured at urban–rural level (H_{ur}). As a consequence while in 1995 urban–rural inequality (H_{ur}) equalled with more than one third – 34 percent – of the total regional inequalities (H), in 2004 it grew to 40 percent, what is considerable very spectacular regarding the shortage of the passed period of a hardly one decade.
The length of the columns (the darker lower and the lighter upper parts together) on the diagram (Fig. 1.) shows the regional inequalities within member states measured at NUTS3 level (H). From this the darker lower parts of the columns indicate the urban–rural inequalities (H_{ur}) characterized the member states. Visegrad Countries are generally characterized with regional development inequalities to a somewhat higher degree, but the real speciality of the examined four East Central European countries is that the bulk of their regional inequalities (H) arise from the development inequalities between their cities and rural areas (H_{ur})[5]. In Czech Republic the value of Hoover-index measured at NUTS3 level totally equals with the value of Hoover-index measured at Prague–rural relation (R_{ur} = 100 percent), but in Slovakia and Hungary the urban–rural inequality amount to near the whole (R_{ur} = 98 and 94 percent) of the total regional inequalities as well. In case of Poland almost one fifth of the total regional inequalities are derived from the urban–rural inequality. From this point of view Poland lags behind from the other three Visegrad Countries, but it counts still as a high value in comparison with all member states of the European Union.

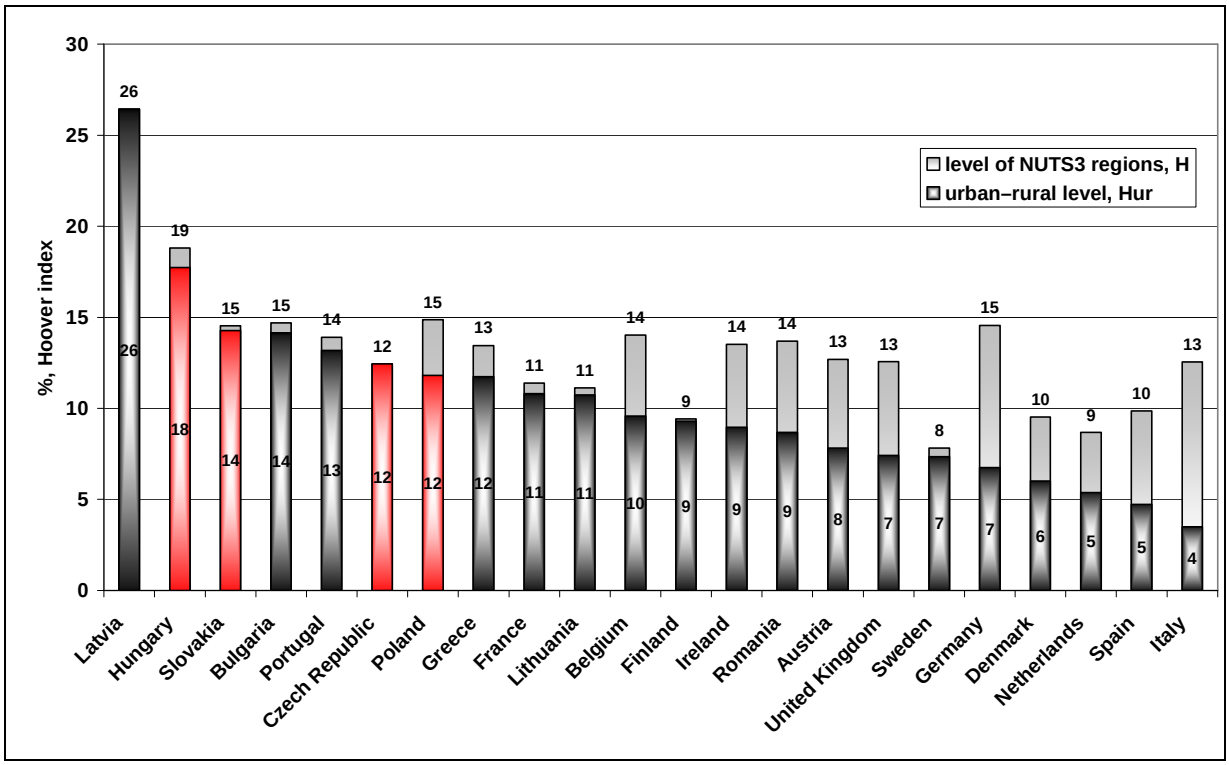

Fig. 1. The degree of urban–rural inequality in proportion to the overall NUTS3 level regional inequality in member states of the European Union, 2004
Source of data: Eurostat

[5] Germany, Italy or Romania are also characterized with more significant regional development inequalities, however, it their cases this doesn't imply urban–rural inequality to the same high extent.

The value of the Hoover-index used for measuring urban–rural inequality (H_{ur}) is basically determined by that how many cities and rural regions exceed the average development level of their countries. The map (Fig. 2.) indicates the position of cities and rural regions related to the average per capita GDP of their countries. While the average values of countries differ from state to state, the same color means another concrete development level in case of each country.

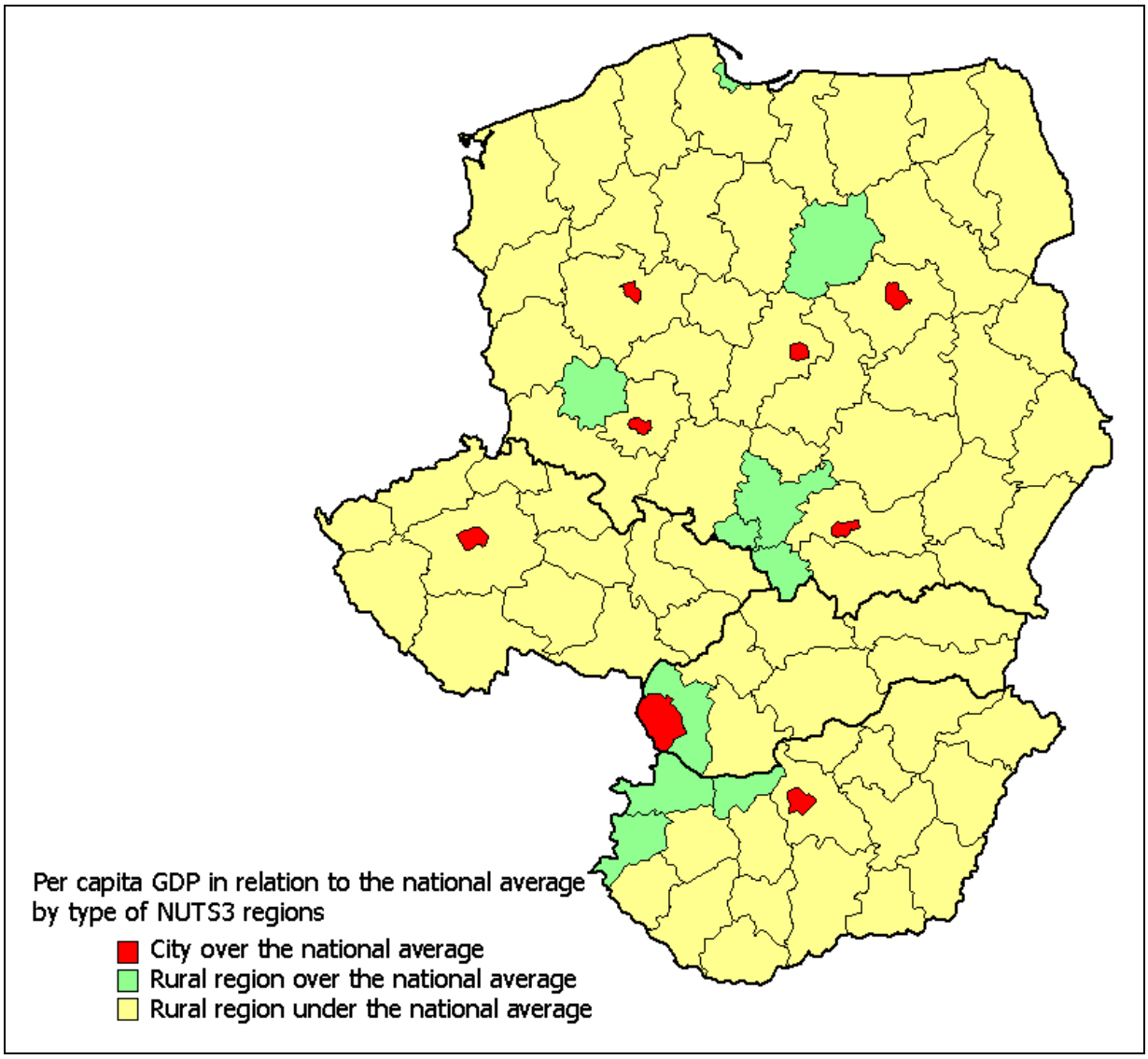

Fig. 2. State of development of cities and rural regions as compared to the national average level of Visegrad Countries, 2004
Source of data: Eurostat

It is conspicuous on the map that development level of all the eight cities of Visegrad Countries exceeds the average development level of their states, however, rural regions can be hardly found above the national average. And what is more in case of the Czech Republic none of the rural regions is over the Czech national average development level. In the other three countries

altogether ten rural regions exceeds the average development level of their countries. These more developed regions are situated generally in the west parts of their countries corresponding to the so-called "Central European Boomerang" of Gorzelak. [16] The potential developing centres form a boomerang-shaped area alongside the west border regions of the four countries on the map: three counties of Transdanubia in Hungary, Trnavský region in Slovakia. In Poland the more industrialized regions of Silesia or the town of Gdańsk belongs to the relatively developed regions. Although Gdańsk isn't considered as a city by this survey because of its population number, but its relative developed economic state strengthens further the basic trend of that economically rapid developed zones concentrates to only a few dynamic centres.
The dynamic development of capitals

3 The sectoral background of the urban – rural development inequalities

In relation to the space structure of the Visegrad Countries one of the most elementary changes was that cities – or at least capitals – of the former socialist countries could integrate to the competition of European cities after transition. These cities realized a significant growth in their tertiary sector, and their manufacturing activity turned pale for the advantage. At the same time in rural regions even the industry became a very dynamic developing sector, a new factor of inequalities among rural regions. [17]
The sectoral structure of the four Visegrad Countries was examined with the help of the three big branches of gross value added (in correspondence with the NACE classification): 1. Agriculture, hunting, forestry and fishing (A–B), 2. Industry (from C to F) and 3. Services (from G to P). The examined period remained the same (1995–2004) in this case as well.

Fig. 3. Changes in shares of sectors in the gross value added in Visegrad Countries for the period 1995-2004

	Agriculture	Industry	Services
Cities 1995	0%	27%	73%
Cities 2004	0%	21%	79%
Rural regions 1995	9%	38%	53%
Rural regions 2004	6%	37%	57%

Source of data: Eurostat

As it is observable on Fig. 3. in case of both cities and rural regions the tertiary sector has got the biggest share from the economy and it has the most dynamic growth. A basic difference between cities and rural regions is the changing state of industry. Whilst there was a radical decrease in the economic share of industrial sector in case of cities this proportion hardly changed in case of rural regions, and what is more this share increased in the Czech rural regions, and stagnated in the Hungarian and Slovakian rural regions.

Fig. 4. Growth indexes of gross value added in the sectors in Visegrad Countries for the period 1995-2004

	Agriculture	Industry	Services
Cities 1995–2004	1.3	1.8	2.6
Rural regions 1995–2004	1.3	1.9	2.1

Source of data: Eurostat

Fig. 4. shows that there was no significant difference between cities and rural regions in case of agricultural and industrial growth, the only significant advantage for the cities was the very rapid growth in sector services. This indicates that the success of the cities was tertiary based. Although the growth of services was the fastest in case of rural regions as well, the degree of this tertiarization was much slower. At the same time industry developed in rural areas to a more significant extent than cities.
Examples of empirical examinations prove that the one of main factor of the increasing urban–rural inequalities is the different intense of tertiarization, which could give a big economic "push" for the cities. On the other hand within the rural regions industry became a more and more important sector, which can determine regional development inequalities within countryside. The luckiest rural counties could attract manufacturing firms (especially in machinery). This is a very significant factor to explain regional differences within rural regions, whilst the differences between cities and rural areas have not industrial base.

4 Conclusion

Summing up what has been mentioned, it can be laid down as a fact that the space structure of the Visegrad Countries is characterized with a high degree of urban–rural duality, which have further increased after the turn of the millennium. Through the example of Poland having more cities it is proved that among the cities especially the capitals are counted as dynamic "pulling regions". Per capita GDP of the member states of the European Union and the urban–rural duality characterized them are in stochastically close connection with each other. This is true from dynamic point of view, namely the economic growth and the increase of the urban–rural duality are in positive correlation as well proving the Williamson's hypothesis. The Visegrad Countries have more significant regional inequalities in comparison with the other member states of the European Union. However, the four East Central European countries are more characterized with that the bulk of their regional inequalities are derived from the urban–rural inequalities. In the background of this is that almost only their cities are able to exceed the average development level of their countries, from the nearly 80 rural regions altogether only 10 are above the national average development level.
In Visegrad Countries success of cities is not independent of the shift of sectoral structure. While the increase of urban–rural inequality is mainly tertiary based, the industrial renewal hide in the background of fine differences among rural regions.

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