

Spatial patterns of the variability of native residents in a transitional society: The case of the Czech Republic

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Abstract

Currently, the native residents of a country are an important social phenomenon. Although extensive mobility challenges the bonds between places and their inhabitants, biographies of native residents are less often based in several spatial contexts because they are born and raised in a specific place and live there for their entire lives. This absence of residential mobility has important consequences for the ways native residents relate to their 'home places' and how they build local attachments. Using data from the Czech Republic, the main objective of this paper is to explore and analyse recent developments in the structure of native residents. The objects of analysis are the municipalities of the Czech Republic, and aggregate census data are used for the purpose of analysis. Spatial and non-spatial approaches to the analysis showed significant changes in the structure of native residents, revealing statistically significant spatial patterns. In general, the residents of Czech municipalities demonstrate levels of co-residence or 'mixing' in a significant way in recent years. Thus, further research into matters such as spatial belonging, attachment and identity should also take into account the influence of mobility.

Keywords: native residents, mobility, transitional period, spatial patterns, local belonging, Czech Republic

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1. Introduction

Extensive mobility is an important process in the contemporary world. A high degree of mobility takes place on all spatial scales and has numerous consequences (Adey, 2010). One crucial consequence is that mobility challenges the relations and links between places and the people who inhabit them (Paasi, 2002). The effects of mobility on these relations and links have been broadly discussed by scholars from various social science disciplines. Geographers have attempted to contribute to the knowledge about the bonds between people and places and about the developing substance of these bonds in an era of high mobility and globalisation.

For instance, Creswell (2002, 2006) explicates the concept of sedentarism, which is challenged in a mobile world. The concept is understood as locating bonded and authentic places, regions or nations, as a fundamental basis of human identity and experience. Sedentarism treats as 'normal': stability, meaning and place, and treats as abnormal distance, change and placelessness (Sheller and Urry, 2006, p. 208). Vainikka (2015) focused on reflexivity, freedom in the late modern society to express cultural affiliations, and a need to create self-identity. He investigates how people with

different worldviews use regions in their identity narratives. Tomaney (2012) seeks to advance the current understanding of the nature of place, the local and regionality with the concept of parochialism as a mode of dwelling. Tomaney's (2015) also focused on local belonging. This author searched for the nature of the phenomenon and one of his crucial conclusions is that local belonging still matters to the majority of people. Similarly, Antonsich (2010) attempted to provide a precise conceptualisation of belonging, and sees the importance of belonging in an era of transnational migration.

Yet, the concepts of native residents are something which are almost impossible to find in recent discussions, despite the fact that they are important social phenomena in each population as they are characterised by long-term residence in a given spatial entity. Biographies of native residents are less often based on several spatial contexts because they are born and bred in a specific place and dwell in this place for their entire lives. According to Kuldová (2005), a prerequisite for gaining consciousness of belonging to a particular area is long-term stay. Similarly, Gustafson (2001) understands both the long-term persistence in a given place and awareness of this persistence as crucial for the process through which people use a specific space to

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construct their own identity. Thus, it is evident that the way native residents use living space in the process of identity formation is specific.

Despite the importance of the native residents examined here, it is possible to state that they have not yet been given adequate attention both in the context of post-communist countries of Europe or in an international context. At least in the case of the post-communist countries of Europe, which, in the second half of the 20th century faced the direct influence of the former Soviet Union, this can be a surprising finding. These countries, after the disintegration of the local totalitarian structures and the collapse of the Soviet Union, went through a transition process which is associated, *inter alia*, with several socio-spatial changes.

The Czech Republic is undoubtedly one of those countries (Dostál and Hampl, 2004). At the end of the 1980s, the socialist regime collapsed, which resulted in a process of extensive economic, political, and cultural changes, collectively denoted as the transition of the society. This transition has received considerable attention in scientific research. Yet, one misses a comprehensive attempt to assess the transition of the cultural aspects of the society, with a couple of exceptions (see: Hampl, Dostál and Drbohlav, 2007; Kučerová, 2009).

As confirmed by previous research (Blažek and Csank, 2007), Czech society during the transitional period is characterised by a deepening of differences. These differences assume both vertical and horizontal forms. It can be assumed that similar processes may also occur in the case of native residents. Moreover, there has been a significant increase in mobility in the Czech Republic since the end of the 1980s. Initial assumptions, however, cannot omit the socio-spatial changes after the Second World War. This refers to the transfer of the German population, mainly from the border regions, and the resettlement of these emptied regions with a wave of immigrants (see Gerlach, 2010). The assumption is that the consequences of this process, which in the affected regions completely disrupted the former structure of native residents, will appear in the course of the transition of Czech society.

Using data from the Czech Republic, the main objectives of this paper are to explore and analyse recent developments in the structure of native residents. With regard to the data used (see below), the transitional period from 1991 to 2011 will be assessed. The following research questions will be addressed:

- RQ1: What are the general trends that can be identified in the variability of the structure of native residents over the transitional era?;
- RQ2: What spatial patterns (dispersion, regularity, clustering) can be found in the structure of native residents and how has this pattern developed during the transitional period?; and
- RQ3: Are there local pockets of instability in the structure of native residents and how have they evolved over time? In other words, are there local clusters of individual types of spatial associations in the spatial pattern of the structures being evaluated?

Any successful fulfilment of the objectives by analysing the data from the Czech Republic will also contribute to the recognition concerning mobility of the population in a country undergoing a post-totalitarian transition of society. In general terms, the article seeks to contribute to discussions about the nature of place, ‘the local’ and

‘regionality’, as recent debate, according to Tomaney (2012), does not offer a satisfactory account of local identification, attachment, and belonging.

2. Theoretical departures: Conceptualising native residents

Each individual is a native person. Everyone is born in some part of a space and has a place of origin, more precisely a place of birth. The place is then seen as the birthplace of that person, who is formally linked with their birthplace throughout their life by being denoted as its native person. This is true even if that person does not live in their birthplace, has not built a relationship to it, and does not use it to construct their own identity or participate in the process of the production of the identity of that place. In this case, any additional factual connection of that person to their birthplace ends at the time of birth. In this sense, it is a concept of a native person which is based purely on being born in a particular place.

Another concept of a native person differs from the first in that it contains a certain added quality, by which is meant the aspect of permanence. A native person is conceived of as an individual who is not only born in a particular place, but remains there throughout their life. A native person thus represents an extreme form of the length of a stay in a particular place. Hence, we can classify this native person as a native resident. For this person, the birthplace is then a specific place because there is a permanent reproduction and transformation of the individual's everyday experience of this place. This person also attributes different meanings to this place on a long-term basis and constantly perceives its landscape (Riley, 1992), as well as other physical attributes. In general, according to Tuan (1975), these processes enable this person to create an identity in relationship to this place. The longer duration of these processes in the case of native residents, in comparison with other individuals, necessarily generates a different sense of place (Hay, 1998a) and a different nature of identity with a place.

In modern societies, in many cases, the latter concept of a native person is difficult to apply. People are usually born in hospitals, which in many cases are elsewhere than in the place of their further residence. The length of this residence may then be equal to the length of one's life. For this reason, the aspect of permanence introduced in the previous paragraph may begin to apply, including its consequences. The third concept of a native person reflects the aspect of permanently being in a certain place, although the actual birthplace is located in another place. Here, native person is applied not to the birthplace, but to the place where a person spends her/his entire life. In the frame of this third concept, a native person can also be classified as a native resident.

Methodologically, this paper is based on the second and third concepts of native person: the permanence of being in a certain place is emphasised at the expense of the birthplace, which is also the approach to native person portrayed by the Czech Statistical Office (see CZSO, 2014). The ‘statistical’ native resident recorded in the Czech statistics (see Section 3 on methodology and data, below) may be identified with the second and third concepts of native person. Hence, in the following text, the author will strictly use the term native resident instead of the term native person.

Native residents have “no” experience with residential mobility, which is understood here as moving from one municipality to another, not as moving within one

municipality. Municipalities are specific identity spaces. In the Czech context, they could be understood as sources of sedentarism, which means that identities are built on stability and around the local environment. On the other hand, municipalities have their own histories and it is also possible to identify municipal borders and institutions, as well, as symbols (Šifta and Chromý, 2017). All of these factors also contribute to identity constructions (Paasi, 1986).

Note that the above-mentioned absence of residential mobility has important consequences concerning how native residents are bonded to their 'home places' and how they build local attachments, since little or no mobility fosters local bonds and local community life (Fried, 2000). Tomaney (2012) sees the formation of local attachments as a complex process and the long-term persistence in a place. According to Kučerová-Kuldová (2008), it is understood as one of the important conditions for the development of an individual's attachment to a particular spatial entity. The process is based on diverse, long-term, and, at times, contradictory influences. These could, according to Paasi (2003), comprise ideas of nature, landscape, the built environment, culture/ethnicity, dialects, economic development, periphery or centre relations, marginalisation, stereotypic images of a people/community (us and them), actual or invented histories, utopias and diverging arguments on the identification of people. In the case of native residents, such processes are less affected by their experiences with different places because they lack residential mobility.

In his contributions, Paasi (2002, p. 144) assumes that living together in the same region or place and social circumstances for a long time, will cause individuals to develop certain dispositions or roots, and these individuals will be provided with adopting attitudes and communicating or certain structures of expectations. Hence, the number of inhabitants of a region born in that region, influence their regional identities. Golledge and Stimson (1997) also discuss the effects of length of residence. They indicate that the importance of the relationship between the length of a stay in a given location, the amount of experience related to that place, and the nature of the perception of that place contribute to identity. Moreover, Gustafson (2009) indicated in his study a negative relationship between residential mobility and local and regional belonging. His conclusions coincide with the research of Hay (1998b), suggesting that local belonging becomes stronger over time and frequent residential mobility makes it difficult to develop a strong sense of local belonging (Fried, 2000; Hay, 1998b). Further, Feng, Breitung and Zhu (2014) similarly identify mobility as a process which has a great impact on people's concepts of identity and belonging. As noted by Chromý and Janů (2003), people not only form a belonging to a place, but also to a group of people who inhabit this place. Theodori (2004) argues that the length of the stay in a given place affects the development of community attachment, and this can be understood as social participation and integration into the community (McCool and Martin, 1994). Furthermore, social contacts, including family members, partners, friends and others, can become essential in the process of homemaking (Feng and Breitung, 2018).

The consequences of a long-term residence in a particular place can continue after moving from that place. Specifically, if a native resident of one place moves to another place, they do not have to accept the new identity of a new place of residence. This was confirmed by Cassidy and McGrath (2015), who showed how young people who grew up

in farms continue to assert rural identities even when they build a life in urban areas away from their home place and local community.

Based on the above research findings, native residents can be assumed as playing an important role in the development of places and regions. For instance, Tomaney (2012) writes about parochialism, suggesting it as a mode of dwelling. He understands a parochial outlook as one that values the local, its culture and solidarities, as a moral starting point and locus of ecological concern and a site for the development of virtues including commitment, fidelity, civility and nurture. Yet, it cannot be stated a priori that the majority of native residents in a population of a given municipality positively contributes to the development of the municipality (Kučerová, 2009). We should also be aware of negative aspects such as marginalisation and locking in. Successful development depends on the willingness of inhabitants to participate in development, their civic engagement and their associated activities. As Semian and Chromý (2014, pp. 268–269) show, demonstrating uncritical patriotism as well as emphasising and celebrating the characteristics of a given spatial entity, instead of finding ways to use them in developing process, can play a role as a barrier. These authors also mention the reproduction of stereotypes and preconceptions which similarly may negatively affect the cooperation among actors within and outside the region. The same effect can occur on the scale of municipalities.

Like other population structures, the structure of native residents is not rigid in time or space. In general, the development of population structures in space and time can be determined by various cultural, economic, and political factors, with an emphasis on the role of the mechanisms of power in this process (Elden, 2007). The Czech Republic and other post-socialist states of Central Europe experienced a number of political factors in the latter half of the 20th century, and two of them are considered to have been essential. The first is from the period after the end of World War II, when massive spatial mobility took place in the context of the reorganisation of space by the political regime of the time, especially in border regions. The second can be observed at the turn of the 1980s and 1990s, when the political system was transformed from a totalitarian one (restriction of mobility) to a capitalist one (liberalisation of mobility).

3. Remarks on methodology and data sources

The research questions defined above are treated by the application of selected statistical methods for analysing aggregated data. The particular methods related to specific research questions are as follows:

- RQ 1: non-spatial approach represented by methods (plot box, histogram) for analysis of general trends in the development of the structure of native residents; interpretation of cartograms;
- RQ 2: a spatial approach to the analysis of the development of the variability of the structure of native residents represented by the method of global spatial autocorrelation. Using this method, an attempt will be made to identify the evolution of the spatial clustering of similar values in the structure of native residents; and
- RQ 3: a spatial approach to the analysis of the development of variability in the structure of native residents as represented by the local spatial autocorrelation method.

The methodological basis is chosen with regard to the character of the main objectives of the paper and the considerable number of research objects we decide to include in the analysis itself. In total, there are 6,251 spatial units; 6,246 of them are municipalities in the Czech Republic and the remaining five cases are so-called military training areas¹.

The data used in the analysis are taken from the Czech Statistical Office (CZSO) (Růžková et al., 1995; Škrabal et al., 2005, 2013), obtained in Censuses of people, houses, and flats. These censuses were carried out three times: in 1991, 2001 and 2011. In 1991, for the first time in the period after the Second World War, the census forms included a question that took into account native residents. The question asked about the municipality of birth, which was meant as the official residence of the respondent's mother at the time of the respondent's birth (CZSO, 2014). If this municipality of birth was the same as the respondent's municipality of the official residence at the time of the census, that respondent was considered to be a native resident of the municipality.

From the previous paragraph, it is obvious that the data used in the research includes a certain dual quality. First, of course, it provides information about the permanence of a respondent's stay in the municipality, which is considered to equate with native resident, and also transmits some information about the spatial mobility of the population. Both of these qualities obviously correlate. Therefore, if these data are analysed, it can be interpreted in two ways: with respect to spatial stability but also with regard to spatial mobility.

It is evident that the information stored in the data described above is largely artificial. Thus, it is necessary to be aware of methodological limitations of the data. First, it is necessary to realise that the data do not identify individuals who live in a given municipality for a substantial part of their lives, so-called autochthons. They do not live in the given municipality for their whole life, but their stay there also shows the character of permanence. These may be persons who moved to the municipality with their parents in early childhood and then remained there for the rest of their lives.

Second, it is necessary to consider native residents who may spend a larger part of their life, e.g. for job purposes, outside the municipality, to which they may at some stage

return. Hence, these persons can have experience with residential mobility. Unfortunately, their actual number is impossible to determine from the data used.

Third, it is necessary to take into account that the analysis was conducted in all three years for the population with official residence² because of the possible mutual comparison. The number of persons with official residence in the given municipality (residence in the municipality in which the person is officially registered) in the Czech Republic often differs from the number of persons with usual (factual) residence in that municipality (Šanda, 2015). Structuring native residents according to their usual residence would definitely take more account of their actual situation.

Fourth, it is necessary to consider the unknown category. It is a part of the population comprising of persons who did not answer the question concerning a municipality of birth. This category tends to distort reality, with the degree of distortion increasing proportionally with the number of inhabitants in the unknown category. It should be noted that the data used does not represent 100% of the Czech population in all three years. In addition, the size of the unknown category varies in individual years: see Table 1.

The above-discussed methodological limitations of the data must be taken into account when interpreting the results of the analysis. Despite these limitations, the data used are the most appropriate for the purpose of recognising developments in the structure of native residents in the period of transition. Regarding the main objective of the paper, the use of these data is necessary since there are no alternative data that could be used.

As mentioned earlier, the data collection took place through censuses conducted during the transitional period. The data collection was carried out by the CZSO, from which the data were taken. The data provide information about the selected objects of the research, i.e. the municipalities. One problem is the subsequent management of the data, as the structure matched the administrative divisions valid at the time of the censuses. The data representing each year vary considerably as the administrative structure of the Czech Republic underwent significant development in the period after 1989. With regard to mutual comparability, a common database was established for the datasets in the years 1991, 2001 and 2011 (see Tab. 1).

	Absolute numbers			Relative frequencies (%)		
Year	1991	2001	2011	1991	2001	2011
Total population	10,302,215	10,230,060	10,436,560	100	100	100
Unknown	253,923	199,516	35,154	2.46	1.95	0.34
Number of municipalities						
Year	1991	2001	2011			
	5,768	6,258	6,251			

Tab. 1: The number and proportion of the population with unidentified persons; and number of municipalities in each census (note: the data refer to the population by official residence)

Sources: CZSO, 2014; Růžková et al., 1995; Škrabal et al., 2005, 2013. author's calculations

¹ Military training area is a defined part of the territory of a state designated for national defence and armed forces training. Like a municipality, a military training area constitutes a territorial administrative unit, but it does not have self-governing status.

² The final results of the censuses 1991 and 2001 were structured in accordance with the official municipality of residence, but in 2011, the final results were structured according to usual municipality of residence. Hence, preliminary data structured according to usual municipality of residence in our analysis for 2011 have been used.

For this database, the administrative structure of the Czech Republic effective in 2011, is used. All three datasets were transformed to this database, which ensured the possibility of mutual comparison. In the above-mentioned transformation, the basic settlement units (BSU) are used. The BSU are statistical and technical spatial units defining territories of the same function. It is the second smallest spatial unit to which the CZSO allocates data collected during its censuses since 1970. The BSU usually allow internal differentiation of municipalities and this principle is utilised in the process of creating a common database.

The data transformed to the common database is analysed using standard and spatial statistical techniques. For the purposes of answering the first research question, the data analysis that is applied uses statistical indicators such as frequencies, standard deviations and quantile indicators. These indicators are used to create box plots that demonstrate the dynamics of changes in the structure of the native residents at the scale of municipalities, as well as to create a common histogram of frequencies. In addition, the cartograms depicting the dynamics of changes and the spatial distribution of them are drawn.

With respect to the remaining research questions, some of the spatial methods of analysing the variability of the phenomenon being evaluated are used. The advantage of this group of methods is that they respect the spatial information inherent in the data (Netrřová and Nosek, 2017). In this paper, selected methods of spatial autocorrelation are applied. Using these methods, we are able to determine the spatial variability and spatial pattern of the phenomena under observation by evaluating the degree of clustering of this phenomenon in space. We account for the rate of clustering at two spatial levels: global and local.

Tests for global clustering are used to investigate whether there is clustering throughout the area under study. By analysing the data on this level, it is possible to

evaluate whether the spatial variability of native residents has a dispersive, regular or clustered spatial pattern. The rate of global clustering is calculated using Moran's I statistic (Moran, 1950). This method is one of the oldest indicators that detect global clustering. It detects whether nearby spatial units have similar or dissimilar attributes overall, that is positive or negative spatial autocorrelation respectively. As Wang (2014) suggests, it is also important to identify cluster locations or local clusters, even when a global clustering test reveals the presence of overall clustering in the area under study, as there may be some places exhibiting local clusters. For this reason, Anselin (1995) suggested the so-called Local Indicator of Spatial Autocorrelation (LISA) to capture local pockets of instability or local clusters. By applying this method, four variants of statistically significant spatial associations can be identified.

4. Results

The development of native residential structure in the period from 1991 to 2011 in the municipalities of the Czech Republic is shown in Figure 1. The box plot depicts the basic statistical distribution of the proportion of native residents in the population of individual municipalities.

This box plot reveals several aspects of change. First, during the period 1991–2011, there was a gradual decrease in the proportion of native residents in those municipalities with the highest proportion of native residents in the population (fourth interval). We can observe a continuous drop in the maximum values in the municipalities, as well as a continuous drop in the values of the third quartile, which defines the bottom limit of this group of municipalities. The width of the fourth interval first stagnates and then increases, which also indicates a decrease in the proportion of native residents in this group of municipalities, accelerated in the second phase.

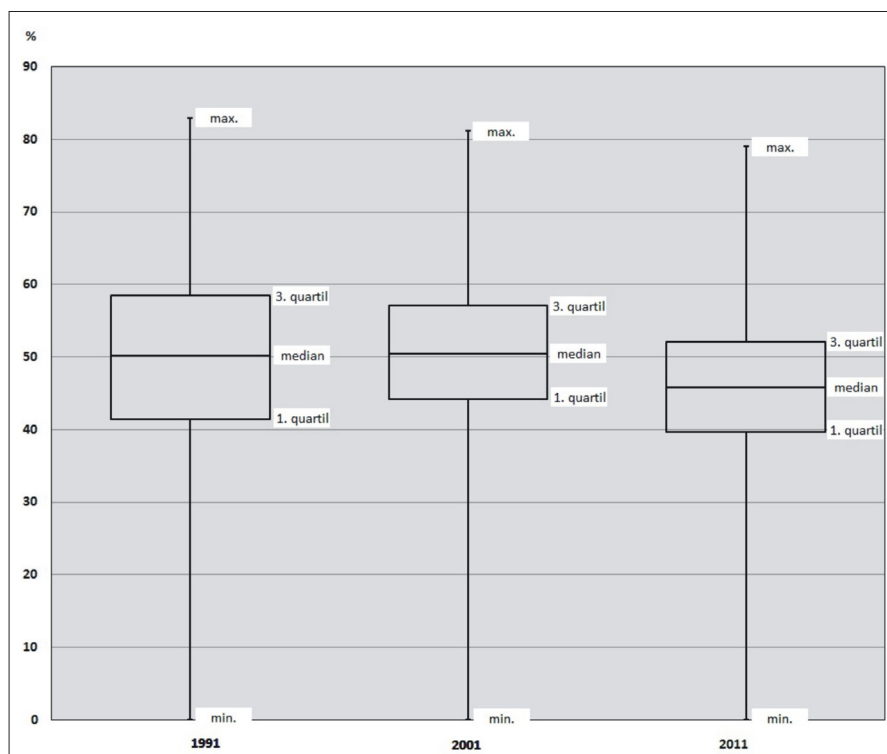


Fig. 1: The proportion of native residents in the population of municipalities of the Czech Republic, 1991–2011
Sources: Růžková et al., 1995; Škrabal et al., 2005, 2013; author's calculations

On the contrary, different processes occur in the first interval of those municipalities with the lowest proportion of native residents in the population. In the case of such municipalities, the proportion of native residents first grows and then begins to drop slightly. At the same time, an increase and then a decrease in the width of the first interval are evident. In this interval, we mostly have municipalities of varying sizes with a break in the continuity of socio-historical developments that occurred after the end of the Second World War. The autochthonous German population was mostly displaced and the authorities attempted to fill the vacated space with massive resettlement. The consequences of these processes were still visible in 1991, when for instance a zero proportion of native residents was found in six municipalities. In this first interval, we can gradually find municipalities that were not affected by the processes outlined above. These municipalities are located around the capital city Prague and regional centres that, during the transitional period, began to experience strong residential suburbanisation processes.

The group of municipalities which are located in the second and third interval between the first and third quartiles represents one half of the municipalities that were analysed. We can observe a continuous reduction of the width of these intervals. The median value is almost identical in 1991 and 2001, but in 2011, its value is considerably lower. If we consider the above-mentioned developments in the first and fourth intervals, we can conclude that there is an equalisation of the proportion of

Year	1991	2001	2011
Median	50.2	50.5	44.2
Standard deviation	13.0	10.0	9.9

Tab. 2: Mean values and standard deviation of the proportion of native residents in the population of Czech municipalities, 1991–2011

Sources: Růžková et al., 1995; Škrabal et al., 2005, 2013; author's calculations

native residents in the population of the municipalities. The equalisation of values is associated in the second phase with a significant decrease in the proportion of native residents in the populations of municipalities comprising the second and third intervals. It seems that the transitional processes not only contributed to a reduction of the proportions of native residents in the population of these municipalities, but also an equalisation of these proportions.

In general, we can state that there is a prevalent equalisation of the proportions of native residents at the municipal level. It is evident from Figure 1 and this thesis is also confirmed by the decreasing values of the standard deviations in different years: see Table 2. The median values (Tab. 2) reveal that for the first two points in time, native residents dominated in a majority of municipalities, while by 2011 the immigrant population prevailed in more than one half of the municipalities.

The intensity of the changes in the proportions of the native residents in the population of the municipalities is shown in Figure 2. An attempt was made to identify the differences in the two sub-periods (1991–2001 and 2001–2011). We can observe the frequency of the municipalities to be analysed within each category shown in intervals, which demonstrates the extent of the difference between the proportions of native residents in the populations of municipalities that occurred during the two decades. The width of the interval is the same, i.e. 5 pp.

The dynamics of change were differed greatly between the two periods. In the first decade, the proportion of native residents increased in 54% of the municipalities (3,403). In the second decade, we witness the opposite trend, as an increase in the proportion of native residents in the population of the municipalities occurs only in 13% of the municipalities (807). In the period 1991–2001, the highest number of municipalities can be found in the category of moderate growth (0.1 to 5.0 pp), but an only slightly lower number is associated with the category of a slight decline (–5.0 to 0.0 pp). Therefore, we can observe two opposite development trends. The second decade differs as the highest

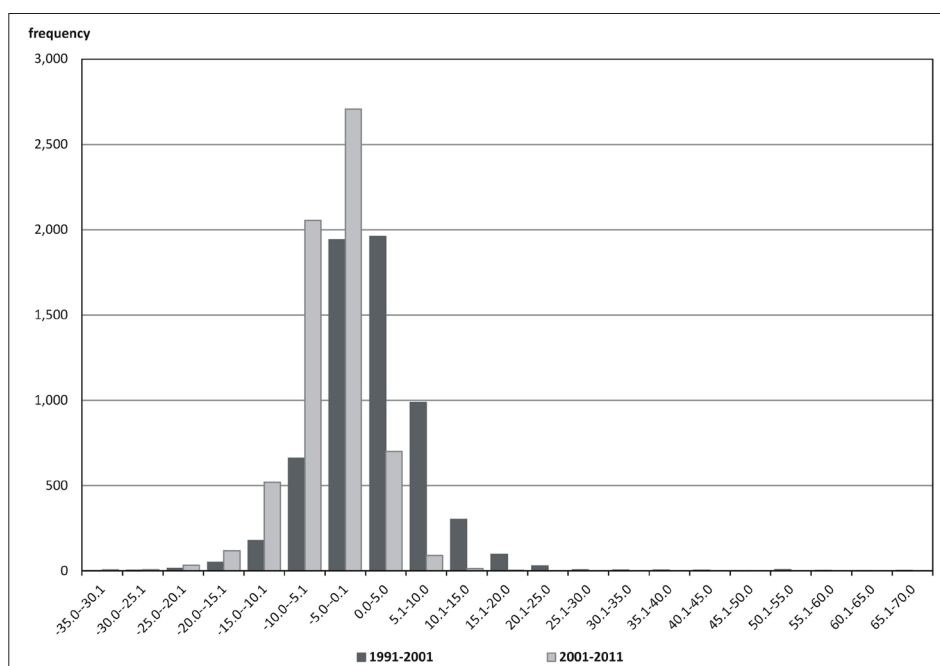


Fig. 2: Differences in the representation of native residents in Czech municipal populations for the inter-census periods 1991–2001 and 2001–2011. Sources: Růžková et al., 1995; Škrabal et al., 2005, 2013; authors' calculations

number (4,762; 76%) of the municipalities is associated with a decline in two categories (interval $\{-5.0$ to $0.0\}$ and the most plentifully represented interval $\{-10.0$ to $-5.1\}$). In the second period, an increase in the proportion of native residents of more than 10 pp only appears in less than 1% of the municipalities (17), while in the preceding period, it was more than 7% of the municipalities (456). In contrast, we can observe a decrease in the proportion of native residents of more than 10 pp in almost 11% of the municipalities (681), whereas in the previous period it was 4% of the municipalities (245). Generally, the upward trends in the development of the proportion of native residents in the population of individual municipalities causes a rather significant levelling of these values in the first decade. In the second decade, this levelling continues to be less intense. For this decade, the predominant reduction of the number of native residents in individual municipalities is considerable.

The development of regional differences in the structure of native residents in the Czech Republic is represented in Figure 3. The first map (1991–2001) depicts a dichotomy between the majority of borderland municipalities and the interior of the Czech Republic. The former municipalities are located in the border regions where German populations were found until the period after the Second World War. The eastern borderlands of the Czech Republic, in comparison with the rest of the border regions, differ and the patterns of development are closer to those in the interior. This is, of course, due to the absence of a German population and the preserved continuity of socio-historical development. In most inland municipalities, the development of the proportion of native residents in the municipalities oscillates around zero (0.0). In general, there is no significant increase in the proportion of native residents in the populations of the municipalities. Conversely, in the immediate hinterlands of some regional

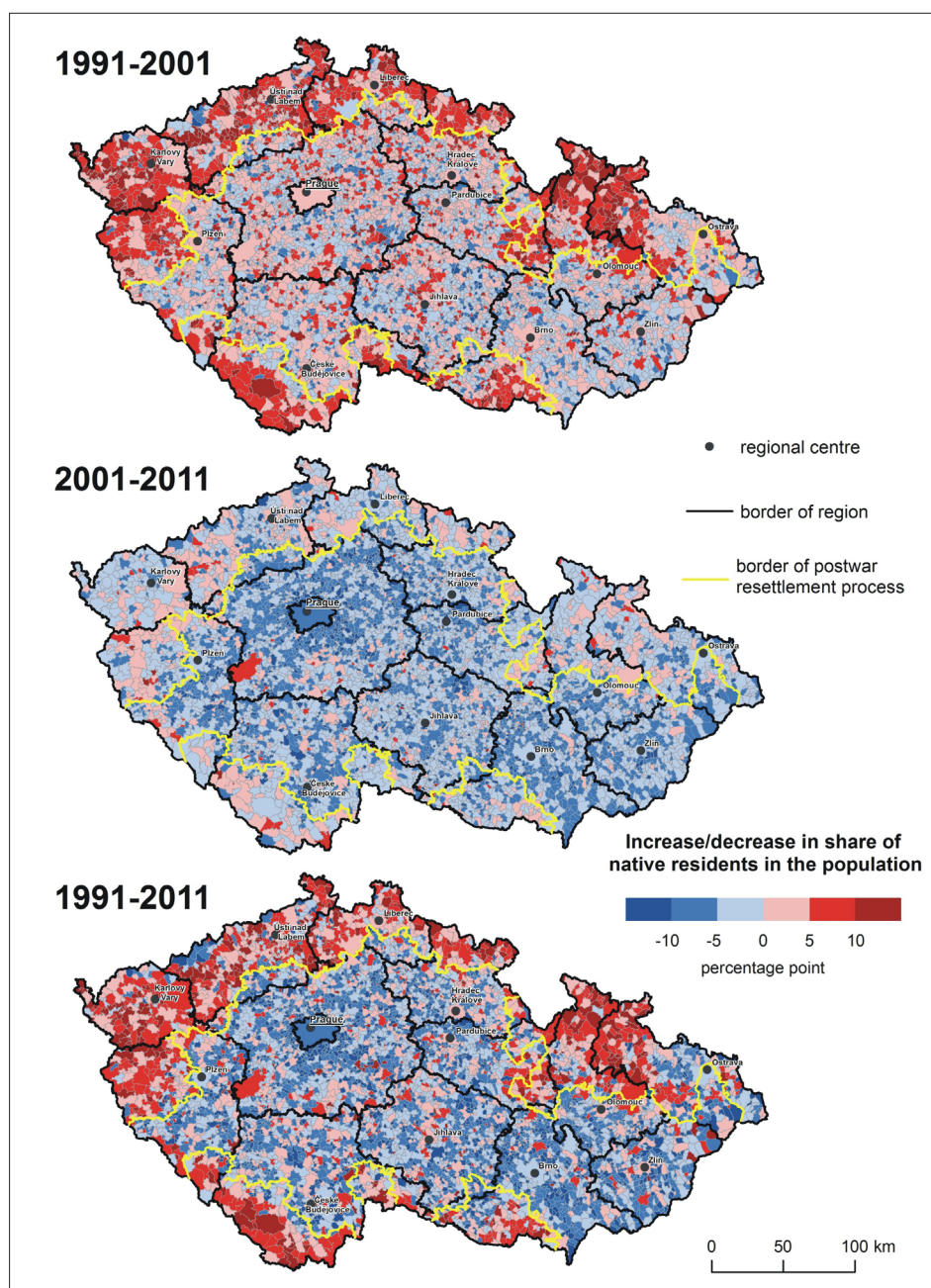


Fig. 3: The spatial distribution of changes in the proportions of native residents in the municipalities of the Czech Republic in the transitional period. Sources: Růžková et al., 1995; Škrabal et al., 2005, 2013; author's calculations

centres and particularly in the hinterland of Prague, we can identify municipalities with a significant decline in the proportion of native residents. This may have been caused by emerging residential suburbanisation process.

In the second decadal period, the above-discussed dichotomy is not nearly as pronounced. In the resettled borderlands, one still finds a majority of municipalities with an increase in the proportion of native residents, but far fewer than in the previous decade. In some borderland municipalities that can be described as tourism destinations, the decline in the proportion of native residents is more significant. In inland municipalities and borderland municipalities without new settlements, a drop in the proportion of native residents prevails. The highest levels of decline are mainly located in Prague and its immediate hinterland, likely due to increasing labour migration, as well as an intensified process of suburbanisation in its hinterland. The latter probably has its greatest effect on the hinterlands of regional centres, where there is also a relatively significant decline in the number of native residents. This second map also indicates that a significant decrease in the number of native residents began to occur in peripheral municipalities close to the boundaries of the regions. The decline in these municipalities has somewhat different reasons: in our opinion it is particularly caused by a negative difference between natality and mortality and negative net migration.

The third map (1991–2011) synthetically shows developments throughout the entire transitional period. Most notably, this map shows the above-mentioned dichotomy of the resettled borderland and the rest of the country. The development of the structure of native residents in the transitional period obviously differs in these geographic locations. The map also depicts that, in general, there is a decrease in the proportion of native residents in the Prague metropolitan area and in the suburbanised hinterlands of regional centres. It is also possible to assert a drop in the proportions of native residents in rural municipalities with a peripheral character situated near regional boundaries experiencing depopulation. In those rural municipalities with the highest percentage of native residents situated in traditional cultural and historical regions (Moravian Wallachia, Moravian Slovakia) at the eastern borderland, the proportion of native residents also decreases.

Given the general description of the patterns of change in native residents, above, we now can proceed to analyse the spatial variability of native residents and its development. A common method of measuring the spatial association rate, Moran's I (Moran, 1950), was used for this purpose. This method gives us information about the spatial pattern of the phenomenon being evaluated. Moran's I represents a global approach because it evaluates the analysed territory as a whole and ignores any spatial instability or local clusters. The results of this method are shown in Table 3.

Moran's I values indicate that the spatial pattern of the structure being evaluated tends to the clustering of spatial units with similar values. In the neighbourhood of municipalities with a high proportion of native residents in the population, there is a concentration of municipalities with similarly high proportions. Similarly, this also applies in the case of municipalities with a low proportion of native residents, which also neighbour municipalities with similarly low proportions. Based on a slight increase in the resulting values in the years under review, we can speak of a very modest evolution of the spatial pattern towards

more intensive clustering. This conclusion is also supported by analysis of the resulting Z-score values (Tab. 3). The Moran's I values can also be interpreted using hypothesis testing: establish the null hypothesis that there is no spatial autocorrelation of the proportion of native residents in the population of municipalities. The Z-scores in Table 3 indicate that the null hypothesis (level of significance = 0.01) must be rejected, as a statistically significant spatial autocorrelation within the structure being evaluated occurs in all years under evaluation. There is less than 1% likelihood that this clustered pattern could be the result of random chance. During the period under review there is also a very slight intensification of the spatial autocorrelation.

The local approach to the assessment of spatial autocorrelation considers the neighbouring effect (Anselin, 1995). Anselin's Local Indicators of Spatial Association (LISA) is a method that has the ability to determine deviations for each spatial unit in the area of interest from the global average of that territory. A further advantage is its ability to identify individual categories of spatial associations and identify spatial clusters of similar values within the area being studied. As a result, the internal spatial variability of the structure under consideration can be examined in a statistically significant way.

For our purposes, LISA was applied to all three years under review and the existence of five categories of spatial association was proven. The quantitative range of individual categories in individual years is shown in Table 3.

The spatial distribution of each category from the LISA analysis is shown in Figure 4. The first category is a high-high cluster. The municipalities in this category have an above-average proportion of native residents and the municipalities in their neighbourhood also show above-average proportions of native residents. The number of municipalities falling into this category stagnated during the transitional period. Within the entire period, this category is represented mostly by municipalities from the eastern part of the country. These municipalities are located in traditional Moravian regions (Moravian Wallachia, Moravian Slovakia) and in traditional Silesian regions (Hlučín region, Jablunkov region). This category is also

Global spatial analysis			
	1991	2001	2011
Moran's I	0.335	0.352	0.384
Z score	223.9	235.0	256.4
critical value	2.58	2.58	2.58
level of significance	0.01	0.01	0.01
Local spatial analysis			
Type of spatial association	Frequency of municipalities		
	1991	2001	2011
high-high cluster	1,654	1,646	1,695
high-low cluster	113	147	175
low-high cluster	247	247	266
low-low cluster	1,256	1,399	1,547
not significant	2,981	2,812	2,568

Tab. 3: Results of the analysis of spatial variability in the structure of native residents in the Czech Republic between 1991 and 2011

Sources: CZSO, 2014; Růžková et al., 1995; Škrabal et al., 2005, 2013. author's calculations

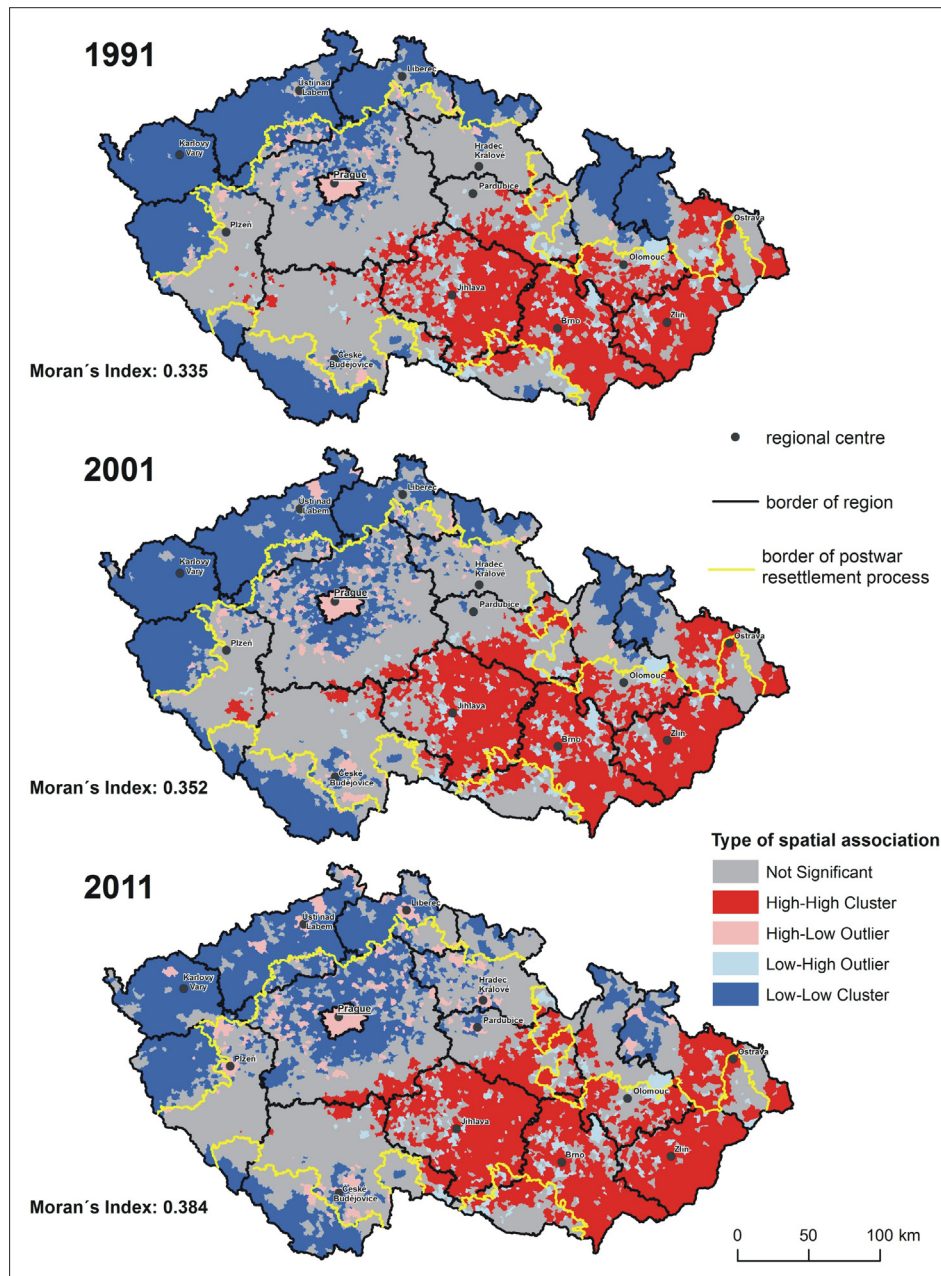


Fig. 4: Spatial patterns of native residents' structure in the Czech Republic in 1991, 2001, and 2011
Sources: CZSO, 2014; Růžková et al., 1995; Škrabal et al., 2005, 2013. author's calculations

bound to the Moravian, i.e. eastern, part of the Vysočina Region. The spatial evolution of the category is very low. The most pronounced trend in this context is the gradual integration of some municipalities of the inner periphery (municipalities along the border of the Central Bohemian Region with the South Bohemian Region and the Vysočina Region), as well as municipalities that underwent a post-war exchange of inhabitants (the Zábřeh region and the so-called Hřebeč island – see Slovákova and Šerý, 2016).

The low-low category comprises municipalities with a below-average proportion of native residents that neighbour municipalities which also show below-average proportions of native residents. A gradual even increase in the number of municipalities belonging to this category is found. This category is mainly present in the northern, western and southern border regions of Bohemia, in the west of the Czech part of Silesia and in the northwest of Moravia. Their common denominator is the experience

of socio-historical discontinuity in the post-World War II period. During the transitional period, a change in the spatial layout of the cluster appears. There is a gradual perforation of the category in the above-mentioned regions, which is especially evident in the west of the Czech part of Silesia and in the northwest of Moravia. On the other hand, the cluster is growing rapidly as a result of developments in the hinterland of Prague.

The high-low category is the last numerous one. The municipalities comprising this cluster show above-average proportion of native residents, but they neighbour municipalities which have a below-average proportion of native residents. The number of municipalities in this category has increased slightly during the transitional period. Also, the municipalities in this category are most often located along the border defining the post-war settlement, especially in the region of northern and western Bohemia. In addition, this type of cluster is located in the metropolitan area of

Prague, and, during the transitional period, it is gradually extended by regional centres located in Bohemia, with the exception of Karlovy Vary. These facts can be connected to the on-going process of residential suburbanisation in the hinterland of Prague and these regional centres.

The low-high category includes municipalities with a proportion of native residents which is below the general average. These municipalities neighbour municipalities where the proportion of native residents is above-average. The size of this category rarely changes during the transitional era. The spatial stability of this cluster is mainly in Brno, where it can be linked to socialist industrialisation and contemporary residential suburbanisation. Furthermore, the cluster is stable in some municipalities in the western part of the Vysočina Region and around Jihlava.

The remaining municipalities do not belong to any of the above-mentioned categories, as no statistically significant spatial autocorrelation has been demonstrated. Generally, it can be concluded that the analysis shows a very sharp west-east dichotomy in terms of the proportion of native residents in the population of municipalities. Although there is a slight development of the clusters' spatial deployment, the dichotomy demonstrates a continuing stability during the transformation period.

5. Discussion and conclusions

The three research questions posed in the introduction are answered below.

With regard to the first research question, the non-spatial dimension of the structure of native residents is primarily connected with three important observations: (i) for the different developments in the two decades that are analysed, the continuous levelling of the proportion of native residents in the population of municipalities, and the gradual decrease in the values of these proportions, has been recorded; (ii) for the spatial dimension or variability of the structure of native residents, a spatial pattern that shows statistically significant clustering tendencies has been found. The clustered spatial pattern is stable during the transitional period and the degree of clustering shows a slightly increasing tendency; (iii) for the question concerning the spatial variability of the structure of native residents, the analysis shows a very sharp west-east dichotomy in the structure of native residents. This dichotomy is stable throughout the whole transitional period and the individual clusters only changed to a limited extent in time (in particular a shift of the low-low category from the border to the metropolitan area). The spatial differences in terms of the western part (Bohemia) / eastern part (Moravia and Silesia) suggested by Kučerová (2009) for native residents, seems to be demonstrated at this time. The findings also correspond with the more general conclusions of Blažek and Csank (2007) and with the regional division proposed by Chromý, Kučerová and Kučera (2009).

The analysis of the data from 1991, 2001 and 2011 shows that the mixing or co-residential status of the residents of Czech municipalities has increased significantly. In the most intensive way, the process has occurred in the metropolitan area of Prague and in the suburbanised hinterlands of regional centres. Based on these observations, it is possible to conclude that local belongings and the narratives of local and other spatial identities based on having roots in an area, as well as people's concepts of "home" (Feng, Breitung and Zhu, 2014), have been challenged by ever-increasing spatial

mobility. Inhabitants have more heterogeneous spatial backgrounds and the personal histories and processes of identification have become diversified (Paasi, 2002). Czech transitional society coincides with contemporary societies characterised by Antonsich (2010) by the co-presence of a plurality of forms of belonging. These forms are differently imbricated in space and variously constituted in relation to the permeability of their identity boundaries.

One other conclusion of note is that the mixing of the residents as mentioned in the previous paragraphs also influences scales of identification. According to Tomaney (2015) and Pollini (2007), the scales of identification to which we belong may be multiplying and changing. Gustafson (2013) adds that heightened rates of mobility may alter the scale at which one expresses belonging. Similar arguments are provided by Feng and Breitung (2018), who studied the ability of high mobility to modify our understanding of home and, specifically, its scales. On the other hand, little or no mobility may limit the opportunities for participation and identification in larger communities (Fried, 2000). In a transitional era, such factors may have concerned the inhabitants of the more traditional Eastern parts of the Czech Republic compared to those inhabiting the Western parts. In general, it is necessary not to omit the influences of mobility when we want to assess any problems of spatial belongings, attachments or identities in current Czech society.

The findings from this research have policy relevance. The assessment of the proportion of native residents and the development of their variability and spatial patterns seems to be of importance. The author argues that central institutions should keep collecting data regarding native residents. Despite the limitations of longitudinal municipal data, as broadly discussed in the methodological part of this paper, the data are worthwhile for dealing with issues such as spatial belonging, identification, 'sedentarism', etc. The proposal is to structure data on native residents based on their usual place of residence. Such data would definitely provide a more realistic account of the situation.

Local belonging can have individual and collective dimensions (Tomaney, 2015). The longitudinal municipal data used for the purposes of this research provide spatial information concerning the entire transitional society. Unfortunately, the analysis of the data is not able to explain specifically the individual dimension of local belonging and its spatial scales. Understanding this individual dimension and its spatial scales, among either native residents or non-native residents, would require different data and methodologies. Another open question concerns the mutual relationship between native residents and social capital. Do native residents support the building of strong social capital for local development? Last but not least, research on local belonging within municipalities which have experienced the most intensive mixture of native residents and non-native residents would be desirable.

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