

Changes in Ethnic Structure of Population in the Light of Recent Trends of Migration and Natural Reproduction

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Abstract

The paper aims to assess the impact of migration and natural reproduction of population to the changes in ethnic structure of population by the case study of three multi-ethnic functional urban regions in Slovakia. All three regions are located at the Slovak-Hungarian ethnic border and are characterized by larger proportion of Slovaks and lower proportion of Hungarians in the core than in the ring. The regions were chosen also with intent to provide a sample with various processes of spatial redistribution of population taking place, which are described in the paper. The ethnic structure at the levels of whole regions, their basic components – cores and rings – is introduced briefly. The analyses of changes in the ethnic structure and its relationships with the natural reproduction and migration of population provides interesting results. It was proved that the migration is a driving force in changes of ethnic structure in analysed regions, even though the patterns of natural reproduction behaviours between ethnic Slovaks and Hungarians are traditionally different. Since the most intensive process of spatial redistribution of population is the decentralization from the cores to the rings of the regions driven by migration, the ethnic structure of the rings tends to approximate to that in the cores.

Key words: Ethnic structure, Slovaks, Hungarians, concentration, decentralization, natural reproduction, migration

Introduction and theoretical background

Spatial redistribution of population (consisting of migration and natural reproduction) has recently become the topic being increasingly addressed in geographic research in Central and Eastern European (CEE) post-socialist countries. The aim of this paper is to assess the relation of current processes of migration and natural reproduction of population with the changes in ethnic structure of population by the case study of three multi-ethnic urban regions in Slovakia.

Central and Eastern European post-socialist countries have undergone significant political, economic and social transformation since the early 1990s. Natural reproduction and migration behaviours of population have been affected strongly by that transformation. This is reflected by many research papers

published by scholars from post-socialist as well as capitalistic countries.

Migration and natural reproduction of population are processes closely related to other characteristics of population. They are affected by factors such as age, sex, education, social status, ethnic or religious structure of population but in the same time migration and reproduction cause changes in these structures.

Considering the migration of population, its impact to the changes of age and educational structure of population has recently been addressed in many research papers in the post-socialist European countries. The research by Plavša (2000), Šnejdová (2006), Ouředníček et al. (2007), Ouředníček, Temelová (2008), Repaská (2013), Stojšavljević, Pantelić (2013), Kurek et al. (2014), Nestorová-Dická (2014), Novotný

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(2014) or Šveda, Šuška (2014) confirms strong relationship between migration and changes in age or education structure of population.

The impact of migration to the ethnic structure of population is often examined at the national or international levels (e.g., Mitchell, Kicošev 1997, Plavša, Bubalo-Živković, 2002, Djurdjev, et al., 2009). At the intra-regional level, changes in ethnic structure of population have rather been investigated in relation to natural reproduction of population, due to (as emphasized by Gabal 1999) specific cultural, social and also reproductive behaviour of each ethnic group, or in different kinds of processes of assimilation (e.g., Majo 2009). On the one hand, there has not been recently any strong need for such a research in ethnically relatively homogenous countries such as Czech Republic, Hungary or Poland. On the other hand, Baltic countries, Serbia, Macedonia, Romania, Slovakia, Ukraine and others are ethnically much more heterogeneous what raises the need for research of changes in ethnic structure of population and their causes, including impact of migration.

Significance of relation between migration and ethnic structure even at the intra-regional level was indicated by the research by Kontuly and Tammaru (2006). In Estonia they identified ethnically heterogeneous rural areas as less attractive destination of immigration than those ethnically homogenous.

Natural increase has long been a key factor of the overall population growth in majority of the CEE regions. During the post-socialist transformation, much attention was paid to the research of changes in natural reproduction trends, including decreasing fertility, ageing of population, postponed marriages, and others (e.g., Marenčáková, Pastor 2006; Mládek, 2008; Hoem, Kostova, Jasilioniene, Murešan, 2009; Káčerová 2009; Kurek 2011). Changes in natural reproduction and migration of population can be well described by the example of development in Slovakia. Since World War II until the end of socialistic regime, Slovakia used to record significant natural increase although the rate of natural increase values started to decline slightly already in the 1970s. As emphasized by Mládek (2008), the period of 1990s in Slovakia can be defined as a destructive phase, as a shift from natural increase to stabilization of natural growth (or even decline) with the values close to zero.

Less attention has been paid to changes in inter-regional and intra-regional migration trends with respect to economic, social, political and cultural transformations in CEE countries. Nevertheless, as Bezák (2011) proved by his research, the number of regions in Slovakia where the migration determines the overall population change has been continuously rising since 1980s. Furthermore, even in the regions where

natural reproduction determines the overall population change at the regional level, it is possible that the migration is the key factor of intraregional redistribution of population (cf. Novotný, 2012).

Gazda and Novotný (2014) indicated that reproduction potential in Slovakia was moved by migration from regions with traditionally high levels of natural growth but worse economic situation to regions with long history of positive migration balance mainly due to considerably better social and economic conditions. All these findings confirms that migration and natural reproduction of population are phenomena closely related to each other but in the same time they indicate growing impact of migration to the spatial redistribution of population and changes in population structure in Slovakia as well as other CEE countries.

Bezák (2006) confirms long-term decline in the level of internal migration in Slovakia during the 1990s accompanied by a rapid decrease of the efficiency of migration in redistribution of population between functional urban regions. However, this decline was not as significant as the decline in the natural growth of population. Moreover, it seems the decline in the level of migration was only temporal consequence of general transformation of migration patterns in Slovakia. This is indicated by the research paper of Bezák (2006) itself, as the substantial changes in migration system with a complete reversal of the previous migration pattern as well as slight increase in the level of internal migration were recorded in the early 2000s.

Concerning transformation of inter-regional migration (the migration between functional urban regions) patterns in Slovakia, the most important is the change from relatively equally distributed smaller migration flows into the number of functional urban regions, to the pattern characterized by high degree of concentration of migration flows into the relatively small number of the most economically developed functional urban regions led by the Bratislava region.

The dominant form of migration within functional urban regions, according to Bezák (2006) remains the exchange of population between urban and rural communities. However, while the centralization of population within the regions (migration from rural areas to urban centres of the regions dominates) was characteristic for socialist era as well as the early 1900s, the number of regions where reversal process takes place started to grow rapidly in the late 1990s. General shift from centralization to decentralization of population in the functional urban regions in Slovakia was confirmed also by the study by Novotný (2014).

This indicates that changes in the ethnic structure by intra-regional migration should be most significant in the urban centres when socialist migration patterns in effect. Recently, when reversal migration

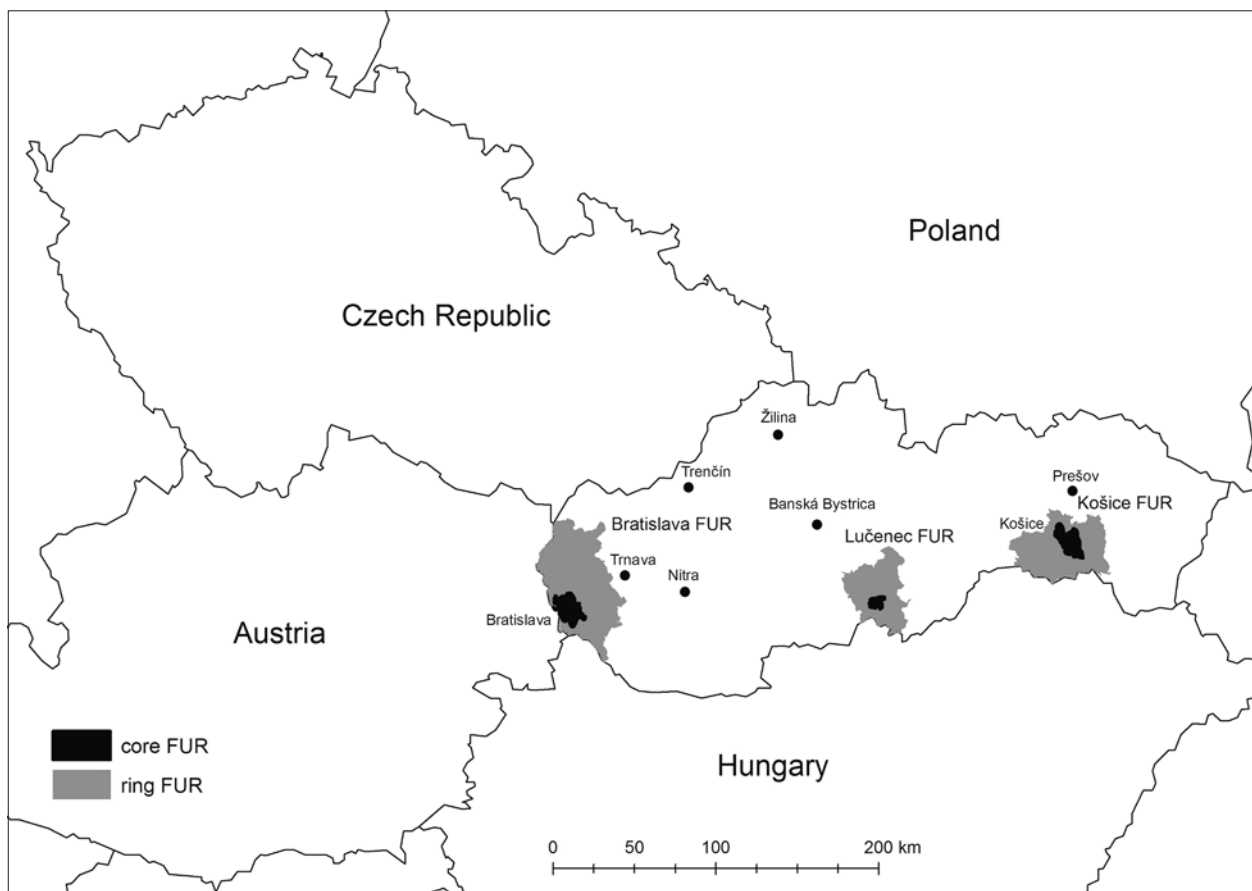


Figure 1. Location of analysed regions within Slovakia

flows are much more significant, it is expected that urban population migrating into the rural hinterlands could affect also the population structures in immigration areas.

Spatial frame

The case study presented in this paper is based on the research in three Slovak regions with different population size of the core and the region itself, different social and economic conditions and with different trends of inter-regional and intra-regional migration: the Bratislava, Košice and Lučenec regions (Figure 1). Majority of population in all three regions is Slovak by ethnicity but there is significant proportion of Hungarian ethnic minority especially in the rural parts of the regions. Moreover, Roma minority creates significant share of population in some rural communities within the regions.

The main spatial units for presented research are functional urban regions (FURs) which, in contrast to administrative units, define the sphere of influence of the core city by commuting. The region's core is the city with the concentration of employment and surrounding ring is an area tied to the city by daily commuting. This enables (but not determines) the change of place of residence within the region with-

out changing the place of employment. The spatial extent of the Bratislava, Košice and Lučenec FURs was taken from the study by Bezák (2000), where FURs in Slovakia were delimited on the basis of the data from the 1991 population census. These FURs are internally coherent and externally relatively closed, when daily commuting is taken into account. Considering these characteristics of FURs it is possible to distinguish between inter-regional and intra-regional migration and its impact to the changes of population structure, as the inter-regional migration is usually related to the change of place of work (economically motivated migration) while the intra-regional is usually driven by change of social status and/or seeking better environmental conditions of residence (cf. Bezák, 2000).

Each FUR consists of the core (urban centre) and the ring (communities tied with the core by daily commuting). The ring of the Bratislava FUR consists of 115 communities including seven towns and six localities which are administratively part of the Bratislava city but are largely rural in nature and spatially separated from the urban core. The core consists of 10 spatially integrated city-districts. The ring of the Košice FUR consists of 123 communities including two towns, and, similarly with Bratislava FUR, six administrative units of Košice city. The core of the Košice FUR consists of 16 city-districts. The core of Lučenec FUR is

Table 1. Basic characteristic of analysed functional urban regions

FUR	size (km ²)	number of inhabitants in 2011 (SOSR 2011)		
		region	core	ring
Bratislava	2585	656 300	381 400	275 000
Košice	1881	363 200	230 000	133 200
Lučenec	1279	96 400	28 500	67 900

created by one urban municipality (Lučenec) and the ring consists of 78 communities including two towns. Basic characteristics of selected FURs are provided in Table 1.

Methods

To assess the trends of spatial redistribution of population we used natural increase rate and net migration rate calculated as a ratio of natural increase/net migration and mid-year population of given spatial unit, expressed in per mile.

To express the spatial redistribution of population, mainly in terms of migration, different names for processes taking place are used in geographic literature. To avoid confusion, in this paper, term *concentration* is used for the process of grouping people into a region, and *deconcentration* for the opposite. Within the region, *centralization* refers to the process of grouping people into the region's core and *decentralization* the process of its dispersion from the core to the ring (cf. Berry, Kasarda 1977; Grzeszczak, 1996; Lisowski, 2005).

The ethnic structure of population was analysed by simple indicator – a share of certain ethnic group at the total population of given spatial unit.

All statistical data were provided by Statistical Office of Slovak Republic (SOSR). Chosen period 1991-2013 is sufficiently long to assess the migration and natural reproduction of population development in different circumstances of post-socialist transformation in Slovakia. The 1991-2000 period is characterized rather by economic decline and worsening of social situation in the country accompanied by the breakdown of former natural reproduction and migration patterns (see Bezák, 2006; Mládek, 2008), while the period after 2001 is characterized by economic growth and formation of new patterns of reproduction and migration.

The strength of the relationships between changes in ethnic structure and migration/natural reproduction of population is expressed by Pearson's correlation coefficient.

The data necessary to calculate the natural increase rate and net migration rate (and their annual averages) comes from Annual Registration of Population at the Level of Communities (SOSR 1991-2013) while ethnic structure analyses are based on data from Annual

Registration of Population by Nationality at the Level of Communities (SOSR 2001-2013). As those data are published by SOSR only since 1999, the analysis of ethnic structure of population in this paper is focused on the period after the population census in 2001. This is also the period when new patterns of migration and natural reproduction are already noticeable (see below).

Annual registration of population by ethnicity in Slovakia is based on the results of the previous population census where individual citizens have free choice of the nationality/ethnicity they declare. Therefore, the results of population censuses are often affected by the census methodology, current social mood, political situation and other circumstances. This is seen especially at the 2011 census. The doubts regarding anonymity of census sheets and doubtfully communicated need and relevance of such a census in modern era of information technologies and wide virtual databases resulted into ignorance of whole census or some questions in the census sheets by significant part of population, especially in urban areas. On the other hand, annual registration calculates only with basic demographic events registered (emigrants, immigrants, born and dead) by nationality/ethnicity. Therefore the data from Annual Registration... (SOSR 2001-2013) are relatively coherent within individual intercensal periods.

According to population census 2011 results, the proportion of population with unidentified ethnicity increased significantly (exceeding 20% in some areas). This may reflect current perception and feelings of some part of population but makes the data on ethnicity of population barely comparable with the results from previous census. Therefore the migration and natural reproduction of population relationship with changes of its ethnic structure is analysed at the period 2001-2010, when the annual registration of population is based on the population census from 2001. However, the development trends of migration and natural reproduction of population are observed from 1991 to 2013 (which is currently the last year the annual registration of population data were published by SOSR) to emphasize their development during post-socialist transformation period.

All the data are available for individual communities and the values for functional urban regions and

their basic components (cores and rings) were obtained by grouping those data.

Trends of migration and natural reproduction

If short-term fluctuations disregarded, it is clear that all analysed regions recorded decline of natural increase during the 1990s. The values of natural increase rate in the Lučenec region were negative almost during whole period of observation and dropped even more during the 1990s. The values of natural increase rate in the Bratislava region shifted from positive to negative in mid-1990s (Figure 2). Natural loss of population was growing in the Bratislava and Lučenec FURs during the late 1990s, while the balance of the natural reproduction of population remained positive during whole observation period, despite a decline of natural increase during the 1990s.

In the Bratislava FUR, natural loss of population mitigated after 2000 and changed into fast growing natural increase after 2005. Natural loss of population in the Lučenec FUR also mitigated after 2000 but the balance of natural reproduction of population remained negative till the end of observation period.

In 1991, the Bratislava FUR recorded insignificant migration growth, and the Košice and Lučenec FURs even migration loss. The balance of migration in the Košice FUR in became negative again in the late 1990s, but it was nearing equilibrium during whole 2000s and after 2010 it became slightly positive again. Mi-

gration balance of the Lučenec FUR remained positive longer, but in mid 2000s became also negative. Only the Bratislava FUR as the most economically developed region in Slovakia was recording migration gains during whole period of observation. After the decline in late 1990s, the values of net migration rate in this region started to grow significantly and reached maximum in late 2000s.

Considering processes of spatial redistribution of population at the regional level, the Bratislava FUR was recording concentration of population in terms of migration during whole observation period. Its intensity was low during the 1990s but grew significantly after the 2000. In the Košice FUR, concentration and deconcentration were alternating but deconcentration was prevailing. Similar situation was observed in the Lučenec FUR, but concentration of population was predominating process.

The values of natural increase rate were higher in the regions' rings than in the cores generally, but the differences between cores and rings were very small (Figure 3). This indicates that impact of natural growth of population to its spatial redistribution within analysed regions was less significant in comparison with migration. The only region recording positive values of natural increase rate in both components – the core and the ring – during whole period of observation was the Košice FUR. Natural loss of population was prevailing in the core and the ring of the Lučenec FUR and shifts from gains to loss and then gains again were recorded in the Bratislava FUR's core and ring.

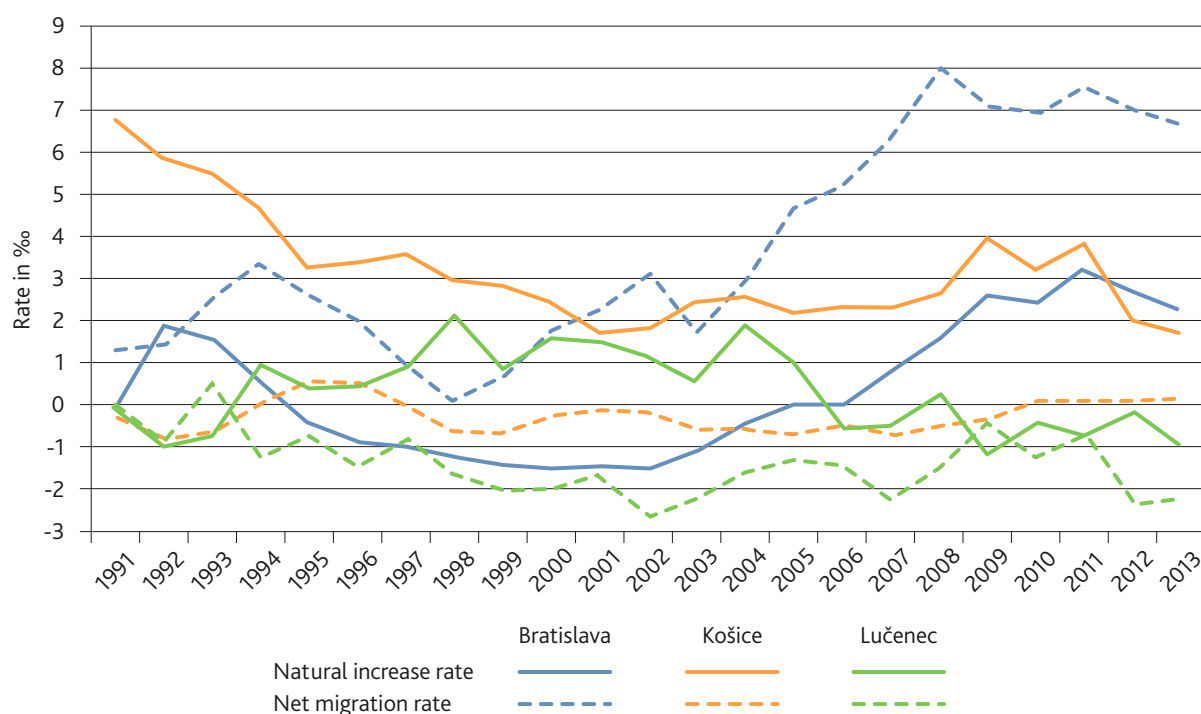


Figure 2. Development of natural increase rate and net migration rate in the Bratislava, Košice and Lučenec FURs in 1991-2013; Data source: SOSR (1991 – 2013)

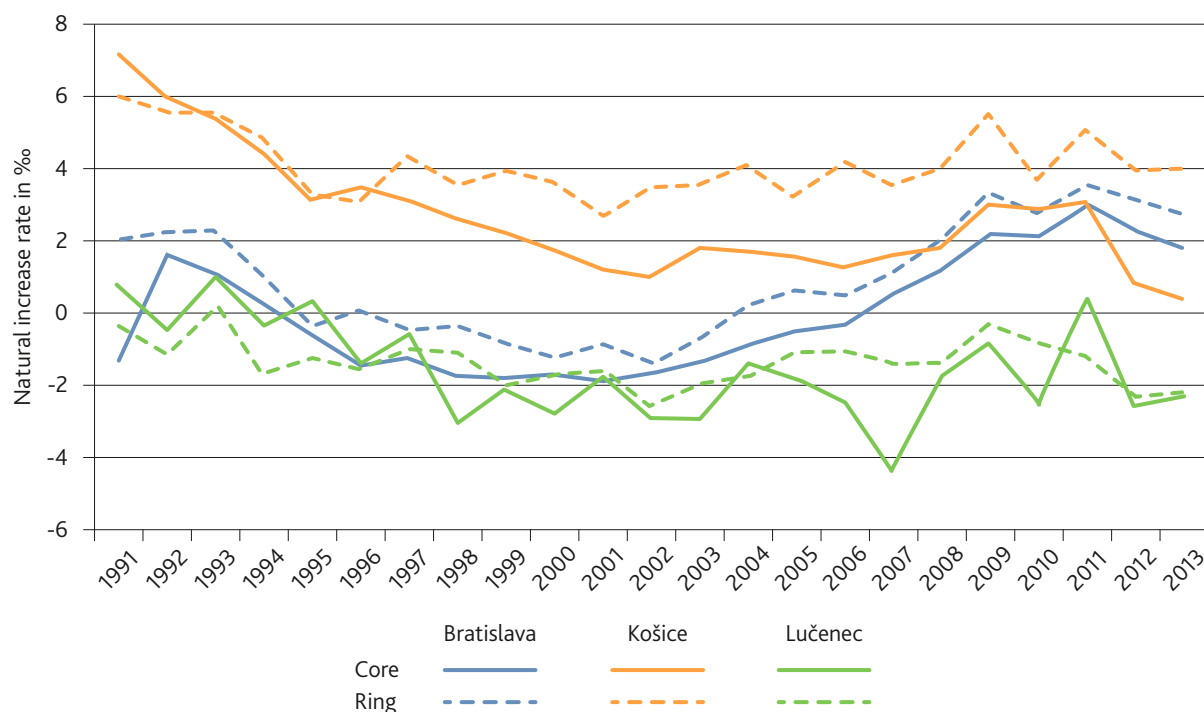


Figure 3. Development of natural increase rate in the cores and rings of the Bratislava, Košice and Lučenec FURs in 1991-2013; Data source: SOSR (1991 – 2013)

Much more dynamic development shows migration at the intra-regional level (between the ring and the core of the given region). In 1991, all cores recorded migration gains and all (except for the Bratislava region's) rings recorded migration losses. This might be seen as a consequence of socialist urbanization. The mid-1990s seem to be period of transformation of

intra-regional migration patterns, as by the late 1990s all rings were already recording migration gains and cores migration losses (Figure 4).

The net migration rate values grew especially intensively in the Bratislava FUR's ring. The attractiveness of Bratislava as economic growth pole of Slovakia resulted into the shift from migration losses to migra-

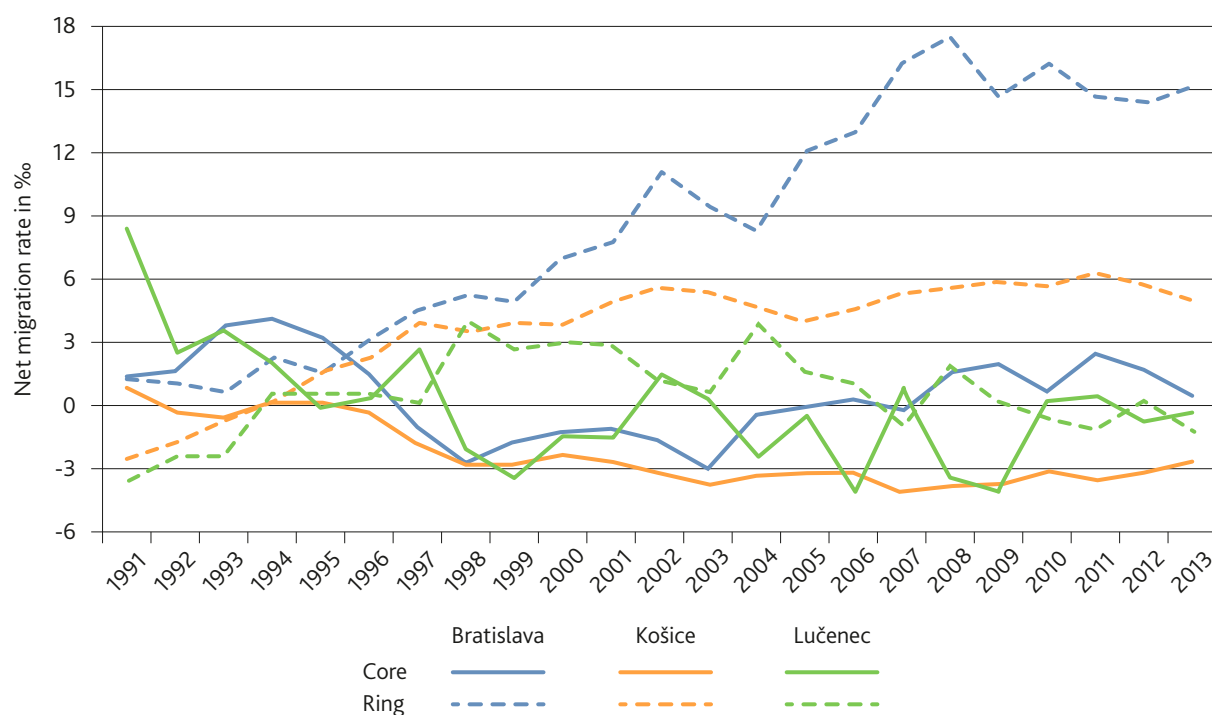


Figure 4. Development of net migration rate in the cores and rings of the Bratislava, Košice and Lučenec FURs in 1991-2013; Data source: SOSR (1991 – 2013)

tion gains also in the region's core in late 2008s but the gains were small in comparison with the ring. In the Košice region, the ring was recording migration gains and the core migration losses till the end of period of observation. Differences between the values of net migration rate in the core and the ring were the lowest in the Lučenec FUR. Both were balancing around zero and in some years the values were higher in the region's core than in the ring, where migration losses were recorded at the end of period of observation.

This indicates that the migration's impact to the spatial redistribution of population within the region was the strongest in the Bratislava FUR, significant in the Košice FUR but relatively low in the Lučenec FUR. This is also confirmed when focusing at the processes of intra-regional spatial redistribution of population (Figure 5). The differences between natural increase rates between cores and rings of all functional urban regions are small and so the intensity of intra-regional spatial redistribution of population by natural reproduction of population is insignificant when compared to the intensity of migration processes.

All three analysed regions recorded centralization of population during the early 1990s and the most intensive centralization was observed in the Lučenec FUR. Till the late 1990s centralization changed into the decentralization with growing intensity especially in the Bratislava but also in the Košice FUR. Intensity of decentralization in the Lučenec FUR was relatively weak and in some years, especially to the end of period of observation, it changed into the centralization.

Assessing the processes of spatial redistribution of population taking place at the levels of the regions and between their basic components, it is possible to distinguish period of their transformation during the 1990s and the period with more or less clearly profiled trends during the 2000s. This continues also after 2010 but some changes are indicated. Intensity of some processes weakened. Deconcentration of population in the Košice FUR changed into the concentration and decentralization in the Lučenec FUR changed into the centralization. However, it is too short period to state clearly if it is only some short-term deviation or beginning of new era in development of spatial redistribution of population in these regions. Therefore, the analysis in following parts of the article will be focused primarily at the development during the decades 1991-2000 and 2001-2010, which also correspond with the inter-censal periods in Slovakia.

The Lučenec, Košice and Bratislava FURs represents unique sample of regions with different processes of spatial redistribution of population taking place (Figure 6). Natural reproduction of population contributed to the deconcentration of population in the Lučenec FUR at regional level and to the centralization of population during 1991-2000 period and decentralization of population during 2001-2010 period. In terms of migration region recorded population concentration and the shift from centralization during 1991-2000 to decentralization during 2001-2010 period.

In the Košice FUR natural reproduction of population allowed for the population growth of the re-

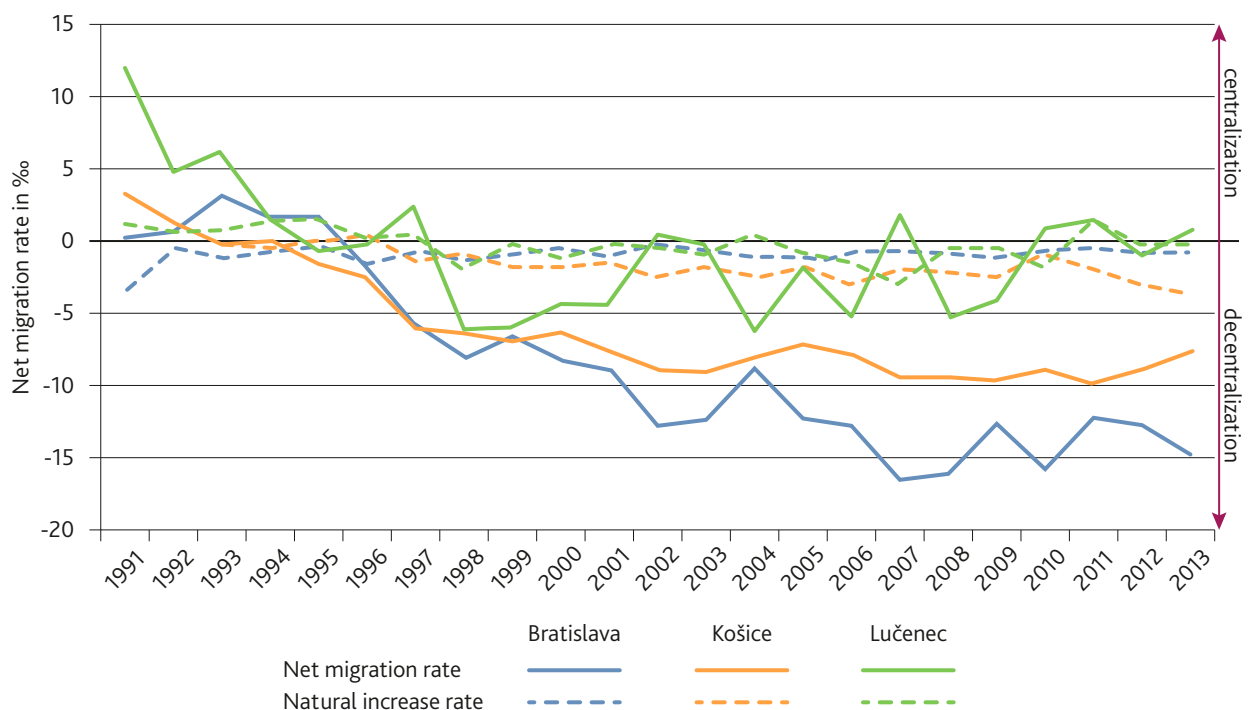


Figure 5. Development of intra-regional processes of spatial redistribution of population by natural reproduction and migration in the Bratislava, Košice and Lučenec FURs in 1991-2013; Data source (SOSR 1991-2013)

gion, even though the deconcentration of population in terms of migration was taking place. At the intra-regional level both, natural reproduction and migration contributed to the decentralization of population in both decades with higher intensity during the latter period.

In the Bratislava FUR concentration and decentralization took place in terms of migration, both with very strong intensity during the 2001-2010 period. Mi-

gration was significantly overshadowing the impact of natural reproduction of population to the processes of spatial redistribution of population in the Bratislava FUR.

Considering abovementioned trends, the chosen regions represents an appropriate set of units for the analysis of changes in the ethnic structure in the relation to the processes of spatial redistribution of population with different character and intensity.

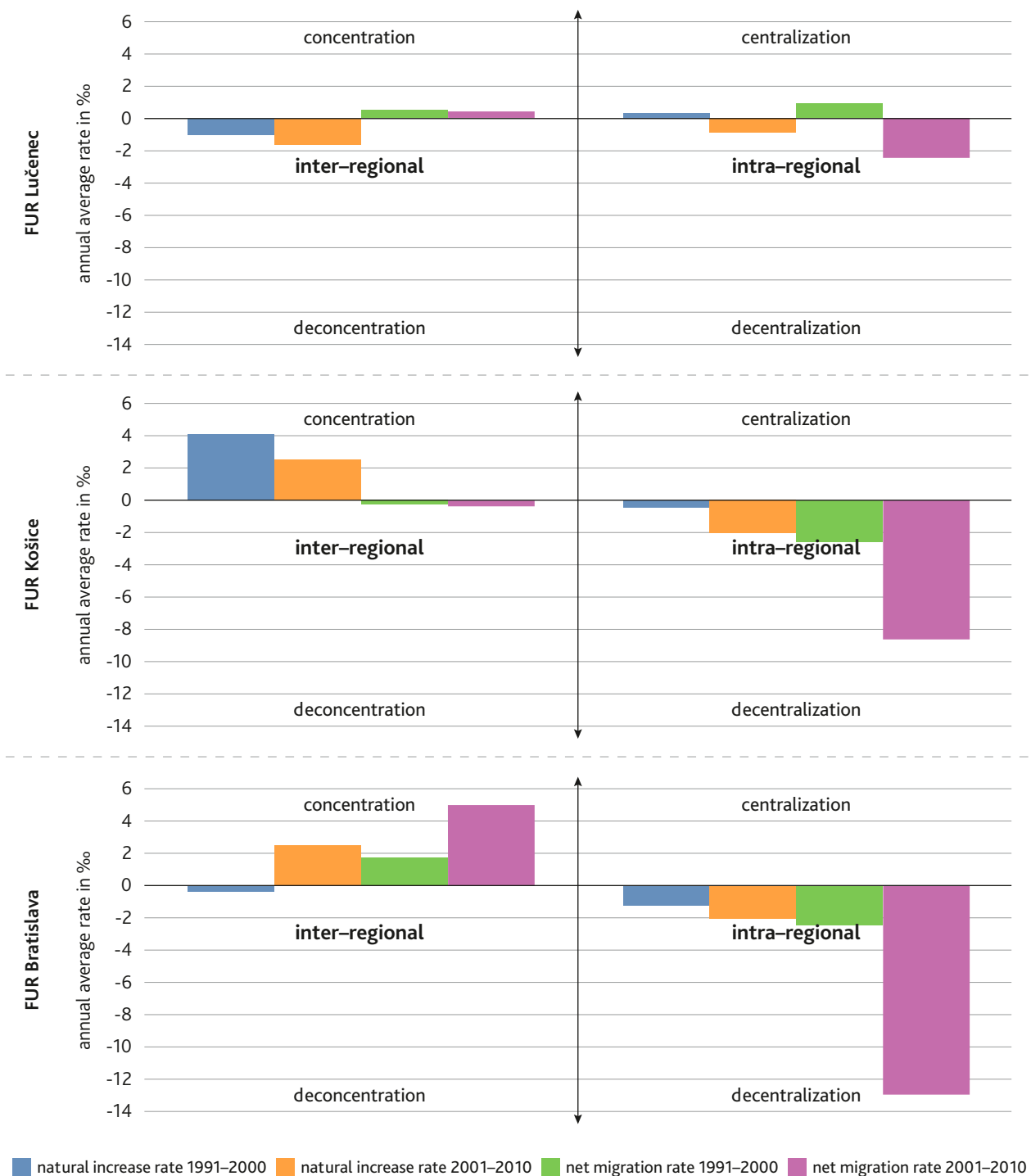


Figure 6. Inter-regional and intra-regional processes of spatial redistribution of population by natural reproduction of population and migration in inter-censal periods 1991-2000 and 2001-2010; Data source: SOSR (1991-2013)

Ethnic structure of population

Ethnic Slovaks dominate in each analysed region. Their proportion on whole regional population ranges from less than 74% in the Lučenec FUR to over 87% in the Bratislava FUR. Hungarian ethnic minority reaches the second largest proportion, from less than 7% in the Košice FUR to almost 22% in the Lučenec FUR. Slovaks and Hungarians, according the data of SOSR (2001, 2001-2013), creates about 95% of total population in each analysed region. However, the distribution of these ethnics is uneven at the level of the regions' cores and rings (Figures 7 and 8) and is even less regular at the level of individual communities (Figures 9, 10 and 11).

The share of Slovaks is higher in the core than in the ring in each region. This might be seen as a result of socialist urbanization closely related to industrialization, which brought immigrants (labour force) from whole Slovakia also to the towns and cities located in regions with predomination of Hungarian ethnic minority.

At the levels of whole regions, their cores and rings, the changes are modest between 2001 and 2010 (except for the Bratislava FUR's ring) but very significant between 2010 and 2013 especially in the Lučenec and

Košice FURs. This is mainly because considerable increase in the proportion of population with unidentified ethnicity at the population census in 2011 (SOSR 2011). This category represented about 5% of population in the cores of the Lučenec and Košice FURs in 2001 but reached about 20% in 2011. Similar increase was recorded also in the rings of these regions, while in the Bratislava FUR it was approximately the same in 2011 as in 2001.

To capture the proportion and spatial distribution of Roma population in Slovakia is very difficult, as majority of this population claims Slovak (or Hungarian in communities with prevailing Hungarian ethnicity) ethnicity at the population censuses. Therefore, also specific characteristics of migration and natural reproduction of this ethnic minority might be statistically attributed to Slovak or Hungarian population. To estimate real proportion of Roma population data from Atlas of Roma communities (Jurásková et al. 2004) were used. So it was possible to exclude communities with large share of Roma population from the sets of analysed communities and so to assess their impact to analysed relationships.

At the level of individual communities, distinct spatial differentiation of population of Slovak nationality distribution is clear in all analysed regions. In

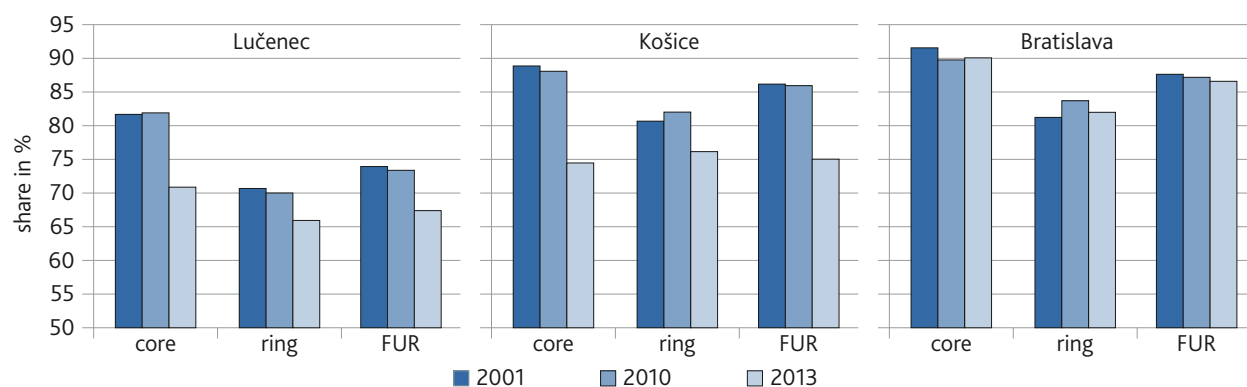


Figure 7. Proportion of Slovaks at the total population of analysed regions, their cores and rings; Data source: SOSR (2001, 2001-2013)

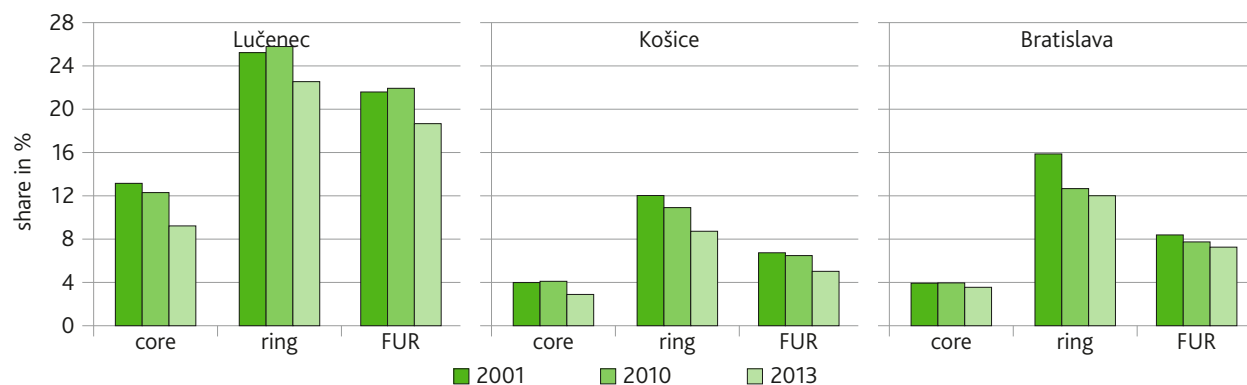


Figure 8. Proportion of Hungarians at the total population of analysed regions, their cores and rings; Data source: SOSR (2001, 2001-2013)

the Lučenec FUR (Figure 9), majority of communities in northern part of the region recorded proportion of Slovaks at total population over 85%. More southern, smaller proportions of Slovaks are recorded and in majority of communities it is fewer than 50%. Two communities (located in central and northern part of the region) reached 100% proportion of Slovaks in total population, while in the Bulhary community in south-eastern part of the region it was only 5.5% in 2001. There were no Hungarians in 12 communities, but on the other hand, in 18 communities Hungarians constituted more than 50% of total population and in two communities even more than 90%. These communities are located in southern and south-eastern part of the region.

According to data from population census in 2001 (SOSR 2001), the proportion of Roma population at total population of the Lučenec FUR is only about 2.5% with no significant difference between the core and the ring. However, considering estimation of Jurásková et al. (2004), the proportion of Roma population in the whole region was more than 15%. In the region's core it was less than 2.5% but in the ring over 22%. Within the ring, there were five communities with over 50% share of Roma population and more than 20% of population was constituted by Roma in 30 communities (almost 40% of all). No Roma population was identified only in 14 communities.

Citizens with Slovak nationality constituted 86.1% of total population in the Košice FUR in 2001. In the core it was almost 89% and in the ring less than 81%. Four communities (all relatively small) were monoethnic as all inhabitants declared Slovak nationality there. Proportion of Slovaks exceeded 90% in more than 70% (87 of 123) of communities but was fewer than 50% in 15% (18 of 123) of communities and in four communities it was even less than 10%. No Hungarians lived in over 28% (35) of communities in 2001. In the same time, in 15 communities they exceeded 50% and in four of them even 90%, according the population census data from 2001 (SOSR 2001).

Majority of communities with relatively low proportion of Slovaks is located at the south-western part of the region (Figure 10). These communities reach relatively large proportion of Hungarians. Two communities (Kecerovce and Vtáčkovce) with fewer than 50% of Slovaks are located at the north-eastern part of the region. Majority of population in these communities is constituted by Roma who declared Roma ethnicity also at the population census 2001.

The proportion of Roma population at the total population is slightly above 3% in the FUR Košice (over 2% in the core and fewer than 5% in the ring) according the data by SOSR (2001). However Jurásková et al. (2004) estimate real proportion of Roma pop-

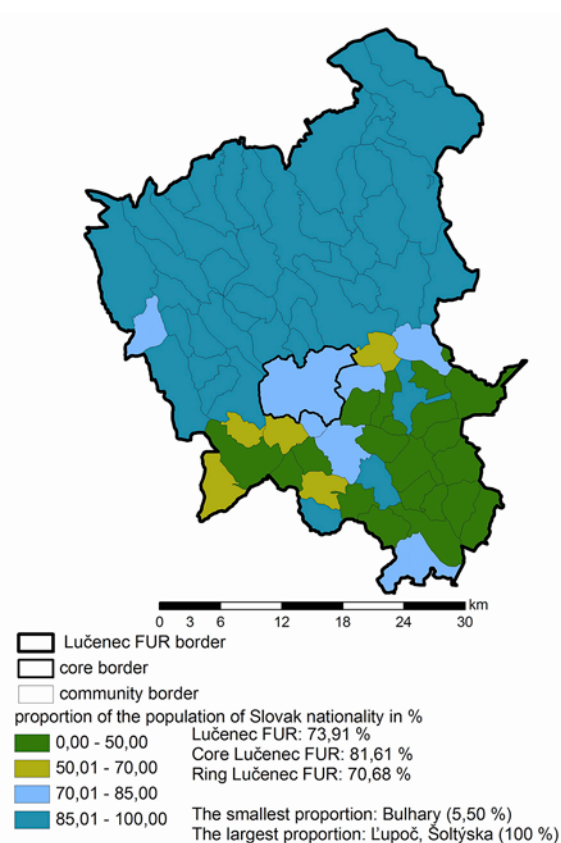


Figure 9. Proportion of Slovaks at total population of communities in the Lučenec FUR in 2001;
Data source: SOSR (2001)

ulation at more than 7%. The core recorded share of Roma smaller than 3% while in the ring it exceeded 15%.

The proportion of Slovaks, more than 87%, in the Bratislava FUR in 2001 was the largest among the examined regions. However, the difference between the proportion in the ring (slightly fewer than 80%) and the core (almost 95%) was the largest (Figure 11). There was only one community with 100% share of Slovaks and six communities with fewer than 10% of Slovaks at the total population within the region's ring in 2001. Hungarians constituted 8.5% in the region with fewer than 4% in the core and almost 16% in the ring. There were only six communities with no Hungarians according to SOSR (2001) in the Bratislava FUR and 32 (28%) exceeding 50% including six communities with more than 90% proportion of Hungarians at the total population of given community.

Statistics by SOSR (2001) report proportion of Roma population below 0.5% in the Bratislava FUR. Atlas of Roma communities (Jurásková et al. 2004) estimates its proportion in the ring to more than 3% but it does not provide any information about the core. Considering 2nd edition of the Atlas (Mušinka et al. 2013) the proportion of Roma population at the total population of the core is about 2%. This is significantly

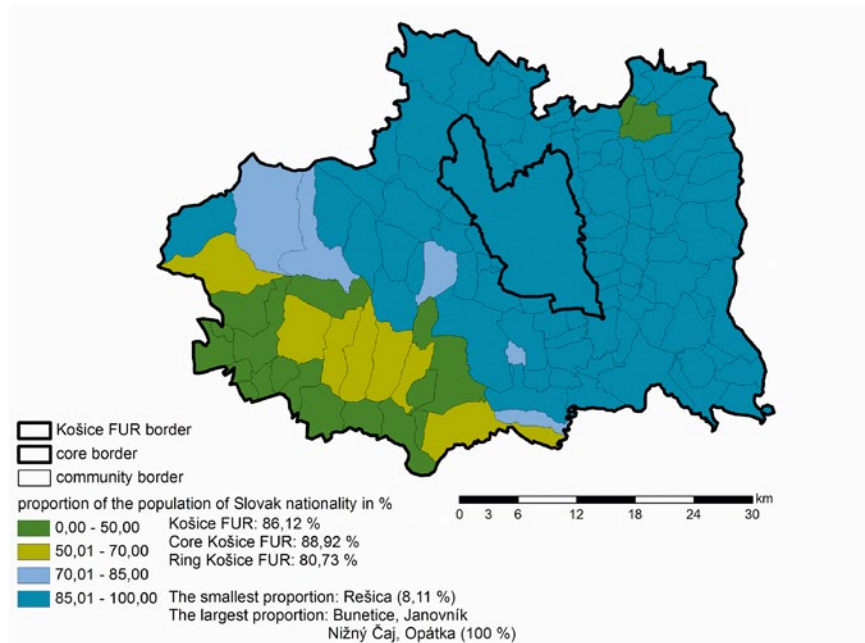


Figure 10. Proportion of Slovaks at total population of communities in the Košice FUR in 2001; Data source: SOSR (2001)

fewer than in the Košice and Lučenec FURs. There is no community with the proportion of Roma at the total population exceeding 50%. However, there are two

communities with significant (over 10%) proportion of Croats and one community with Czechs.

While Slovaks dominate in the population of communities in central and northern part of the Bratislava FUR, Hungarians constitute majority of population in the communities in southern and south-eastern parts of the region.

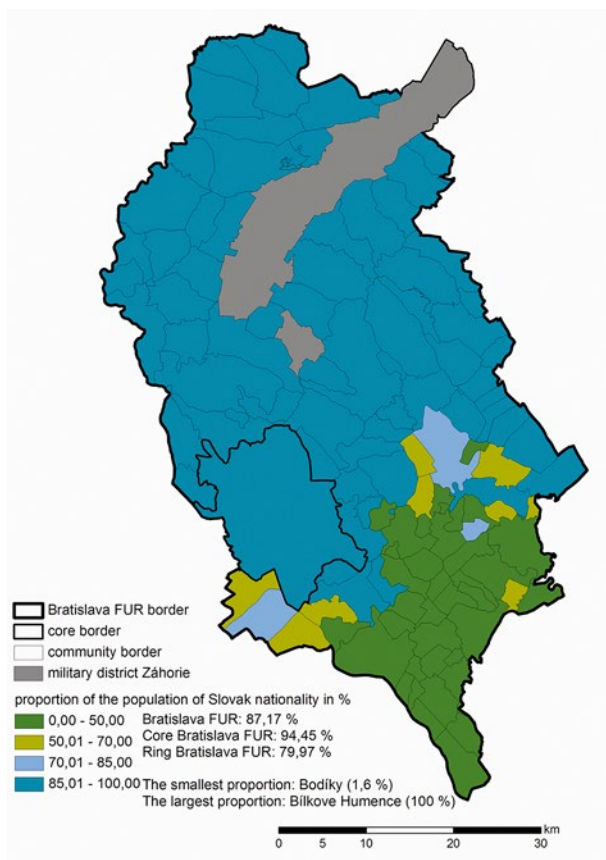


Figure 11. Proportion of Slovaks at total population of communities in the Bratislava FUR in 2001; Data source: SOSR (2001)

Relation of changes in ethnic structure with migration and natural reproduction of population

The Bratislava and Košice FURs recorded slight decrease in the proportion of Slovaks as well as Hungarians during the period 2001-2010 (Figures 7 and 8). In case of the Bratislava FUR it might be seen as a result of ongoing concentration of population with immigration from other Slovak regions as well as from abroad, and so the ethnic structure of population became more heterogeneous. In the Košice FUR it rather results from significant share of Roma population with high natural increase. The proportion of Slovaks decreased also in the Lučenec FUR but the share of Hungarians increased slightly. This might be also seen as a result of growing Roma community which is concentrated more in the communities with Hungarian majority, where Roma people tend to declare Hungarian ethnicity. In 18 communities in the region's ring out of 29 where the proportion of Slovaks is smaller than in the core, Roma population constituted over 20% and more, and 9 communities even more than 40% in 2004 according to the estimation by Jurásková et al. (2004). However, according to the data by SOSR (2001)

proportion of Roma people was much smaller and the Hungarians constituted majority in these communities. Thus the growth of Roma population is statistically recorded as the increase in proportion of Hungarians.

Nevertheless, the change in the proportions of Slovaks and Hungarians at the level of whole FURs was very modest and further long-term research will be necessary to draw definitive conclusions in relation to natural reproduction and migration trends.

Clearer development was recorded during the period 2001-2010 at the level of cores and the rings of the regions, especially in case of the Bratislava and Košice FURs, where intensive process of decentralization of population takes place (Figures 7 and 8). Increase in the share of Slovaks and decrease in the share of Hungarians in the rings reflects the process of decentralization of population. The share of Slovaks is higher in the cores and by decentralization of population from the cores to the rings, the ethnic structure of population became more similar with these in the cores.

The cores of the FURs are in the same time the destination of inter-regional immigration as the cities are attractive for immigration especially for young job-seekers and people starting-career (Kabish and Haase 2011). It was also indicated by Bezák (2006) that Košice and Bratislava regions are attracting migrants from neighbouring regions but also from distant regions especially in case of the Bratislava FUR. So the ethnic structure of the cores become more heterogeneous and it may explain slight decrease in the share of Slovaks there. These relations are much less distinctive in the Lučenec FUR, where the intensity of inter-regional and intra-regional processes was much lower.

To assess the character and the strength of relationship between changes in ethnic structure on the one hand and intra-regional processes of migration and natural reproduction of population on the other hand, at the level of individual communities, Pearson's correlation coefficient is used. However, the impact of the same process could be contradictory to the various categories of communities considering their population's ethnic structure. As the dominant intra-regional process in all analysed regions was the decentralization of population, the set of communities with proportion of Slovaks lower than in the core (according to SOSR 2001) was chosen for each analysed FUR. This enabled to estimate the extent to which the processes of spatial redistribution of population are responsible for the approximation of ethnic structure of population in the communities in the rings to the structure in the cores.

Therefore, the set of 29 communities with the proportion of Slovaks below 81.61% was analysed for the Lučenec FUR, set of 36 communities with the propor-

tion of Slovaks at the total population of given communities smaller than 88.92% for the Košice FUR, and the set of 48 communities with proportion of Slovaks smaller than 94.45% for the Bratislava FUR.

To reduce impact of specific demographic behaviour of Roma population, which is registered as Slovak or Hungarian by SOSR, to the analysed relations, analogous analysis was conducted for the sets of communities, where the proportion of Roma people was not exceeding 20% according to Atlas of Roma communities (Jurásková et al. 2004). To this analogous analysis only 11 communities were considered in the Lučenec FUR, 24 communities in the Košice FUR, and 46 in the Bratislava FUR.

In the set of selected communities in the Lučenec FUR, analysis indicates decisive role of migration in the changes of ethnic structure of population. The relationship with both the net migration rate and the natural increase rate has character of positive correlation which might be considered as medium (migration) or weak (natural reproduction) in line with Cohen (1977)¹ when considering Slovak nationality. This indicates that although there is very weak evidence for the impact of migration to the changes of ethnic structure at the level of whole Lučenec FUR, it is significant at the level of individual communities. Despite relatively large variability of input values, it is clear, that communities with relatively high values of net migration rate tend to record significant increase in the proportion of people with Slovak nationality at their total population. The impact of natural reproduction of population is significantly lower but not negligible (Figure 12A).

When excluding communities with significant share of Roma population (Figure 12B) the relationship between changes in proportion of Slovaks and migration remains the character of positive correlation but its strength changes from medium to weak. The relationship with natural reproduction remains weak but changes into negative correlation. It is clear that the proportion of Slovaks is growing with growing natural decrease of population. This might be explained by different age-structure of population, as the population of Hungarians in Slovakia is older than the population of Slovaks in Slovakia (cf. Majo 2009). So the population of ethnic Hungarians in Slovakia reaches higher mortality than in the case of ethnic Slovaks. Nevertheless, the impact of migration to the changes in ethnic structure remains stronger in comparison with natural reproduction and weak cor-

¹ In line with Cohen (1977), weak (Pearson's correlation coefficient from 0,1 to 0,3), medium (0,3-0,5) and strong (over 0,5) relationship might be distinguished when considering linear correlation in social phenomena.

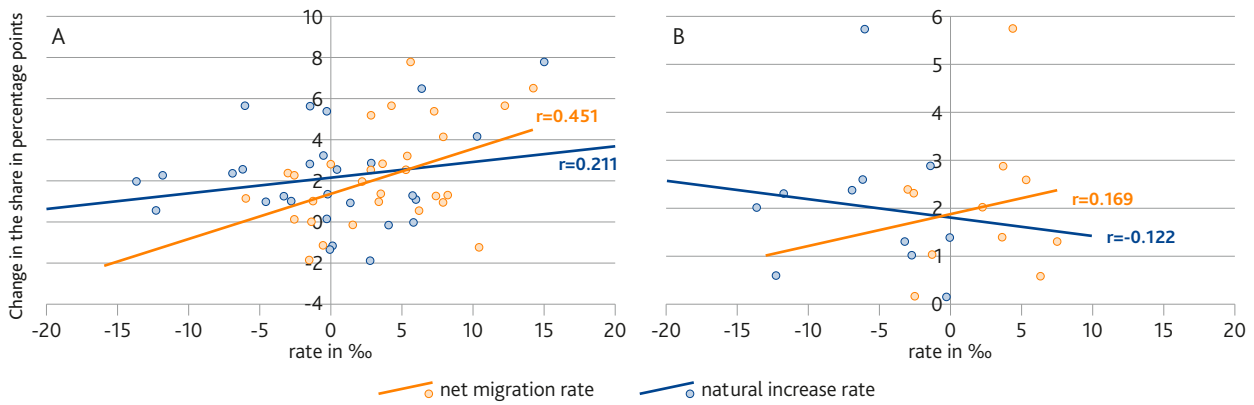


Figure 12. Relationship between the changes in the proportion of the population of Slovak nationality at the total population of selected communities* of the Lučenec FUR, and the values of selected indicators of spatial redistribution of population in 2001-2010; Data Source: SOSR (1991-2013, 2001-2013); *A: all communities with the proportion of Slovaks lower than the proportion in the region's core; B: all communities with the proportion of Slovaks lower than the proportion in the region's core and proportion of Roma people below 20% according to Atlas of Roma communities (Jurásková, et al. 2004)

relation might be also a result of relatively small sample of communities.

Relationship between migration and changes in the proportion of population with Hungarian ethnicity has opposite character as with the Slovak one. It is negative whether the communities with Roma population share over 20% are included or not (Figures 13A and 13B). This also indicates that migration from the core influences significantly the ethnic structure of population in the affected communities. Relationship with the values of natural increase rate is positive but weak in the whole sample and medium when communities with significant share of Roma population are excluded. In the second case the character of relationship is opposite as in the case of Slovak nationality, what confirms differences in natural reproduction behaviour between population of Hungarian and Slovak ethnicity.

Analysis of two sets of communities also indicates significant impact of population of Roma ethnici-

ty (especially its specific natural reproduction behaviour) into changes of spatial redistribution of population and the changes in its ethnic structure. However, due to character of population census data provided by SOSR, this behaviour is attributed to ethnic Slovaks or Hungarians, according to what nationality was declared by given Roma people at the population census.

The sample of communities included in the analysis in the case of the Košice FUR is much bigger than in the case of the Lučenec FUR what makes the results more reliable. Also the strength of correlations identified is much stronger.

When all communities with the proportion of Slovaks smaller than in the region's core considered, relationship of change in the share of Slovaks at the total population of analysed communities was positive and strong with both indicators of spatial redistribution of population but significantly stronger with the natural increase rate (Figure 14A). Howev-

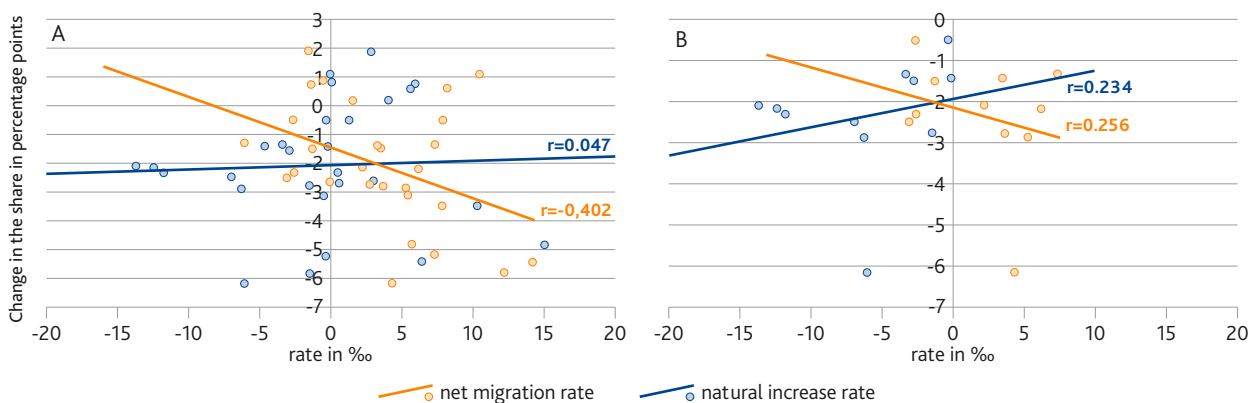


Figure 13. Relationship between the changes in the proportion of the population of Hungarian nationality at the total population of selected communities* of the Lučenec FUR, and the values of selected indicators of spatial redistribution of population in 2001-2010; Data Source: SOSR (1991-2013, 2001-2013);* see the explanatory at Figure 12

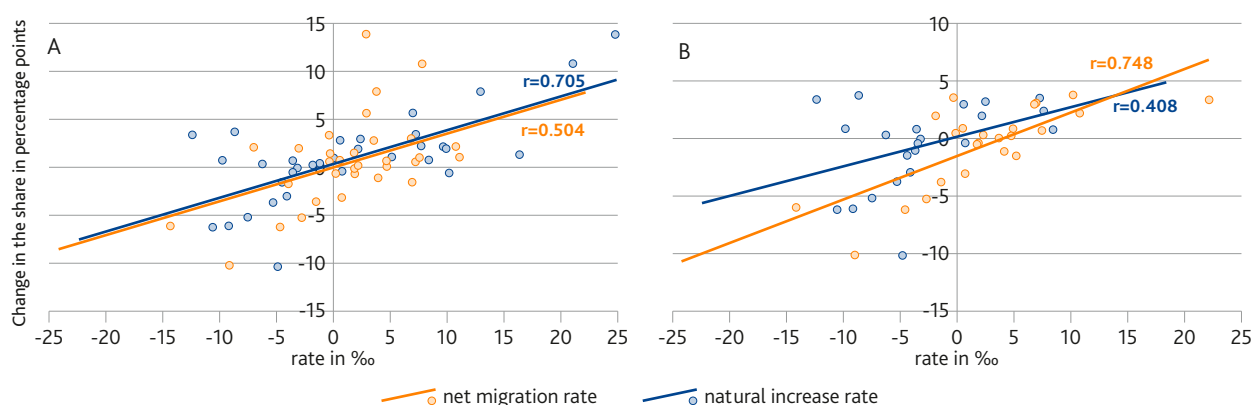


Figure 14. Relationship between the changes in the proportion of the population of Slovak nationality at the total population of selected communities* of the Košice FUR, and the values of selected indicators of spatial redistribution of population in 2001-2010; Data Source: SOSR (1991-2013, 2001-2013); * see the explanatory at Figure 12

er, when communities with Roma population share over 20% excluded from the analysis, the strength of correlation with natural increase rate became medium and correlation with net migration rate much stronger (Figure 14B).

Changes in the share of population with Hungarian ethnicity recorded opposite character of correlation as in the case of population with Slovak ethnicity. The strength of correlations was medium, and even strong in the case of net migration rate in the sample of communities with proportion of Roma people not exceeding 20% (Figures 15A and 15B).

Analysis in the Košice FUR indicates decisive role of migration at the changes of ethnic structure in the examined communities. Similarly with the Lučenec FUR, the impact of statistical evidence of Roma people as Slovaks or Hungarians leads to attributing their demographic behaviour to the ethnics to which they statistically affiliated at population census. The results also indicates significant impact of natural reproduction behaviour differences between Slovak and Hungarian ethnics to the changes of ethnic structure of population but the impact of the migration is even

stronger what corresponds with intensive decentralization of population by migration identified within the Košice FUR.

The Bratislava FUR recorded the most intensive process of decentralization of population within the region in terms of migration. The impact of migration to the spatial redistribution of population is very strong here. Despite significant dispersion of net migration rate values, its relationship with the changes in the share of population with Slovak nationality at the total population of given communities has character of positive correlation with medium strength. Extremely high values of net migration rate in many analysed communities causes increase in the proportion of Slovaks also in the communities with negative balance of natural reproduction. This results into the negative correlation of the change in the proportion of Slovaks with the natural increase rate (Figures 16A and B). The correlation is slightly stronger when the communities with Roma population share exceeding 20% are excluded from the analyses but as there are only two such a communities in the analysed sample, the difference is insignificant.

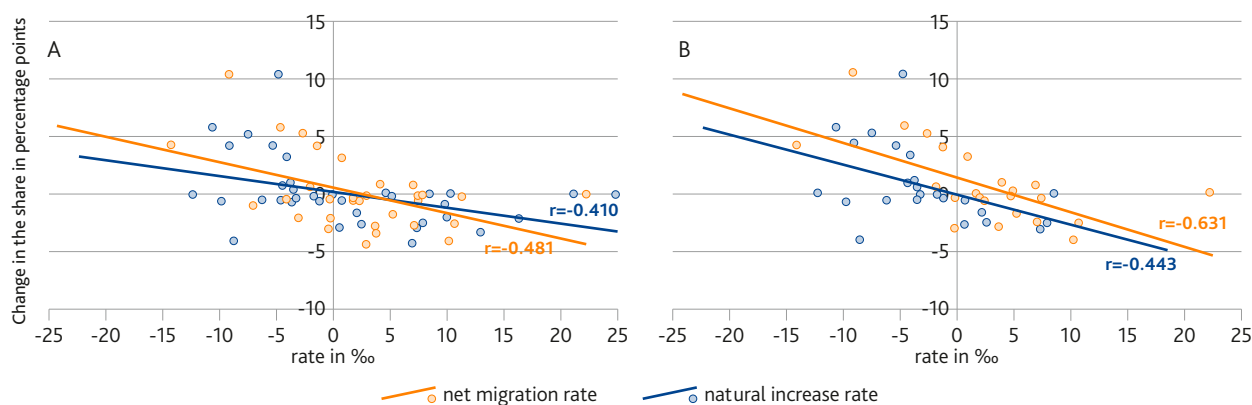


Figure 15. Relationship between the changes in the proportion of the population of Hungarian nationality at the total population of selected communities* of the Košice FUR, and the values of selected indicators of spatial redistribution of population in 2001-2010; Data Source: SOSR (1991-2013, 2001-2013); * see the explanatory at Figure 12

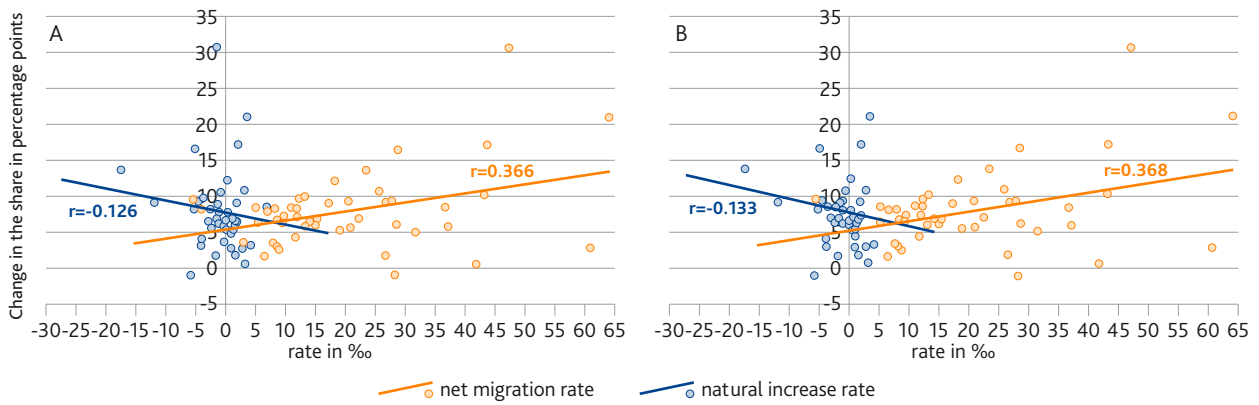


Figure 16. Relationship between the changes in the proportion of the population of Slovak nationality at the total population of selected communities* of the Bratislava FUR, and the values of selected indicators of spatial redistribution of population in 2001-2010; Data Source: SOSR (1991-2013, 2001-2013); * see the explanatory at Figure 12

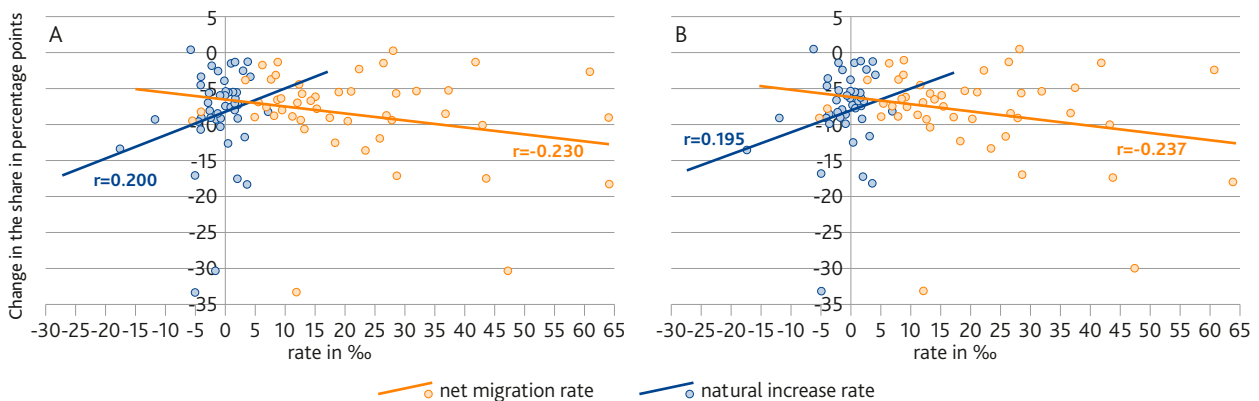


Figure 17. Relationship between the changes in the proportion of the population of Hungarian nationality at the total population of selected communities* of the Bratislava FUR, and the values of selected indicators of spatial redistribution of population in 2001-2010; Data Source: SOSR (1991-2013, 2001-2013); * see the explanatory at Figure 12

Similar strength but opposite character has relationship between changes in the proportion of population with Hungarian ethnicity at the total population of given communities with the indicators of spatial redistribution of population (17A, B).

Results obtained for the Bratislava FUR indicates dominant role of migration in the spatial redistribution of population which is manifested by very intensive decentralization of population within the region. It is reflected also in the impact of migration to the changes of ethnic structure of population which is strong enough to abolish the impact of natural reproduction of population that is observed in the Lučenec and Košice FUR.

Conclusion

The research presented in this paper confirms dominant role of migration at the intra-regional spatial redistribution of population. Nevertheless, the role of natural reproduction of population remains significant, especially in the Lučenec FUR. During the period of re-

search 1991-2013, processes of spatial redistribution of population, whether in terms of migration or natural reproduction, recorded significant changes. The 1990s represents the period of collapse of migration and partially also natural reproduction patterns originating in the socialist era, followed by formation of new patterns, while during the 2000s new patterns of spatial redistribution of population were already well established.

This, along with the problematic comparison of data from different population censuses, was a reason why the relationship of changes in the ethnic structure with the processes of spatial redistribution of population was focused primarily on the 2001-2010 period.

In the Košice and particularly in the Bratislava FUR very intensive process of decentralization of population by migration was recorded during 2001-2010 period. In the Lučenec FUR, decentralization of population from the core to the ring was also dominant process but its intensity was much lower and it even shifted into the centralization in some years. Natural reproduction of population also contributed to the

decentralization in each analysed region but the differences in natural increase in the regions' rings and cores were only modest and so the intensity of decentralization by natural reproduction was very low.

Considering inter-regional migration, outstanding economic position of the Bratislava FUR was reflected by intensive process of concentration of population. Concentration of population was recorded also in the Lučenec FUR but its intensity was very slight and the Košice FUR recorded very slight deconcentration of population.

A key finding of the research is identification of certain regularities in the relationship of changes in ethnic structure of population with the trends of migration and natural reproduction of population in each analysed region, despite different character of inter-regional and intra-regional processes of spatial redistribution of population.

Concentration of population to the Bratislava FUR might be responsible for decrease in the proportion of population with Slovak as well as Hungarian ethnicity at the total population of the region as the concentration (including immigration from abroad) tend to make the ethnic structure of population more heterogeneous.

The proportion of Slovaks in the core was larger than in the ring in each analysed region, and conversely, the proportion of Hungarians was lower in the cores than in the rings. So the process of decentralization of population is reflected in increasing share of Slovaks and decreasing share of Hungarians in the regions' rings. The development in the Lučenec FUR seems to be exception of this trend as the share of Hungarians increased slightly and the share of Slovaks decreased slightly in the regions ring. However, it was demonstrated that in many communities where Hungarian ethnicity is dominant according the data from population census (SOSR 2001), Roma people constituted significant proportion of population. However, as majority of Roma population declared Hungarian ethnicity in these communities at the population census, its specific demographic behaviour (typical by natural increase considerably higher than the average of other ethnics in Slovakia) was partially attributed to the Hungarian ethnic group.

This phenomenon is even more apparent at the level of individual communities. The relationship between the processes of spatial redistribution of population and the changes in the ethnic structure of population is clearer when the communities with the proportion of Roma people exceeding 20% as estimated in the Atlas of Roma communities by Jurásková et al. (2004), were excluded from the analyses.

The relationship between the change in the proportion of Slovaks at the total population of analysed

communities, and the net migration rate has character of positive correlation in the sample of communities where the proportion of Slovaks was lower than in the region's core in 2001 in each region. The strength of this correlation differs among the regions but in all cases it is stronger than the correlation with the natural increase rate whether positive or negative. The character of relationships when considering changes in the proportion of Hungarians is opposite to the case of Slovaks but the correlation is also stronger in case of migration than in the case of natural reproduction of population.

This indicates that the impact of natural reproduction of population is not negligible, but the driving force behind the changes in the ethnic structure became the migration. And since the process of decentralization of population is the most intensive among the processes identified, the ethnic structure of the rings and even individual communities in the rings tend to approximate to the ethnic structure of the core in each region. Of course, the process of approximation is influenced by the intensity of decentralization of population and also many other phenomena. These trends are to some extent contrasting with those observed in the past, when different patterns in the natural reproduction of population typical for various ethnic groups in Slovakia were perceived as a key factor of changes in ethnic structure of population. Natural reproduction of population seems to be the driving force in the changes of spatial distribution of Roma people but due to lack of reliable data, it is not possible to assess it in similar way as the changes in spatial distribution of population with Slovak or Hungarian ethnicity.

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