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ABSTRACT

Ethnic Dimensions of Suburbanisation in Estonia

Large scale suburbanisation is a relatively recent phenomenon in East Central Europe and responsible for major socio-spatial changes in metropolitan areas. Little is known about the ethnic dimensions of this process. However, large minority population groups, mainly ethnic Russians, remained into the former member states of the Soviet Union after its dissolution in 1991. We use individual level Estonia Census data in order to investigate the ethnic dimensions of suburbanisation. The results show that ethnic minorities have a considerably lower probability to suburbanise compared to the majority population, and minorities are less likely to move to rural municipalities – the main sites of suburban change – in the suburban ring of cities. Individual characteristics that measure strong ties with the majority population and host society exert a positive effect on ethnic minority suburbanization, and on settling in rural municipalities.

JEL Classification: J61, R21, R23

Keywords: suburbanisation, ethnicity, Census data, East Central Europe, Estonia

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INTRODUCTION

In many formerly centrally planned countries in Eastern Europe, the land use of places within commuting distance from larger cities has changed dramatically since the 1990s. Many of these places have lost their formerly agricultural and industrial character and have been transformed into suburban residential and service areas (Borén and Gentile 2007; Hirt, 2006; Krišjāne and Bērziņš 2009; Leetmaa *et al.* 2009; Ouředníček 2007; Timár and Váradi 2001). The new inhabitants of these suburban areas are mostly affluent households who have left larger cities in search for better quality housing and living environments (Kährrik and Tammaru 2008; Ouředníček 2007) and neighbourhoods reflecting their (new) socio-economic status (Golubchikov 2009). The socio-economic dimensions of suburbanisation in Eastern European countries are relatively well understood. Less is known about the ethnic dimensions of suburbanisation, despite the existence of often sizeable Russian minority populations in some member states of the former Soviet Union.

Studies on suburbanisation in Western European countries and the US have shown clear ethnic dimensions to suburbanisation (Bonvalet *et al.* 1995; Clark 2006; Goodwin-White 2007; Massey and Denton 1988; Li 1998; Teixeira 2007; Bolt *et al.* 2008). In these countries, ethnic minorities are often less likely to move to more affluent middle class suburbs and concentrate within a limited number of neighbourhoods in urban areas. Such residential careers are partly due to socio-economic differences between ethnic minority and majority groups. Other explanations given are ethnic differences in knowledge about regional housing markets, differences in search behaviour, discrimination of ethnic minorities, and limited language skills of ethnic minorities. Although there are large differences in both the ethnic composition of populations and the history and spatial patterns of urban development between Western Europe and the US, and Eastern European countries, it can be expected that also in the formerly centrally planned Eastern European countries there is an ethnic dimension to suburbanisation.

This study uses individual level Census data for Estonia in order to shed more light on differences in suburbanisation between the majority and minority populations after the demise of the Soviet Union. We will investigate the (a) individual level characteristics of those members of the ethnic minority population who left core cities and those who stayed; and (b) destination choice of suburbanizers. We are specifically interested in clarifying the role of socio-economic status (measured by education and occupation) and ties with the majority population and host society (measured by country of birth, partner ethnicity and majority language proficiency) on the probability to suburbanise, and on the probability to settle in rural areas in the suburban ring for ethnic minorities. The latter areas are the main sites of ongoing suburban transformation in many formerly centrally planned countries in Europe since they provide available land for the construction on new residential areas, which was previously used for agricultural purposes (Kulu and Billari 2004; Ouředníček 2007; Tammaru *et al.* 2009). In Estonia only few members of the ethnic minority population lived in rural municipalities in the suburban ring by the end of the Soviet period.

Estonia was one of the member states of the former Soviet Union between 1944 and 1991. Ethnic minorities form about a third of the Estonian population, with the largest minority groups being Russians (80% minorities), Ukrainians (7%), Byelorussians (4%) and Finns (3%). Ninety per cent of the ethnic minorities live in urban areas and they form about half of the total urban population. In this study, a 'core city' is defined as a continuous built-up area, which includes both the inner city

area and Soviet time high-rise housing estates and some older areas with detached housing from the inter-War and Soviet periods. The ‘suburban ring’ is defined as the municipalities surrounding the core cities, but within daily commuting distance (see the data and methods section for more details). This is the area of most intense immigration and housing development in Estonia over the last two decades (Tammaru *et al.* 2009). We define suburbanisation as a process of intra-metropolitan population dispersal: moves from core cities to the suburban ring.

LITERATURE REVIEW OF ETHNIC MINORITY SUBURBANISATION

Most of the previous research on ethnic minority suburbanisation has been done in North American and West European contexts. These studies reveal that ethnic minorities are still more likely to live in core cities than those belonging to majority populations, but there is also an increasing trend towards ethnic minority suburbanisation (Bonvalet 1995; Wen *et al.* 2009). In this section we will review literature on ethnic differences in suburbanisation rates, and literature on the destinations and characteristics of minority suburbanizers.

Many studies show that ethnic minorities are not always willing or able to suburbanize at a similar rate as the majority population (Hou 2006; Massey and Denton 1988). For example, discriminatory practices towards minorities in the housing and labour markets, or the preference to live together with co-ethnic could decrease the likelihood that ethnic minorities leave core cities (Kulu and Billari 2004). High concentrations of ethnic minorities in cities could lead to higher out-migration rates for the majority population (Alba and Nee 2003; Bolt *et al.* 2008; Frey and Liaw 1998; Feijten and van Ham 2009; van Ham and Clark 2009; van Ham and Feijten 2008). This implies that a higher suburbanisation rate of the members of the majority population relative to members of the minority population could lead to an increase in ethnic minority concentration in core cities despite growing minority suburbanisation.

Most of the research on minority suburbanisation focuses on the destinations of minority suburbanizers and its effects on residential segregation or integration with the majority population. Several studies found evidence that suburbanisation increases co-residence of ethnic minorities with the majority population (Clark 2006; Goodwin-White 2007; Logan *et al.* 1996). This is partly explained by the similarity of the causes that shape residential choices of both minority and majority populations (Finney and Simpson 2008; Newbold 1996). Moves to suburban areas are strongly related to life course events, housing needs, and increased personal wealth. All these motives also trigger moves of members of the minority populations to suburban destinations, and contribute to their increased co-residence with the majority population (Alba and Nee, 2003). Also characteristics which measure minority exposure to, or ties with, the host country (for example, immigrant generation, host language proficiency, ethnic intermarriage, and host country citizenship) have been found to increase co-residence of ethnic minorities with the majority population in suburban areas (Alba *et al.* 1999; Brubaker 2001; Painter and Zhou 2008). In short, when the socio-economic status of ethnic minorities improves, and when they develop stronger ties with their host society, they are more likely to move to suburban locations with relatively high percentages of the majority population (Bolt and van Kempen 2010).

Other studies show that ethnic minorities suburbanise to ethnic suburbs, in which case suburbanisation does not necessarily increase co-residence with the

majority population (Li 1998). According to the group affinity hypothesis, social networks and institutional resources are more likely to flourish in large, viable, ethnic communities. Own-group preference and spatial self-selection out of a desire for cultural cohesion imply that even wealthy minorities that move to suburban destinations might still prefer to reside in own-group ethnic areas (Goodwin-White 2007). As a consequence, patterns of core city ethnic segregation are replicated in suburban areas. Li (1998) introduced the concept of ‘ethnoburbs’ to characterize the emerging minority clusters in the suburbs.

Ethnic concentrations in suburbs are not necessarily the result of choice. The structure of the housing market can also lead to the formation of suburban ethnic clusters (Pamuk 2004). A study from Australia showed that ethnic minorities tend to cluster in older and cheaper housing stock available in the suburban areas (Randolph and Holloway, 2005). The spread of social housing construction to the suburban ring has an important effect on the concentrations of ethnic minorities in certain suburban areas in European countries (Bonvalet *et al.* 1995). Thus, the relationship between the socio-economic status of ethnic minority suburbanisers and their residential destinations in the suburbs are contested. Along with the increase in co-residence with the majority population in suburban areas, the concentration of both wealthy and disadvantaged ethnic minorities into specific suburban locations can also be observed.

We have summarised the above literature review into three theoretical models of minority and majority suburbanisation and how these can change the ethnic landscape in metropolitan areas (Figure 1). Model 1 is characterised by a low suburbanisation rate of ethnic minorities and a high suburbanisation rate of the majority population. The result is an increasing concentration of ethnic minorities in the city. Model 2 is characterised by suburbanisation of all ethnic groups, which leads to increasing minority-majority co-residence in metropolitan space. Model 3 is characterised by minority suburbanisation to specific locations in the suburban ring, leading to suburban ethnic clusters.

<<<FIGURE 1 ABOUT HERE>>>

Figure 1 shows that the literature review revealed various patterns of minority suburbanisation in Western Europe, North America and Australia. Different patterns for different ethnic groups within individual cities and countries arriving at different times add further diversity to metropolitan ethnic change (Alba and Nee 2003; Finney and Simpson 2008). An important cause of these diverse patterns is that existing studies have different time horizons. Only a few studies are able to explicitly study differences in the probability to suburbanize by immigrant generation. Because the factors shaping the first settlement choices of new immigrants in a country and their later spatial mobility choices differ strongly, Hou (2006) suggests that it would be ideal to find research areas where minority populations do not increase through immigration in order to better understand the residential choices of established ethnic minority populations over time. Estonia is such a place: it has a very sizeable minority population, but has not experienced major immigration since the demise of the Soviet Union in 1991. Furthermore, Estonia is undergoing rapid suburbanisation similarly to many other formerly centrally planned countries in Europe (Tammaru *et al.* 2009).

URBAN CHANGE IN FORMERLY CENTRALLY PLANNED COUNTRIES IN EUROPE

To better understand contemporary suburbanisation patterns in formerly centrally planned countries in Europe, we will briefly discuss the evolution of metropolitan areas under central planning. From the 1960s to the 1980s, the drive towards industrialisation and constant housing shortages led to the construction of large standardized high-rise housing estates in larger cities of the Soviet Union and East Central Europe (Smith 1996; Kährik and Tammaru 2010). Public housing was highly subsidized by the state (Sýkora, 2009), making it an attractive segment of the housing “market” (Leetmaa *et al.* 2009). Most of the high-rise housing construction remained within the core cities, but over time similar housing started to spread to suburban ring as well. The development of secondary urban centres or satellite towns intensified in the 1970s, when part of the industrial and housing investment was allocated to areas within commuting distance from major cities in order to limit the population growth of these cities (Lappo 1992).

Detached housing remained the dominant housing type in rural areas in the suburban ring, although pre-fabricated apartment blocks were built in rural areas as well in the former Soviet Union (mainly in the central settlements of collectivized farms). Single-family homes were built almost exclusively by homeowners themselves and the construction often took several years of hard work (Konrád and Szelényi 1974). Central planners supported such initiatives indirectly in order to alleviate metropolitan housing shortages (Gentile and Tammaru 2006). Self-construction also implied that detached houses became mainly available to manual workers (Konrád and Szelényi 1974; Smith 1996). The high attraction of subsidized urban apartments on the one hand, and self-construction as an important mean of access to suburban detached housing on the other caused socio-spatial differentiation of the population. Consequently, we find that people with a higher social status were somewhat over-represented in core cities and in urban apartments while people with a lower social status were somewhat over-represented in suburban areas and in detached houses (Kulu 2003; Tammaru and Leetmaa 2007).

In the former Soviet Union, ethnicity was an additional element of the metropolitan level socio-spatial differentiation in many satellite states. The few existing studies document a considerable ethnic segregation as a result of the relationships between immigration, industrialisation, and central allocation of housing (Kulu 2003; Gentile and Sjöberg 2010; Gentile and Tammaru, 2006). New housing with modern facilities in the cities of member states of the former Soviet Union, was preferentially allocated to Russian and other Slavic immigrants (Kulu 2003; Smith 1996). The allocation of immigrants to newly built pre-fabricated apartment blocks caused them to settle in core cities and in satellite towns, whereas the native population was over-represented in rural areas within the suburban ring (Tammaru 2001). The establishment of an ethnic infrastructure, such as Russian-language schools and cultural houses, followed population patterns and therefore became widely available in core cities and satellite towns. Satellite towns were spatially compact with manufacturing plants being the main employers, while rural areas just around the core cities remained agricultural in character until the very end of the Soviet period (Kulu and Billari 2004; Lappo 1992).

To conclude, by the end of the Soviet period, two distinct areas had emerged in the suburban ring around larger cities in many satellite states; industrial satellite towns with mainly urban apartments and high concentrations of (Russian and other)

immigrant populations, and rural areas dominated by agricultural activities with mainly detached housing and a low presence of immigrant populations. This legacy of the Soviet time has left a clear impact on contemporary patterns of suburbanisation in those countries. After the fall of the Soviet Union, agricultural production collapsed in many rural areas in the suburban rings of core cities, which meant that this land became available for new residential suburban developments.

ETHNIC MINORITIES IN ESTONIA

In the former satellite states of the Soviet Union live about 25 million Russians, which form the most important ethnic minority group in those countries (Peppe and Hagendoorn 2001). In Estonia, ethnic minorities form one third of the total population, and Russians form 80 per cent of the minority population. Ethnic minorities form 46 per cent of the total core city population of Estonia and 19 per cent of the suburban ring population (see the data and methods section for more details). Seventy per cent of ethnic minorities live in the core cities of Tallinn and regional towns, and another 6 per in their suburban rings. The respective figures are 38 and 10 per cent for Estonians. The political and economic reforms that followed after the demise of the Soviet Union in 1991 had an important ethnic dimension.

First, in the process of nation-building in the newly independent countries, the position of Russians changed dramatically; from being the largest and most powerful ethnic group in the former Soviet Union, they now suddenly became a minority group in the independent states (the former satellite states) (Laitin 1998). In Estonia, the two most important elements of this nation-building process were related to language and citizenship policies (Rannut 2008). Estonian language replaced Russian as the official language of Estonia. The decisive precondition for getting Estonian citizenship was proficiency in Estonian language (Lindemann 2009). The language requirement was far reaching as many Russian immigrants who had lived in Estonia for a long time, or where even born in Estonia, did not qualify for Estonian citizenship because of a lack of language skills. A lack of language skill also limits access to the labour market as Estonian language proficiency is required by law in public and some private sector jobs (Lindemann 2009). According to the 2000 Census, around 40 per cent of the ethnic minorities in Estonia had Estonian citizenship, 19 per cent were Russian citizens, and as many as 38 per cent had no citizenship at all (Tammaru and Kontuly 2010).

Second, ethnic minorities in Estonia suffered more than the native population from the shift from a Soviet time industry based economy to a services based economy (Aasland and Fløtten 2001), partly because towards the end of the Soviet period, Russians and other minority groups were especially over-represented in manufacturing. While unemployment was non-existent in Estonia at the end of the Soviet period; in 2000, 19 per cent of the ethnic minorities and 12 per cent of the Estonians were unemployed (Tammaru and Kulu 2003). Being proficient in Estonian language and having Estonian citizenship reduced the risk of unemployment among members of the minority population, but did not bring it down to the level of Estonians (Lindemann and Saar 2008). The changes in occupational structure are also notable; the largest decreases in minority employment were in public administration and financial intermediation after the demise of the Soviet Union (Tammaru and Kulu, 2003). The decreased share of minorities in public administration is quite characteristic of the former satellite states of the Soviet Union (Kaiser 1995) and is

partly explained by the nation-building process and the requirement to speak Estonian in such occupations.

HYPOTHESES

The literature review on patterns and processes of ethnic minority suburbanisation, the features of the ongoing (sub)urban change in the formerly centrally planned countries in Europe, and the changes in the relative position of ethnic minorities in Estonia over the last decades lead us to two hypotheses on ethnic differences in suburbanisation in Estonia.

Hypothesis 1. Ethnic minorities are less likely to move from core cities to the suburban ring, and especially less likely to move to rural municipalities within the suburban ring, than those belonging to the majority population.

There are several reasons to expect why ethnic minorities are less likely to move to the suburbs than the majority population in Estonia. First, studies in other immigrant societies observe that minorities are not always able or willing to leave core cities at an equal rate compared to the majority population (Hou 2006; Massey and Denton 1988). Those who do move to the suburbs do so within a few years after arrival as part of their housing adjustment process (Bonvalet *et al.* 1995; Teixeira 2007). However, Estonia has a long established minority population with very few new immigrants since the country regained independence in 1991. Second, the ethnic infrastructure, including Russian-language schools, is most dense in the core cities. This makes moves to the suburbs less attractive for the Russian minority population. Third, Estonians have more economic resources to improve their housing conditions and residential location within the metropolitan space than ethnic minorities. Studies on ethnic differences in labour market performance reveal a clear “glass ceiling” effect for ethnic minorities (Lindemann and Saar 2008). Fourth, the housing condition of many Estonian households living in core cities towards the end of the Soviet period were worse than those of ethnic minorities (Kulu 2003). This makes them more likely to leave the core cities in search for better housing. All these factors lead us to expect a higher suburbanisation rate among ethnic Estonians than among ethnic minorities. If this hypothesis is correct, this will lead to an increasing concentration of ethnic minorities in core cities (see Figure 1, Model 1). We expect that the probability of moving to rural municipalities in the suburban ring is especially low among the members of the ethnic minority population since this implies moving away from the established minority settlement areas.

Hypothesis 2. Higher socio-economic status and stronger ties with the majority population increase the probability that members of the ethnic minority population move to rural destinations in the suburban ring.

Previous studies in other immigrant countries do not provide conclusive evidence of those minority characteristics that lead to an increase of minority-majority co-residence in suburban areas. For example, it has been found that minorities with a higher socio-economic status move to both majority-dominated (Clark 2006; Logan *et al.* 1996) and minority-dense (Li 1998; Wen *et al.* 2009) suburban destinations. The context of suburban change in Estonia leads us to expect that minorities with a higher

socio-economic status would be more likely to settle in rural destinations in the suburban ring (Figure 1, Model 2), while minorities with a lower socio-economic status would be more likely to settle in urban destinations in the suburban ring (Figure 1, Model 3). Satellite towns offer more affordable housing, and previous studies on general mobility patterns for the Estonian population show that these areas are attractive destinations for those with a lower-socio-economic status (Leetmaa and Tammaru 2007). Rural areas around core cities offer better opportunities for improving ones housing condition since most of the more attractive dwellings, including new residential areas and detached housing, could be found there (Tammaru *et al.* 2009). Following previous studies, we also expect that stronger ties with the majority population and the host society would increase the probability that ethnic minorities move to non-ethnic concentration destinations: rural areas within the suburban ring (Figure 1, Model 2). Weak ties with the majority population and the host society would increase the probability of moves to secondary ethnic clusters: satellite towns within the suburban ring (Figure 1, Model 3).

DATA AND METHODS

This study uses anonymous individual-level data from the 2000 Estonian Census. The data includes the entire population living in the 15 urban regions of Estonia (Figure 2). All areas surrounding a core city from which at least 30 percent of the workers commute to the core city are defined as being part of the urban region (see Kährik and Tammaru 2008; Ouředníček 2007). We distinguished three types of metropolitan areas based on the size of the urban area: capital city, regional town, and county seat metropolitan areas. The total size of the research population is 697,121 people. We identified 660,495 ‘stayers’ who live in a core city in both 1989 and 2000. We also identified 36,626 suburbanisers who lived in a core city in 1989, but in a suburban ring in 2000.

<<<<FIGURE 2 about here>>>>

This study distinguishes two different residential contexts within the suburban ring. Rural municipalities located within the suburban ring represent areas with a low population density, a high share of detached houses and a low share of minority population (on average 10 per cent). Urban municipalities in the suburban ring (Soviet-era satellite towns) represent a quite different suburban residential context, with a high share of apartments and ethnic minorities (43 per cent). Moves of ethnic minorities from core cities to rural suburban municipalities could be seen as moves away from core city ethnic concentration areas, lowering core city ethnic concentrations. Moves of ethnic minorities to suburban municipalities with higher densities could be seen as moves to secondary ethnic clusters.

<<<<TABLE 1 about here>>>>

There are some important compositional differences between Estonians and ethnic minorities living in the urban regions of Estonia (Table 1). First, as one would expect, the migration background is different because only two per cent of Estonians but 52 per cent of ethnic minorities are foreign-born. Estonia already has a large second-generation immigrant population, and a third generation of immigrants is emerging as

well. This provides researchers with an excellent opportunity to study differences in spatial redistribution by immigrant generation. Most of the ethnic minorities live in urban areas and multifamily houses.

To investigate the probability that different groups move from core cities to the suburban ring, we have fitted a series of multinomial logistic regression models (dependent categories are: stay in core city; move to rural municipality in suburban ring; move to urban municipality in suburban ring). The models can be written as follows:

$$\log \frac{p(Y_i = j)}{p(Y_i = J)} = \alpha + \sum_{k=1}^K \beta_{jk} X_{ik}$$

where $p(Y_i = j)$ is an individual's $i = 1, \dots, I$ probability of being a suburbaniser to a rural ($j=1$) or an urban ($j=2$) municipality, and $p(Y_i = J)$ is the probability of being a stayer in a core city ($J=3$). α is the constant, and X_{ik} is an individual level variable, and β_{jk} is the parameter for this individual level variable, with K variables. We first estimate a model for the whole population to investigate ethnic differences in suburbanisation and to test hypothesis 1 (Table 2). Next we estimate a model only including ethnic minorities to test hypothesis 2 (Table 3).

RESULTS

There are large ethnic differences in Estonian suburbanisation patterns. The majority population is over-represented among movers from core cities to the suburban ring: 80 per cent of the suburbanisers are Estonians, while they only make up 54 per cent of the population living in core cities. Subsequently ethnic minorities, who make up 46 per cent of the population residing in the core cities, account for only 20 per cent of moves from core cities to the suburban ring. There are also important differences by ethnicity in destinations within the suburban ring. Of those who suburbanise, 86 per cent of Estonians settle in rural municipalities in the suburban ring, while only 50 per cent of the ethnic minorities settle in rural municipalities. The other half moves to urban satellite towns in the suburban ring.

The choice of destination differs by type of urban region (see Figure 2 for locations and types). Thirty seven per cent of ethnic minorities suburbanising from Tallinn city move to rural municipalities, compared to just over 73 per cent of those from regional core cities, and 95 per cent of those moving from County seat cities. These differences clearly reflect regional differences in the structure of the housing market, as it is mainly the larger cities which have urban satellite towns in their suburban ring. A similar relationship between type of urban region and destination choice can be found for ethnic Estonians, but the differences are much smaller. Eighty per cent of those suburbanising from Tallinn move to rural municipalities, 92 per cent of those from regional cities, and 94 per cent of those from county seat cities.

Table 2 presents a multinomial logistic regression model of residential mobility destinations in the 1989–2000 period, for those who lived in cities in 1989 (including both Estonians and ethnic minorities). The reference category consists of those who are still in core cities in 2000. We modelled the probability that people moved to either urban or rural destinations in the suburban ring of cities. The modelling results confirm that Estonians are more likely to suburbanise than ethnic

minorities. There are important differences between the two suburban destinations. The ethnic differences in the probability to move to urban destinations in the suburban ring are much smaller than the ethnic differences in the probability to move to rural destinations in the suburban ring. For example, Russians are 1.13 times (1/0.888) less likely than Estonians to move to urban destinations, but 6.41 times (1/0.156) less likely to move to rural destinations in the suburban ring. These results confirm our earlier descriptive findings and indicate that these are real ethnic differences and not differences caused by other compositional effects (as we control for many individual characteristics in the model). The model gives us some insight in why there are these ethnic differences in destination choices. We controlled for socio-economic status by including level education and occupation in the model. This indicates that the ethnic differences are likely to be caused by differences in preferences (urban destinations provide better services for ethnic minorities), and in lack of access to rural destinations because of a range of barriers related to ethnic infrastructure and housing, including relatively low earnings of minorities. The suburbanisation patterns seem to suggest that the concentration of ethnic minorities in the core cities and satellite towns in suburban ring will increase due to selective ethnic migration patterns.

<<<TABLE 2 about here>>>

The parameters of the control variables in the model in Table 2 are largely as expected. Women are slightly less likely to move to rural municipalities in the suburban ring than men (compared to staying in the city and moving to urban suburbs). Because most moves are likely to be made in a household context, and our data does not allow us to control for this, it is difficult to give a meaning to this result. However, there are some indications that urban residence is more attractive for women than for men (Halfacree and Boyle 1999). The probability of suburbanisation is highest for the younger birth cohorts, and decreases with age. This age effect reflects that moving propensity generally drops with age. Those living in couples are more likely to have moved to the suburban ring than singles, especially to rural destinations. So after controlling for ethnicity, suburbanisation has a clear life course and family dimensions. Our results also confirm earlier research (Tammaru and Leetmaa 2007) showing that in the 1990s people with a low level of education were more likely to move to the suburbs than university educated people, and especially to the urban areas in the suburbs. The reasons for this are likely to be complex and possibly linked to urban employment and income. Unfortunately, we do not have income data, but previous research shows that also in Estonia education is a reasonable proxy for income (Helemäe *et al.* 2000). Especially urban areas in the suburbs might be attractive to those with a lower level of education because these provide cheap accommodation: Soviet time urban apartments are priced lower in suburban areas relative to core cities. Occupation was found to be a good predictor of suburbanisation as well. Those in managerial positions are the most likely to suburbanise, especially to rural destinations in the suburban ring. Managers are likely to enjoy good incomes and they are found to move to the most attractive suburban housing. Finally, the model shows that those living in the largest cities are most likely to suburbanise to urban areas in the suburban ring and those living in county seat cities are most likely to move to rural areas in the suburban ring. By including this variable we controlled for some of the structural housing market differences between areas.

Table 3 presents a similar multinomial logistic regression model, but this time only including ethnic minorities. Again, the reference category consists of those who are still in core cities in 2000 and we modelled the probability that people moved to either urban or rural destinations in the suburban ring of cities. The model in Table 3 allows us to examine more closely the role of ethnic minority specific characteristics in suburbanisation behaviour. The results show that other non-Slavic ethnic groups have the highest probability to move from cities to suburban (both urban and rural) areas. They are most likely the least sensitive of all ethnic groups to the existence of ethnic specific infrastructure such as schools. As expected, the probability to move to urban destinations in the suburban ring is highest for recent immigrants (first generation/foreign born) and lowest for third generation ethnic minorities. The probability to move to rural suburban locations seems to increase with immigrant generation. Although the differences are not statistically significant, we think they are still meaningful as we are working with data including the whole population of Estonia, not a sample. So we could carefully argue that the longer ethnic minorities are in Estonia for, the more likely they are to move away from traditional ethnic concentration areas in both the city and suburbs. The results for other variables which measure ties with the majority population and host country are more straightforward. Those with Estonian language proficiency and Estonian citizenship are the most likely to move to rural municipalities within the suburban ring. Minorities who do not speak Estonian, or who have Russian citizenship are most likely to stay in core cities. Furthermore, ethnic minorities with an Estonian partner are 3.3 times more likely to move to rural municipalities in the suburban ring than singles and those with a minority partner.

<<<TABLE 3 about here>>>

The effects of age, level of education, and labour market characteristics are similar to those in the model for the whole population. The probability to suburbanize decreases with age, but the age effect on the probability to move to rural areas is less pronounced than for the whole population. Those with university education are the least likely to suburbanise. Ethnic minorities in managerial occupations are the most likely to suburbanise, especially to rural destinations. The effect of education is much stronger for ethnic minorities than for the whole population (see Table 2). As found for the whole population, those living in the capital city metropolitan area are the most likely to move to urban areas in the suburban ring. These satellite towns around the capital city have a well established ethnic infrastructure and this seems to be an important trigger of minority moves to suburban destinations.

CONCLUSIONS AND DISCUSSION

The results of this study confirm our first hypothesis: ethnic minorities are less likely to move from core cities to the suburban ring than Estonians. These differential residential patterns can be partly explained by ethnic differences in both preferences and opportunities to participate in residential suburbanisation. The lower probability of ethnic minorities to leave cities could be due to a higher presence of co-ethnics and a high density of ethnic infrastructure in core cities relative to the suburban ring. Also the fact that ethnic minorities are over-represented in the best segment of the urban stock of apartments, and that they therefore gained more from housing privatisation in

the cities, contributes to their lower out migration rates. Estonians are more likely than ethnic minorities to leave core cities and move to the suburban ring, and especially to rural destinations.

Although the elevated out-migration of the majority population from core cities implies that these become more ethnically concentrated (Figure 1, Model 1), the Estonian literature gives little reason to suggest that the underlying mechanisms can be interpreted in a similar way as the ‘White Flight’ process observed in the United States (Frey and Liaw, 1998). First, Estonians had more to gain from moving to the suburbs because they lived in relatively poor quality urban housing by the end of the Soviet period (Kulu 2003). Second, Estonians also gained more economically from the post-Soviet transition period than ethnic minorities (Lindemann and Saar 2008), giving them the financial means to suburbanise. The higher probability of ethnic minorities to stay in core cities is most likely related to the higher density of ethnic infrastructure such as Russian language schools and cultural clubs in core cities compared to suburban ring.

We also found significant ethnic differences in destination choices within the suburban ring. Ethnic minorities are less likely to settle in rural municipalities than Estonians, and more likely to move to secondary ethnic clusters in the suburban ring (Figure 1, Model 3). There are several possible explanations for this. One of them is that ethnic minorities have a less strong preference for single-family houses than Estonians (Kulu 2003). Estonia went through a rapid suburbanisation period during the inter-War period, before the large-scale immigration of Russians started. For example, Tallinn lost about 20 per cent of its population to the largest garden town Nõmme that was built during the 1920s and 1930s (Tammaru 2001). During Soviet time Estonia, when large numbers of immigrants entered the country, standardised high-rise housing became the norm (Kährik and Tammaru 2010). There is also another reason which explains why Estonians are over-represented in moves to rural municipalities in the suburban ring. While ethnic minorities gained from the housing privatisation process that transformed sitting tenants into home owners of the post WW II housing stock, ethnic Estonians gained from the restitution of pre-War land and housing properties in the suburban ring to their gainful owners (Kõre *et al.* 1996). A third reason is that while some ethnic infrastructure could be found in urban municipalities in the suburban ring, such infrastructure is almost missing in rural municipalities. Thus, only those minorities who do not need the existence of ethnic infrastructure will be able and willing to settle in the latter areas.

One of the most important findings of our study highlights that ethnic minorities who show strong ties with the majority population and the host country (speaking Estonian, having Estonian citizenship, and living with an Estonian partner), are the most likely to suburbanise and to settle in rural municipalities in the suburban ring, which increases co-residence with the majority population (Figure 1, Model 2). This confirms our second hypothesis. Lacking such ties increases the probability to stay in cities, or move to urban municipalities in the suburban ring (Figure 1, Model 3). Living with an Estonian partner has an especially strong effect on moves to rural municipalities.

We found relatively strong effects of people’s phase in the life course (age and partner status) on suburbanisation behaviour, irrespective of ethnic origin. During the Soviet period, due to housing shortages, housing careers were only weakly related to changes in life courses: once people were allocated an urban apartment, it was difficult to make any subsequent moves (Gentile and Tammaru, 2006; Gentile and Sjöberg 2010). This changed during the transition period and we now observe that

especially young people and families are prone to moving to suburban destinations. We also found that having economic resources is important to explain suburbanisation. During the Soviet period, access to detached housing was a function of both economic resources and the ability to self-build, while nowadays the role of economic resources has increased. Other studies have shown that more affluent households in Estonia move to the suburban ring to improve their housing conditions (Kährik and Tammaru, 2008), or to improve their socio-spatial status (Golubchikov 2009). Those with less resources have been found to move to less attractive suburban destinations (Tammaru and Leetmaa 2007). The above effects of socio-economic characteristics were found for both Estonians and ethnic minorities.

This study has provided new insights into the ethnic dimensions of suburbanisation patterns of the mainly Russian minority population residing in the countries that were once part of the former Soviet Union. Given the ethnically selective process of suburbanisation found in Estonia, suburbanisation has an effect on ethnic concentrations of both cities and suburban locations. Cities and urban areas in the suburban ring are becoming more ethnically concentrated. Rural municipalities in the suburban ring will remain residential locations for ethnic Estonians and those minorities that have established close ties with the majority population in their host society, e.g. by being proficient in the native language. The rural areas are the main sites of new residential construction both in Estonia (Tammaru *et al.* 2009) and many other formerly centrally planned countries in Europe (Ouředníček 2007).

The socio-spatial polarisation that results from the higher suburbanisation rates of wealthier people in East European countries has an additional ethnic dimension in the countries of the former Soviet Union with a large minority population, such as Estonia. Therefore, there is a need for further comparative and in-depth research in other countries of the former Soviet Union which focuses more explicitly on the ethnic dimension of urban change.

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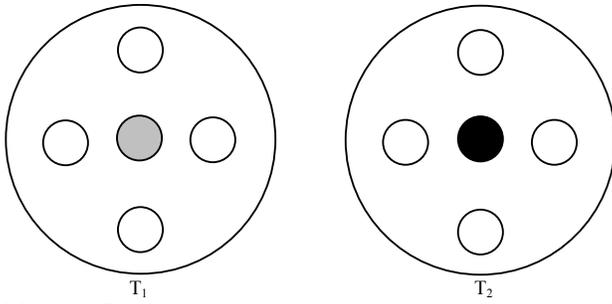
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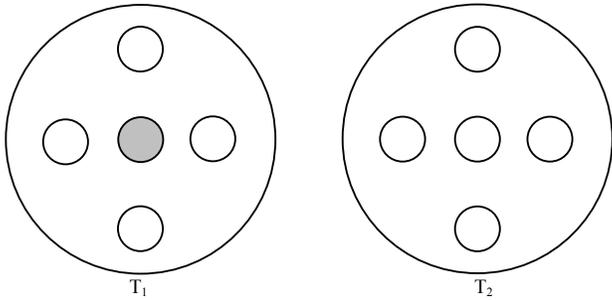
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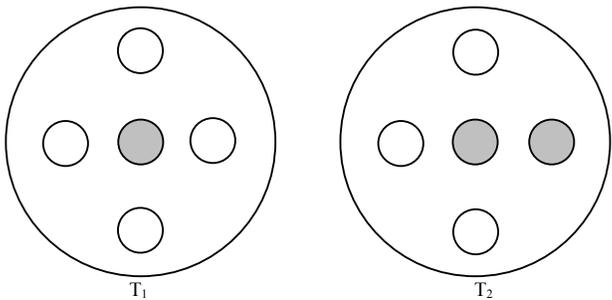
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Model 1. Low suburbanisation rate of ethnic minorities and high suburbanisation rate of the majority population lead to increased segregation.



Model 2. Similar destinations of all suburbanizing groups lead to increased minority-majority co-residence.



Model 3. Different destinations of suburbanizers lead to the formation of suburban ethnic clusters.

Legend

Big outer circle denotes the boundary of the suburban ring
 Small circle in the centre denotes core cities
 Other small circles represent residential locations in the suburban ring
 White, grey and black colours indicate an increasing share of the minority population
 T₁ refers to time 1; T₂ refers to time 2

Figure 1. Three models of how minority and majority suburbanisation could change the ethnic landscape in metropolitan areas.

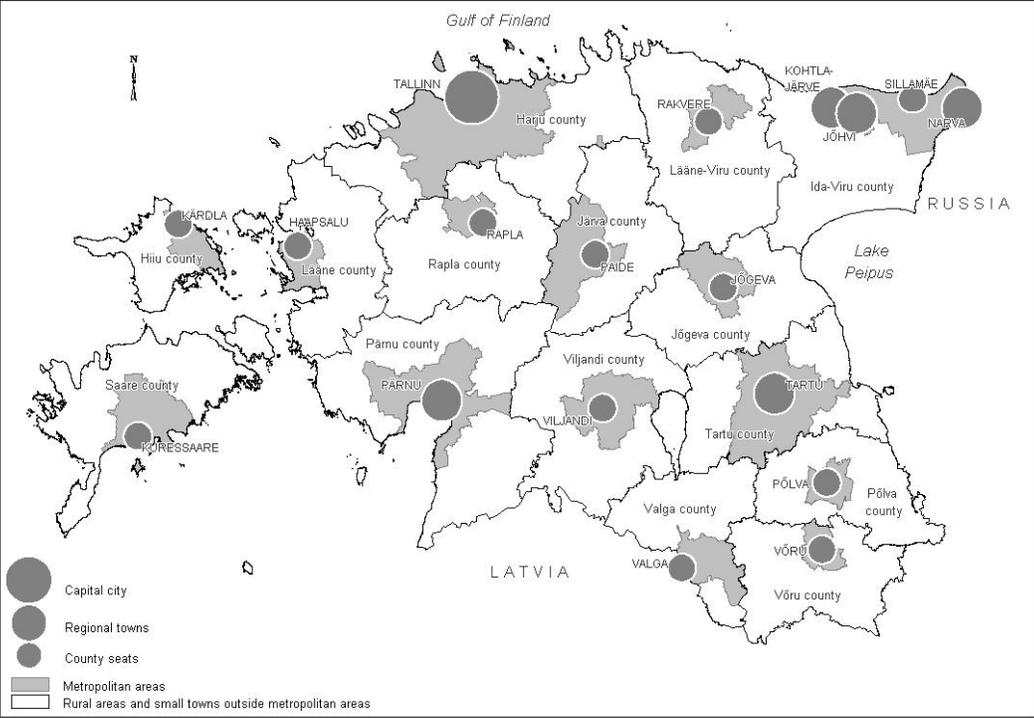


Figure 2. Urban regions of Estonia.

Table 1. Compositional differences between Estonians and ethnic minorities in the research population (%).

		Estonians	Minorities	Total
Immigrant generation	Born in Estonia, both parents Estonia born	84	8	53
	Born in Estonia, one parent foreign born	11	13	12
	Born in Estonia, both parents foreign born	3	27	13
	Foreign born	2	52	22
Gender	Female	55	56	55
	Male	45	44	45
Age	20–29	15	15	15
	30–39	16	14	15
	40–49	15	15	15
	50–59	15	20	17
	60–69	14	13	14
	70–79	13	13	13
	80+	11	10	11
Family Status	In union	42	48	44
	Not in union	58	52	56
Education	Primary	43	40	42
	Secondary	40	46	42
	Tertiary	17	14	16
Dwelling type	Multi-family	72	96	82
	Single-family	28	4	18
Place of residence	Urban	77	96	85
	Rural	23	4	15
Location in metropolitan space	Tallinn	24	44	30
	Suburban ring around Tallinn	6	4	5
	Regional towns	14	36	22
	Suburban rings around regional towns	4	2	4
	County seats	12	4	9
	Suburban rings around county seats	5	1	4
	Outside urban regions	35	9	26
N		489,252	334,406	823,658

Table 2. Multinomial logistic regression model of residential mobility destinations between 1989 and 2000 (odds ratios). Total population, reference category are stayers in core cities.

		Suburbanizer to urban areas		Suburbanizer to rural areas	
		Exp(B)	Sig.	Exp(B)	Sig.
Ethnicity	Estonian	1.000		1.000	
	Russian	0.888	***	0.156	***
	Ukrainian	0.879	*	0.228	***
	Byelorussian	0.993		0.159	***
	Other ethnicity	1.124		0.265	***
Gender	Male	1.000		1.000	
	Female	1.025		0.926	***
Birth cohort	After 1970	1.000		1.000	
	1960–69	1.133	***	1.094	***
	1950–59	0.676	***	0.697	***
	1940–49	0.499	***	0.636	***
	1930–39	0.388	***	0.465	***
	Before 1930	0.319	***	0.264	***
Family status	Single	1.000		1.000	
	In union	1.227	***	1.371	***
Level of education	Primary	1.000		1.000	
	Secondary	0.842	***	0.954	
	University	0.870	***	0.885	***
	In education	0.703	***	0.965	*
Occupation	Inactive	1.000		1.000	
	Manager	1.185	***	1.473	***
	Other white collar	0.667		0.321	***
	Blue collar	0.801		0.347	***
	Unemployed	0.491	***	0.459	***
Region of residence	Capital city urban region	1.000		1.000	
	Regional town urban region	0.212	***	0.922	***
	County seat urban region	0.259	***	1.251	***

-2 Log likelihood = 20952.469

Significance: * p < 0.10 ** p < 0.05 *** p < 0.01

Table 3. Multinomial logistic regression model of residential mobility destinations between 1989 and 2000 (odds ratios). Ethnic minority population only, reference category are stayers in core cities.

		Suburbanizer to urban areas		Suburbanizer to rural areas	
		Exp(B)	Sig.	Exp(B)	Sig.
Ethnicity	Russian	1.000		1.000	
	Byelorussian	0.952		1.297	***
	Ukrainian	1.064		0.975	
	Other ethnicity	1.252	***	1.247	***
Immigrant generation	First/Foreign born	1.000		1.000	
	Second	0.897		1.075	
	Third	0.850	**	1.066	
Speaks Estonian	No	1.000		1.000	
	Yes	0.852	***	1.288	***
Partner ethnicity	Single	1.000		1.000	
	Estonian	1.182	*	3.255	***
	Minority	1.051		0.999	
Citizenship	Estonian	1.000		1.000	
	Russian	0.892	*	0.537	***
	Other country	1.006		0.859	
	Not chosen	1.076		0.833	***
Gender	Male	1.000		1.000	
	Female	1.115	***	0.858	***
Birth cohort	After 1970	1.000		1.000	
	1960–69	1.113	*	1.231	***
	1950–59	0.658	***	1.014	
	1940–49	0.455	***	1.059	
	1930–39	0.364	***	0.904	
	Before 1930	0.285	***	0.579	***
Level of education	Primary	1.000		1.000	
	Secondary	1.123		0.935	
	University	0.877	***	0.901	**
	In education	0.664	***	0.799	***
Occupation	Inactive	1.000		1.000	
	Manager	1.213	**	2.393	***
	Other white collar	0.510		0.239	**
	Blue collar	0.595		0.260	*
	Unemployed	0.387	***	0.521	***
Urban region	Capital city urban region	1.000		1.000	
	Regional town urban region	0.149	***	0.780	***
	County seat urban region	0.111	***	2.348	***

-2 Log likelihood = 25891.889

Significance: * p < 0.10 ** p < 0.05 *** p < 0.01