Highly qualified social strata in urban areas of Hungarian regional centres from 1980 to 2011*

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This study investigates the spatial concentration of highly qualified strata using statistical indicators and methods. Representation of highly qualified social strata means the spatial concentration of groups with higher social status (i.e. education level, foreign language skills, professional skills, and employment level) in the urban regions being studied; it does not coincide with mainstream definitions of social capital (based on interaction and networks between social groups). According to one of the most basic assumptions of the complex city concept, settlements with urban status are much more complex in terms of their economic, social, and technical structure and their network relations and interactions than settlements that have not been declared as cities. Simultaneously, the difference in social composition between cities and other settlements cannot be disputed because the concentration of economic resources and activities and the potential of employment and the fact that higher income attracts skilled workers to the cities and their catchment areas; all of these resulting in a higher proportion of highly qualified social strata. To meet the increasing needs of the global society and results of the transition to a market economy and globalization processes, a wider range of services are emerging, so the workforce is also undergoing significant differentiation, causing changes in the characteristics and composition of society. This paper attempts to study these processes exploring the dynamic trends of

* The last census in Hungary was carried out in 2011.

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change in the spatial distribution of the examined groups. The author is looking for answers to questions such as how this aspect of society could be measured? Is there a difference in the structure of the society of urban centres and their catchment areas regarding highly qualified groups? Has there been a change in the spatial-social characteristics of urban areas over the decades?

Keywords:
highly qualified social strata,
spatial concentration,
spatial-social structure of
catchment areas

Introduction

Society is a pattern of people's personal disparities, which usually may be vertically and horizontally oriented (Csizmadia 2004). Nominal differences can be considered horizontal divisions, with only an 'otherness' relation between the elements; significant differences can be considered vertical divisions, where there are inequality relations between the individual elements. In this system, social groups can be formed based on different aspects (e.g. employment, income, wealth, education, nature of work).

Literature review

In the 1990s, patterns of socio-spatial differentiation became more visible in the urban areas of Central and Eastern Europe (CEE) due to the collapse of centralized management and structural-economic changes caused by transformation and globalization processes (Hamilton et al. 2005, Sachs 2012, Szirmai 2004, Bálint et al. 2017, Kincses–Bálint 2016, Zdanowska et al. 2020). Consequently, the scientific community has been debating the impact of new forms of housing that appeared as a result of these changes on post-socialist cities, including in Hungary.

The housing market has been completely transformed through extensive privatization and the emergence of new markets. Market conditions, ownership, and construction structures changed while supply has shifted significantly (Rácz 2019). Simultaneously, due to economic and social changes, a new pattern of demand appeared in the housing markets (as indicated in Harangozó et al. 2019). Owing to the decline in centralized management, new socio-spatial patterns have emerged in urban regions of CEE countries. Some studies (e.g. Lee–Struyk 1996, Sachs 2012) show that the housing market, transformed by privatization, has increased socioeconomic disparities.

Since the turn of the millennium, a number of studies have been available that systematically compare the socio-spatial differentiation of urban regions. These socio-spatial studies with different perspectives are widely disseminated. Musterd et

al. (2015) investigates spatial changes of social segregation in European capitals. Markusen (2006) explores the spatial representation of artistic activities and examines the social and economic status of artists. Regarding Hungary, Enyedi (2012) analyses the development of urbanization and urban society, Kovács (2006) examines its post-socialist imprints on Budapest, and Szirmai (2004) discusses the negative impacts of social inequality and the sharpening social polarization of post-socialist cities.

Intraregional displacement between the city and its surroundings is viewed primarily from a quantitative perspective; however, mobility has a socially selective effect (Brade et al. 2009). The transition to a market economy, starting in the 1990s, impacted urban regions (Konecka-Szydłowska et al. 2018), influencing migration between the city centre and the suburbs, a still ongoing.

Previous research on post-socialist suburbanization has explored different cities such as Leipzig (Nuissl–Rink 2005, Aring–Herfert 2001), Sofia (Hirt 2007), Budapest (Kok–Kovács 1999), Tallinn (Leetmaa–Tammaru 2007), and Prague (Ourednicek 2007) (cited in Brade et al. 2009, pp. 234). The diversification of the housing stock also gives a more differentiated picture in the case of an urban environment; it must be considered in analysis as well as the national and regional conditions, special characteristics, and framework conditions (as in this study).

According to Brade et al. (2009, pp. 243), 'Regarding these first empirical results of our survey concerning housing preferences, there is an undeniable danger of ongoing devaluation of the large-scale housing estates and pronounced suburbanisation. If residents are increasingly enabled to fulfil their residential ideals, CEE cities will be strongly challenged by the negative consequences of socio-spatial differentiation.' We can agree in part as pronounced suburbanization is not necessarily a danger but, rather, a natural process with negative effects that need to be addressed. The expansion of the depreciation of housing estates carries the risk of segregation, so intervention is needed.

However, it is still relevant: 'Closely connected to this are questions pertaining to value change in society and the desire, suppressed in the socialist era, to express social status by place of residence' (Brade et al. 2009, pp. 243).

Meanwhile, a view emerged saying that the observed changes should be seen more as part of a global change (e.g. Eckardt 2005, pp. 22). Metropolitan society is becoming increasingly diversified due to urban sprawl and urbanization processes. It is also important to note that, due to globalization, the development of transport infrastructure, and the spread of modern technology, there are different places for residence, school, workplace, social interactions, and consumption. Additionally, since the built environment also adapts to changed social habits, within a big city, society is in dynamic motion with activities not fixed in one space but, rather characterized by uneven movement within networks. Geographic studies have explored social interactions related to space in many cultures (Boros et al. 2016,

Kovács–Szabó 2016, Marcińczak et al. 2014). For a complete understanding of this phenomenon, action spaces of people should be examined (e.g. residence, workplace, place of leisure time), but this study uses only a residential focus.

It is worth examining the relationship between industrialization and urbanization. To understand the results of this study, it is necessary to explore the spatial patterns of demographic processes in Hungary taking place since the dualist system of Austria–Hungary[1]. Under this dualist system – and, later, only in parallel with other types of urban development tendencies – the Budapest-centricity characterized Hungary's urban network. The regional centres prospered due to the development of industry and transport and the establishment of the system of territorial administrative institutions. However, we cannot talk about the urban network as defined today, as cities did occupy a place in the spatial structure as a network in today's sense during this period, but the regional roles of the centres should be outlined according to the spatial structure and other conditions. Nevertheless, in 1869, 13% of the population and, towards the end of dualism, 20% lived in cities (Gyáni 2012, Hajdú–Rácz 2019). The growth of the urban population pushed the administrative boundaries of the cities, thus changing land use (see urbanization cycles [Enyedi 1988, 2012], which can be interpreted as a theory in the case of Hungarian regional centres, but, in practice the individual phases cannot be clearly identified).

Around the turn of the 20th century, the proportion of agricultural population accounted for nearly 70% of society (and had been halved by the early 1950s). In 1910, the strata of independent traders and craftsmen, who may be cautiously classified as bourgeoisie, made up only 8% of the population (Kövér–Gyáni 2006). These strata were mainly made up of village craftsmen, whose livelihoods were not provided by industry but by agriculture, which is why the real bourgeoisie was rather represented by independent traders and craftsmen living in cities.

Modernization, the emergence of industrialization, and particularly the advancement of capitalization resulted in the creation of a new social group: a modern industrial working class who accounted for 13% of active workers in the 1910s (Kövér–Gyáni 2006). The working class was also characterized by strong internal divisions between the so-called workers' aristocrats, skilled workers, and unskilled labourers due to the big differences between them in terms of both living standards and social prestige.

[1] Dualism, in terms of politics, refers to specific political concepts that are related to functional or structural duality of a particular political system. The Austrian Empire granted the Kingdom of Hungary, which had been part of the Habsburg-controlled empire since 1526, internal political and administrative independence via the Austro–Hungarian Compromise of 1867, thus establishing the dualist state of the Austro–Hungarian Monarchy, which was a real union under one ruler: who was the Emperor of Austria and King of Hungary simultaneously. This union, also known as the Dual Monarchy or Austria–Hungary, lasted until the declaration of the Hungarian People's Republic shortly after the end of the First World War.

Between the two World Wars, economic stabilization slowly began, while the dominance of agriculture declined; citing Tomka (2020, pp. 97): '*The results of this analysis suggest that the reconstruction was successful in post-Trianon Hungary, and the economic growth approximately equalled the average rate in Western Europe*'. During this period, the greatest social crisis was the unemployment of agricultural workers without land property together with those who managed to find work having low incomes. The proportion of people in intellectual employment almost doubled in the three decades between 1910 and 1940, accounting for more than 7% of the employed, a trend partly explained by embourgeoisement (Kövér–Gyáni 2006).

After the First World War, the process of urbanization became controversial also, due to the new borders (Hajdú 2020). The proportion of the urban population increased from 20% to 30% in the two decades between the World Wars. Owing to the Treaty of Trianon, the urban network suffered a great loss as some significant Hungarian cities (e.g. Oradea, Kosice, Cluj-Napoca, Bratislava, Timisoara, Subotica) ended up beyond the new borders, making the 'remaining' five regional centres 'border towns' (Demeter 2020, Pénzes 2020, Szilágyi–Elekes 2020, Elekes–Szilágyi 2020). Additionally, these cities lost much of their traditional catchment area. Moreover, the imbalance in population distribution was augmented by the fact that, after the capital (Budapest), with a population of one million at that time, the most populous cities of the country had barely one hundred thousand inhabitants (Debrecen, Szeged, Miskolc) (Kollega Tarsoly 2000).

After World War II, society was restructured by large estates and their owners disappearing as a social group while the proportion of small estates significantly increasing as a result of land reforms in 1945. These processes however were short-lived as agricultural collectivization began in 1948. Within the framework of nationalisation, the capitalist and entrepreneurial strata were abolished, as were the strata of independent traders and craftsmen who made up the majority of petty bourgeoisie (Valuch 2005, Kollega Tarsoly 2000).

This historical background led to the development of five Hungarian regional centres in addition to the capital (within today's national borders). The 'repeated' urbanization cycle can be observed (Enyedi 1988) with the end of the second cycle coinciding with the starting point of our analysis. The urban-rural disparities already began to take shape by the interruption of social structural transformation and have deepened since the 1950s (other processes have also been affected) (Hajdú et al. 2017).

The expansive industrialization starting in the 1950s was somewhat of a solution for agricultural workers left unemployed (many of them fled agriculture due to collectivization and the expulsion of kulaks) by finding work in industry. In the 1960s, more than 60% of the population were actively employed while the peasantry continued to decline (Kollega Tarsoly 2000).

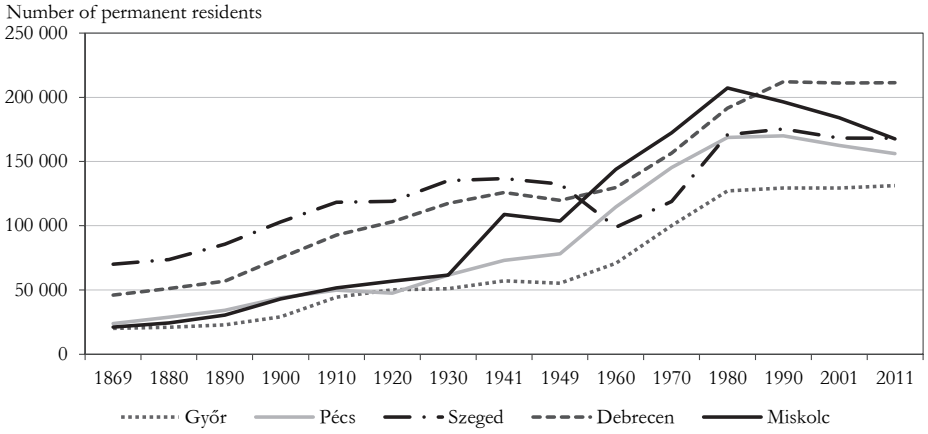
The expansion of the educational system was likely because the proportion of people in intellectual employment continued to increase gradually as the administrative tasks that people were able to perform increased with the expansion of the bureaucratic apparatus. Here again, reference should be made to the fact that society adapts to the economy. The labour market is linked to the economy, and its accessibility or even its impediment influences the structure of society. For example, areas with constrained labour markets overlap more highly with areas of social exclusion (Tagai et al. 2018).

By the early 1970s, changes in social stratification slowed down, and the transformation took place through new dynamics. Although the proportion of people in intellectual occupations did not change significantly until the early 1990s, the strata of those in physical occupation were restructured (manufacturing labour; Czirfusz 2020). From the early 1970s to the early 1980s, the proportion of skilled and female auxiliary workers increased and did not change much until the early 1990s. From the 1970s until the regime change, the proportion of agricultural manual workers also decreased significantly. At the same time, while self-employed artisans and retailers constituted narrow sections of society, their numbers increased by the early 1990s (from 115,000 to 360,000) (Valuch 2005).

Owing to the privatization processes associated with the regime change, the needs of the market towards workers (primarily the middle class) changed as there was a higher demand for highly skilled labour and an increase in the proportion of employees in the private sector took place. The territorial distribution of highly educated individuals was examined by Szakálné Kanó et al. (2017), who reached similar conclusions. Additionally, the proportion of people with a high level of education increased in large cities but also in the suburbs. Figure 1 illustrates the main stages of population growth in regional centres.

Figure 1

Population change in regional centres



Source: Our own compilation based on HCSO census data, 1869–2011.

Figure 1 shows that the population of cities grew significantly between 1869 and 1910. The population growth of cities can even be interpreted as an 'urban explosion' (Beluszky 2015, pp. 191). We assert this only for the five cities represented in the figure; formal urbanization has been dynamic since the political transformation, doubling the number of Hungarian cities and, consequently, the growing the population. However, although this was the source of urbanization in Hungary (Konecka-Szydłowska et al. 2018), the regions cannot be defined as cities by population and function. Between 1870 and 1910, Debrecen doubled its population while Szeged increased its population by 69%. Among the industrializing traditional central places of the time, we can find faster growth also: in 1910, Győr had twice as many inhabitants as in 1870. It can be seen that, under the dualist monarchy, the population grew relatively evenly in cities. However, this balance was upset by the First World War, and since then the regional centres took unique paths in this respect. After 1980, Miskolc lost a significant proportion of its population, which can also be observed to a lesser extent in the case of Pécs (Egyed–Rácz 2020) whereas Szeged, Debrecen, and Győr were able to maintain their population.

Methods for measuring highly qualified strata

Territorial delimitation

As a first step to measure highly qualified strata, territorial delimitation is required so that the centre does not form a unit on its own, thus excluding its surroundings and territorial connections. Therefore, we decided to designate a catchment area based on the attraction of labour force. The most important source is the delimitation of the Hungarian Central Statistical Office (HCSO) agglomerations and urbanized areas in 2014. This has already been discussed before, but there are some basic differences between the present research and the one carried out by the HCSO. That is, the latter is based on 10 indicators and imposes the following four criteria for settlements belonging to these areas:

1) the value of the complex index using the 10 indicators should be higher than the rural average
2) settlements located within a 25-minute commuting area has been deleted
3) a positive migration balance
4) the boundary condition, which emphasizes the role of indicator 10. The resident population is min. 10%, or min. 30% of locally employed people commute to the centre (HCSO 2014, Tóth 2014).[2]

[2] A similar study was conducted by Faluvégi (2008, pp. 1094) with the following constraints: urban center: 5000 or more are locally employed; rural center: 1200–4999 employed locally; urban center ring or co-center: daily commuters > 40.0%.

The study provides a good basis, but our research topic justifies its rethinking as the methodology must be adapted to the diversity of economic potential. As our hypothesis suggests, each role may have a different spatial extent, and the purpose of measuring change over time requires the same. Therefore, it is necessary to expand the narrower agglomeration framework (Atkinson 2019, Salvati 2020) and examine it within a larger catchment area.

Table 1

Differences between agglomeration and catchment area

Agglomeration	Catchment area
– a certain number of cities and populations – economic, infrastructural (not only geographical) concentration – based on urbanization processes – self-organizing and organic – consists of an integrated settlement body characterized by territorial concentration – horizontal (and multi-directional) connections between the settlements – a well-functioning form of a functional urban area – characterized by a growing population (the whole area) – housing construction activity in the settlements surrounding the centre – the majority of jobs for the active population located in the centre – measurement: using several dynamic and static indicators, conditions, and constraints	– can be connected to the control panel via one or more functions – physical movement between the centre and the surrounding settlements can be monitored (can be delimited) – instrument: institutional system and economy – larger than agglomeration due to re-drawing – measurement: using a gravity model (Dusek 2003, Nagy 2011) or by experience (e.g. Disparity of out-commuting, Pálóczi 2016)

It further reinforces the finding that a catchment area should be designated as almost none of the characteristics of agglomeration are relevant to our research (Table 1). In particular, for example, regarding the criterion of a growing population, since 2010, in 305 of the 480 settlements, the migration difference has been negative while in 45 settlements, it has been over 15 per thousand. Additionally, we can notice a boom in housing construction whereas 196 settlements did not build new houses between 2011 and 2016.

In this research, we did not use the complex index presented above (developed by HCSO) as this is an area of attraction. We only measured the role of the centre attraction by modifying the fourth criterion, which is a boundary condition. We assigned two degrees of tolerance to two types of indicators: one is the proportion of commuters to the centre accounting for all commuters, and the other is the proportion of commuters to the centre accounting for the total number of employees. It can be seen that the two types do not always coincide, so we used a combined approach to delineate the catchment area. We set a threshold of 10% for employees and 30% for commuters; if the settlement meets one of the conditions, it

is included in the catchment area we use (i.e. examined separately according to two conditions). The largest catchment areas that can be established are not always territorially contiguous. (This is especially evident in the case of Miskolc [Józsa 2020]). In the case of commuters, the daily domestic commuters are the basis (2011 census data). In the case of different solutions, the indicated population data do not include the data of the 'correctional' settlements to ensure territorial contiguity. Table 2 and Figure 2 compare the results of our study and those of the HSCO one in terms of delimitation and the size of each agglomeration/catchment area.

Table 2

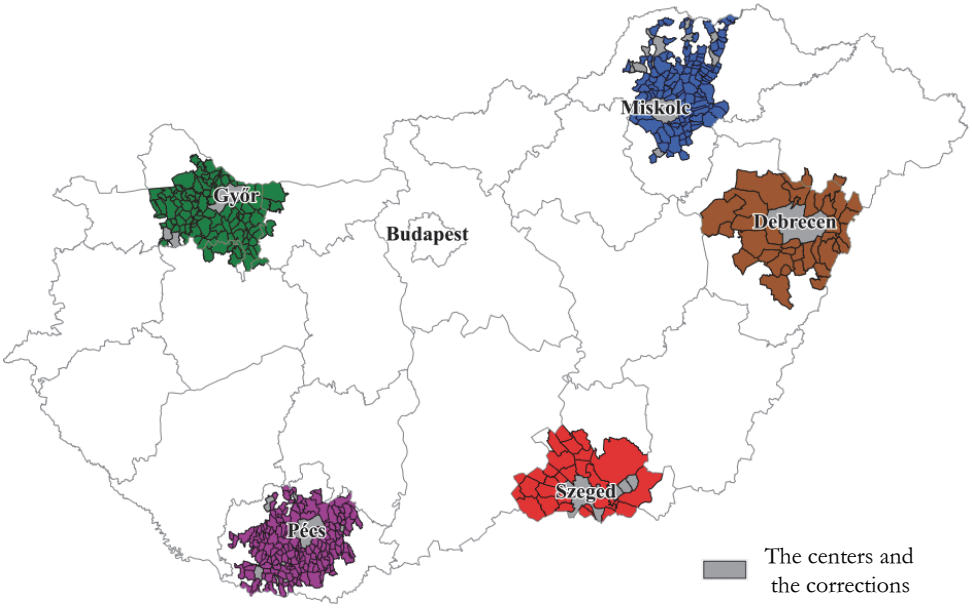
Comparison of the results of HCSO and the present study

Town	Our study	HCSO	HCSO category
Debrecen	34	13	Metropolitan settlement complex[a)]
Győr	106	68	Agglomeration
Miskolc	112	36	Agglomeration
Pécs	163	41	Agglomeration
Szeged	28	15	Metropolitan settlement complex

a) According to its definition (HCSO 2014), there are strong functional relations between the center and the settlements in its (narrow) surroundings. Owing to intensive land use, urban living conditions can be observed in the settlements surrounding the center. In our case, we assume the strength of the functional relationships; however, the rest of the definition does not – or does only partially – characterize the catchment areas we delimit.

Figure 2

Catchments areas by our own delimitation



Selection of variables

To 'measure' society, a complex indicator was created along one dimension (i.e. quality features of the society). Although the structure of society can be determined by exact indicators, the spatial movement of population is dynamic and variable; thus, these can be deduced mostly from the relationship with the centre (e.g. natural reproduction, migration difference).

Based on the research objectives described above, we can determine the most important characteristics of highly qualified strata in modern societies: education, the nature of work, and language skills. It should be noted that nowadays, this is one of the research topics for which data are hardly available for all census years, thus limiting the course of the study. Table 3 lists the set of indicators included in the study.

Table 3

Data selected to measure highly qualified strata

Data	Unit	Source
Quality dimension (KMO 0,593; Bartlett's Sig. 0,000)		
Proportion of speakers of one or more languages other than their mother tongue to the resident population	%	HCSO Population Census and Demographic Statistics Department
Proportion of leading intellectuals employed to the total employed population	%	HCSO Population Census and Demographic Statistics Department
Proportion of university or college (etc.) graduates to the population aged 25–X	%	HCSO Population Census and Demographic Statistics Department

Source: Since the data are not public, they were obtained on the basis of an individual application and our own compilation.

Making basic variables suitable for comparison and indexing

To illustrate the change, we examine the years before the market economy transformation; thus, the database was compiled based on information from the 1980, 1990, 2001, and 2011 censuses.

In the case of the language proficiency variable, there were extreme outliers in the database as among the settlements belonging to the five centres there are many settlements inhabited mostly by ethnic minority populations (up to 50%). This is most typical of the Pécs area (Rácz 2017) with German-speaking and/or Croatian-speaking population who also speak Hungarian. These outliers have been corrected in the database so as not to skew the complex indicator.

Weighting and aggregation

The use of principal component analysis is necessary to set empirical weights. In each case, we performed a principal component analysis with the last 2011 data with their weight values retained for the variables of the other three years (2001, 1990, 1980) included in the analysis (Table 4).

Table 4

Communality and weights of the principal component analysis

Data	Communality	Weights of PC
Proportion of speakers of one or more languages other than their mother tongue to the resident population	0.498	0.670
Proportion of leading intellectuals employed to the total employed population	0.851	0.927
Proportion of university or college (etc.) graduates in the population aged 25–X	0.900	0.946

The aggregation was done in the following six steps:

1. Normalization (range)
2. Weighting
3. Adding weighted values along the dimension[3]
4. Normalization of dimension
5. Addition of normalized values = complex indicator
6. Comparison (centre = 100%)

The results

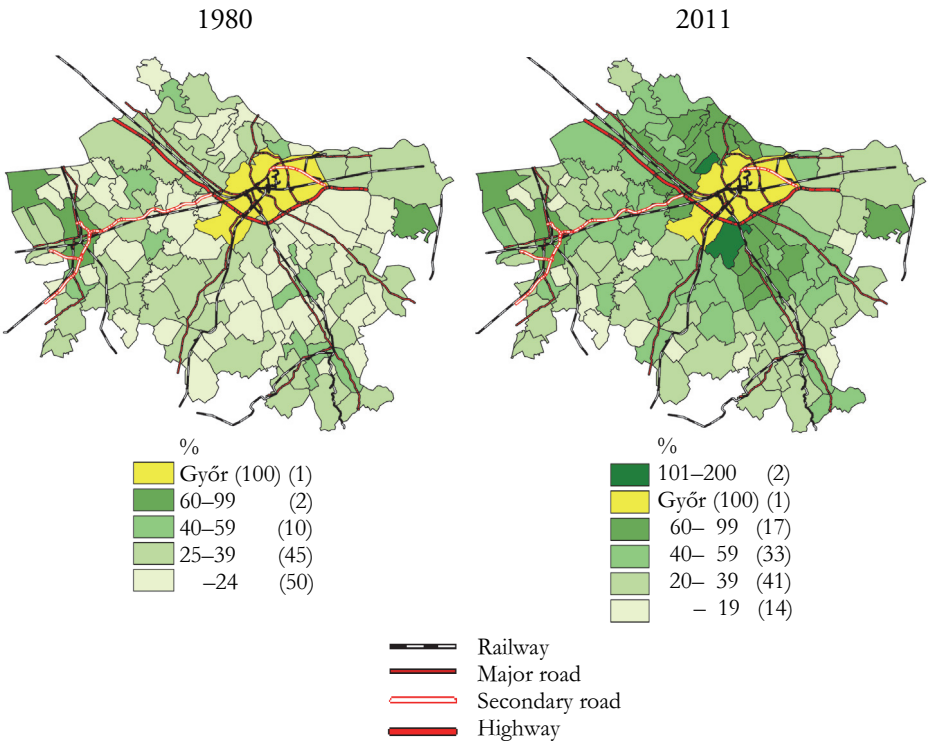
While in 1980 there was a settlement with a highly qualified population in the Győr catchment area (Figure 3), by 2011, the highly educated, graduate, foreign language-speaking intellectuals of the society began to concentrate in the direct agglomeration of the centre (Győrzámoly, Vámosszabadi, Kisbajcs, Győrladamér, Győrújfalu, Győrújbarát); however, for example, Nyúl, Écs, Abda, Öttevény, and Kunsziget also stand out in this dimension. We found a north-west-south-east axis, where the settlements had a particularly good complex score. These settlements are also located next to the main road (lines 1 and 82), indicating that the well-trained workforce lives in smaller settlements outside the borders of Győr but commutes to Győr on a daily basis. If we observe, the employment potential and the migration gap are also remarkably high in these areas. Consequently, we can cautiously conclude that high-status strata move primarily from Győr or within the catchment area to Győr while those who want to live near Győr due to change of residence for better employment conditions move to those distant settlements of the agglomeration.

[3] There is one dimension here, the 'quality dimension', which presents the highly qualified social strata.

Figure 3

Results of the social complex indicator in 1980 and 2011*

(The centre is Győr = 100%)



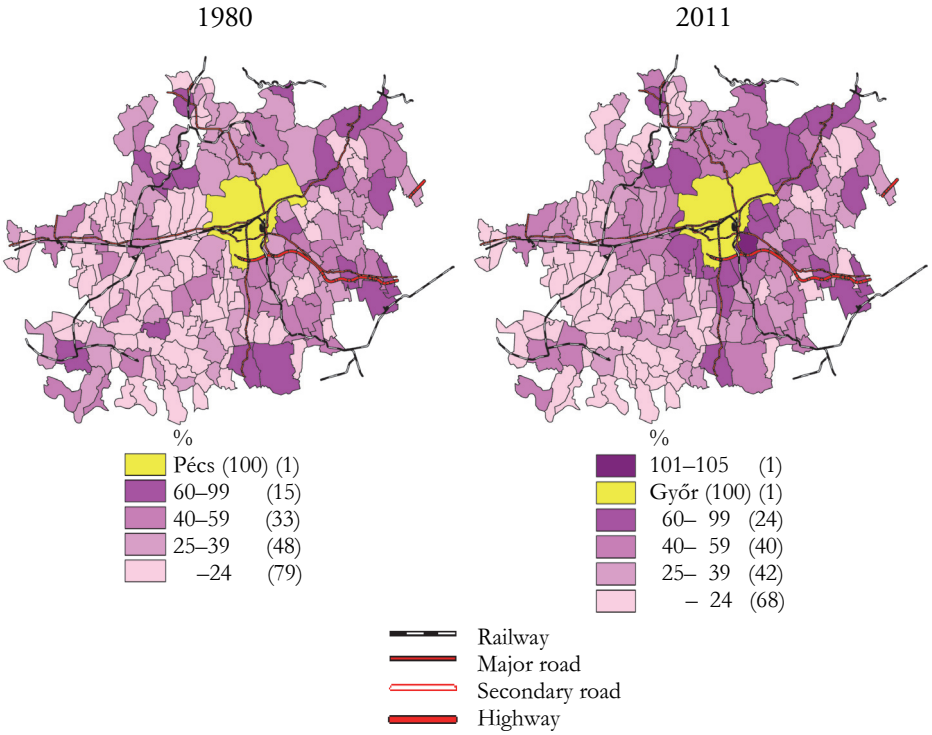
* Owing to the size limitations of the study, only the results for 1980 and 2011 are shown.

From these settlements, the 'elite' strata presumably moved to the centre and its immediate surroundings (in a small proportion to a completely different city, but this should be treated conditionally due to lack of data). Over the decades, the highly skilled population was slowly emptied from this region, resulting in high unemployment, low employment potential, and poor economic performance and structure (Berkes 2020). Apart from Kozármisleny, we did not measure the higher quality features of the society in other settlements than Pécs; however, the suburbanization is somewhat visible (Figure 4).

Figure 4

Results of the social complex indicator in 1980 and 2011

(The centre is Pécs = 100%)



Overall, we can see that the highly qualified strata of the Szeged region increased exponentially in recent decades (Figure 5). With the exception of a few settlements (Maroslele, Óföldeák, and Földeák) – due to poor transport facilities, highly qualified strata do not gravitate toward Szeged, Makó, or Hódmezővásárhely – the education of the population is clearly higher in this catchment area.

The outstanding, highly qualified strata of Deszk and Újszentiván can be best explained by the proximity of the centre and the part of the urban area that is not a 'classic farm' area.

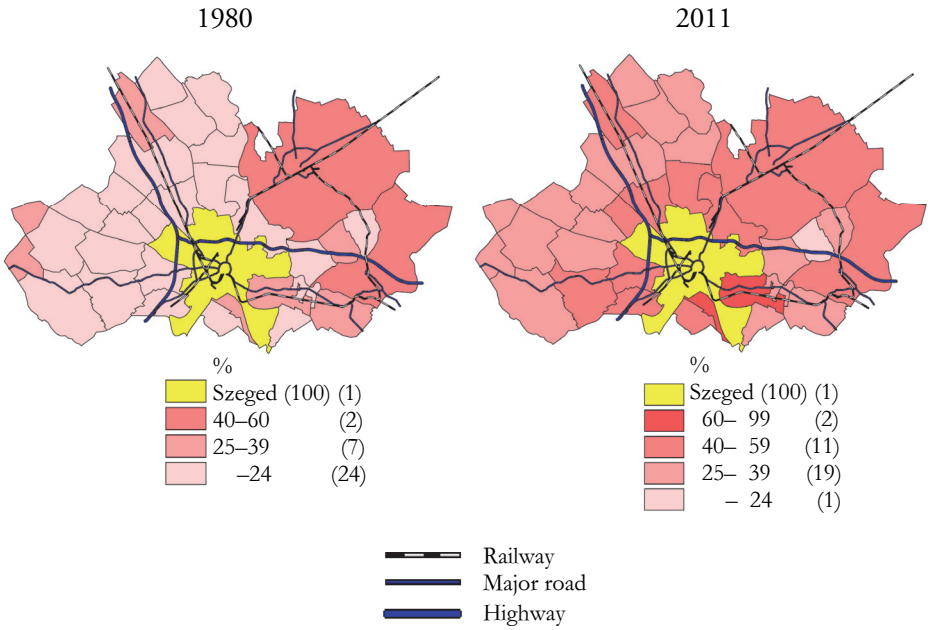
Although Makó and Hódmezővásárhely have a highly educated population and their economic performance and employment are outstanding (Berkes 2020), their migration balance has been negative in recent decades. The reason for this is that, although the population is indeed highly educated, employment is only outstanding compared to the surrounding villages. However, these villages are not cities where the higher educated can expect too many opportunities.

All five centres also function as traditional centres of higher education, so the dimension of structure of society and the context of migration obviously need to be interpreted with caution. Evidently, the general increase in educational attainment may partly explain the background of the processes.

Figure 5

Results of the social complex indicator in 1980 and 2011

(The centre is Szeged = 100%)

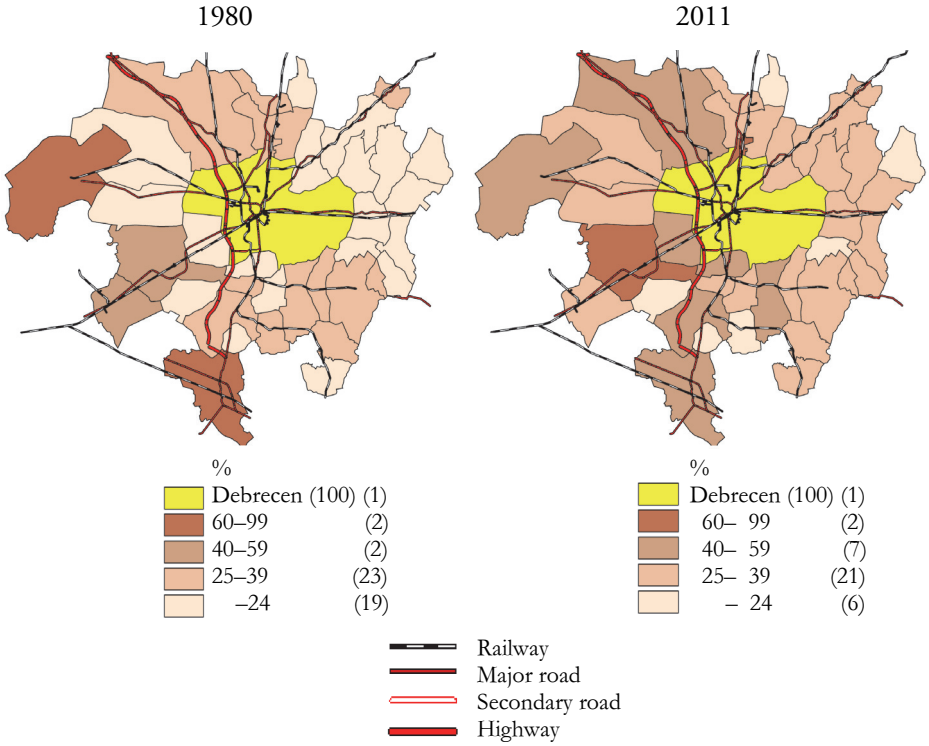


In the catchment area of Debrecen, the highly qualified strata are hard to detect (Figure 6) because the environment of Debrecen seems to be less differentiated due to the extent of the areas of the surrounding settlements. However, some outstanding settlements can still be found. In 1980, the qualifications of the populations of Hortobágy, Hajdúszoboszló, and Berettyóújfalu were outstanding compared to those of other settlements, but it is important to note that Debrecen was not preceded by any settlement in any of the years. Presumably, the proximity of the centre played a role here as well as in the fact that the level of education of the whole region improved. By 2011, however, Hortobágy was replaced by Ebes, with Bocskaikert's indicator in this direction being the only one close to the centre as it is a suburban area. In the case of Bocskaikert, the effect of direct neighbourhood with the centre is clear with its history influencing the social change. (Since 1993, Bocskaikert has been an independent village offering recreation at mansions and vineyards for rich citizens during the summer.)

Figure 6

Results of the social complex indicator in 1980 and 2011

(The centre is Debrecen = 100%)



The migration of highly qualified social strata toward the centre can also be seen in the Miskolc catchment area (Figure 7) with some high scores also measured in 2011 in certain island-like settlements. In 1980, there were a total of three settlements in the catchment area where the percentage of highly qualified social strata was visibly higher (Baktakék due to the effect of 'small settlement size', Encs, and Kazincbarcika). Since then, the structure of society has improved in the region as a whole with the exception of the northern region, where the unemployment rate is high and employment potential is low (Berkes 2020). None of the settlements did exceed the value of the centre in any of the examined years. In this regard, Miskolc has the most stagnant and weakest indicators among the five regional centres with Miskolc showing the biggest differences. If we compare it with the maps of the migration difference, where Miskolc is the only regional centre with a negative balance (between 1980 and 1990), we can see that the settlement ring forming its immediate neighbourhood showed a high, lasting, and positive balance of migration, indicating that those who intended to change their place of residence in this direction moved closer to the immediate vicinity of Miskolc.

Figure 7

Results of the social complex indicator in 1980 and 2011

(The centre is Miskolc = 100%)

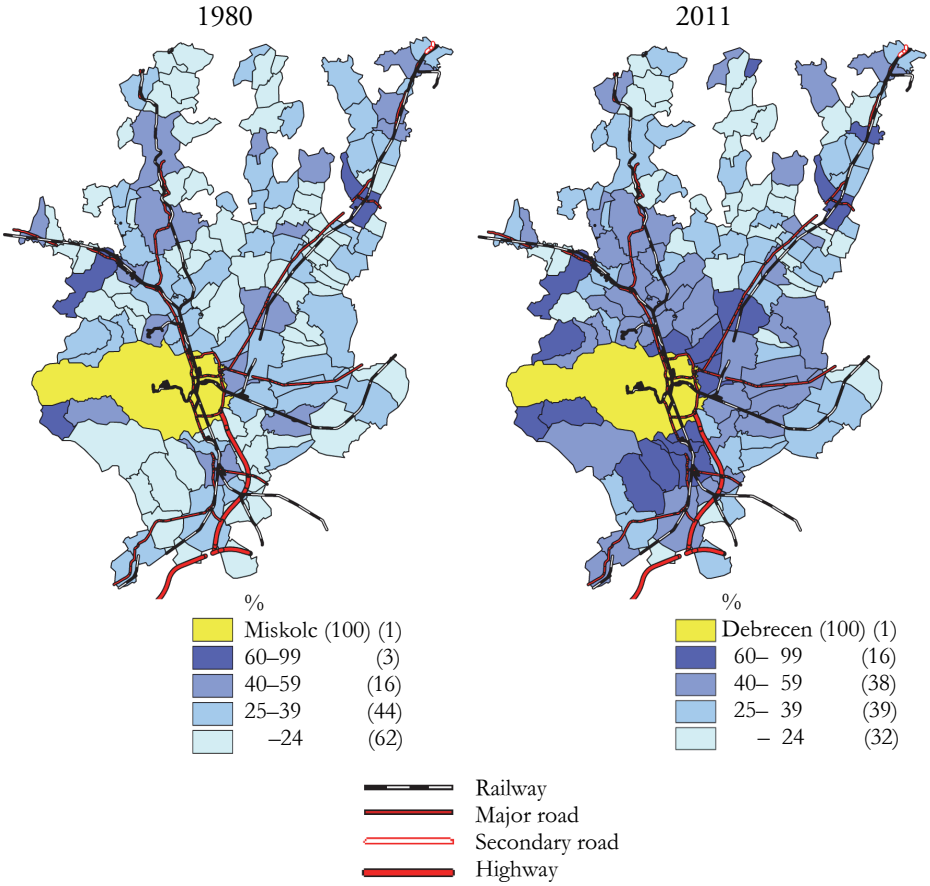
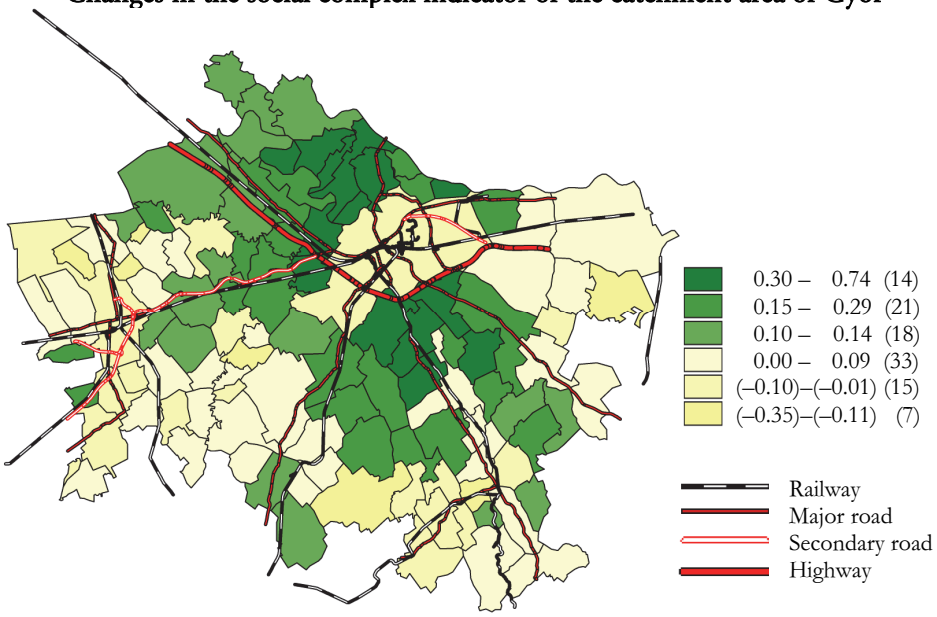


Figure 8 shows results of the examination of changes in the social structure of Győr. The growth of social qualities is characteristic of the direct agglomeration of Győr. The necessary routes for commuting are outlined, along which 'intellectuals' commuting to the centre and the agglomeration is presumably taking place, thus pointing to the migration directions. The settlements showing the strongest positive change (e.g. Győrújbarát, Nyúl, Écs, Töltéstava, Ikrény, Abda, Győrzámoly, Vámosszabadi) almost completely cover settlements with strong employment potential. In the case of Győr, the relative shift of the indicators representing highly qualified social strata is slightly negative; thus, we can cautiously verify the aforementioned assumptions that highly qualified strata leaving the centre characterise these settlements.

Figure 8

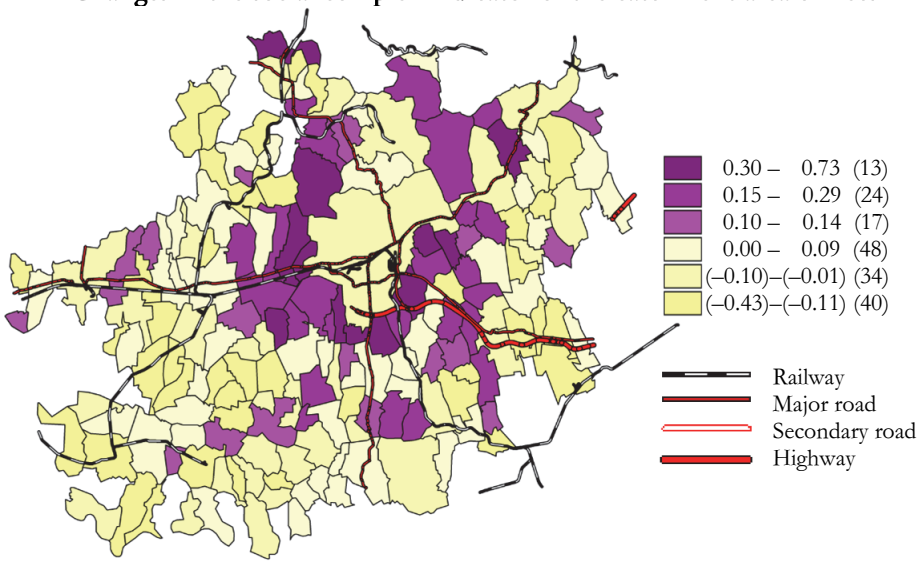
Changes in the social complex indicator of the catchment area of Győr*



* Based on the absolute difference between the 2011 and 1980 complex indicators.

Figure 9

Changes in the social complex indicator of the catchment area of Pécs*



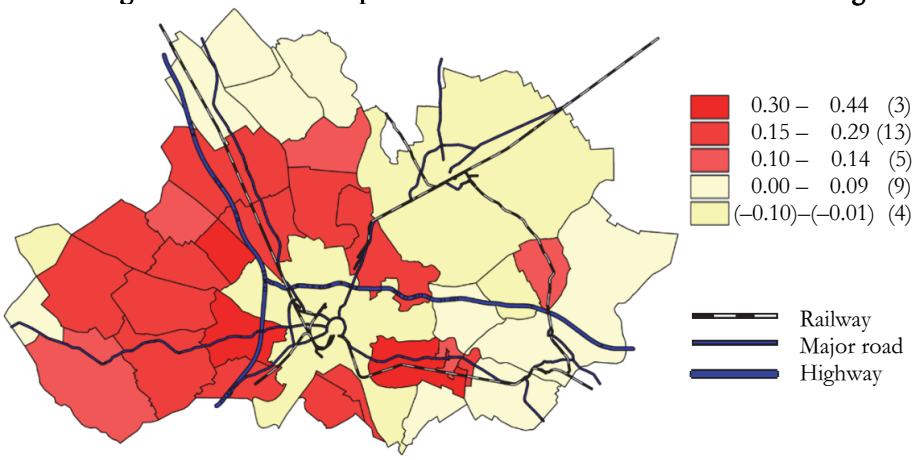
* Based on the absolute difference between the 2011 and 1980 complex indicators.

Here, the structure of society shows a significant improvement, mainly in the very narrow agglomeration of the centre (Figure 9), enclosing the centre as a ring. Additionally, the weakness of the centre/region is visible as it cannot attract a highly qualified population from the outside; thus, for the most part, they tend to migrate. Therefore, the small extent of highly qualified strata, which can be explained by the fact that this process is generated only by the centre, has no significant influence on stable small centres. Here, the cautious assumption made in the analysis of highly qualified strata makes sense again. According to this assumption, the Pécs elite live in the narrow settlements as close to the centre as possible (direct neighbours of the centre), – based on Figure 9 as it covers part of it – to facilitate their commuting. A negative trend can be observed in more than 40% of the settlements (these lost their highly qualified social strata).

The catchment area of highly qualified strata (Figure 10) covers almost only the western part of the region (as the Tisza River divides the area) and the smaller settlements, which were integrated into the area (suburb) of Szeged. It can be conditionally stated that the highly qualified strata of Szeged moved to these settlements, from where daily commuting is easier than from the eastern side.

Figure 10

Changes in the social complex indicator of the catchment area of Szeged*

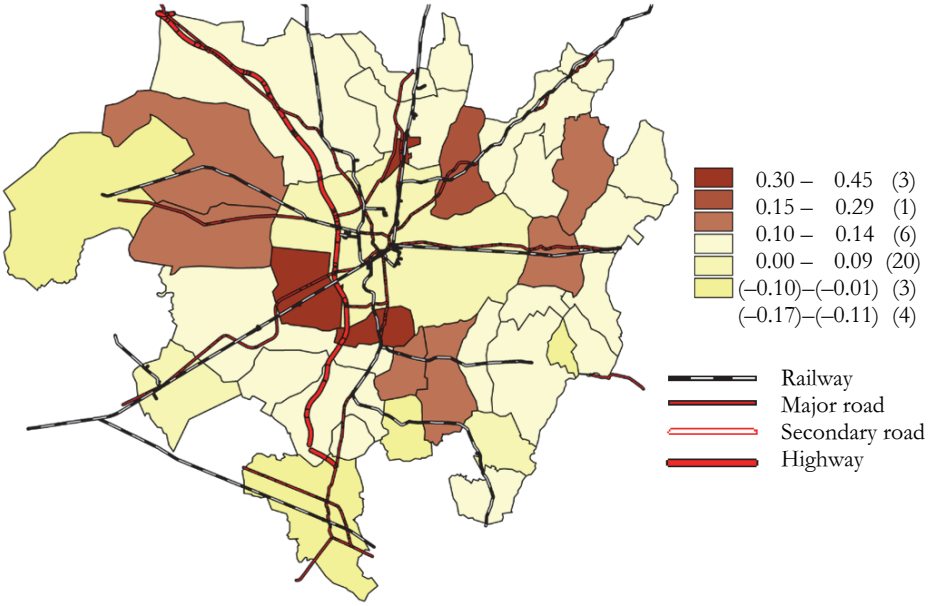


* Based on the absolute difference between the 2011 and 1980 complex indicators.

The highly qualified social strata shape the area into the narrowest agglomeration (Figure 11). Based on the census data, the process of labour attraction and employment is negative in three settlements: Hortobágy, Berettyóújfalu, and Kaba. In the same settlements, the social 'elite' has been also declining in recent decades. We can carefully assume – as it cannot be substantiated due to the lack of accurate data – that the highly qualified social strata 'migrate' from these settlements to the direct suburb zone, and not only from Debrecen.

Figure 11

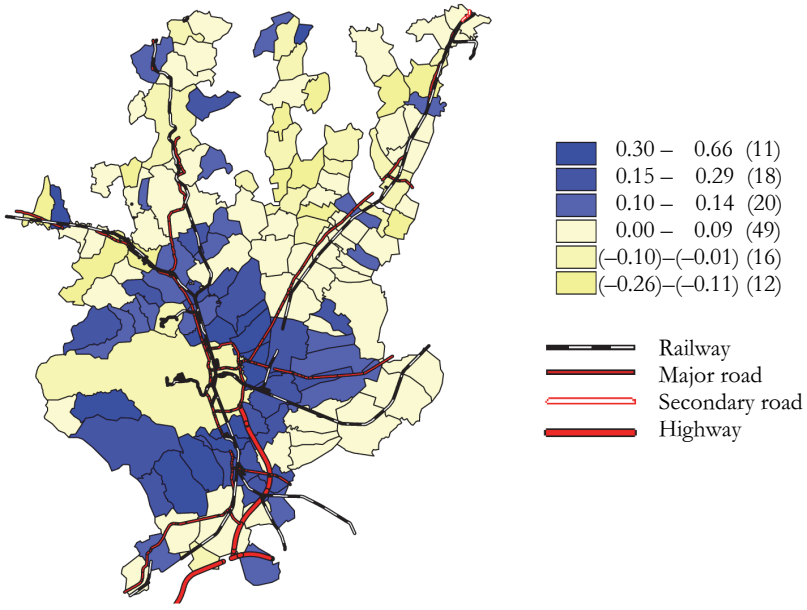
Changes in the social complex indicator of the catchment area of Debrecen*



* Based on the absolute difference between the 2011 and 1980 complex indicators.

Figure 12

Changes in the social complex indicator of the catchment area of Miskolc*



* Based on the absolute difference between the 2011 and 1980 complex indicators.

In this case, the increase in the highly qualified strata also affects the narrowest agglomeration circling around the centre (Figure 12). This is the 'most regular' example of an 'elite' suburban zone. The positive shifts of the other settlements can be explained by the aforementioned effect of 'small settlement's size'. Only a quarter of the settlements that make up the entire catchment area have deteriorated in their ability to concentrate highly qualified social strata with little change compared to the rest in recent decades.

Conclusions

This study investigated the territorial structure and location of highly qualified social strata of Hungarian big cities. Referring back to the research questions, it is not easy to examine attributes that refer to the structure of society due to limited data sources, the debatable validity of the census data, and the irreplaceability of data between censuses. Nevertheless, this research has attempted to analyse the spatial arrangement of highly qualified social strata.

Changes in the geographical location of highly qualified strata since 1980 have also been presented, showing some differences in the structure of highly qualified strata of urban regions and their catchment area. Overall, it can be stated that intellectual strata around the centre are concentrated in a narrow suburban ring within the catchment area; however, all five settlements show specific, unique features.

In1980, the good position and role of small centres was clear. Then, it disappeared with the proximity of the centre becoming the focal point.

A fundamentally important difference between urban regions is whether or not the area attracts highly skilled labour from outside the region. Győr shows distinct characteristics: suburbanization and moving in from distant places. This process comprises four layers: 1. people go to Győr regardless of education level; 2. people with high education moving to the inner settlements; 3. people with lower education move to the cheaper, more distant settlements but go to work in Győr; 4. people with lower qualifications moving to more remote settlements or working in Austria. For other centres, these processes and tendencies are much lower. Győr is characterized by the concentration of high-status social strata in the immediate vicinity of the centre. Spectacularly, there is a broadly inverse movement; compared to 1980, the direct agglomeration is in its worst position.

There are also differences in the characteristics of settlement networks. In the case of Debrecen and Szeged, the classic middle-city agglomeration cannot really develop, whereas in Miskolc and Pécs, having small villages, the development of transport infrastructure can make a big difference.

Szeged has the highest proportion of highly qualified strata with exponential growth across the region. Debrecen is a big city with no sign of suburbanization. Its

centre is the primary target for the highly qualified social strata. It is characterized by stagnant social 'potential' (i.e. retaining the dominance of the three sub-centres and the opposite of east-west development). Overall, the five cities perform similarly in this dimension with a small difference, except for Szeged, which has the highest total score of the complex indicator for all years.

There is also a difference in the process of concentrating resources in an area depending on whether there is a middle-centre within or near the area that could distort this agglomeration (e.g. Szeged and Debrecen).

It is no aim of this research to examine the impact of economic factors on urbanisation, but it is necessary to note that the flexibility and renewable capacity of the economy also have a strong effect on the processes.

Although it requires further research, it can still be cautiously assumed based on the results that urbanisation phases seem to coincide with each other. However, this study did not aim to examine this aspect.

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