The impact of the Trianon Peace Treaty on the border zones – an attempt to analyse the historic territorial development pattern and its changes in Hungary*

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The multidimensional approach of territorial development is applied in the research. A composite indicator created for the present situation and named 'territorial development index' was adapted to the Hungarian historical data from 1910 on the LAU 2 level. The effects of the Trianon borders were observed on the basis of the comparative analysis of the historical and present development indices. The common methodological basis provided the opportunity to compare the outputs of the computations.

Some of the underdeveloped areas along the present state border of Hungary have existed even before the demarcation of the Trianon borders (dominantly along the Eastern-Slovakian border, the Northern part of the Romanian border and along the Slovenian border). Large scale disparities existed at the beginning of the 20th century which decreased significantly by 2016. The general tendency of convergence influenced the border zones as well – both closing up to the Hungarian average and within-region convergence could be measured. Contrary to this, the geographical concentration of the most underdeveloped settlements (the lowest quantiles of the settlement ranking) became visible along the Eastern-Slovakian, the Ukrainian, the Romanian and the Croatian sections of the border zone. The former hinterlands of the large towns along the Hungarian-Romanian

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border tended to face negative tendencies in their development paths. The settlements in the border zone characteristically stepped forward along the Slovenian, Austrian and Western-Slovakian border sections.
The results tended to draw the attention to the spatial polarization process because significant parts of the underdeveloped territories located along the borders did not exist prior to 1920. Furthermore, the increasing concentration of disadvantaged settlements in the border zone was not only the direct effect of the creation of the new state boundary but the cumulative result of multiple disadvantageous ongoing social processes. However, the border – undoubtedly – has had a significant role in the conservation and strengthening of the negative tendencies. At the same time, developed zones – more or less independently of the new borders – became more developed by 2016 (especially along the Western and North-western part of the state border).

Keywords:
border areas,
composite indicator,
spatial inequality,
spatial pattern,
territorial development

Introduction

The effects of state borders on territorial development are complex including several possible negative or positive factors depending on the local circumstances together with the geographical and historical context.

This issue has been expressively emphasized in Central Europe where new state borders were drawn as the result of the Trianon Peace Treaty. Border areas are often characterized by peripheral symptoms and these are basically attributed to the border location.

In the current paper, the effects of the newly demarcated state borders of the Trianon Peace Treaty on territorial development were investigated in the present area of Hungary. One of the most important issues was 'how to detect the territorial development pattern and its inequalities within the country in historic context'. The objective of the paper was to apply a methodology for the calculation of territorial development in 1910 that could be compared with the actual situation. A recently published dataset of the historic Hungary (from the period before World War I [WWI]) provided adequate background for the computations. The comparative analysis focusing on the border zone tried to discover the territorial development levels in 1910 and to detect the most important changes in the spatial pattern of Hungary. The altering development path came to light with the segmentation of the

border zone. The author – as a geographer – put the emphasis on the investigation of the spatial characteristics of the territorial development.

General characteristics of territorial development

Development is a complex phenomenon which has several aspects: from the one that refers to the act of making the area more useful or more productive of useful things to the development of people who reside in a given area, and it is often associated with the idea that places and their inhabitants can reach higher stages of organization (Dunford 2009).

Regional (and spatial) development is clearly a multidimensional concept with a great socioeconomic variety tdetermined by a multiplicity of factors (Nijkamp–Ambreu 2009). The variety of factors taken into consideration depends on the technological and infrastructural conditions, the available and consumable resources, the social and political context (Gyuris 2014) and the attitude of policy makers (Nagy–Koós 2014). All of these components represent long (or even short) term changes and great geographical diversity that makes the comparative analyses especially difficult and hypothetical.

A significant number of studies dealing with the issue of territorial development are available (with different focus on the most and least developed areas). The rest of the studies differ from each other regarding the following issues (Pénzes 2015):

- the issue of spatial aggregation which means the territorial level relied upon in the study;
- the temporal issues – time coverage of the study and the decision about static or dynamic approach;
- the dilemma of indicators involved expressing the development – one indicator (e.g. gross Domestic product [GDP]) or multivariate indicators;
- the selection of methodology applied during the creation of the multivariate indicator (it is not relevant in the case of one observed variable);
- the setting of threshold values – separating the developed or underdeveloped spatial units.

The listed issues are responsible for the limited comparability of territorial development studies based on lower territorial level especially between different states (Pénzes 2013, Tagai et al. 2018). The detection of temporal (historic) changes in the territorial development is also rarely observed within the studies due to the limited access to spatially detailed historic datasets (few exceptions inter alia Musil–Müller 2008, Győri–Mikle 2017, Szilágyi 2018a). However, these temporal comparative analyses might have an essential contribution in detecting territorial processes in historical context, which is especially important in the case of the newly formed border areas (after the Trianon Peace Treaty).

Borders and their effects on the territorial development

State borders significantly influence the spatial processes in various forms. In general, borders are perceived as features acting as a constraint rather than an incentive upon the operation of spatial systems (Reichman 1993). Borders often appear as barriers having important effects on regional development (Geenhuizen et al. 1996). The different barriers, obstacles distort the market networks, divide the potential spatial markets, thus causing economic losses. Taxes introduced at the state borders could be compared to the elongation of distances in an economic sense (Lösch 1962). As a result, decrease and discontinuity can be observed in the number and intensity of activities (Houtum 2000, Czimre 2006, Pásztor 2014a). An increase in the expenditures might occur due to the higher risk for investments in the case of border areas in insecure political situations (Hansen 1977, Ratti 1993).

These are the primary causes why border regions are frequently described as underdeveloped areas and can often be affirmed empirically (Petrakos-Topaloglou 2006), especially in Central and Eastern Europe (Erkut–Özgen 2003, Süli-Zakar 2014). Borders of the countries of Central and Eastern Europe have been changed many times in the course of the past centuries, and have broken again and again the process of development. Certain border areas – including Eastern-Hungary – can be described as real peripheries from geographical and economic point of view (Gorzelak 1996, Nemes Nagy 1996, Baranyi et al. 1999, Baranyi 1999, Lőcsei–Szalkai 2008, Szakálné Kanó et al. 2017, Papp et al. 2017, Alpek et al. 2018, Alpek–Tésits 2019, Kóti 2018, Pénzes et al. 2018, Rozgonyi-Horváth 2018, Lennert 2019). This so-called external periphery of Hungary can be regarded as a traditional backward area (Pénzes 2015, Szilágyi 2015) where the unfavourable situation strengthened after WWI due to the appearance of new state borders and protectionism, import substituting industrial developments, lack of connections between new states (Süli-Zakar 1992). Before the change of regimes in Central Europe and the European integration process, barrier and filter functions dominated the state borders and created significant obstacles regarding cross-border co-operations (Ratti 1993).

However, as a result of the integration process, border areas might become contact zones where the open border generates connections between the two sides of the border (this is the third function – according to Ratti 1993). The 'melting' of national borders can help to re-establish former spatial relations, as their barrier function decreases; in this manner their contact zone-role may become stronger. Besides, opening national borders also help social cohesion by increasing the mobility of people or creating the possibility of it (Erkut–Özgen 2003). An open border area might attract investments that profit from the different characteristics of the other side of the state border (differences in wages, taxes, restrictions, consumption customs etc.). A certain development level is necessary to induce

economic interactions, while a considerable gap between the development levels of the neighbouring territories can also be an obstacle in the cross-border co-operation and imbalanced territorial development (Van der Velde–Wever 2005, Baranyi 2007, Pásztor 2014b). Consequently, border regions may be put in a state of flux by their changing economic role through the reallocation of activities and opportunities (Topaloglou et al. 2005). Positive effects of borders – even during the period of barrier and filter dominance – accumulate in the close neighbourhood of border crossing points (Pénzes 2007, Tagai et al. 2008), but the anticipated stimulating effect of newly opened border crossing points on the local economic development has proved really limited along the underdeveloped border areas – see inter alia Kiss (2000).

The delineation of the border area is not unambiguous due to the unsure character of the territorial extension of the zone itself (however the state border is fixed enough as a line in the geographical space). Border zone is the part of space influenced directly and significantly in its social and economic life by the existence of a state border (Hansen 1977). The delineation of the border area is a typical research topic within the regional analyses due to its emphasized relative character (Dusek 2004). Several approaches may be collected on the basis of the special literature (Papp 2019).

The investigation of borders, border areas and cross-border co-operations became an important research issue among Hungarian researchers after the regime change (Hardi 2015, Pete 2018).

In the current paper the 20 km broad strip along the Hungarian state border is highlighted as it is one of the most frequently used distance category (Houtum–Eker 2015, Papp et al. 2017) and it is appropriate for the investigation. As part of the current analysis, the Hungarian border areas' development levels and their changes are observed.

The territorial development index and its background

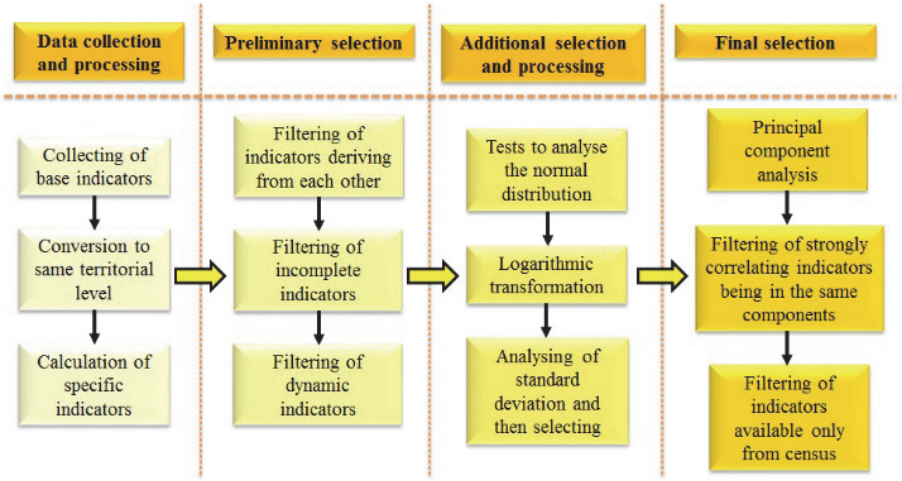
The territorial development – according to the author's viewpoint – is a multivariate phenomenon that can be expressed in several ways. After the overview of the Hungarian studies about territorial development patterns, we decided to create our own development indicator appropriate to detect the settlements in peripheral situation.

In order to find the most appropriate variables describing the social and economic disparities in Hungary, 136 different indicators were collected on the level of micro-regions (from the years of 2011 and 2012). Seven variables were selected after a systematic multi-step filtering procedure (Figure 1). This procedure included a selection of indicators by their applicability and availability (dynamic and markedly incomplete ones were not included). Test of normality was applied to find the

indicators having normal distribution. Finally, a factor analysis with principal component method has been completed in order to reduce the dimensions of variables and to filter the correlating ones. The exclusion of census data is explained by the limited temporal flexibility – annual updates cannot be realized in these cases (for more details see: Pénzes 2015).

Figure 1

The multi-step process used to select the appropriate indicators for the 'territorial development index' calculation



The following variables became part of the composite indicator calculated on the settlement (LAU 2) level:

1. Elderly dependency ratio (ratio of population over 65 years in the percentage of the population between 15–64 years), percentage;
2. Ratio of children supported by regular child protection aid, percentage;
3. Number of respiratory disease cases per capita (compared to the population over 60 years);
4. Number of inhabitants per dwelling;
5. Taxable income per capita, HUF;
6. Ratio of newly built dwellings (newly built dwellings between 2003 and 2012 in the percentage of the dwellings), percentage;
7. Average housing price, million HUF/dwelling.

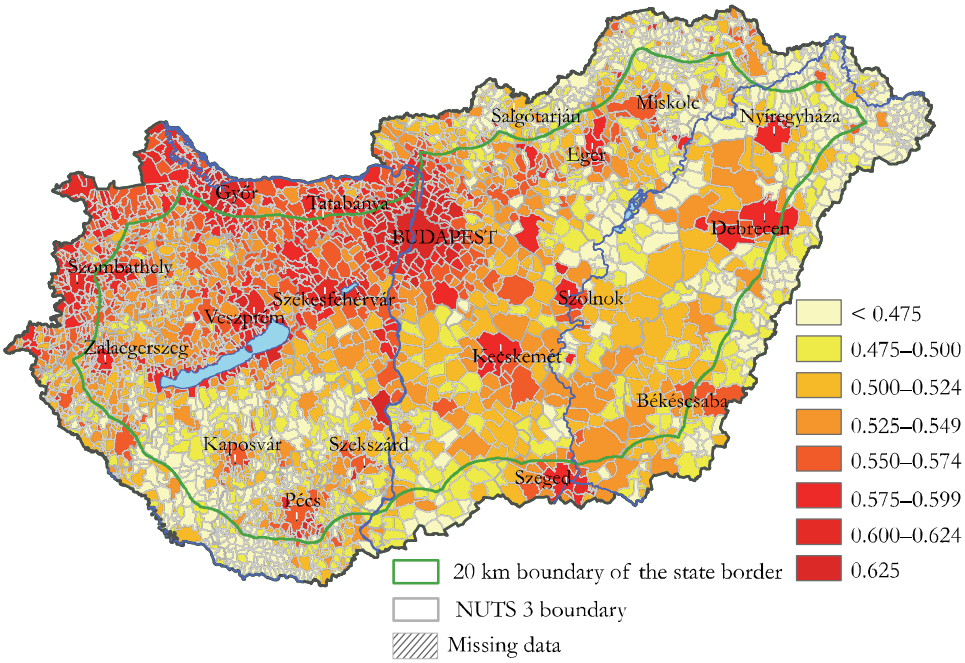
The composite indicator named 'territorial development index' was calculated by the average of the normalized values of the listed indicators – after testing different scaling and multivariate methods (e.g. standardization, normalization, discriminant analysis, cluster analysis etc.) (Figure 2).

The 'territorial development index' was updated by the datasets from 2016 and the resulted pattern of spatial disparities are confirmed by the rest of the studies

after 2010 (e.g. Nagy–Koós 2014, Koós 2015, Pénzes 2015, Kovács–Koós 2018, Tagai et al. 2018). This phenomenon evidences the 'frozen' spatial pattern in the case of Hungary after the millennium. This is the primary reason why different methodologies produced quite similar results and spatial overlapping.

Figure 2

The values of the 'territorial development index' in 2016 according to the actual LAU 2 administrative division



Source: calculated based on datasets from the Hungarian Central Statistical Office (HCSO), the National Information System of Regional Development and Spatial Planning (TeIR) and the National Tax and Customs Administration (NAV).

Territorial development pattern in 1910 – attempt to make a retrospective analysis on the example of Hungary

As part of the project GISta Hungarorum[1] an enormous amount of detailed historic datasets became available in electronic format (from the years between 1870 and 1910) ready to be analysed (Demeter–Szulovszky 2018). One of the most important challenges was 'how to detect the territorial development pattern and its inequalities within the historic Hungary' (Demeter 2018, Jakobi 2018, Pénzes 2018, Szilágyi 2018a).

[1] www.gistory.hu/g/hu/gistory/otka – website of OTKA K 111 766 Principal investigator: Demeter Gábor.

Some studies provided precedents for historical multivariate development indicators on the basis of datasets from the first decades of the 20th century (Beluszky 2000, Győri 2006, Szilágyi 2018a, Szilágyi 2018b) and important attempts were also made to detect the alteration of the spatial pattern (Győri–Mikle 2017). The objective of the current analysis was to develop a composite indicator, appropriate for making comparative analysis with the current state after 2010. The core problem of these analyses is to find the most appropriate indicators representing the 'ancient' social and economic features from territorial point of view. To find parallel indicators to the present characteristics of territorial development may lead to incorrect deductions, as some of the indicators tended to alter in their content in general and they may represent the features of disparities inadequately or inaccurately. Some of the 'old' development indicators may be criticised due to their territorially variant effectiveness to represent the local situation. Consequently, it is quite difficult to know about a given historic indicator whether it appropriately describes the development level or not. This is the reason why the investigation of the spatial pattern can be regarded as a relevant and actual research issue.

The methodology of the 'territorial development index' might have been adaptable to the analysis of the historic datasets. The most neuralgic part of the method is the finding of the appropriate variables applied to the composite indicator; however the multi-step process (see Figure 1) was regarded as useable with minor modifications. The background for the collection of base indicators was provided by the previously mentioned GIStory project. The list of the created development indicators was inspired by the cited studies which investigated the same period from the aspect of territorial development (G. Fekete 1991, Beluszky 1999, 2000, Győri 2006, Kiss 2007, Gál 2010, Demeter–Radics 2015, Szilágyi 2015, Győri–Mikle 2017). Some of the important and relevant development indicators were not included due to the territorially incomplete datasets – as these were typically urban variables (Vörös 1982, Beluszky 1999, Kókai 2017).

Demographic indicators deserved greater emphasis because these could highlight the deep structural characteristics of the society (however the deduction might be unambiguous e.g. the long lasting migration gain of the Hungarian Great Plain was the result of the resettling of the territory after the depopulation of the Ottoman period). Ethnic and religious indicators might correlate with the modernization (Beluszky 2000).

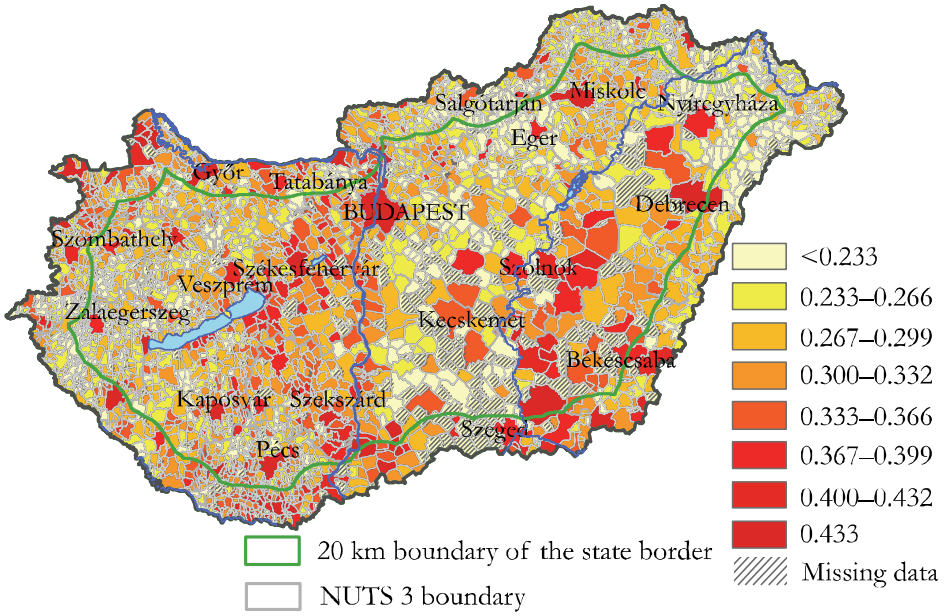
Taking these characteristics and constraints into consideration, 48 specific indicators were created from the approximately 200 base variables after the aggregation into district levels. After the systematic filtering steps (see Figure 1) 18 indicators remained to be processed by the principal component analysis. The last step of the procedure was excluded as the rest of the database was derived from census data. The selected variables represented the components mostly and the total explained variance was 83.47 percent, with a 0.638 value by the KMO-Bartlett test:

1. Infant mortality ratio within the total deaths between 1901–1910, %
2. Earner/non earner ratio per 100 inhabitants, 1910
3. Ratio of industrial earners, 1910, %
4. Cadastral net income per one inhabitant, 1910, Kronen
5. Direct state burden per capita, 1909, Kronen
6. Net income of settlements per capita, Kronen.

The normalized average values provided the 'territorial development index' from 1910 and the mapped results illustrated the spatial pattern of the historical Hungary (as seen in Pénzes 2018). In the cited paper a comparative analysis of the results took place in which the 'territorial development index' and the methodology developed by Róbert Győri (2006) were published (for details see Szilágyi 2015, Pénzes 2018). There are major differences between the results of the methodologies, but significant overlaps could also be detected. Strong correlation was proved with the size of settlements in the case of the 2 different methods and the so-called 'Győri-method' showed greater sensitivity to the population number of settlements. Both methods drew the attention to the high development level of the largest towns (with more than 20,000 inhabitants).

Figure 3

The values of the 'territorial development index' in 1910 according to the LAU 2 administrative division of 2016



Source: own calculation on the basis of the census from 1910 and taxation data from 1908 – http://www.gistory.hu.

In order to make a comparison between the historic and the current territorial development pattern, some important steps were necessary to be taken. The complete historic dataset was narrowed to the present area of Hungary and an additional significant correction of the territorial data was required with the application of GIS methods – almost 380 settlements were not officially separated and administratively created in 1910 (some of them did not exist one century ago, particularly in the region of the Great Hungarian Plain), but many settlements were attached to larger towns during the last decades. The territorial development values of these settlements were calculated regarding their population number as weight (Figure 3).

The spatial pattern of Hungary reflected major disparities with the outstanding development level of Budapest and the county seats. North-Western Transdanubia and the Budapest-Veszprém axis seemed to had been developed above average. Southern Transdanubia was also proved to be in a better situation than nowadays (especially the Ormánság). The rest of the larger towns on the Hungarian Great Plain had an above average development level – and these results partly support the statements of Pál Beluszky (1999, 2000), Róbert Győri and György Mikle (2017). However, extended and continuous underdeveloped zones could be detected in Zala and Vas counties due to their segmented structure of settlements, at the territories of the Bükk and Mátra mountains and the areas with disadvantageous characteristics for agricultural cultivation (e.g. sand covered areas of Bugac and in the Nyírség). Some of the areas which became border zone a decade later could be regarded as underdeveloped even in this period.

Border areas of Hungary in the mirror of changes during a century

Border areas of Hungary and their territorial development level

In the current study, border areas were targeted with special attention in regard to the state of their development levels before the Trianon Peace Treaty and nowadays. The formerly mentioned 20 km broad zone was created along the Hungarian side of the state border. This zone included 1224 settlements (on the basis of the administrative division from 2016) which has been reduced to 1100 considering the settlements' list from 1910.

In order to detect the changes in the territorial development levels along the state border, the border zone was segmented according to the neighbouring country (as a matter of course, this division fitted into the current sections of the state border). Each settlement was ordered to the section closest to it in the light of accessibility. According to this categorization 8 sections were separated from which

the longest border zone, the Hungarian-Slovakian one was divided into two parts (Table 1).

Table 1

Sections of the border zone along the Hungarian state border

Territorial categories	Number of settlements in 2016	Number of settlements after the correction
Austrian	179	163
Western-Slovakian	107	94
Eastern-Slovakian	332	310
Ukrainian	90	84
Romanian	156	141
Serbian	42	26
Croatian	242	212
Slovenian	76	70
Non-border areas	1 931	1 676
Hungary	3 155	2 776

Source: calculated by the http://www.gistory.hu.

The results of calculations might have been predicted by the mapped values (Figure 2 and 3), however the aggregated numbers drew the attention to the general characteristics (Table 2). The direct comparison was only hypothetic because of the differing sets of indicators but the relative values provide reasonable possibility to compare the results from 1910 and 2016 (omitted values skipped due to administrative reasons caused only negligible changes in the results). The Ukrainian border zone was the most underdeveloped along with the Slovenian section. The latter one could develop more impressively and it came closer to the national average. The most developed sections – the Serbian, the Western Slovakian and Austrian sections – reached and exceeded the Hungarian value in 1910, however the Serbian (and the Croatian) were characterized by reduced relative values. It is important to emphasize that each territorial category could improve in their absolute values and the most spectacular change was seen in the case of Budapest. The changes of the values highlighted an unambiguous and remarkable convergence between 1910 and 2016. As part of this process, a massive decrease of the relative development could be detected in the case of Budapest caused by the increased values in the rest part of the country.

Table 2

The absolute and relative values of the ‚territorial development index' and their changes in sections of the border zone

Territorial categories	Absolute values			Relative values in the percent of the national average, %		
	1910	2016	change, %	1910	2016	change, percentage point
Austrian	0.345	0.593	+71.96	100.58	104.01	+3.41
Western-Slovakian	0.356	0.606	+70.40	103.77	106.34	+2.47
Eastern-Slovakian	0.281	0.498	+77.03	82.06	87.37	+6.46
Ukrainian	0.250	0.474	+89.50	72.99	83.18	+13.96
Romanian	0.302	0.505	+67.26	88.02	88.54	+0.58
Serbian	0.374	0.569	+52.06	109.22	99.88	–8.55
Croatian	0.341	0.516	+51.29	99.52	90.55	–9.02
Slovenian	0.255	0.538	+111.03	74.42	94.44	+26.91
Non-border areas[a)]	0.307	0.557	+81.28	89.65	97.73	+9.01
Budapest	0.525	0.641	+22.01	153.27	112.46	–26.62
Hungary	0.343	0.570	+66.29	100.00	100.00	0.00

a) Without Budapest.

Source: calculated on the basis of the census from 1910 and taxation data from 1908 – http://www.gistory.hu and by the datasets from the HCSO, the TeIR and the NAV.

This long term convergence did not contradict the discovered divergence trends of spatial inequalities after the change of regime in the 1990s (e.g. Nemes Nagy 2006, Nagy 2007, Jakobi 2011, Nagy et al. 2015). Convergent periods were identified during the socialist era (e.g. Beluszky 1976, Nemes Nagy 2006) that confirmed the relevance of the convergence during the century.

The convergence was demonstrated by the spatial inequality calculations showing significantly larger within-region inequalities on the basis of the territorial development index for 1910 (Table 3). Two methods – the logarithmic weighted deviation and the Hoover index – highlighted the largest inequalities in the case of the Austrian border section that included three outstanding centres (Győr, Sopron and Szombathely). The Romanian border zone showed a South-North development slope that resulted in the second greatest values of inequalities. The Eastern-Slovakian section consisted of the largest number of settlements that typically tended to involve higher levels of within-region inequalities. The Serbian section was the most even from this point of view. The changes during the more than 100 years resulted in a significant decrease in the inequality values and the Croatian and the Eastern-Slovakian sections (on the basis of the logarithmic weighted deviation the Austrian section too) had the largest levels of inequalities (the non-border and the Hungarian national values were not appropriate to make comparisons due to their significantly higher number of spatial units – Dusek–Kotosz 2016).

Table 3

The absolute and relative values of the ‚territorial development index' and their changes in the sections of the border zone

Territorial categories	Logarithmic weighted deviation, %			Hoover index, %		
	1910	2016	change, %	1910	2016	change, %
Austrian	10.840	4.371	–6.47	9.978	3.827	–6.15
Western-Slovakian	9.624	4.048	–5.58	8.808	3.748	–5.06
Eastern-Slovakian	10.581	4.289	-6.29	9.899	3.904	–5.99
Ukrainian	9.612	4.006	–5.61	8.714	3.717	–5.00
Romanian	10.746	4.211	–6.53	9.890	3.749	–6.14
Serbian	8.371	3.062	–5.31	6.971	2.571	–4.40
Croatian	10.377	4.436	–5.94	9.723	3.954	–5.77
Slovenian	10.583	3.720	–6.86	9.681	3.438	–6.24
Non-border areas [a)]	14.042	5.042	–9.00	13.538	4.608	–8.93
Hungary	13.327	4.987	–8.34	12.704	4.536	–8.17

a) Without Budapest.

Source: calculated on the basis of the census from 1910 and taxation data from 1908 – http://www.gistory.hu and by the datasets from the HCSO, the TeIR and the NAV.

Additional territorially detailed calculations might be required for an adequate background in order to test the characteristics of the borderland – including the hypothesis about the higher level of inequalities along the state borders compared to the non-border areas (e.g. Peach 1997, Pénzes et al. 2014).

Changes in the pattern of development levels along the border areas of Hungary

The absolute and relative formula of the 'territorial development index' from 1910 and 2016 were not completely appropriate to detect the alteration of the spatial pattern and the position of settlements because the significant decrease of spatial inequalities diminished these tendencies. In order to investigate these research issues, a simplification was required. The settlements of Hungary (according to the corrected list – see Table 1) were ordered and ranked into 10 quantiles by the territorial development levels.

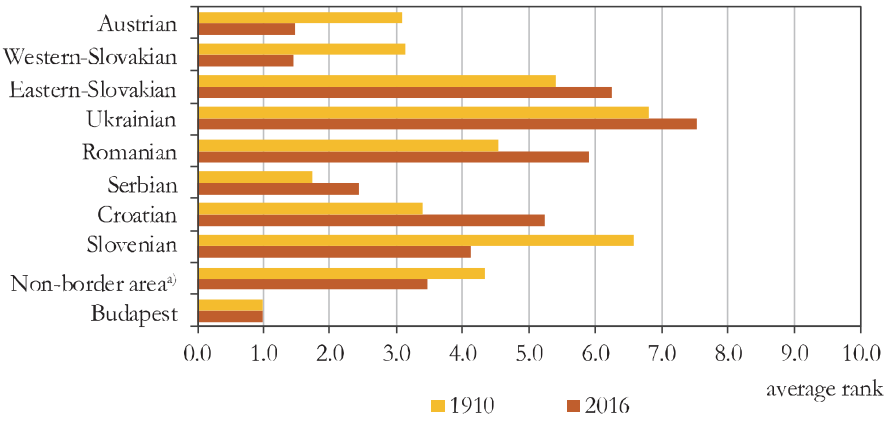
Weighted average rank was calculated to the territorial categories of the border zone on the basis of the ranked values. With the help of this simple method changes of the relative position could be detected (Figure 4).

The diagram illustrates the changes of the average values weighted by the settlements' population number (Figure 4) in which lower values represent a better situation regarding the position within the development rank and higher values mean a worse position. In the light of the results, the Austrian and Western-

Slovakian sections of the border zone had been developed even before the Trianon Peace Treaty and their average position became more favourable. However, the Serbian section could be regarded as the most developed border zone whose position weakened until 2016. This section included only 26 settlements, among them Szeged with its outstanding size and development. The most impressive change could be detected in the case of the Slovenian section where the average ranking became significantly better.

Figure 4

The average rank of settlements within the sections of the border zone in 1910 and in 2016



a) Without Budapest.

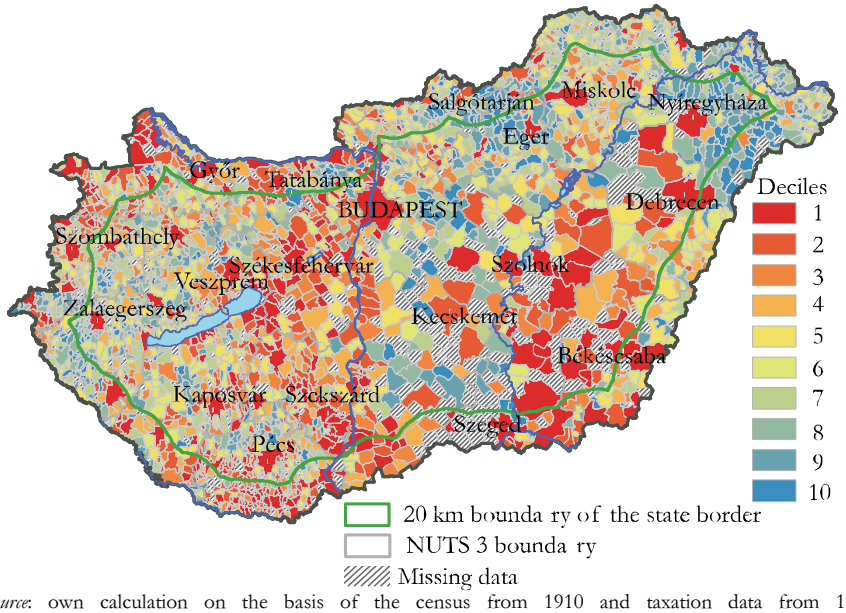
Source: own calculation on the basis of the census from 1910 and taxation data from 1908 – http://www.gistory.hu and by the datasets from the HCSO, the TeIR and the NAV.

The average values weakened in the Croatian, Romanian, Eastern-Slovakian and Ukrainian sections, out of which the Croatian one was better than the non-border area's value in 1910 but it became much worse by 2016. The other sections' position – the Romanian, the Eastern-Slovakian and the Ukrainian one – could be regarded as underdeveloped even in 1910 and this situation worsened (and became geographically concentrated).

The pattern of the deciles created from the territorial development index values were illustrated on maps (Figure 5 and 6). These maps clearly demonstrate the location of developed and underdeveloped areas within the country – disregarding the exact values of the index. The formerly listed characteristic territories – in spite of the convergence – represented a massive spatial clustering (the formation of extended developed zones versus contiguous underdeveloped areas until 2016). This visible process could be observed on the maps and it had been confirmed by the strengthened values of spatial autocorrelation since 1910 (as it was proved by Győri–Mikle 2017).

Figure 5

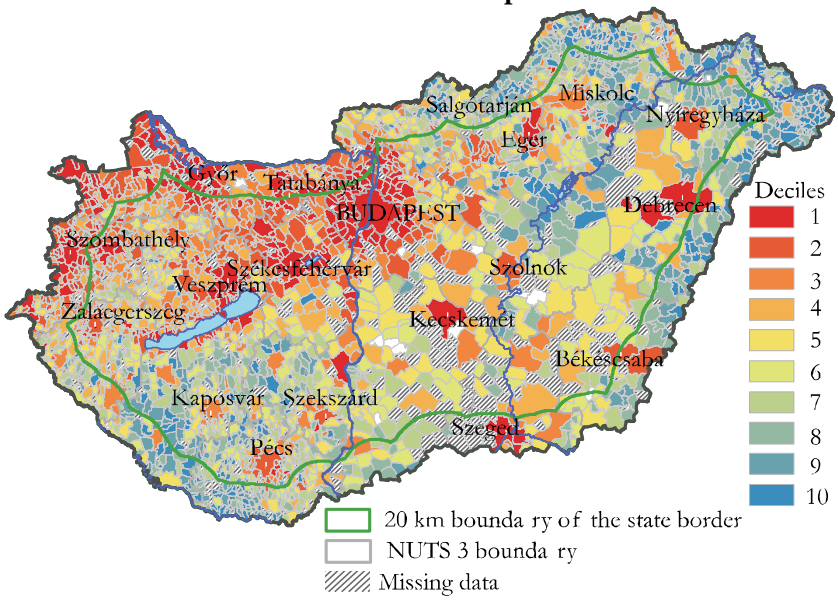
The deciles of the 'territorial development index' in 1910 according to the LAU 2 administrative division of 2016



Source: own calculation on the basis of the census from 1910 and taxation data from 1908 – http://www.gistory.hu.

Figure 6

The deciles of the 'territorial development index' in 2016

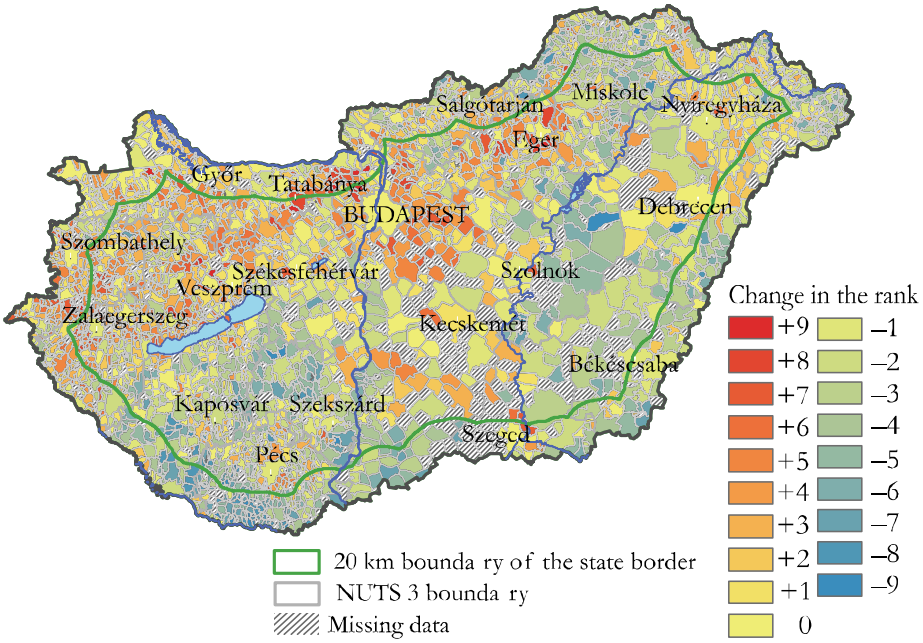


Source: calculated by the datasets from the HCSO, the TeIR and the NAV.

The changes in the rank of settlements clearly demonstrated the developing and the deteriorating territories between 1910 and 2016. This pattern illustrated on the map (Figure 7) could be adequately interpreted only with the previous maps about the development categories (Figure 5 and 6). From this point of view, the increasing impact of the large towns on their neighbours (especially Budapest) was explicitly visible. The settlements in the border zone characteristically stepped forward along the Slovenian, Austrian and Western-Slovakian sections, while the Eastern-Slovakian, Ukrainian and Romanian sections decreased in their development ranks. Groups of settlements with negative tendency could be detected in the former hinterlands large towns along the Hungarian-Romanian border – e.g. Satu Mare (Szatmárnémeti), Oradea (Nagyvárad), Arad (Arad). This pattern could not be unambiguously observed at the Eastern-Slovakian section of the border zone – e.g. in the hinterland of Košice (Kassa), however a continuous peripheral territory (Cserehát) formed by 2016. The demarcation of the state border was not the cause of every problem in the case of these areas but it had an important role in the escalation of the acute social and economic problems (Kovács 1990, Süli-Zakar 1992, Baranyi 2007, Pénzes 2015).

Figure 7

Changes in the rank between 1910 and 2016 – according to the LAU 2 administrative division of 2016



Source: own calculation on the basis of the census from 1910 and taxation data from 1908 – http://www.gistory.hu and by the datasets from the HCSO, the TeIR and the NAV.

The most obvious peripherization occurred along the Croatian border – especially in the territory of Ormánság. These characteristically underdeveloped territories could be described by several social challenges and some of them had no relationship with the existence of the state border (e.g. only-child birth control in the Ormánság caused below average natural reproduction which led to population decrease along with the significant migration related loss – see Klinger–Mikes (1965), Andorka (1970), the deportation of German population after WWII deeply affected Baranya county (Kocsis 1996; Molnár 1998) as well as the rapid increase of the Roma population during the last decades (Baranyi et al. 2003).

Conclusions

Territorial development is a multidimensional concept representing long (or even short) term changes and great geographical diversity that makes the comparative analyses especially difficult and hypothetical.

State borders significantly influence the spatial processes in various forms and the newly demarcated borders after the Trianon Peace Treaty also caused a drastic change in the circumstances of the effected territories in Hungary.

The method of the 'territorial development index' created for the recent situation could be adapted for the historical datasets as well, and detailed (LAU 2 level) results were produced. The common methodological basis provided the opportunity to compare the outputs of the computations. The limitations of the direct comparisons between 1910 and 2016 could be managed with some simplifications.

The most important findings could be concluded as follows; some of the underdeveloped areas along the present state border of Hungary had existed even before the demarcation of the Trianon borders (dominantly along the Eastern-Slovakian border, the Northern part of the Romanian border and along the Slovenian border). Large scale disparities existed at the beginning of the 20th century within the country which decreased significantly by 2016 (however the precise detection of the stages within this period lasting for more than one century require more accurate calculations). The general tendency of convergence influenced the border zones as well – both approaching the Hungarian average and within-region convergence could be measured. On the other hand, the geographical concentration of the most underdeveloped settlements (the lowest quantiles concerning the rankings of settlements) became visible along the Eastern-Slovakian, the Ukrainian, the Romanian and the Croatian sections of the border zone. Groups of settlements with negative tendency could be detected in the former hinterlands' large towns along the Hungarian-Romanian border. The settlements in the border zone characteristically stepped forward along the Slovenian, Austrian and Western-Slovakian sections.

The results tend to draw the attention to the spatial polarization process because significant part of the underdeveloped territories located along the borders did not

exist prior to 1920. Furthermore, the increasing concentration of underdeveloped settlements in the border zone was not only the direct effect of the creation of the state boundary but the cumulative result of multiple disadvantageous social processes. However, the border undoubtedly had a significant role in the conservation and strengthening of the negative tendencies. At the same time, developed zones – more or less regardless of the new borders drawn in 1920 – became more developed. Nevertheless, additional researches are required to prove these findings more adequately.

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