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Immigrant groups and the local environment: socio-spatial differentiation in Czech metropolitan areas

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Abstract

The spatial distribution of immigrant groups is a more relevant topic now than ever before. While the study of this topic has a long tradition in the 'traditional' immigration countries, it is rare in the very different context of Central and Eastern Europe, especially at the level of metropolitan areas. This study aims to address this gap by providing an analysis of the spatial distribution of various immigrant groups (defined by country of citizenship) in 17 Czech metropolitan areas, and its determinants. First, we characterise the specific situation of the Czech immigration system. Then we use cluster analysis to create a typology of neighbourhoods and compare the distribution of immigrant groups in each type of neighbourhood. Finally, we use regression analysis to examine which characteristics of the local environment are connected to concentrations of different immigrant groups. We show that the presence of foreigners remains associated with core urban areas. Some predominantly Western citizens act as gentrifiers, being associated with spacious pre-war apartments in prestigious inner-city areas, but there are also signs of suburbanization among more well-off immigrants to Czech metropolitan areas. We identify little evidence of ghettoisation of immigrants into socially excluded areas.

Keywords

Czech Republic, immigrant groups, international migration, metropolitan areas, spatial distribution

1. Introduction

Ethnic residential differentiation in the urban population has been a focus of academic attention since at least the early work of the Chicago school. Subsequent research on the issue has been conducted mostly in the United States and other immigrant-receiving countries, such as Western European states where the share of the immigrant population has risen in the second half of the 20th century (Kaplan & Woodhouse, 2004; Peach, 1996). However, the surge of international migration worldwide and the demise of socialism at the turn of the 1980s/1990s have extended the importance of understanding spatial differentiation in the immigrant population to other regions, such as Southern Europe (Kandylis, Maloutas, & Sayas, 2012; Malheiros, 2002) and Central and Eastern Europe (CEE).

More than 25 years of post-socialist transition has profoundly altered the face of CEE: the opening of state borders in former socialist countries has led to significant changes in their economies and societies (Stanilov, 2007). Moreover, it has contributed to a far-reaching transformation of migration patterns in Europe, whereby countries previously isolated by the Iron Curtain have become an integral part of the continental migration system (Bonifazi, Okólski, Schoorl, & Simon, 2008; Drbohlav, 2012). Czechia currently holds the notable position among post-socialist countries in the region of being the main immigration country (Drbohlav & Lesińska, 2014). Despite international migration being one of the major processes shaping the contemporary socio-spatial differentiation of the country (Novák, Puldová, Ouředníček, & Temelová, 2007), knowledge of the spatial distribution of immigrants in Czechia (as well as in the whole of CEE) remains limited. Previous studies on immigrants' spatial distribution and the determinants of their observed residential patterns have mostly focused on the scale of districts (Novotný, Janská, and Čermáková 2007; Drbohlav et al. 2010), while the fine-grained patterns and driving forces of immigrant distribution within municipalities gained much less attention (some exceptions are Janská & Bernard, 2015; Sýkora, 2009; Sýkora, Fiedlerová, Freidingerová, Svobodová, & Čermáková, 2016).

As we show in the next section, the social environment in the post-socialist countries is very different to that seen in traditional immigrant-receiving countries. This raises significant questions regarding whether the findings of literature from the latter will prove valid in this new context. Evidence from Europe shows a variety of immigrant spatial distribution patterns within metropolitan areas, ethnic concentrations being mostly associated with socially deprived areas (Malheiros, 2002). The aim of this paper is to examine to what extent the socio-spatial distribution of the immigrant population in a post-socialist country, and its determinants, resemble those of its European counterparts. We use a classification of local environments within Czech metropolitan areas to show which locations are typical of immigrant populations and whether there are differences in the settlement patterns of different immigrant groups (defined by country of origin). Then, we run a regression analysis for the most significant immigrant groups in order to establish which physical and social characteristics of local environment determine immigrant presence in the Czech context. We conclude by comparing our results with the findings from the traditional European immigration countries.

2. The immigration context of a post-socialist country

Due to geographical, cultural, economic and historical-political factors, the Czech immigration system differs from those of traditional immigration countries in at least three important aspects: its immigration history, its composition of source countries, and the specific context of a post-socialist country.

First, immigration to Czechia was negligible until 1989, with the exception of immigration from some allied socialist countries like Vietnam or Mongolia. The fall of the Iron Curtain and the subsequent Czech economic growth initiated immigration (Figure 1), which further increased after 2005 owing to the country's accession to the EU as well as to persisting labour market demands (Drbohlav & Valenta, 2014). International migration then declined in 2008 due to the economic crisis. However, the number of immigrants residing in the country later stabilized, with a growing share of them being permanent residents (Figure 1). The country's experience with international migration is

thus very limited, naturally making the migration-related institutions less developed. The relatively short history of immigration contributes to low shares of immigrants in Czech cities (the highest prevalence of 13-14% registered immigrants in 2015 was in the cities of Mladá Boleslav, Bílina and Prague; Klsák, 2017) as opposed to the traditional immigration countries, where in extreme cases the proportion of immigrants may reach up to 45% of the city population (Eurostat, 2017).

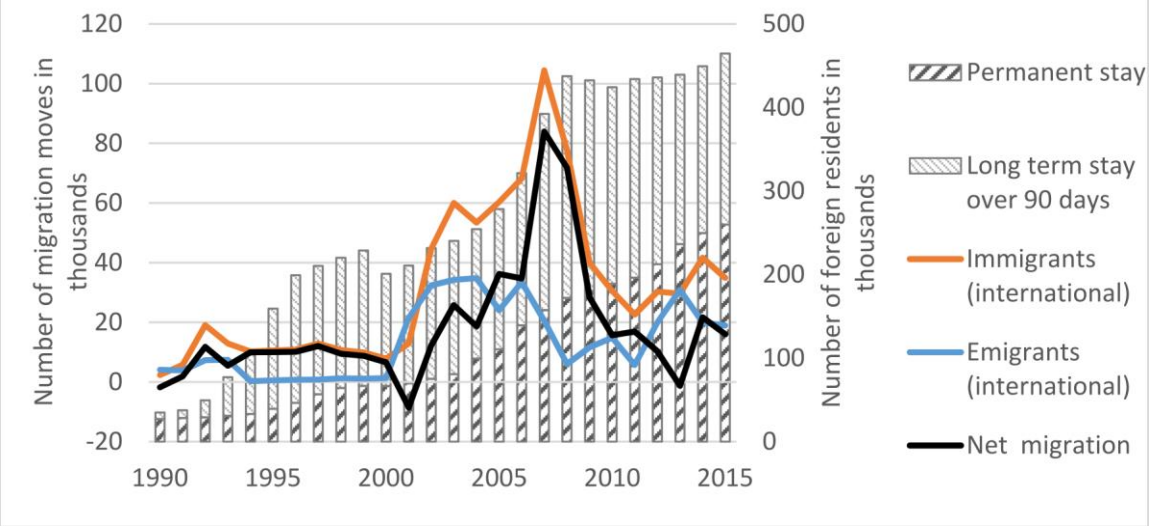

Figure 1: International migration and number of foreign residents in Czechia, 1990-2015.

Source: Czech Statistical Office and Ministry of Interior

Second, the immigration and integration patterns are very dependent on the migrants' origin. While immigrants tend to come from diverse (often very distant) geographical areas and cultures in the traditional immigration countries, migrant groups from geographically and culturally proximate CEE region are remarkably prevalent in Czechia. Ukrainians are the largest group (about 116,000 as of the Census of 2011), followed by Slovaks (82,000), who share a common history and culture with Czechs as they were members of the same state until 1992. The fourth most numerous group is Russians (32,000). Czechia attracts immigrants from these countries by its economic and political stability and its geographical and cultural proximity, the linguistic similarity being of special importance. There are several less numerous groups from Western countries and Vietnamese (53,000) are the only more significant group from a geographically and culturally distant environment. The Vietnamese immigration originated in co-operation between the countries during socialism; today

they focus on retail, which explains their relatively specific (and dispersed) spatial distribution (Janská, Čermák, & Wright, 2014).

Third, the legacy of the socialist era contributes to the contemporary dissimilarity of Czech social and spatial urban structures from those of the traditional immigration countries. In general, post-socialist cities typically feature more socially mixed neighbourhoods and thus less distinct patterns of socio-economic segregation than their Western European counterparts (Tammaru, Musterd, van Ham, & Marcińczak, 2015). Despite a growth in social inequality after 1989, the rather small extent of class differences in Czech society seems to have persisted until today (Lux, Sunega, & Katrňák, 2013; Ouředníček, Pospíšilová, Špačková, Kopecká, & Novák, 2016). Furthermore, housing market developments such as the housing restitutions, the decline in housing construction and the low turnover in the regulated housing sector created a strong preference for home ownership, causing a low level of spatial mobility within the Czech population (Lux & Sunega, 2010a, 2010b). A sharp decrease of the public sector during the post-socialist transformation led to the current fragmentation of the Czech housing market and to the absence of public social housing, which accommodates a non-negligible share of immigrants in Western Europe (Whitehead & Scanlon, 2007). The Czech social environment thus provides a remarkably different setting for international migration than that of the traditional immigration countries.

These dissimilarities make migration concepts developed in traditional immigration countries of little use in the Czech context. For example, migration networks, which play a significant role elsewhere, have not yet developed much in Czechia. Moreover, networks are generally most utilised by immigrants from cultures very different from the host country's. Groups which are more socially, culturally and economically distant from the majority population show spatial patterns generally more dissimilar to it and have a higher risk of segregation and settlement in deprived neighbourhoods than groups which are more similar to the majority in these aspects (Massey, 1985; Hasman, Novotný, 2017). However, only a few immigrants from culturally distant areas can be found in Czechia (with the exception of Vietnamese, whose networks are more developed – see Kušniráková, 2013). Therefore, as immigrants from CEE do not suffer much from language barrier and Western Europeans

are usually skilled and economically better-off than the native population, neither of these groups tends to be dependent on migration networks. For similar reasons, the model of spatial assimilation (Massey, 1985) is also less relevant in the Czech context. One important exception are Ukrainians, whose internal migration shows some signs of this process (Janská & Bernard, 2015) and who also use migration networks (Čermáková & Nekorjak, 2009; Leontiyeva, 2016), although their linguistic proximity to the host population makes them less likely to rely entirely on these networks than the culturally more distant immigrants. The cultural proximity between most immigrants and the native population also limits some selective moving processes among immigrants and natives such as 'white flight' and 'white avoidance' known from racially more diverse areas (Bråmå, 2006; Frey, 1979). The low spatial mobility of the Czech population (Čermák & Janská, 2011) further decreases the likelihood of the process. Finally, the processes of residential segregation and ghettoisation, widely discussed in traditional immigration countries, may be difficult to detect due to the low prevalence of immigrants in the Czech population.

3. Immigrant socio-spatial distribution in metropolitan areas

The immigrant population in both traditional and newer immigrant-receiving countries is usually unevenly distributed in space, with immigrants concentrated predominantly in large metropolises and their hinterlands (Rees & Butt, 2004; Schönwälder & Söhn, 2009; Van der Gaag & Van Wissen, 2001). It is well known that immigrant spatial distribution within metropolitan areas differs greatly between the USA and Europe. However, variability within Europe is also high (Arbaci, 2007; Malheiros, 2002). In Northern European metropolises, immigrants are concentrated in the core city, while the native population is over-represented in the periphery (Malheiros, 2002). Within the urban core, major immigrant clusters appear solely (e.g., in German and some Dutch cities like The Hague or Rotterdam) or predominantly (e.g., in the UK) in the inner city (Arbaci, 2007; Bolt, van Kempen, & van Ham, 2008). In other Dutch cities (Amsterdam, Utrecht), and in France, Denmark, and Sweden, foreigners settle in housing estates located in the city outskirts (Andersen, Andersen, & Ærø, 2000; Bolt et al., 2008; Murdie & Borgegård, 1998; Shon, 2010). In Southern Europe, immigrants are dispersed throughout metropolitan areas ranging from peri-urban and suburban areas

to some central city areas (Arapoglou, 2012; Malheiros, 2002). Finally, in Moscow, one of the few post-socialist cities to have experienced recent immigration, a polarized pattern appears: economically weak populations from ex-Soviet countries cluster in the outer city while a small group of immigrants from other regions is attracted to central districts (Kashnitsky & Gunko, 2016).

Immigrant spatial distribution at the local level is influenced by a large number of determinants operating on the global, regional, local and individual levels (for a detailed discussion of the determinants on different hierarchical levels, see Hasman & Novotný, 2017; Murdie & Borgegård, 1998; Van Kempen & Özüekren, 1998). We focus on the three broad groups of determinants which we consider of prime importance in the Czech context characterised above. First, spatial distribution of immigrants depends on the wider economic, demographic, and political conditions, such as the economic performance of the city, the possibility of competition between immigrants and natives in the housing market, and the prospects of immigrants' long-term settlement in the host country, that impact local urban settings (Van Kempen & Özüekren, 1998). The resulting socio-spatial differentiation of the neighbourhoods thus makes some parts of the city more suitable for immigrant settlement than others, especially in terms of the local housing and labour markets.

Second, patterns of immigrant settlement relate to housing types, which in turn are an integral part of a country's welfare regime rooted in specific state-market relationships and principles of redistribution (Arbaci 2007). Countries with a higher prevalence of small-scale housing contain more heterogeneous neighbourhoods, thus allowing for more fragmented immigrant settlement than areas where large-scale housing prevails, favouring substantial concentrations of immigrants. Spatial distribution of immigrants is also shaped by housing tenure, with most being accommodated in the generally most affordable rental sector (Musterd & Van Kempen, 2009; Buisman and Muus 1992 in Van der Gaag & Van Wissen, 2001), although the rising affluence of ethnic minority groups leads to the increase in ethnic minority owner-occupation (Musterd & Van Kempen, 2009). While the socio-spatial differentiation of the neighbourhoods impacts on immigrants' ability to afford to live in particular parts of the city, the third determinant – local labour market – also plays an important role by channelling immigrants towards the proximity of their workplaces. Therefore, while in early 20th

century Chicago immigrants were settling in proximity of their industrial workplace in the inner city, nowadays they can be scattered across the metropolitan region and beyond (Burgess, 1928; Kandylis et al., 2012; Rees & Butt, 2004; Schönwälder & Söhn, 2009).

In the academic literature, the immigrant residential differentiation resulting from these (and other) factors is usually referred to in terms of the physical environment and economic status of neighbourhoods, and scholars also point to concentrations of low-status immigrants in deprived locations and the attraction of fewer, better-off immigrants to prestigious localities. However, urban neighbourhoods are much more complex and there is a need for more detailed classification techniques (Reibel, 2011). While the research on immigrant neighbourhood types is more extensive in the USA (Owens, 2012; Vicino, Hanlon & Short, 2011), analyses of the local environment and immigration in European (especially post-socialist) cities are scarce, some exceptions being the works of Kandylis et al. (2012), and Piekut, Rees, Valentine & Kupiszewski (2012). Kandylis et al. (2012) show that some immigrant groups are not only in more disadvantaged positions than others but also live in a generally more deprived milieu: in the Athens metropolitan area, diversity has increased in peri-urban areas and a multi-ethnic city centre has emerged as a result of immigrant settlement in areas close to (notably low-status) immigrant employment. According to Piekut et al. (2012), in Leeds (UK), some 60% of the immigrant population are concentrated in inner city, working-class areas, which also contain young and middle-aged populations, lone parents, some disabled residents, and substandard housing.

4. Data and methods

This study aims to reveal patterns in the spatial distribution of foreign citizens within Czech metropolitan areas (MAs), allowing a comparison of the position of immigrant groups in the social ecology of these post-socialist areas with other European contexts. The definition of metropolitan areas used in our study follows the delimitation by Špačková et al. (2015), based on housing construction and migration from the core city. A MA comprises an urban core with at least 10,000 inhabitants and its suburban area. Remote parts of hinterland isolated from the core city by other MAs

(9 municipalities) were excluded from the analysis. Using a threshold of 2,400 foreign citizens – a value representing a distinctive cut-off in distribution of foreigners' numbers in Czech metropolitan areas – yielded a set of 17 MAs (Figure 2). It includes both the largest MAs and smaller ones with a high proportion of foreigners in the population. Altogether, it comprises 4 million inhabitants (i.e., about 40% of the Czech population), including 305,000 foreigners (i.e., about 60% of all foreign residents).

The study first employed detailed data from the census of 2011 to show some basic characteristics of immigrant groups. Then, a classification of local environments was developed and the structure of population citizenship compared for each cluster. Finally, a binary logistic regression was performed to reveal the factors associated with concentrations of the most important immigrant groups in specific types of local environment. The analyses were carried out at the level of 3,730 basic settlement units (BSUs), the second smallest Czech territorial unit. In urban areas, they have on average 1,000 inhabitants and are delimited with respect to the predominant function of the area. As a sufficient number of foreign residents is needed for robust quantitative analysis, the smallest Czech territorial units (census tract) could not be used; similarly, extremely small BSUs with less than 20 inhabitants were omitted from the analysis.

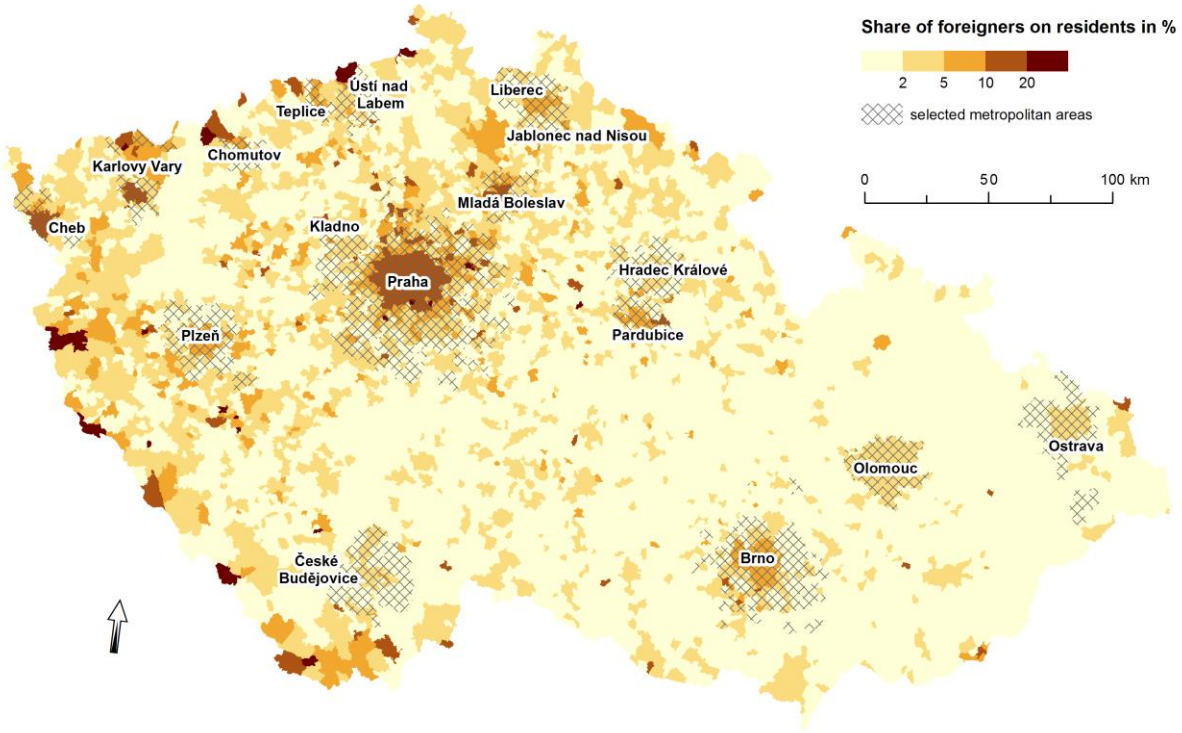

Figure 2: Spatial distribution of foreign citizens and the 17 selected Czech metropolitan areas in 2011. Source: Census 2011, Czech Statistical Office

The group under scrutiny consists of foreign citizens residing in Czechia as of Census 2011. Because the Czech 2011 Census was linked to the population register, the data also includes foreigners who were registered but did not participate in the census, their total number thus possibly being somewhat overestimated. Conversely, foreigners living in the country without registration (undocumented migrants, staff of foreign embassies and other foreign citizens who need not register their short-term residence), who did not participate in the Census, were not considered in the analysis. Given the low number of naturalizations in the country prior to 2011 (around 1,000 naturalizations occurred annually; Ministry of Interior, 2014), the group is interchangeably labelled ‘foreigners’ and ‘immigrants’.

As argued above, the complexity of the urban environment can only meaningfully be grasped by producing a classification of neighbourhoods. To capture this complexity, we employed 23 variables from Census 2011 describing local environment on the three levels of differentiation identified by Lupton, Fenton, Tunstall, & Harris (2011). First, variations emerge due to the intrinsic

characteristics of urban areas such as their geographic location and built environment, which affect the opportunities and challenges for their residents (Lupton & Power, 2002). Second, variation between places contributes to residential sorting, which, together with the population composition, in turn forms the final level of differentiation of urban areas: acquired characteristics (Lupton et al., 2011), such as population mobility, feelings of safety, daily rhythms, interactions among residents, and perceptions of the locality, which together produce a specific local social climate (Ouředníček, 2002).

The classification draws on as comprehensive set of domains as possible for the set of 3,730 BSUs, reflecting the geographic, economic and social characteristics of the BSUs, to represent their intrinsic characteristics and population structure. Due to limited availability of other data capturing the social climate of BSUs, population mobility variables were employed as its proxy, as high levels of population turnover are perceived to result in deterioration of local social relations (Bailey, Kearns, & Livingston, 2012), which in turn may affect the social climate of localities. We used a similar methodology to Hanlon (2009) and Murdie, Logan, and Richard (2013). First, to reduce the number of variables we used a Principal Component Analysis using a Varimax rotation with Kaiser Normalization. Based on both Eigenvalue (> 1) and interpretability of the resulting components, we extracted six factors explaining 65.8% of the total variability (component loadings are displayed in Table 1). The components were then entered into a Hierarchical Cluster Analysis in order to create the final typology of neighbourhoods within the Czech metropolitan areas. Like Mikelbank (2011) or Murdie et al. (2013), we used squared Euclidean distance as the similarity measure and Ward's method as the statistical algorithm. Evaluation of the dendrogram showed that the optimal number of clusters was seven. Although we repeated the cluster analysis using different algorithms and different numbers of clusters, this combination proved best because no extremely large or extremely small clusters were created.

	Component number					
	1	2	3	4	5	6
Intrinsic characteristics						

Location	Relative distance from the geographical centre of the metropolis	0.37			-0.69		-0.22
Housing	% population living in institutions		-0.74				
	% houses finished or reconstructed before 1945						0.81
	% houses finished or reconstructed after 1990	0.45		0.38		0.30	-0.39
	Mean size of apartment	0.74	0.32			0.29	
	Mean population per apartment	0.77					
Labour market	Log of job opportunities on number of labour force			-0.59			
Population structure							
Demographic	% population aged 0-14	0.52	0.40	0.44			
	% population aged 20-34	-0.21		-0.84			
	% population aged 65 and more	-0.44	-0.30	0.62			
	% population unmarried			0.83			
	% one-person households	-0.77					
Socio-economic	% population with basic or no education					-0.79	
	% population with university degree				0.47	0.64	
	% population of labour force		0.76			0.26	
	% population of unemployed		-0.26			-0.62	0.21
	% labour force in primary sector				-0.76		
	% labour force in tertiary sector				0.73	0.28	
	% population living in own house	0.82			-0.32		
	% population living in own apartment		-0.70			0.32	
Social climate							
Population mobility	% population commuting outside BSU of residence						
	% population living in municipality of birth		0.58			0.44	-0.29
	% population living in the same municipality 1 year ago		0.46	-0.22			0.50

Table 1: Variables used to develop the typology and component loadings for Principal Component Analysis.

Note: Numbers represent Pearson correlations between extracted factors and original variables; cells with absolute values lower than 0.2 were suppressed. Relative distance from the geographical centre of the metropolis was calculated as the ratio of distance of given BSUs from the centre of the metropolis to the distance of the most distant BSU in given MA.

Source: Census 2011, Czech Statistical Office; authors' own calculations

Second, we compared the types of neighbourhoods obtained from the perspective of their residents' citizenship. We used data disaggregated on the level of 94 citizenship groups including Czechs (groups with fewer than 150 citizens were merged). Then we computed the percentage of BSUs of each given neighbourhood type in which each group was concentrated. This enabled us to compare the 'popularity' of each neighbourhood type between individual citizenship groups. This approach differs from that of Hanlon (2009), Mikelbank (2011) and Murdie, Logan, and Richard (2013), who included information about migration background or ethnicity directly within their typology. We believe that, if we wish to prove a possible relationship between location characteristics and residents' migration background, we should first develop a typology without this information and only then compare it with the typology.

However, it was important first to delineate our use of the term 'concentration'. We assumed that citizenship group *i* is concentrated in a BSU *r* if its location quotient ($LQ_{i,r}$) there is greater than 1, meaning it is more prevalent in BSU *r* than in the whole set of 3,730 BSUs. The location quotient can be formally written as:

$$LQ_{i,r} = \frac{F_{i,r} \Big/ \sum_i F_{i,r}}{\sum_r F_{i,r} \Big/ \sum_i \sum_r F_{i,r}},$$

where $F_{i,r}$ denotes the size of the population group *i* in the BSU *r*. The threshold of $LQ_{i,r} > 1$ was applied because of its intuitive interpretation (setting a different threshold would however influence the results only marginally). Using a location quotient has the important advantage of revealing the spatial distribution of citizenship groups regardless of the various population sizes of both immigrant groups and BSUs.

Finally, to thoroughly examine the associations between the a) different aspects of local neighbourhoods seen as potential drivers of immigrant settlement (housing and labour markets, and urban socio-economic differentiation) in the Czech context and b) concentrations of the most populous immigrant groups (those presented in Figure 3) in a given locality, we used a binary logistic regression. We employed an indicator of $LQ_{i,r} > 1$ as a dependent variable, independent variables being the same as in Table 1 except that five variables were excluded due to the risk of multicollinearity.

5. Results

5.1 The immigrant population of the Czech metropolitan areas

The immigrant population is often referred to in public discourse as a homogeneous group, or distinguished from citizens from the EU and from 'third countries' in Czech legislation. However, this generalisation obscures substantial differences between the internal structures of individual immigrant groups. Therefore, we next provide a brief overview of the demographic and socio-economic characteristics of the most populous groups residing in the selected Czech metropolitan areas (Figure 3). A clear difference can be distinguished between: 1) male-dominated groups characterized by a large prevalence of working-age persons, a) predominantly in manual labour (Ukraine, Moldova, Bulgaria, Romania), and b) in both high- and low-skilled occupations (Slovakia, Poland, Romania), suggesting labour-oriented migration; and 2) groups with a balanced gender ratio and a higher proportion of children, often a) working in retail (Vietnam, China) or manual professions (Mongolia) or b) highly-qualified Russian citizens, indicating family migration, and migration of Western professionals. Following Kandylis et al. (2012), we hold that such differentiation of groups can be seen as a proxy for their position in a socio-economic hierarchy, with well-educated professionals at one end and those with less education working in low-status jobs at the other. The census data for the selected metropolitan regions reveal that citizens of developed countries have the strongest socio-economic position, with the least favourable being held by citizens of most of the Eastern countries, whereas citizens of Slovakia and Russia hold specific positions of former fellow citizens, and a group

socio-economically exceptionally well-positioned among immigrants from the East, respectively. Whilst we acknowledge that such a hierarchy – like any form of generalization – masks further internal differences, we believe that it can be a valuable tool not only to highlight the diversity of the migrant population, but also to explain the differences in its spatial distribution.

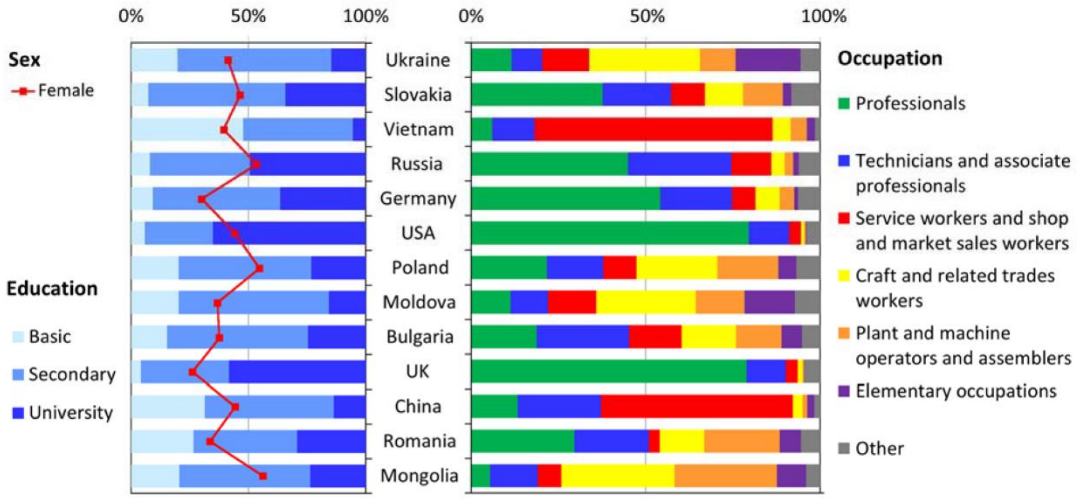

Figure 3: Sex, education, and occupation structure of the largest immigrant groups in the 17 MAs in Census 2011.

Source: Census 2011, Czech Statistical Office; authors' own calculations

5.2 The distribution of immigrant groups within types of residential environment

The cluster analysis produced seven types of residential environment in the selected Czech metropolitan areas (Table 2). For each of them, we calculated the percentage of BSUs in which each immigrant group had established concentrations (Table 3). Moving from the city centre outwards and concluding with two less spatially distinct types of environment, we briefly describe the key characteristics of each type of local environment and the composition of their foreign residents. This reflects the tendency for the prevalence of foreigners in the population to decrease as distance of the local environment from the core of metropolitan areas increases (with some exceptions in suburbs), which supports the general trend of declining share of immigrants in population when moving down the Czech urban hierarchy (Janská et al., 2014).

	Total MAs	*Core urban areas*	*Housing estates*	*Suburbs*	*Hinterlands*	*Peripheries of the MA*	*Dormitories*	*Socially excluded areas*
Number of BSUs	3,730	1.044	604	259	1.439	228	101	55
Average population size	1.095	1.285	2.727	592	593	107	372	482
Foreign citizenship	7.5	10.2	6.1	12.8	3.7	3.2	44.8	8.8
Intrinsic characteristics								
Relative distance from the centre	33.2	**17.1**	**18.9**	**28.7**	**47.9**	**66.1**	**14.9**	27.8
Living in institutions	3.7	2.4	**1.7**	**2.0**	**1.1**	**0.4**	**57.7**	**17.1**
Pre-1945 housing	32.1	**45.9**	**20.2**	**16.0**	**30.9**	29.6	19.6	40.3
Post-1990 housing	28.7	**24.6**	**15.4**	**71.3**	**31.1**	**24.2**	21.2	22.7
Mean apartment size	62.9	**61.4**	**48.2**	**78.1**	**69.8**	**67.6**	28.8	40.1
Mean population per apartment	2.63	2.60	**2.07**	**2.80**	**2.88**	2.68	**1.94**	2.91
Job opportunities	0.086	**0.163**	**0.013**	0.066	**0.017**	**0.009**	**0.802**	**0.364**
Population structure								
Aged 0-14	15.0	**14.1**	**12.9**	**21.7**	**16.1**	14.4	**3.7**	**21.7**
Aged 20-34	22.4	22.8	**23.0**	**26.4**	**20.1**	**20.9**	**38.1**	23
Aged 65 and more	14.3	**14.9**	**17.9**	**5.9**	14.1	**15.9**	12.1	**6.0**
Unmarried	40.7	**41.4**	**39.5**	**45.9**	**39.1**	**38.3**	46.5	**58.8**
One-person households	25.8	**26.9**	**34.1**	**20.5**	**21.4**	26.3	37.7	26.2
Basic or no education	11.3	**10.0**	**14.6**	**4.3**	11.8	**2.9**	9.6	**55.7**
University degree	19.1	**24.4**	**17.8**	**97.8**	13.8	**13.4**	19.8	**3.5**
Labour force	69.8	69.5	**72.3**	**74.0**	**70.7**	**72.7**	**39.1**	**50.9**
Unemployed	9.1	8.9	9.3	**5.1**	8.8	8.6	10.0	**39.6**
Primary sector	2.7	**0.9**	**0.5**	**0.7**	**3.1**	16.7	0.4	1.8
Tertiary sector	64.3	**71.2**	**68.6**	**75.9**	**59.1**	**44.4**	61.9	**53.6**
Own house	60.2	**56.0**	**10.8**	**67.1**	**83.1**	**84.9**	**17.8**	**28.0**
Own apartment	13.6	12.9	**40.0**	**21.7**	**3.5**	**3.1**	16.3	**3.2**
Social climate								
Commuters	19.8	**18.4**	20.3	**28.1**	**20.5**	19.8	**8.5**	**6.3**
Born in municipality	43.1	**51.2**	**47.8**	**29.5**	**39.5**	42.6	**16.4**	44.4
Living in the municipality 1 year ago	70.4	**68.8**	**71.3**	70.1	**73.6**	**75.4**	**34.8**	**48.7**

Table 2: Mean values of selected variables in types of local neighbourhoods.

Note: Values in bold differ on 99% confidence level from the total mean value. For full variable names see Table 1.

Source: Census 2011, Czech Statistical Office; authors' own calculations

Citizenship	*Core urban areas*	*Housing estates*	*Suburbs*	*Hinterlands*	*Peripheries of the MA*	*Dormitories*	*Socially excluded areas*
Western countries							
Australia	17.0	13.2	7.7	2.6	0.0	5.9	1.8
Austria	22.7	15.9	14.7	7.4	1.8	12.9	3.6
Belgium	11.5	9.6	9.7	1.2	0.0	3.0	0.0
Canada	24.1	16.9	13.1	5.0	2.2	13.9	5.5
France	23.8	7.6	17.0	5.4	0.4	15.8	3.6
Germany	**30.7**	16.4	**27.8**	**16.9**	**8.3**	24.8	9.1
Greece	16.5	22.4	9.7	3.3	0.0	9.9	3.6
Ireland	14.3	7.9	6.2	0.6	0.4	5.0	0.0
Italy	21.6	11.4	21.2	6.6	0.4	17.8	1.8
Netherlands	18.8	10.1	17.4	6.0	2.2	9.9	1.8
Portugal	9.6	5.5	3.9	0.6	0.0	10.9	1.8
Spain	18.1	10.9	8.9	2.1	0.0	13.9	1.8
Sweden	15.4	10.1	8.1	3.0	0.0	6.9	0.0
Switzerland	18.5	14.9	10.8	4.5	1.3	5.9	0.0
United Kingdom	**27.9**	9.6	**32.0**	8.0	2.2	17.8	1.8
USA	**25.1**	9.1	23.6	6.9	1.8	14.9	1.8
Central and Eastern Europe							
Bosnia and Herzegovina	14.5	15.6	12.4	2.6	0.0	13.9	1.8
Bulgaria	23.6	**23.5**	22.0	8.3	1.8	**32.7**	**16.4**
Croatia	17.2	20.0	13.9	3.5	0.4	9.9	3.6
Hungary	13.5	14.6	10.0	2.4	0.4	9.9	5.5
Kosovo	7.5	11.4	5.0	1.3	0.4	6.9	1.8
Macedonia	14.8	16.9	8.5	2.8	0.0	15.8	3.6
Poland	24.5	**28.8**	20.5	**14.0**	**4.8**	**36.6**	**30.9**
Romania	19.6	20.2	12.4	6.9	**3.5**	28.7	14.5
Serbia	19.3	16.2	15.8	2.6	0.9	15.8	10.9
Slovakia	**36.0**	**33.4**	**52.5**	**14.7**	**8.8**	**63.4**	**49.1**
Former Soviet Union							
Armenia	13.0	18.2	10.8	3.3	0.0	14.9	10.9
Belarus	21.8	22.2	23.6	5.5	1.3	31.7	12.7
Georgia	11.4	12.1	6.9	1.7	0.0	14.9	0.0
Kazakhstan	16.9	19.5	23.6	3.8	0.9	23.8	5.5
Kyrgyzstan	8.8	11.6	6.2	0.5	0.4	9.9	0.0
Lithuania	10.1	11.8	3.5	1.3	0.0	13.9	7.3
Moldova	23.2	22.0	17.8	**8.5**	1.8	**44.6**	14.5
Russia	23.6	19.4	**37.8**	7.7	0.9	32.7	5.5

Ukraine	**38.5**	**24.7**	**29.0**	**14.0**	**12.7**	**63.4**	**32.7**
Uzbekistan	15.7	11.9	10.0	1.8	0.0	28.7	5.5
Eastern Asia							
China	17.3	15.6	18.1	2.0	0.0	13.9	9.1
Japan	16.4	7.9	6.9	0.8	0.0	10.9	0.0
Mongolia	12.8	19.2	3.9	2.9	0.4	25.7	5.5
Vietnam	22.6	**26.3**	11.6	8.0	1.3	22.8	**32.7**
Other citizenship							
Algeria	12.1	16.4	6.6	1.4	0.0	7.9	5.5
Brazil	10.3	7.3	4.2	1.0	0.0	6.9	0.0
Egypt	11.2	15.9	7.7	1.3	0.0	5.9	3.6
India	16.4	12.6	4.6	1.5	0.0	16.8	3.6
Israel	13.5	12.3	11.2	1.9	0.0	7.9	3.6
Mexico	11.3	7.0	5.0	0.8	0.0	8.9	0.0
Nigeria	12.3	13.9	4.2	1.0	0.0	5.9	1.8
South America, others	12.9	9.3	7.7	1.6	0.4	7.9	0.0
Syria	9.4	12.3	3.1	0.8	0.4	5.0	3.6
Tunisia	11.6	19.7	6.2	2.8	0.4	7.9	3.6
Turkey	16.4	12.4	11.6	1.5	0.0	17.8	0.0
West Africa, others	13.4	16.1	7.7	1.2	0.0	14.9	3.6

Table 3: Population citizenship concentration in different types of local environment.

Note: Figures show the percentage of BSUs falling within the specific type of local environment in which a given immigrant group is concentrated ($LQ_{i,r} > 1$). Values in bold represent the five most frequently concentrated groups in the given type. Only groups concentrated in more than 10% of BSUs of at least one type are listed.

Source: Census 2011, Czech Statistical Office; authors' own calculations

The large cluster of *core urban areas* is characterized by relatively large BSUs with an above-average share of the labour force working in the service sector, an above-average share of university-educated, and older housing stock typical in the urban cores, especially that of Prague. It has a high proportion of foreign residents, mostly from Western countries, the former Soviet Union, and Slovakia. Overall, its citizenship structure is very complex, also including concentrations of relatively small groups (e.g., from Africa or Latin America) in more than 10% of BSUs of this type, although the total prevalence of citizens from these regions on the whole foreign population is very small

(Table 4). Predominantly inner-city locations thus provide diverse local environments attracting populations from all positions in the socio-economic hierarchy. As observed in Prague, these areas are desirable for upper middle class Western citizens (Hanzlíková, 2012) as well as for low-status guest workers sharing apartments in affordable housing (Medová & Drbohlav, 2013). Inner-city locations thus have become cosmopolitan, socio-economically diverse areas.

Citizenship	*Urban areas*	*Housing estates*	*Suburbs*	*Hinterlands*	*Peripheries of the MA*	*Dormitories*	*Socially excluded areas*	*Total*
Former Soviet Union	41.6	45.8	42.0	43.6	59.8	52.9	44.2	42.9
Central and Eastern Europe	22.4	28.8	31.1	28.2	23.4	25.9	26.7	26.5
South-East Asia	9.2	6.2	13.4	12.3	3.6	3.7	21.5	10.5
Western Europe	10.4	7.1	4.4	8.5	9.0	6.4	3.4	7.8
East Asia	3.7	4.7	3.1	1.8	1.3	2.7	1.5	3.3
Northern America	5.0	1.9	1.4	1.9	1.8	2.5	0.3	3.2
Southern Europe	2.9	1.2	1.0	1.1	0.3	1.8	0.2	1.9
Middle East and North Africa	2.0	2.3	1.8	1.2	0.3	2.1	1.0	1.9
Latin America	0.8	0.6	0.4	0.4	0.6	0.9	0.1	0.6
South Asia	0.8	0.5	0.5	0.3	0.0	0.4	0.6	0.6
Sub-Saharan Africa	0.7	0.7	0.5	0.3	0.0	0.5	0.5	0.6
Oceania	0.4	0.2	0.2	0.2	0.0	0.1	0.1	0.3

Table 4: Population by region of citizenship and type of local environment.

Note: Figures show the percentage of the given immigrant group on total foreign population in the particular type of local environment.

Source: Census 2011, Czech Statistical Office; authors' own calculations

The category of *housing estates* can generally be found adjacent to core urban areas. Typical for this cluster are densely populated spatial units with small apartments in socialist-era housing stock, often inhabited by single households. Citizens from Eastern Europe are by far the most common here, but some other groups (from Vietnam, Mongolia, and some African countries) are also over-

represented. Conversely, immigrants from Western Europe are relatively scarce. Following the socio-economic hierarchy of foreign residents presented above, it may be assumed that housing estates represent an environment generally linked with low-to-middle-status foreign populations which generally contribute to the rejuvenation of the local population, while at the same time maintaining the existing social mix of the neighbourhoods (Ouředníček, 2016).

Suburbs typically contain recent housing stock, a large proportion of university-educated and service workers, children, and unmarried persons, with a significant proportion of the population commuting to work and schools outside their BSU of residence. Similarly to core urban areas, suburbs are most prominent in Prague, and they contain similar immigrant groups. We thus presume this cluster to be preferred by foreign populations who have a rather high socio-economic status. The most common type of local area, *hinterlands*, is, on the other hand, represented by less-populated BSUs in the more remote parts of most other MAs than Prague. It is typified by small prevalence of labour force in services and fewer university graduates, and is made up of large households living in relatively spacious houses. Finally, the *peripheries of MAs* contain countryside-like BSUs with few inhabitants, and, out of all clusters, feature the highest shares of agricultural labourers and of owner-occupied houses. Hinterlands and peripheries of MAs have similar citizenship structures: concentrations of immigrant groups are scarce, and most common in both cases are citizens of neighbouring countries (Germany, Slovakia, and Poland) and Ukraine. The most plausible explanation for the scarcity of immigrant groups is that job opportunities are limited in these BSUs, which reduces their appeal for immigrants.

Generally located in the core of the MAs and notably in Prague, *dormitories* represent a few small BSUs with extremely large proportions of population residing in institutional housing and in workers' and students' dormitories, and few children. Interestingly, this cluster is characterized by an extremely high prevalence of foreign residents (44.8%), although this variable did not enter into the typology calculation. Our analysis supports findings of previous studies (Baršová, 2001; Drbohlav & Ezzeddine-Lukšíková, 2004; Valenta, 2012), showing that neighbourhoods with dormitories are most notably inhabited by Eastern Europeans (especially Ukrainians and Moldovans). However, Mongols,

Germans, Vietnamese, Uzbeks, and Kazakhs have established a considerable number of spatial concentrations here as well. Given the modesty of housing and high proportion of immigrants, areas in this cluster might be especially attractive to low-status guest workers. Although interactions between dormitory residents and the surrounding population have been described as limited and trouble-free (Drbohlav et al. 2007), the Czech media often label dormitories as alien sites (Šafránková Pavlíčková, 2009). Given the currently exacerbated public discourse throughout Europe about immigrants, we argue that these areas should be at the centre of further research on immigrants and the social environment. However, we must note that the number of foreigner in this type is likely to be overestimated due to the link between the Czech 2011 census and the register data, discussed above. Moreover, as the Czech population need not register for temporary stay, their number in dormitories (especially student dormitories) is underestimated, and the share of immigrants thus overestimated. Besides immigrants living in dormitories, this number can also include some foreigners living in hotels and other short-term accommodation establishments (which explains concentrations of some Western European groups in some BSUs of this cluster). In Census 2011, a total of 9,300 foreigners were enumerated in such establishments because they may have been living there for longer periods. However, our data do not allow for further distinctions at the BSU level. On the other hand, some immigrants live elsewhere than in their registered permanent residence (Čermák & Janská, 2011).

The final and least frequent type of local environment typically features extremely low levels of education, large numbers of children, small proportions of outgoing commuters, high unemployment and population turnover, a high proportion of dormitories, and low owner occupation. It is typical in economically weak MAs and its distance from the centres of metropolises varies. Because this cluster significantly overlaps with the map of *socially excluded localities* (https://www.esfcr.cz/mapa), we use the same term. In the Czech context, a socially excluded locality is defined as "a location with more than 20% concentration of persons living in inadequate conditions […] and inhabiting a physically or symbolically delimited space" (GAC, 2015, p. 16). This cluster is especially associated with the presence of Slovak citizens. Generally, inhabitants of Roma ethnicity make up the majority of the population of socially excluded localities (GAC, 2015). Given the Slovak

origin of the Czech Roma population (Uherek, 2007), it is likely that the observed concentration of Slovaks in this cluster comprises mostly Roma. To a smaller extent, some groups from Eastern Europe are also concentrated in a higher proportion of socially excluded areas. However, these areas currently do not feature concentrations of immigrants with origins in culturally distant countries (except Vietnamese). This prevents the situations reported in other countries, where immigrants suffer not only from living in stigmatized areas, but also from lacking local language skills (Ley & Smith, 2000; Whitehead & Scanlon, 2007).

5.3 The determinants of foreigners' presence in the Czech metropolitan areas

The previous section has shown a clear relationship between certain groups of immigrants and particular types of local environment. However, there is still a need to uncover the determinants that drive the spatial distribution of immigrants into specific local environments. Hence, we introduce logistic regression to show the respects in which the BSUs that contain concentrations of a particular immigrant group ($LQ_{i,r} > 1$) differ from those BSUs in which the group is not concentrated. The obtained odds ratios show how the characteristics of a BSU's environment affect the probability that a given immigrant group is concentrated there (Table 5). We are particularly interested in three aspects of the local environment which are considered as drivers of immigrants' settlement by the academic literature: the socio-economic structure of the city, its housing market and its labour market (see Section 3 of this paper).

First, our results seem to support the expected relationship between the socio-economic structure (proxied by the characteristics of the local housing stock and educational level of the population) of the city and that of immigrants. The majority of locations where foreigners cluster are associated with older (pre-1945) housing stock. This would be in line with findings of other studies which reported on immigrants concentrating in old, lower quality housing (Arbaci, 2007; Musterd & Van Kempen, 2009; Van Kempen & Özüekren, 1998). However, the concentration in the oldest category of houses was strongest in the case of the most socio-economically well-off groups of German, UK, and USA citizens. Together with the simultaneous overrepresentation of these three

groups in new housing and their association with larger mean sizes of apartment, we assume that their higher socioeconomic status enables them not only to access valuable inner-city real estate, thus possibly acting as gentrifiers, but also to buy newly built properties. The matching of the socio-economic structure of the urban environment with that of immigrants is further illustrated by the association between presence of immigrants and education of the local population. Relevant differences arise in relations between presence of some groups and share of university-educated in population. Citizens of the USA and UK, but also Slovakia and Romania, are more often associated with areas with higher proportions of university-educated persons, while citizens of Mongolia and Vietnam are found in areas with a lower proportion of university graduates. We also found a positive association of the concentrated presence of most immigrant groups with less educated local populations. This relationship however is not linear: foreigners are mostly concentrated in BSUs where a low share of the population has only basic education, avoiding BSUs with both high and zero proportions of persons with basic education.

Second, the housing market characteristics proved to influence the spatial distribution of immigrants in the Czech MAs, yet in a way partly dissimilar from the traditional immigration countries. Rental housing appears to be of lesser importance in the Czech MAs, with immigrants being more likely to concentrate in areas where owner-occupation prevails. This is somewhat surprising, given that in traditional immigrant countries migrants usually stay within the rental housing sector, which was previously the case in Czechia, too (Baršová, 2001). However, discrimination against foreigners in the Czech rental housing market (Baršová, 2001; Šmídová & Šafr, 2009; Valenta, 2012) and the liberalization of rules for buying real estate (Gürlich, 2011) might have caused a growth in owner-occupation among immigrants, thus making them adopt the behaviour of the majority population. On the other hand, the negative relationship with the share of residents born in the same municipality (for all groups except Vietnamese, who have been settled in Czechia for a relatively long time, and Chinese), may be connected to the enduring salience of residentially less-stable neighbourhoods, which allows for a greater likelihood of housing vacancies available to

immigrants (however, the relationship with the share of residents born in the same municipality may be somewhat overestimated due to the arrival of immigrants per se).

Third, our results confirm an important role of local labour markets in shaping spatial patterns of immigrant concentrations. All groups are more likely to be concentrated in more central locations, where job opportunities predominate. The relationship between proximity of jobs and immigrant presence is further asserted by immigrant overrepresentation in areas with lower unemployment, higher proportions of residents employed in services, and a lower share of employment in agriculture. However, differences are apparent between citizenship groups: for example, whereas a higher share of the labour force in agriculture predicts a lower presence of Bulgarians, Poles, and especially Vietnamese (whose economic activity mostly adheres to retail), the relationship is reversed for Ukrainians (the group constituting the second highest share of the labour force in agriculture). The importance of job accessibility as a predictor of immigrants' presence is further stressed by the negative relationship with the number of outgoing commuters.

	Bulgaria	*China*	*Moldova*	*Mongolia*	*Germany*	*Poland*	*Romania*	*Russia*	*Slovakia*	*Ukraine*	*USA*	*UK*	*Vietnam*
Intrinsic characteristics													
Relative distance from the centre	0.97	0.98	0.98	0.97	0.99	0.99	0.99	0.98	0.98	0.98	0.99	0.98	0.98
Living in institutions	1.01	0.98	1.00	1.00	1.00	1.00	1.01	0.99	1.01	1.00	0.99	0.99	0.98
Pre-1945 housing	1.01	1.01	1.01	1.00	1.06	1.01	1.01	1.01	1.01	1.01	1.02	1.02	1.00
Post-1990 housing	1.00	1.00	1.00	0.99	1.02	1.00	1.00	1.01	1.01	1.00	1.01	1.01	1.00
Mean apartment size	0.99	1.01	0.99	1.00	1.01	0.99	0.99	1.00	0.99	0.98	1.01	1.02	1.00
Job opportunities	0.59	0.70	0.60	0.62	0.70	0.72	0.59	0.53	1.21	0.86	0.76	0.58	0.61
Population structure													
Aged 0-14	0.99	1.00	0.97	1.00	0.96	0.99	0.97	0.97	1.02	0.96	0.97	0.98	0.93
Aged 20-34	1.01	1.07	1.03	1.08	1.01	1.04	1.02	1.01	1.07	1.04	1.02	1.04	1.04
Aged 65 and more	1.00	0.98	0.97	1.01	0.99	0.99	1.00	0.95	0.98	0.95	0.99	1.00	0.95
Basic or no education	1.01	1.03	1.02	1.03	1.01	1.02	1.03	1.01	0.99	1.00	1.00	1.01	1.03
University degree	0.99	0.99	0.99	0.98	1.00	1.00	1.01	1.01	1.01	1.00	1.02	1.01	0.98
Unemployed	0.99	0.97	0.97	0.96	0.99	0.98	0.98	0.97	1.01	0.97	0.95	0.96	0.99

Primary sector	0.94	0.95	0.98	0.96	0.99	0.95	0.97	0.97	1.00	1.03	1.01	1.02	0.93
Tertiary sector	1.02	1.09	1.02	1.02	1.02	0.98	1.01	1.07	1.01	1.02	1.06	1.06	1.01
Own apartment	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.02	1.02	1.00	1.00	1.00	1.01
Social climate													
Commuters	1.01	0.98	0.99	0.99	0.97	0.99	1.02	0.97	1.01	0.95	0.98	0.99	0.96
Born in municipality	0.99	1.02	1.00	1.01	0.99	1.00	1.01	0.97	0.97	0.98	1.00	0.99	1.01

Table 5: Associations between immigration concentration in BSUs and characteristics of BSUs (unadjusted odds ratio).

Note: Odds ratios > 1 denote positive relationships.

Source: Census 2011, Czech Statistical Office; authors' own calculations

6. Conclusions

This paper aimed to shed light on the spatial differentiation of various immigrant groups in Czech metropolitan areas, and on the links between this spatial distribution and the socio-economic variables that have proved to be inter-related in more established immigrant countries (Kandylis et al., 2012). Unlike in Western and Northern Europe, immigrants are only rarely concentrated in the most deprived neighbourhoods, the majority residing instead in core urban areas and socially heterogeneous housing estates. Contrary to Southern Europe, and despite increasing shares of immigrants in the populations of Czech MAs, the presence of foreigners is still mostly associated with core urban areas. Some, predominantly Western, citizens act as gentrifiers, being associated with spacious pre-war apartments in prestigious inner-city areas, which are generally being vacated by the Czech population (see also Přidalová & Ouředníček, 2017). Unlike in Moscow, an immigrant-receiving city in another post-socialist country, there have been signs of suburbanization among the well-off strata of immigrants in Czech MAs.

The immigrant spatial distribution in Czechia seems to be driven by determinants similar to those identified in traditional immigration countries, albeit not always in the same way. The socio-economic status of immigrants tends to match the socio-spatial differentiation of the Czech MAs, with the better-off concentrating mostly in more attractive metropolitan locations and the lower-status

immigrants in less desirable areas. Compared to traditional immigration countries, rental housing is associated with immigrants only to a small extent, reflecting the specific conditions of the post-socialist housing market. Like in the German guest worker era (Schönwälder & Söhn, 2009), the proximity of job opportunities is crucial for the Czech immigrant population at the local as well as at the national level of immigrant spatial distribution, which is demonstrated by their overrepresentation in Prague (Přidalová & Ouředníček, 2017).

The observed lack of immigrant ghettoisation (with the exception of some Slovaks) is in accordance with findings of Hasman, Kostelecká, and Hána (2016), who found rather small and decreasing segregation of foreign pupils in Czech schools. This is probably due to an interplay of several factors. First, most of the immigrant population in Czech MAs is culturally proximate to the majority (all significant groups from CEE countries are Slavonian like Czechs), comes from relatively well-off countries or tends to spatial dispersal (Vietnamese). Second, virtually non-existent social housing and fragmented (largely privatized) home ownership restrain spatial concentrations into particular housing types, as opposed to Western and Northern Europe. Third, the dominance of labour-oriented immigration together with very low unemployment and good job accessibility further decreases the risk of immigrant poverty and ghettoization.

Before concluding on this rather optimistic note, two remarks should be made. First, the present-day immigrant population is recent, consisting only exceptionally of second or later generations (Bernard & Mikešová, 2014). Although no evidence of ghettoization of the current immigrant population was found, in no instance can we say that this will not change. Cities represent dynamic environments, and migration is just one – though crucial – of the factors affecting their transformation. Second, further analyses using alternative methods of mapping spatial distribution of immigrants (e.g., mobile phone positioning data, see Silm & Ahas, 2014) are needed to overcome the data reliability issues and to contribute to a better understanding of immigrants' position in the socio-spatial differentiation of post-socialist urban areas in other spatial and temporal contexts.

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