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## Ethnic differences in housing in post-Soviet Tartu, Estonia

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### ABSTRACT

Social and ethnic stratification has changed significantly in the former Soviet space since 1991. This research analyses the evolution of inherited ethnic differences in housing during two post-Soviet decades in Tartu, Estonia. The results suggest that ethnic inequalities in dwelling type as well as in housing size per person decreased between 1989 and 2008. More minorities now occupy single-family houses than at the end of the Soviet period. Access to modern facilities within dwelling units, however, is still higher among the minority population. We conclude that inherited ethnic differences in housing conditions were pronounced and, despite evidence of decreasing housing inequalities, subsequent changes have been too modest to overcome inherited patterns of housing segmentation from the Soviet period.

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### Introduction

Ethnic housing differences under central planning in Central and Eastern Europe (CEE) differed from the ethnic housing inequality phenomena observed in Western Europe and North America, where immigrants often start their housing career at the low end of the housing ladder. Policy encouraged immigration from Russia (and, to a lesser extent, from Belarus and Ukraine) to the other republics of the Soviet Union. There, immigrants often gained access to the newest housing units of the time—with full modern facilities—leaving much of the native population in older housing units and producing distinct housing inequality patterns according to ethnicity (Ojamäe & Paadam, 2011). This was a driver of significant ethnic differences in housing, despite the overall egalitarian aims of the state socialist system (Gentile & Tammaru, 2006; Kulu, 2003a; Rukavishnikov, 1978). The disintegration of the Soviet Union in 1991 was followed by important changes in the social structures of its former member states. Although the political and economic reforms differ vastly in the newly independent countries (Borén & Gentile, 2007), their common feature is an improved position of the native population relative to the Russian immigrant minority population (Aasland & Fløtten, 2001; Kaiser, 1995). Russians suffered more from large employment losses in the military and industry—sectors in which they were overrepresented—compared to native populations. This provides a unique opportunity to analyze changes in ethnic differences in housing in the context of shifting relative positions of ethnic groups in the course of social transformation from a centrally planned to a market economy.

To date, little research investigates changes in ethnic differences in housing since the collapse of the Soviet Union. The most notable exception is a study by Gentile and Tammaru (2006) in Ust'-Kamenogorsk, Kazakhstan, which showed the native population housed in less attractive dwellings compared to the Russian immigrant population. This study was based on a sample survey conducted at the beginning of the new millennium. At that time, emigration (including return-migration) of Russians to Russia had an important impact on ethnic changes in housing. Two decades have now elapsed since the disintegration of the former Soviet Union, allowing us to trace longer-term changes in ethnic differences in housing and to distinguish the post-reform period from the immediate transition years (Leetmaa, Tammaru, & Anniste, 2009).

Research in the former Soviet space is not only important for understanding ethnic differences in housing in this particular part of the world but also for contributing to a more general understanding of the evolution of the housing careers of members of the minority and majority populations in an important way. In regions where immigrant housing differences have been studied, such as North America and Western Europe, the housing change of an established minority population is shaped by the first residential choice of newly arrived immigrants. For example, new areas of immigrant concentration arise as a result of the first residential choice of new immigrants in those countries, allowing the established immigrant groups to proceed to disperse as well (Bolt & Van Kempen, 2010; Hou, 2006; Li, 1998). Few such new ethnic areas have emerged in the former member states of the Soviet Union, since there has been no significant new immigration there for the two last decades, with the exception of major new flows of labor migrants between the region's least and most developed

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areas (O'Hara et al., 2009) and of minor flows of recent 'nontraditional' (mainly Asian) migrants (see, e.g., Popson & Ruble, 2000). This provides a "purified" context for studying changes in ethnic differences in housing, as the housing change between both the immigrant minority and the native majority population is rarely shaped by new residential choices of new immigrants in the former Soviet territories.

The aim of this research is to shed new light on changes in ethnic housing inequalities in the former Soviet space. We draw our empirical evidence from Tartu, Estonia, the country's second largest city, with 103,300 inhabitants in 2010 (Statistics Estonia, 2010). Tartu is an illuminating case study site for three reasons. First, it accommodates a predominantly Russian-speaking minority population that formed during the Soviet period (1944–1991), accounting for 27% of the population in 1989 and 22% in 2000.<sup>1</sup> Tartu, which housed an important Soviet military air force base, lost 13,300 people as a result of emigration in the 1990s (Kulu & Tammaru, 2003), which was mainly a return migration of Russians back to Russia; since then, however, the size of the minority population has not changed considerably. Second, ethnic differences in late Soviet Tartu are well documented in analyses using 1989 census micro data (Kulu, 2003a). Third, Estonia, a member of the European Union since 2004, has experienced significant societal changes since the disintegration of the Soviet Union. Thus the current research expands on past studies of residential and housing inequalities by investigating the degree to which ethnic differences in housing conditions persist or change—with regard to dwelling type, housing size per person, and access to higher-order facilities—among an established immigrant group in the context of significant societal transformation and negligible new immigration.

## Background and previous research

Housing differences in the countries of CEE followed a unique pattern compared to other places under central planning. In European and North American cities, housing segmentation of ethnic minorities—which commonly restricts minorities to less desirable housing—generally has two causes: fewer resources for the minority group, limiting the ability to acquire housing, and housing market discrimination, restricting housing choice (Bolt & Van Kempen, 2010; Semyonov & Glikman, 2009). For example, in the United States, the legacy of poor housing conditions of Blacks and African Americans has been long lasting (Massey & Denton, 1993; Wilson, 1987). Studies of ethnic residential segregation and housing segmentation under central planning are scarce. The few studies that do exist reveal significant ethnic differences in housing and residence (Rukavishnikov, 1978; Ruble, 1989; Ladányi, 1989; Kulu, 2003b; Kulu & Tammaru, 2003; Gentile & Tammaru, 2006).

In the former Soviet Union, rapid industrial growth was supported by the immigration of Russian-speakers from Russia to other republics, prompting desperately needed yet insufficient additions to the housing supply in the form of new apartment complexes (Rybakovskiy, 1987; Rybakovskiy & Tarasova, 1991; Zayontshkovskaya, 1987). Immigrants required immediate shelter and thus received priority treatment in the housing allocation system over residents currently occupying housing and wishing to improve their housing conditions (Ojamäe & Paadam, 2011). In this way, immigrants generally lived in newer accommodations and were more likely to have modern facilities, such as central heating, than native Estonian residents (Gentile & Tammaru, 2006; Kulu, 2003a).

During the Soviet period, multifamily housing was mostly owned by state entities (Gentile & Sjöberg, 2010a). The state devoted few resources to housing renovation and maintenance, since the building of new apartment blocks was the priority across countries under central planning (Szelényi, 1983; Gentile & Sjöberg, 2010a, 2010b; Marcinczak & Sagan, 2011). Privatization of state-controlled housing after the disintegration of the Soviet Union favoured sitting tenants (Marcuse, 1996), solidifying the patterns of housing differences established during the Soviet period. Today, housing subsidies are withdrawn, the now-privatized housing market is active, and home ownership is available to most of the population, depending on household income (Borén & Gentile, 2007; Golubchikov & Phelps, 2011; Lamine, 2009).

Residential mobility in Estonia during the last two decades has been studied in considerable detail (Kulu, 2003a; Gentile & Tammaru, 2006; Tammaru, 2001; Tammaru & Leetmaa, 2007). The primary focus, however, has been on the complex phenomenon of suburbanization in Tallinn, the capital city, where expansion of new housing into the suburban fringe since the late 1990s has been brisk (Ahas, Aasa, & Tiru, 2010; Kährik & Tammaru, 2008; Palang & Peil, 2010; Leetmaa & Tammaru, 2007; Tammaru, Van Ham, Leetmaa, & Kährik, 2011). The research suggests that more suburbanization has occurred in the 2000s compared to the 1990s and that a change of residence from city to suburb is less likely for the Russian-speaking population than for Estonians. However, less is known about the housing change within cities. The few studies that exist show that socialist-era apartments that house the majority of the urban population retained their relative attractiveness also during the post-socialist period (Kährik & Tammaru, 2010), and dwelling size per person significantly increased as the population size of cities declined (Ojamäe & Paadam, 2011).

We expand existing research on housing in post-Soviet space by focusing on the evolution of ethnic differences in housing conditions during the post-Soviet period. We use a previous study of ethnicity and housing in late Soviet Tartu (Kulu, 2003a; Kulu, 2003b; Kulu & Tammaru, 2003) as an explicit point of departure because it allows us to examine the subsequent changes. The base study (Kulu, 2003a) suggests—drawing from the final Soviet census in 1989—that the Russian-speaking immigrant population was considerably more likely to live in multifamily dwellings and to enjoy higher-order private facilities, while ethnic differences in housing size became insignificant after controlling for relevant background variables. Subsequent research has investigated comparable housing dynamics in Kazakhstan and also found that Russians were overrepresented in apartments, enjoying both more living space and higher-order facilities compared to Kazakhs in the city of Ust'-Kamenogorsk (Gentile & Tammaru, 2006).

## Data and methods

We use data from the 2000 Estonian census and the 2008 Tartu Survey. We arrange our data so that they replicate as closely as possible the base study by Kulu (2003a) that used 1989 census micro data (based on a 25% sample) to describe the differences in housing conditions by ethnicity in Tartu in the late Soviet period. An anonymous individual-level database, the 2000 census includes the entire population of Tartu. We use data for people aged 15 years and older, and the total research population includes 83,337 individuals, of whom 78.5% are Estonian and 21.5% represent other ethnic groups. The 2008 Tartu Survey is a sample survey among inhabitants of Tartu carried out by the Tartu city government. The survey, which employs stratified (district-based) random sampling that is weighted to reflect the population composition of the city, includes questions about housing conditions and satisfaction. This survey was carried out among inhabitants

<sup>1</sup> Russians form 76% of the ethnic minority in Tartu today. Ukrainians and Byelorussians comprise most of the remainder.

**Table 1**

Characteristics of the research population (%). Sources: Kulu, 2003a; Census, 2000; Tartu Survey, 2008.

	1989		2000		2008	
	Estonians	Minorities	Estonians	Minorities	Estonians	Minorities
<i>Gender</i>						
Male	50	59	42	43	44	47
Female	50	41	58	57	56	53
<i>Age</i>						
15–24	10	7	24	20	23	22
25–34	13	22	19	15	25	19
35–49	27	29	21	27	25	31
50–59	20	19	13	13	9	11
60–74	21	19	16	19	15	15
75+	9	4	7	6	3	2
<i>Family status</i>						
Married	54	66	45	54	48	44
Not married	46	34	55	46	52	56
<i>Education</i>						
University	24	19	24	16	33	20
Secondary	41	49	57	60	58	70
Primary	35	32	19	24	9	10

between the ages of 15 and 74; 83% of the 1718 respondents are Estonian, and 17% represent other ethnic groups. To compare changes in housing conditions by ethnicity, we develop similar variables and variable categories as presented by Kulu (2003a), using the 2000 and 2008 data.<sup>2</sup>

Significant changes in the composition of Tartu's population have taken place since the demise of the Soviet Union, especially with regard to age and level of achieved educational attainment (Table 1). For example, we note an increase in the share of younger people between 1989 and 2008. This could be explained by two phenomena. First, there is a trend of in-migration of young people from rural areas and smaller towns to urban areas (Kontuly & Tammaru, 2006). The urban service sector has provided most of the new jobs over the last two decades, while rural employment has significantly decreased. Second, Tartu is Estonia's main university town, and the number of students in Estonia has tripled since the end of the Soviet period (Tammaru & Leetmaa, 2007).

An important compositional change relates to education. As a result of the expansion of university education, we observe an increase in the share of university-educated adults in Tartu. However, this applies mainly to native Estonians, for whom the share of people with a university degree (at least a bachelor's degree) increased from 24% in 1989 to 33% in 2008. No such change can be traced among the minority population. This is likely related to the effect of selective return migration of ethnic minorities in the 1990s, whereby minorities with a university degree were more likely to leave Estonia (during the inter-census period, between 1989 and 2000, we note a decrease in the share of university-educated adults among ethnic minorities). The share of university-educated adults began to increase in the 2000s among the minority population, reflecting the effects of a general expansion of university education in Estonia since 1991.

<sup>2</sup> The following variables can be identically constructed in all three (1989, 2000, and 2008) databases: ethnic origin, sex, education, and family status. Small differences remain for three other variables used in the 1989 analysis. (a) The 2008 survey data do not include people older than age 75; (b) Kulu (2003a) differentiates between Soviet-specific categories of "state" and "co-operative" multifamily dwelling when making comparisons with "detached housing." No such categorisation can be replicated with our 2000 and 2008 data. However, only 7.1% of people lived in co-operative housing in 1989 (Kulu, 2003a, p. 130), while 76.4% of people lived in "state" housing (and 16.5% in privately financed, single-family homes). Consequently, multifamily dwellings in 1989 are interpreted as "state" dwellings; (c) we are unable to identically replicate the coding schemes of employment sector and place of origin variables.

We carefully consider such compositional changes in the population in order to better understand recent changes in housing segmentation in Tartu. Ethnic differences in university education might have an especially important effect on the evolution of ethnic differences in housing, since a strong, positive relationship between the level of education and income emerged in Estonia after 1991 (Helemäe, Saar, & Vöörmann, 2000). Following the previous studies by Kulu (2003a) and Gentile and Tammaru (2006), we begin our analysis by clarifying changes in ethnic differences in the housing type by fitting a binary logistic regression model. We proceed with an analysis of ethnic differences in housing size and facilities to clarify the differences in housing conditions between Estonians and other ethnic groups. We apply linear and logistic regression, respectively. The models include dwelling type as one of the control variables. Following the study by Kulu (2003a) and Gentile and Tammaru (2006), higher-order facilities include electricity, cold and hot water, bath/shower, and connection to a sewer system, that is, the most elementary facilities for a modern home. If one of these facilities is missing, we classify the housing into the lower-order facilities category. Nearly one-third of housing units in Tartu in 2008 did not possess higher-order facilities.

## Results

We begin with a descriptive analysis to provide an overview of the structural changes in the housing market. Changes are smallest in terms of dwelling type. While 17% of the population lived in single-family homes in 1989, the corresponding figures were 15% in 2000 and 14% in 2008, thus there is a slight decline in the share of people living in detached houses. This is expected, given the rise in the share of young adults in the population. The trend is somewhat different for Estonians and ethnic minorities; we observe increasing shares of members of the minority population living in detached housing, from 3% in 1989 to 6% in 2008. Only a small number of Estonians live in single-family houses: 16% of Estonians lived in single-family houses in 2008, which is similar to the 17% level in 1989.

The extent of change is larger with regard to housing conditions. First, we observe a significant expansion of housing size per person and an increase in access to higher-order facilities over the two decades between 1989 and 2008 (Table 2). The increased housing size per person is probably due to three factors: (1)

**Table 2**  
Housing size<sup>a</sup> and facilities<sup>b</sup> by ethnic origin. Sources: Kulu, 2003a; Census, 2000; Tartu Survey, 2008.

	Total			Estonians			Minorities		
	1989	2000	2008	1989	2000	2008	1989	2000	2008
<i>All housing</i>									
Size	18.9	22.0	24.5	19.8	22.7	25.1	16.3	19.6	21.4
Facilities	59.3	63.3	61.1	55.2	59.9	59.0	70.3	75.0	70.6
<i>Multi-family housing</i>									
Size	16.8	19.9	21.1	17.3	20.0	21.3	15.9	19.3	22.1
Facilities	63.1	67.4	63.3	61.0	64.3	61.0	70.7	77.3	71.5
<i>Detached housing</i>									
Size	27.2	30.2	43.8	27.3	30.3	43.4	26.8	30.9	48.0
Facilities	19.6	39.7	48.0	20.2	40.6	48.5	9.1	26.0	41.2

Note: Living space values for 1989 as reported by Kulu (2003a) have been increased by 30% (Bater, 1980; Herman, 1971) to estimate housing size. This allows comparison of 1989 values with housing size values for 2000 and 2008.

<sup>a</sup> Mean housing size in square meters per capita.

<sup>b</sup> Share of people living in housing with higher-order facilities.

**Table 3**  
Ethnic differences by dwelling type (0 – detached, 1 – multi-family), odds ratios. Sources: Kulu, 2003a; Census, 2000; Tartu Survey, 2008.

	1989	2000	2008
<i>Ethnic origin</i>			
Estonian	1.000	1.000	1.000
Minority	8.534***	7.265***	4.739***
<i>Age</i>			
15–24		1.372**	1.213***
25–34		0.915	1.300***
35–49		1.000	1.000
50–59		0.791***	1.064
60–74		0.452***	1.038
75+		0.389***	0.764***
<i>Gender</i>			
Male		1.000	1.000
Female		1.201***	1.138***
<i>Family status</i>			
Married		1.000	1.000
Not married		1.435***	1.716***
<i>Education</i>			
University		0.924	0.818***
Secondary		1.000	1.000
Primary		0.933	0.807***
–2LL	6087.1	5228.8	69274.2
N	10,072		83,557

Significance:

\* 10%.

\*\* 5%.

\*\*\* 1%.

declining population in Tartu due to return migration of ethnic minorities; (2) extension of floor space within existing housing stock (attics of pre-World War II multifamily houses have been converted to residential use); and (3) new housing construction in the 2000s in favor of larger housing units over smaller housing units (Tammaru, Leetmaa, Silm, & Ahas, 2009). The living conditions have become less crowded among both Estonians and ethnic minorities, with Estonians still enjoying more space per person than members of other ethnic groups. Second, the availability of higher-order facilities significantly increased in detached houses and in older pre-World War II apartments mostly inhabited by the native population as a result of *in situ* housing improvements. For example, only 20% of people living in single-family homes in 1989 had access to modern facilities, while the figure increased to 48% in 2008.

*Ethnic differences in dwelling type*

Our descriptive analysis demonstrates that the share of ethnic minorities living in single-family homes increased between 1989 and 2008. The results of the logistic regression analysis show that Estonians had 8.5 times higher odds of living in detached housing than members of the other ethnic groups in 1989 (Table 3). Ethnic differences by dwelling type were reduced significantly and in a linear fashion across our three study years; the odds of living in detached houses were 4.7 times higher among Estonians in 2000 and 2.9 times higher in 2008. The results change little after adding other variables into the regression models. Our data were cross-sectional, however, and we are not able to separate the effects of selective emigration of minorities and in-migration of Estonians by dwelling type, nor were we able to examine ethnic differences in the intra-urban mobility between multifamily and single-family houses. Despite these limitations, our results are straightforward and reveal a decrease in ethnic differences by dwelling type; these differences are independent of other compositional differences between native Estonians and mainly Russian-speaking minorities, for example, in terms of education.

The results for other variables are interesting as well. There was a linear relationship between age and living in a single-family home in 1989, with younger people more likely to live in apartment houses. This relationship has subsequently changed, and considerably. The linear relationship was still evident in 2000, but it was significantly weaker, with insignificant differences for the 35–59-year-old age group. A U-shape relationship emerged in 2008, with both the youngest and oldest most likely to live in multifamily homes. Married people have a higher probability of living in detached houses both in 2000 and 2008, which is different from the 1989 situation. Families had preferential access to state-allocated apartments during the Soviet period (Sillince, 1985). It seems that people in the prime working ages are the most successful in relocating from Soviet-era apartments to single-family houses in the 1990s and 2000s. These housing units are now more attractive, since they are considerably better equipped with higher-order facilities (Table 1). Finally, the differences regarding educational attainment are not extraordinary. The most consistent results relate to a lower probability for university-educated adults to live in housing units in multifamily buildings. The results are statistically significant for 2000 only, but the odds ratios were surprisingly similar in 2000 and 2008.<sup>3</sup>

*Ethnic differences in housing size*

The general trend of an increase in dwelling size per person between 1989 and 2008 is consistent with previous studies (Ojamäe & Paadam, 2011). When ethnic origin only is included in the regression model, we find that Estonians enjoy significantly more space than members of other ethnic groups (Table 4). However, ethnic differences diminished between 1989 and 2000, and then again between 2000 and 2008. As in the 1989 base study (Kulu, 2003a), ethnic differences also disappear in 2000 and 2008 after controlling for other compositional differences, especially the differential distribution of Estonians and ethnic minorities across multifamily and single-family dwellings. In short, ethnic origin per se did not explain differences in variation in housing size per person in late Soviet Estonia, and ethnicity continues to be an insignificant factor since then.

Other personal characteristics relate to housing size. First, we find a decrease in crowding relative to age in linear fashion in

<sup>3</sup> Recall that the 2008 data are based on a sample survey; statistical significance is also a function of the size of the research population.

**Table 4**

Ethnic differences in housing size (square meters per capita). Sources: Kulu, 2003a; Census, 2000; Tartu Survey, 2008.

	1989		2000		2008	
<i>Ethnic origin (Ref.: Estonian)</i>						
Minority	-0.165***	-0.014	-0.102***	-0.017	-0.072***	-0.030
<i>Age (Ref.: 35–49)</i>						
15–24		-0.333***		0.056***		-0.077***
25–34		-0.196***		-0.040***		-0.097***
50–59		0.194***		-0.047***		0.032
60–74		0.324***		-0.094***		-0.093***
75+		0.260***		-0.056***		-0.068***
<i>Gender (Ref.: Male)</i>						
Female		0.032***		-0.002		-0.010
<i>Family status (Ref.: Married)</i>						
Not married		0.332***		-0.119***		-0.114***
<i>Education (Ref.: Secondary)</i>						
University		0.083***		0.114***		0.087***
Primary		-0.092***		-0.012***		-0.015
<i>Dwelling type (Ref.: Detached)</i>						
Multi-family		-0.343***		-0.494***		-0.522***
R square adjusted	0.020	0.340	0.010	0.298	0.005	0.348
N	10,072		83,557		1718	

Significance:

\* 10%.

\*\* 5%.

\*\*\* 1%.

1989. However, a reversed U-shaped pattern between age and housing size per person has emerged since 1991, with people ages 35–59 enjoying the most spacious living conditions. Interesting changes relate to family status as well; unmarried people enjoyed more space at the end of the Soviet period, while the opposite is observed in 2000 and 2008. Thus families, more than other population groups, have improved their living conditions in terms of size of dwelling. This likely results from a larger housing supply that became available when a share of the minority population left Estonia in the early 1990s, as well as from enhanced opportunities to access mortgages for people in their prime working ages (these people are the most desirable customers for banks). The most consistent results for educational attainment relate to people with university degrees. There were no financial returns (in terms of salary) for university education in the former Soviet Union (Helemäe et al., 2000), but university-educated adults were, nonetheless, often able to acquire larger apartments under the state-allocated housing system (Kulu, 2003a; Gentile & Tammaru, 2006). There were few changes in the parameter estimates between 1989 and 2008, indicating that university-educated people continue to enjoy the most spacious living conditions. Controlling for education is the only personal variable that significantly reduces initially observed ethnic differences in dwelling size,<sup>4</sup> thus living in less crowded conditions is, to a large degree, related to the higher share of university-educated people among Estonians.

#### *Ethnic differences in access to higher-order facilities*

Members of ethnic minority groups were generally better equipped with higher-order facilities than Estonians at the end of the Soviet period (Table 5). These differences decreased but remained statistically significant after controlling for dwelling type and personal characteristics based on 1989 census data. The results of the 2000 and 2008 data analysis are compelling, for two reasons.

<sup>4</sup> However, controlling for dwelling type is the most important factor that causes the initial ethnic differences in housing size per person to become statistically insignificant.

First, better access to higher-order facilities has remained almost unchanged in models with ethnic origin only. Second, we do not find a reduction of ethnic differences in the full model in 2000 and 2008 once we take into account dwelling type and personal characteristics. This suggests that members of the minority population are still better equipped with higher-order facilities than Estonians.

With regard to other personal variables, it appears that a U-shaped pattern emerged with both younger and older people experiencing improvement in facilities relative to people in the 35–49-year-old age group. Thus people in the prime working ages have achieved greater floor space per person, but this has occurred at the expense of access to higher-order facilities. It might be that some of these people have moved to pre-World War II housing stock (both detached and multifamily houses) that has become more attractive than standard Soviet-era apartments as part of the urban gentrification process. That married people are generally less equipped with higher-order facilities could be explained by the same phenomenon. Finally, we find—with only modest changes over time—a linear and positive relationship between access to modern facilities and level of education. That is, higher educational attainment is associated with better living conditions both in terms of housing size and facilities. However, the underlying mechanisms that describe the relation between education and access to better housing have changed: today there is an increased return on education (Helemäe et al., 2000) compared to the Soviet period, when people with higher levels of education were better able to use tacit knowledge and social networks to acquire the most attractive housing.

#### **Conclusion**

Ethnic differences were significant and inverse in the former Soviet Union compared to ethnic housing inequalities observed in Western Europe and North America. Mainly Russian immigrants, the majority population in the former Soviet Union, were given access to the most modern segments of the housing stock in other republics of the former Soviet Union. Immigration from Russia

**Table 5**  
Ethnic differences in housing facilities (0 – lower order, 1 – higher order), odds ratios. Sources: Kulu, 2003; Census, 2000; Tartu Survey, 2008.

	1989		2000		2008	
<i>Ethnic origin</i>						
Estonian	1.000	1.000	1.000	1.000	1.000	1.000
Minority	1.929***	1.326***	1.933***	1.688***	1.758***	1.847***
<i>Age</i>						
15–24		0.912		1.012		1.511**
25–34		0.619**		1.021		1.128
35–49		1.000		1.000		1.000
50–59		0.846**		1.210***		1.277
60–74		0.548***		1.266***		2.042***
75+		0.283***		0.913***		1.803*
<i>Gender</i>						
Male		1.000		1.000		1.000
Female		0.987		1.115***		0.965
<i>Family status</i>						
Married		0.553***		0.640***		0.712***
Not married		1.000		1.000		1.000
<i>Education</i>						
University		1.501***		1.601***		1.554***
Secondary		1.000		1.000		1.000
Primary		0.737***		0.914***		0.975
<i>Dwelling type</i>						
Detached		1.000		1.000		1.000
Multi-family		3.271***		3.262***		2.001***
–2LL	13418.2	11715.7	108548.8	102874.1	2278.9	2213.0
	10,072		83,557		1718	

Significance:

\* 10%.

\*\* 5%.

\*\*\* 1%.

(and, to a lesser extent, from Belarus and Ukraine) to other republics largely ceased with the disintegration of the former Soviet Union in 1991, providing a unique opportunity to study housing change among a sizeable minority group in the near absence of new immigration over the last two decades.

The results of research based on the case study of Tartu, Estonia, confirm a reduction in ethnic differences by dwelling type (and these ethnic differences remain high). There is also only weak evidence for diminishing ethnic differences in housing size per person. The situation is different with regard to access to higher-order facilities: ethnic minorities are still better equipped compared to native Estonians. These results suggest that Estonians are still clearly overrepresented in single-family housing, while the Russian-speaking minority population is better equipped with elementary modern facilities, although the quality of such facilities cannot be judged in this research.

The persistence of ethnic differences in access to facilities in Estonia was unexpected, since both detached houses (where Estonians are overrepresented) and older apartments have experienced significant improvements in the 1990s and 2000s, as elsewhere in CEE (Bouzarovski, 2009; Bouzarovski, Salukvadze, & Gentile, 2011; Marcinczak & Sagan, 2011). We interpret such findings as follows. The relative attractiveness of older pre-Soviet apartment houses has increased in the housing market, since such dwellings provide unique home environments unlike standardized Soviet-era, multi-family buildings. Thus, Estonians are willing to make compromises, even at the expense of having access to the most elementary modern facilities, in order to acquire a desirable living space. The growth in the number of so-called nontraditional households (Haase, Großmann, & Steinführer, 2012), and these household members' search for something different from the standardized, high-rise housing estates, can be viewed as an opportunity for regeneration for pre-Soviet multifamily housing in other formerly centrally planned countries in Europe as well (Bouzarovski, 2009; Marcinczak & Sagan, 2011; Temelová, 2007).

Finally, we find that ethnic differences in housing were quite pronounced at the end of the Soviet period, and, despite evidence of decreasing housing inequalities in Tartu along certain dimensions (housing type, most notably), such changes have been too modest to overcome the inherited patterns of housing segmentation from the Soviet period.<sup>5</sup> While a mainly Russian-speaking minority population has been long established in Estonia, important factors limit ethnic housing integration, despite changes in the relative position of ethnic groups in the course of post-Soviet transition. Such findings are of critical importance within the ongoing debate about ethnic residential and housing mixing in countries with high immigration rates (Musterd & Andersson, 2005; Vervoort, Flap, & Dagevos, 2010). Our research in Estonia suggests that when the policy goal is to reduce ethnic residential segregation and housing segmentation, it is crucial for long-term success to first focus on immigrants' initial residential choice. Ethnic housing segmentation patterns, once established, are long lasting, even when ethnic groups experience status and power changes and when significant societal transformations occur.

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<sup>5</sup> Future research should thus clarify whether persistent housing inequality is due to more objective factors (e.g., concentration of ethnic social infrastructure, such as Russian schools, in particular areas) or to more subjective factors (e.g., ethnic differences in housing preferences).

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## References

- Aasland, A., & Fløtten, T. (2001). Ethnicity and social exclusion in Estonia and Latvia. *Europe-Asia Studies*, 53, 1023–1049.
- Ahas, R., Aasa, A., & Tiru, M. (2010). Daily rhythms of suburban commuters' movements in the Tallinn metropolitan area: Case study with mobile positioning data. *Transportation Research Part C: Emerging Technologies*, 18, 45–54.
- Bater, J. (1980). *The Soviet city*. London: Edward Arnold.
- Bolt, G., & Van Kempen, R. (2010). Ethnic segregation and residential mobility: Relocations of minority ethnic groups in the Netherlands. *Journal of Ethnic and Migration Studies*, 36, 333–354.
- Borén, T., & Gentile, M. (2007). Metropolitan processes in post-communist states: An introduction. *Geografiska Annaler, Series B: Human Geography*, 89B, 95–110.
- Bouzarovski, S. (2009). Building events in inner-city Gdansk, Poland: Exploring the socio-spatial construction of agency in built form. *Environment and Planning D*, 27(5), 840–858.
- Bouzarovski, S., Salukvadze, J., & Gentile, M. (2011). A socially resilient urban transition? The contested landscapes of apartment building extensions in two post-communist cities. *Urban Studies*, 48(13), 2689–2714.
- Gentile, M., & Sjöberg, Ö. (2010a). Soviet housing: Who built what and when? The case of Daugavpils, Latvia. *Journal of Historical Geography*, 36(4), 453–465.
- Gentile, M., & Sjöberg, Ö. (2010b). Spaces of priority: The geography of Soviet housing construction in Daugavpils, Latvia. *Annals of the Association of American Geographers*, 100, 112–136.
- Gentile, M., & Tammaru, T. (2006). Ethnicity and housing in the post-Soviet city: Ust'-Kamenogorsk, Kazakhstan. *Urban Studies*, 43, 1757–1778.
- Golubchikov, O., & Phelps, N. (2011). The political economy of place at the post-socialist urban periphery: Governing growth on the edge of Moscow. *Transactions of the Institute of British Geographers*, 36(3), 425–440.
- Haase, A., Großmann, K., & Steinführer, A. (2012). Transitory urbanites: New actors of residential change in Polish and Czech inner cities. *Cities*, 29(5), 318–326.
- Helemäe, J., Saar, E., & Vöörmann, R. (2000). *Kas haridusse tasus investeerida? Hariduse selekteerivast ja stratifitseerivast rollist kahe põlvkonna kogemuse alusel [Returns to education. The selective and stratifying effect of education in two generations]*. Tallinn: Estonian Academy of Sciences Press.
- Herman, L. (1971). Urbanization and new housing construction in the Soviet Union. *American Journal of Economics and Sociology*, 30(2), 203–220.
- Hou, F. (2006). Spatial assimilation of racial minorities in Canada's immigrant gateway cities. *Urban Studies*, 43, 1191–1213.
- Kährik, A., & Tammaru, T. (2008). Population composition in new suburban settlements of the Tallinn metropolitan area. *Urban Studies*, 45, 1055–1078.
- Kährik, A., & Tammaru, T. (2010). Soviet prefabricated panel housing estates: Areas of continued social mix or decline? The case of Tallinn. *Housing Studies*, 25, 201–219.
- Kaiser, R. (1995). Nationalizing the work force: Ethnic re-stratification in the newly independent states. *Post-Soviet Geography and Economics*, 36, 87–111.
- Kontuly, T., & Tammaru, T. (2006). Population subgroups responsible for new urbanization and suburbanization in Estonia. *European Urban and Regional Studies*, 13, 319–336.
- Kulu, H. (2003a). Housing differences in the late Soviet city: The case of Tartu, Estonia. *International Journal of Urban and Regional Research*, 27, 897–911.
- Kulu, H. (2003b). Residence and migration in post-war Soviet Estonia: The case of Russian-born Estonians. *Tijdschrift voor Economische en Sociale Geografie*, 94, 576–588.
- Kulu, H., & Tammaru, T. (2003). Housing and ethnicity in Soviet Tartu. *Yearbook of Population Research in Finland*, 39, 119–140.
- Ladányi, J. (1989). Changing patterns of residential segregation in Budapest. *International Journal of Urban and Regional Research*, 13, 555–572.
- Lamine, B. (2009). Estonia: Analysis of a housing boom. *ECFIN country focus. Economic analysis from the European commission's directorate-general for economic and financial affairs*, 7(7).
- Leetmaa, K., & Tammaru, T. (2007). Suburbanization in countries in transition: Destinations of suburbanizers in the Tallinn metropolitan area. *Geografiska Annaler, Series B: Human Geography*, 89, 127–146.
- Leetmaa, K., Tammaru, T., & Anniste, K. (2009). From priority-led to market-led suburbanization in post-communist metropolis. *Tijdschrift voor Economische en Sociale Geografie*, 100, 436–453.
- Li, W. (1998). Anatomy of a new ethnic settlement: The Chinese ethnoburbs in Los Angeles. *Urban Studies*, 35, 470–501.
- Marcinczak, S., & Sagan, I. (2011). The socio-spatial restructuring of Lodz, Poland. *Urban Studies*, 48, 1789–1809.
- Marcuse, P. (1996). Privatization and its discontents: Property rights in land and housing in the transition in Eastern Europe. In G. Andrusz, M. Harloe, & I. Szelényi (Eds.), *Cities after socialism: Urban and regional change and conflict in post-socialist societies* (pp. 119–191). Oxford: Blackwell.
- Massey, D., & Denton, N. (1993). *American apartheid: Segregation and the making of the underclass*. Cambridge, MA: Harvard University Press.
- Musterd, S., & Andersson, R. (2005). Housing mix, social mix, and social opportunities. *Urban Affairs Review*, 40(6), 761–790.
- Ojamäe, L., & Paadam, K. (2011). Housing conditions and neighbourhood satisfaction. In R. Vetik & J. Helemäe (Eds.), *The Russian second generation in Tallinn and Kohtla-Järve* (pp. 143–163). Amsterdam: Amsterdam University Press.
- O'Hara, S., Ivlevs, A., & Gentile, M. (2009). The impact of global economic crisis on remittances in the commonwealth of independent states. *Eurasian Geography and Economics*, 50(4), 447–463.
- Palang, H., & Peil, T. (2010). Mapping future through the study of the past and present: Estonian suburbia. *Futures*, 42, 700–710.
- Popson, N., & Ruble, B. (2000). Kyiv's nontraditional migrants. *Post-Soviet Geography and Economics*, 40(5), 365–378.
- Ruble, B. (1989). Ethnicity and Soviet cities. *Soviet Studies*, 41(3), 401–414.
- Rukavishnikov, V. (1978). Ethnosocial aspects of population distribution in cities of Tataria. *Soviet Sociology*, 3, 59–79.
- Rybakovskiy, L. (1987). *Migratsiya naseleniya: Prognozy, factory, politika*. Moskva: Statistika.
- Rybakovskiy, L., & Tarasova, N. (1991). Contemporary problems of migration of the population of the USSR. *Soviet Geography*, 32, 458–473.
- Semyonov, M., & Glikman, A. (2009). Ethnic residential segregation, social contacts, and anti-minority attitudes in European societies. *European Sociological Review*, 25, 693–708.
- Sillince, J. (1985). The housing market of the Budapest urban region 1949–1983. *Urban Studies*, 22, 141–149.
- Statistics Estonia (2010). Population indicators and composition. <[http://pub.stat.ee/px-web.2001/\\_l\\_Databas/Population/databasetree.asp](http://pub.stat.ee/px-web.2001/_l_Databas/Population/databasetree.asp)>. Last accessed 20.11.10.
- Szelényi, I. (1983). *Urban inequalities under state socialism*. New York: Oxford University Press.
- Tammaru, T. (2001). Suburban growth and suburbanisation under central planning: The case of Soviet Estonia. *Urban Studies*, 38(8), 1341–1357.
- Tammaru, T., & Leetmaa, K. (2007). Suburbanisation in relation to education in the Tallinn metropolitan area. *Population, Space, and Place*, 13, 279–292.
- Tammaru, T., Leetmaa, K., Silm, S., & Ahas, R. (2009). Temporal and spatial dynamics of the new residential areas around Tallinn. *European Planning Studies*, 17(3), 423–439.
- Tammaru, T., Van Ham, M., Leetmaa, K., & Kährik, A. (in press). Ethnic dimensions of suburbanization in Estonia. *Journal of Ethnic and Migration Studies*.
- Tartu Survey (2008). *Tartu housing survey*. Tartu: Tartu City Government.
- Temelová, J. (2007). Flagship developments and the physical upgrading of the post socialist inner city: The Golden Angel project in Prague. *Geografiska Annaler, Series B: Human Geography*, 89B(2), 169–182.
- Vervoort, M., Flap, H., & Dagevos, J. (2010). The ethnic composition of the neighbourhood and ethnic minorities social contacts: Three unresolved issues. *European Sociological Review*. (Published online 15 June 2010).
- Wilson, W. J. (1987). *The truly disadvantaged: The inner city, the underclass, and public policy*. Chicago: University of Chicago Press.
- Zayontshkovskaya, Z. (1987). Migratsiya naseleniya v sotsialno-ekonomicheskom kontekste. In K. Katus (Ed.), *Podhody k upravleniyu migratsionnym razvitiem* (pp. 57–68). Tallinn: Valgus.