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Original Article

Income Mobility and Moving to a Better Neighbourhood: An Enquiry into Ethnic Differences in Finland

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Abstract

The spatial concentration of immigrants in disadvantaged neighbourhoods may hinder their opportunities for social and economic integration. It is therefore important that immigrants can translate their available economic resources into mobility to less disadvantaged neighbourhoods. This study adds to existing research on the relationship between socioeconomic and spatial integration by focusing on the effects of income mobility on residential mobility. We analyse intra-urban residential mobility from low-income neighbourhoods into non-low-income neighbourhoods among immigrants and native-born residents in three urban regions in Finland. We use longitudinal register data for the 2004–2014 period for the full population, allowing a dynamic analysis of changes in income and neighbourhood of residence. Based on fixed-effects multinomial logit modelling of residential outcomes, we found that upward income mobility is connected to exit from low-income areas, but the effect is stronger among the native-born Finns than among those with an immigrant background. This stronger effect for natives is in contrast to findings of previous European studies, suggesting that these might have been influenced by unobserved individual-level heterogeneity. Our findings imply that both policies improving labour market opportunities of immigrants and policies reducing constraints for spatial integration are needed if the aim is to decrease ethnic residential segregation.

Introduction

In recent years, ethnic segregation and integration of immigrants have become increasingly visible themes in political debates in Europe, and sociological literature has reflected this greater attention from different perspectives (e.g. Loch, 2014; Kogan, 2016; Müller, 2018). Immigrants are more likely than natives to live in poor neighbourhoods, and many poverty concentration areas are also areas with relatively high concentrations of ethnic minorities. It is often suggested that place matters for various socioeconomic outcomes of individuals (e.g. Buck and Gordon, 2004; Steil, de la Roca, Gould Ellen, 2015; Bambra, 2016; Chetty and Hendren, 2018), so if immigrants are more likely to remain in poor immigrant-dense neighbourhoods, this may hinder their opportunities for

upward social mobility and integration (Musterd *et al.*, 2008; Steil, de la Roca, Gould Ellen, 2015).

We already know that residential mobility is one of the main mechanisms shaping residential segregation by income and ethnicity (Boschman and van Ham, 2015). An important related question is to what extent increases in income are translated into residential moves away from poverty concentration neighbourhoods to higher income neighbourhoods and to neighbourhoods with lower shares of ethnic minorities. The effects of income mobility might not be the same for immigrants and natives, and it is likely that natives are more able to translate gains in income into moves to better neighbourhoods. Very few studies have considered the impact of income *mobility* on moves to different types of neighbourhoods, apart from Wessel *et al.* (2017), who did not find a consistent pattern among the Nordic capital regions.

Even when upward socioeconomic mobility leads to moves to neighbourhoods with a higher socioeconomic status, ethnic minorities might still move to neighbourhoods with higher shares of immigrants due to discrimination and/or ethnic preferences (Schelling, 1969; Boschman and van Ham, 2015; Boschman, Kleinhans, van Ham, 2017). Therefore, the ethnic dimension of neighbourhoods has to be assessed in addition to the socioeconomic dimension.

This study takes a dynamic approach and focuses on the relationship between upward income and residential mobility in Finland, and how this relationship differs between ethnic groups. We combine a traditional line of sociological research on income mobility with another one on the dynamics of residential segregation. The latter is a well-established research theme in American sociology (e.g. South, Crowder, Chavez, 2005; Sampson and Sharkey, 2008) and is getting more attention also in European sociological studies (e.g. Müller, Grund, Koskinen, 2018). Our findings will illustrate to what extent a rise in income is translated into an improvement in neighbourhood socioeconomic status and the extent to which economic integration affects the spatial integration of immigrants. The strength of this association may have significance for individuals' life chances and social cohesion. Finland is an interesting context for this study as it is characterized by a relatively equal income distribution, immigration is a rather recent phenomenon, and there are strong migrant integration policies[1].

We use rich longitudinal register data spanning from 2004 to 2014 and comprising the total population living in Finland. We study simultaneously immigrants' income and intra-urban residential mobility in comparison to the native-born Finns. In contrast to the majority of existing studies, we use panel data and employ a fixed-effects design that enables us to make stronger causal inferences about the mechanisms underlying residential patterns. Panel data allows us to take into account the explanatory factors contemporaneously with the moves as opposed to a cross-sectional design in which the current neighbourhood may reflect individuals' past circumstances instead of the effect of the current characteristics such as income (Painter, 2000). The fixed-effects design takes into account unobserved heterogeneity concerning time-invariant personal characteristics that could affect both individuals' income and residential mobility. The analysis focuses on individuals aged 20–49 living initially in low-income areas in three Finnish cities: Helsinki, Turku, and Tampere, which are the centres of the three largest urban regions in Finland.

Literature

Models of Residential Mobility and Segregation

In today's European cities, immigrants make up an important share of the low-income population, also in Finland. The strong association between poverty and immigration status means that in order to understand socioeconomic segregation, processes contributing to ethnic segregation have to be understood as well, and vice versa.

Although a holistic explanation of the causes of residential segregation needs to take into account forces operating at several levels beyond individuals and households, including global, national, and local processes (e.g. Musterd, 2005), segregation is ultimately shaped by selective residential mobility of households between neighbourhoods (Boschman and van Ham, 2015). Analysing mobility at the micro-level therefore leads to a better understanding of the processes behind segregation and the drivers of geographic concentration of immigrants and/or poverty. There is a large literature on residential mobility in general, and on mobility as a driver of ethnic segregation.

The first is connected to the latter to the extent to which immigrants differ from the majority population in some key sociodemographic factors that affect overall residential mobility patterns. A host of factors can be expected to affect both immigrants' and natives' neighbourhood destinations (e.g. Hedman and van Ham, 2012). These include individual and household characteristics such as preferences and needs related to the current and anticipated life situation, constraints such as an urgent need to find housing, and the availability of financial resources and information. Additionally, they include contextual factors such as the current housing market situation, i.e. where vacant housing is available,

characteristics of individual neighbourhoods and the social environment, and the unequal spatial distribution of different types of dwellings. Residential mobility research has highlighted the role of individual and household characteristics and life course events that affect residential mobility: age, education, marital status, household composition and size (and connected housing-space requirements), home ownership, and neighbourhood characteristics (e.g. Kan, 1999; Clark and Huang, 2003; Feijten, 2005; Rabe and Taylor, 2010).

The second body of literature deals with mobility as a driver of segregation. Although direct immigration from abroad to certain cities and neighbourhoods may have important effects on neighbourhood population change (e.g. Finney and Simpson, 2009), selective intra-urban migration of different ethnic groups is the main micro-level mechanism shaping ethnic residential segregation among the already-settled population. Selective migration may indicate preferences for co-ethnic neighbours or constraints on spatial integration, in addition to the effects of general sociodemographic determinants of migration (e.g. Boschman and van Ham, 2015).

Three broad explanatory frameworks of residential segregation and mobility are commonly presented (e.g. Bolt and van Kempen, 2010): (i) the spatial assimilation model concentrating on the individual level taking into account preferences, restrictions, and resources, (ii) the place stratification model focusing on the macro level constraints of the housing market, and (iii) the cultural preference or ethnic enclave model on the individual preferences concerning the ethnicity of neighbours.

The spatial assimilation model starts from the idea that immigrants are initially segregated from the native population, but disperse spatially as they become acculturated to the host community and experience socioeconomic mobility. In other words, ethnic segregation would to a large extent reflect socioeconomic integration. Bolt and van Kempen (2010: p. 335) write: 'acculturation provides desire and social mobility the means, for immigrants to achieve spatial assimilation'. This highlights the importance of looking at the two processes at the same time, i.e. examining income and residential patterns together. Based on this model, it can be expected that upward income mobility influences residential mobility of immigrants similarly to the native-born population so that they would move to higher income neighbourhoods when controlling for other factors.

A competing theory, the place stratification model, emphasizes the constraints immigrants may face on the housing market, such as discrimination. It does not predict immigrants to become completely dispersed, or their spatial distribution to directly reflect their socioeconomic resources, unless these constraints disappear. This means that immigrants are unable to match their economic resources to their neighbourhood due to these factors. This has been called the 'strong' version of the place stratification model, meaning that discrimination would impede even wealthier minority members' escape from poverty concentrations (Logan and Alba, 1993; South and Crowder, 1997; South, Crowder, Chavez, 2005). An alternative, or 'weak', version of the model, however, proposes that individual characteristics have a stronger influence among minority members. In this case, mostly those immigrants with a high income are able to leave poverty concentrations, leading to a stronger association of economic resources and mobility patterns among immigrants than natives. This pattern was found among African Americans in the United States by South and Crowder (1997), although not replicated in a later study (South, Crowder, Chavez, 2005). In the Netherlands, Bolt and van Kempen (2003, 2010) have found similar or stronger income effects among minority ethnic groups as compared to the native Dutch population.

Even if immigrants are socioeconomically mobile and do not suffer from discrimination, the natives' and immigrants' preferences regarding the ethnicity of neighbours may lead to ethnic segregation (Schelling, 1969). Bolt, van Kempen, van Ham (2008) call this the cultural preference approach. In this vein, both self-selection of immigrants into ethnic concentration neighbourhoods and the 'avoidance' and 'flight' behaviour of natives have been offered as explanations for ethnic segregation. Based on this model (as well as the stratification model), it is expected that even when moving to higher-income areas, immigrants move to areas with higher shares of immigrants as compared to the destination neighbourhoods of the native-born movers.

Characteristics of the local context affect the migration outcomes as well. For example, the housing supply in poor and non-poor neighbourhoods may be important (South, Pais, Crowder, 2011). If immigrants have restricted access to some types of housing, such as home-ownership, their neighbourhood options may be restricted to the extent that other types of housing are distributed unevenly across neighbourhoods.

Finnish Context

Finland became a net immigration country only in the 1980s and the number of immigrants in Finland is still fairly low compared to, for example, other Nordic countries, but recent decades have seen a steady increase in their number. Based on the register data used in this article, the share of individuals with a foreign background

almost doubled between 2004 and 2014 in Finland, from 4.6 per cent in 2004 to 8.5 per cent in 2014. There is a strong concentration of people with a foreign background in the Helsinki region and, in particular in the city of Helsinki. In 2014, 47 per cent of all immigrants in Finland lived in the Helsinki region (compared to 25 per cent of the native-born population), of these more than half lived in the city of Helsinki. The share of immigrants in the cities of Tampere and Turku is considerably lower than in Helsinki (respectively 9.3 per cent, 12.8 per cent, and 17.3 per cent in 2014).

Among the three study regions, ethnic residential segregation has been found to be the strongest in the Turku region, while being at a similar lower level in the Helsinki and Tampere regions (Saikkonen *et al.*, 2018). A high share of immigrants live in low-income neighbourhoods in all three cities. From an international perspective, the level of segregation in Finnish cities remains relatively low, and the Finnish welfare model has contributed to a more equal distribution of income than in many other countries. The social and spatial equality in Finland, as in other Nordic countries, may reduce both the barriers to mobility between neighbourhoods (Nieuwenhuis *et al.*, 2019), and the need for spatial mobility (Wessel *et al.*, 2017). The net effect of these tendencies is not clear. Producing evidence from various institutional and cultural settings is essential: as Small, Manduca, Johnston (2018) note, research on low-income neighbourhoods needs to be conducted in a wide variety of contexts in order to avoid biased conclusions.

Hypotheses

In this study, we test hypotheses on the relationship between income mobility and mobility to a higher status neighbourhood, and we compare the outcomes between native Finns and immigrants. The first hypothesis is based on spatial assimilation theory, and according to it:

H1: Income mobility has a similar impact on the likelihood to move from a low-income to a non-low-income neigh bourhood among immigrants and the native-born population.

A competing hypothesis, based on the 'strong version' of the place stratification model, is that:

H2: Income mobility is not translated into moving to a higher-income neighbourhood to the same extent among immigrants as among the native-born Finns.

A third hypothesis, based on the 'weak version' of the place stratification model suggests that:

H3: The effect of an income increase is actually stronger among immigrants as for them moving to a more affluent neighbourhood may be more dependent on having a favourable economic situation than for the native-born Finns.

Data and Methods

Data

The analyses are based on a unique register-based dataset constructed by Statistics Finland (contract TK-53-356-16). It covers the full population of the Helsinki, Turku, and Tampere 'sub-regions' (the Local Administrative Unit 1 level in the Classification of Territorial Units for Statistics in the European Union) spanning from 2004 to 2014. The study population is limited to individuals aged 20–49 years old (excluding students) with at least two consecutive years of data and who lived in a low-income neighbourhood in year *t-1* in the city of Helsinki, Turku, or Tampere, and did not move away from the city and the surrounding region under study in the year *t-0*.[2] We do the analysis separately for men and women to avoid clustering at the household level.

Individuals are grouped into four categories: (i) native-born Finns, (ii) East European immigrants, (iii) other non-Western immigrants (excluding individuals of Japanese and South Korean origin)[3], and (iv) second generation immigrants (including immigrants who have arrived to Finland before the age of 12, and excluding children with parents of Western, Japanese or South Korean origin).[4] Anyone with at least one non-Finnish (East European or non-Western) parent is categorized as a second generation immigrant. Western immigrants and their children are not included in the study because of the relatively small number of observations especially in Turku and Tampere and high rate of marriages with native-born Finns.

Neighbourhoods are defined by zip codes, which had on average 6,000–7,000 residents in the central cities in 2014 (areas with less than 250 inhabitants are excluded from the analysis). Income is defined as the equivalized disposable household income (income after social transfers and taxes). The modified OECD equivalence scale is used to take into account the size and composition of the household. Individuals are divided into income groups based on the working age (20–64 years old) population in the region for each year separately. Low-income individuals are defined as those who belong to the poorest 20 per cent of the region. A low-income neighbourhood is defined as an area with more than 25 per cent of inhabitants aged between 20 and 64 in the bottom income quintile, when students are not included in the low-income population.

Analytical Strategy and Methods

Because of the longitudinal nature of the data, we are able to consider the timing of different events, such as changes in incomes, household composition, and labour market status, in relation to residential mobility. This reduces the possibility of the alternative causal pathway in which spatial integration impacts on employment opportunities and income. We analyse residential mobility always from one year to the next, predicting it by changes that happened before the move. Hence, income, labour market status, or household characteristics are measured in *t-1*, while residential mobility occurs between *t-1* and *t-0*.

We use a multinomial specification that allows us to compare the determinants of moving to non-low-income neighbourhoods to the determinants of other moves, enabling us to differentiate between general factors associated with residential mobility and those specific to moves to non-low-income neighbourhoods.

Our results are based on multinomial logistic regression with individual fixed effects (Stata 15 command 'femlogit') (Pforr, 2014). This allows us to better take into account unobserved heterogeneity that can be related to observed covariates and to assess the causality between income mobility and residential outcomes. This method implicitly controls for the constant effects of all time-invariant characteristics and experiences of the individual, such as constant preferences, personality, motivation or effort to integrate, and constantly experienced discrimination. In this design, variation of income between years provides the information on income, instead of just a cross-sectional measurement of income. The findings on the effects of income changes on residential mobility are not confounded by the constant effects of time-invariant unobserved characteristics on both income and residential mobility.

Using this method, all the cases with no changes in the outcome variable (mainly those who stay in the same dwelling for the total observation period) are omitted from the analysis. This could reduce the generalizability of the fixed-effects results. We have accordingly compared the full and restricted samples, leading us to believe that there is no meaningful bias in the restricted sample due to this sample selection (see Appendix Table A2), and in the end of the results section we also report findings from a robustness check applying the fixed-effects linear probability model (LPM) as an alternative method. Results from this check also show whether the conclusions regarding differences between groups in the effects of income are similar on the probability scale of the LPM to those obtained using the log odds scale of the femlogit model (see Mize, 2019).

Finally, the shares of immigrants in the origin and destination neighbourhoods are described at the end of the empirical analyses. This is done in order to see whether upward moves in socioeconomic terms have different ethnic characteristics among immigrants and the native-born movers.

As our data covers the total population under study, there is no sampling error. We still report the statistical significance of the estimates, because the individual life histories can be seen as realizations of stochastic processes that are subject to random variation (Hoem, 2008). However, we do not rely on the statistical significance in our conclusions.

Variables

The dependent variable in the regression analysis is 'moving category' that can take three values: (i) did not move between *t-1* and *t-0* (base category), (ii) moved within or to another low-income area between *t-1* and *t-0*, and (iii) moved from a low-income area to a non-low-income area between *t-1* and *t-0*. All moves between dwellings are counted as moves.

Our main independent variable is income, more specifically the natural logarithm of household's equivalized disposable income. Using log income allows for a more accurate measurement of income changes as it reduces the weight of exceptionally high incomes, while it also retains the measurement of relative changes. We also found the association between income changes in euros and the probability (or log odds) of moving to non-low-income areas to be non-linear among the native-born Finns, suggesting the application of the logarithmic transformation. In the fixed-effects specification, the income variable measures the deviation of the given year's income from the average income across the person's annual observations. Income is measured at *t-1*. Incomes are deflated to the price level of 2016 with the harmonized index of consumer prices (HICP).[5]

The fixed-effects model omits all variables that do not vary over time, thus only time-variant characteristics are included as control variables. Some changes in household composition and labour market status might affect incomes and residential mobility at the same time as discussed in the literature review. Therefore, we control for civil status (married or not married) and the number of children in *t-1*. Labour market changes impact incomes directly, while they can also have an independent effect on residential mobility as they reflect the

longer term income security of the person and potentially the need to move closer to work. To control for this, we use a dummy variable for unemployment in *t-1*. Tenure type in *t-1* (dummy for home-ownership) is added in the model as it is closely related to residential mobility. In addition, we use a measure of overcrowdedness in *t-1* to reflect on the need to move to a more spacious dwelling.

Tables 1 and 2 presents some key characteristics of the study population by immigrant background. The total number of observations (person-years) is 758,627. The second generation differs from the rest of the study population by their younger age, which is associated with a higher prevalence of moving. Non-Western immigrants have, on average, more children than the other groups and, together with East Europeans, they are less likely to live alone.

Non-Western immigrants are both most likely not to experience an income increase and to experience an income increase of more than 50 per cent (Table 2). In general, the biggest relative increases in income are more likely to happen at the bottom of the income distribution. In absolute terms, the native-born Finns and second generation immigrants have slightly bigger increases in income.

Results

Association Between Income Change and Moves to Non-Low-Income Areas

Figure 1 shows the share of individuals moving from a low-income area to a non-low-income area by the level of income change. Income change is measured here as the observed change in income in the previous year. First, greater increases in household disposable income are associated with an increased probability of moving to a higher-income neighbourhood in all groups. Second, East Europeans and non-Western immigrants have a lower likelihood of moving to a non-low-income area (see also Table 1), but an income growth of more than 50 per cent is associated with a 1.6 times greater likelihood compared to those with no income increase, similar to native-born Finns. Third, for second generation immigrants, the association between income change and move is weaker, while they have a higher overall likelihood of moving to a non-low-income area. Finally, while there is an association between an income increase and moving to a non-low-income neighbourhood, the strength of this association might be considered rather modest. This may, for example, be related to the fact that those with the highest

Table 1. Characteristics in the study population by immigration background

	Observations (person-years) in the study population	Mean age	Mean number of children below 18	Mean equivalized disposable household income (EUR)	Share living alone	Share of women	Share in the bottom income quintile
Native Finns	631,645	34.8	0.5	25,827	72.4 per cent	50.1 per cent	22.9 per cent
East European	54,148	36.5	0.9	20,308	48.1 per cent	55.3 per cent	42.3 per cent
Non-Western	56,177	35.7	1.3	17,124	38.2 per cent	42.8 per cent	60.7 per cent
Second generation	16,657	26.6	0.5	21,297	80.0 per cent	49.0 per cent	36.6 per cent
	Share of owner-occupiers	**Share living in crowded dwelling**	**Mean share of immigrants in the area**	**Mean share of low-income individuals in the area**	**Share moved to non-poor areas**	**Share moved within poor areas**	
Native Finns	40.9 per cent	0.8 per cent	13.6 per cent	27.3 per cent	13.7 per cent	6.8 per cent	
East European	22.6 per cent	3.3 per cent	18.0 per cent	28.1 per cent	9.1 per cent	9.0 per cent	
Non-Western	17.1 per cent	7.9 per cent	17.6 per cent	27.8 per cent	10.0 per cent	9.8 per cent	
Second generation	24.1 per cent	2.1 per cent	17.1 per cent	27.8 per cent	15.8 per cent	10.9 per cent	

Table 2. The level of income change by immigration background

	Native-born Finns	East Europeans	Non-Westerns	Second generation
No income increase	39.9 per cent	40.6 per cent	43.3 per cent	39.1 per cent
Less than 10 per cent increase	27.4 per cent	22.4 per cent	19.1 per cent	19.6 per cent
10–20 per cent increase	12.0 per cent	12.3 per cent	11.3 per cent	12.6 per cent
20–50 per cent increase	12.9 per cent	14.8 per cent	14.5 per cent	16.4 per cent
More than 50 per cent increase	7.8 per cent	9.9 per cent	11.8 per cent	12.3 per cent
Mean income increase among those with a positive income change (EUR)	4,565	4,358	4,226	4,820

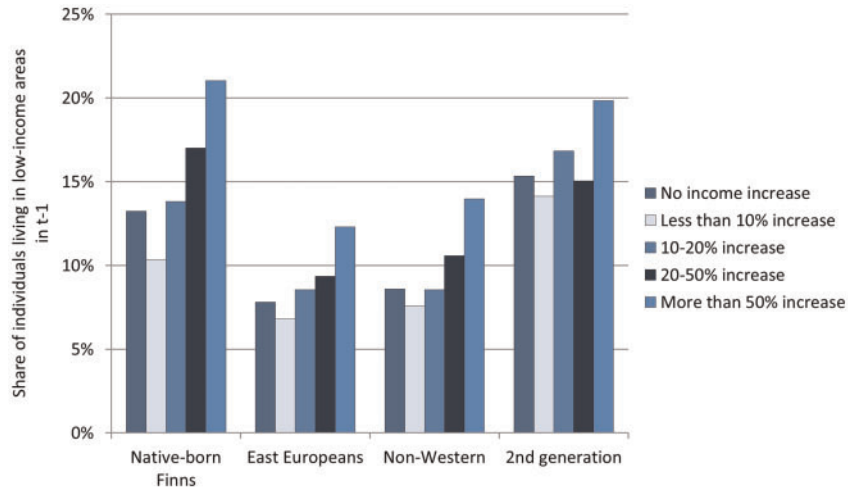

Figure 1. Share of individuals moving from a low-income to a non-low-income area, by the level of income change (per cent of individuals living in low-income areas in *t-1*)

Notes: Income increase between *t-2* and *t-1*, while moving happens between *t-1* and *t-0*. Pooled years.

relative increases in income are more likely to have low incomes initially.

Effects of Income Change on Residential Mobility

In Table 3, we present the results of a fixed-effects multinomial logit regression model separately for men and women. The reference category is 'not moving', and the two other outcome categories are 'moving to a non-low-income area' and 'moving within a low-income area'.

The results show that an increase in income is positively associated with exiting low-income areas for all groups, but the effect is stronger among the native-born Finns than among immigrants. To a much lesser degree, a rise in income also increases the likelihood of moving within low-income areas among native-born Finns and second generation immigrants. Overall, these results suggest that the causal effect of an income increase is stronger among the native-born Finns (and the second generation females) than among the East European and non-Western immigrants. Results from the robustness check described below indicate that this conclusion holds also on the probability scale.

Table 4 shows the share of immigrants in the origin and destination neighbourhoods of those who moved within low-income areas or moved to a non-low-income area and in the neighbourhoods of those who did not move. First, we see that those who moved to non-low-income areas moved from areas that had less immigrants to begin with, meaning that there is some spatial selection on who exits low-income areas. Second, the share of immigrants is significantly lower in the destination areas of the individuals moving to non-low-income areas. East Europeans and non-Western immigrants moved to non-low-income areas with slightly higher shares of immigrants than in the destination areas of the native-born Finns and second generation immigrants, but the share of immigrants drops clearly with each

Table 3. Results from a fixed-effects multinomial logit model separately for men and women

	Men 20–49		Women 20–49	
	b	Standard error	*b*	Standard error
Moving to a non-low-income area				
Native Finn, log income	1.231***	0.034	1.324***	0.034
East European, log income	0.748***	0.107	0.791***	0.100
Non-Western, log income	0.678***	0.082	0.415***	0.098
Second generation, log income	0.817***	0.154	1.518***	0.175
Number of children under 18	0.336***	0.019	0.334***	0.020
Unemployed	0.052	0.039	−0.022	0.043
Married	0.738***	0.037	0.652***	0.036
Home-owner	−0.953***	0.035	−1.015***	0.036
Crowded dwelling	0.724***	0.073	0.915***	0.082
Moving within low-income areas				
Native Finn, log income	0.179***	0.030	0.171***	0.031
East European, log income	−0.197**	0.073	−0.268***	0.069
Non-Western, log income	−0.058	0.056	−0.188*	0.077
Second generation, log income	0.047	0.124	0.053	0.141
Number of children under 18	0.011	0.015	−0.082***	0.016
Unemployed	−0.027	0.034	0.003	0.036
Married	−0.121**	0.035	0.103**	0.033
Home-owner	−1.090***	0.028	−1.259***	0.029
Crowded dwelling	0.788***	0.064	1.148***	0.071
Number of observations	195,640		196,027	

Notes: $*P < 0.05$, $**P < 0.01$, $***P < 0.001$. All variables are measured in *t-1*. Base category is not moving.

Table 4. Share of immigrants in origin and destination neighbourhoods

	No move		Move within low-income areas		Move to a non-low-income area	
	Area *t-1*	Area *t-0*	Area *t-1*	Area *t-0*	Area *t-1*	Area *t-0*
Native-Finns	13.9 per cent	14.8 per cent	13.7 per cent	14.9 per cent	12.4 per cent	7.5 per cent
East European	18.2 per cent	19.5 per cent	17.7 per cent	19.4 per cent	16.9 per cent	10.1 per cent
Non-Western	17.7 per cent	18.9 per cent	17.7 per cent	19.3 per cent	16.6 per cent	10.5 per cent
Second generation	17.3 per cent	18.4 per cent	17.6 per cent	18.8 per cent	15.8 per cent	9.5 per cent

groups' moves to non-low-income areas. As there are few non-low-income areas in our study cities with high proportions of immigrants, those immigrants who leave low-income areas are also very likely to leave areas with ethnic minority concentrations. Therefore, immigrants exiting low-income neighbourhoods contribute to more equal ethnic distribution in these cities.

Robustness Check: Fixed-Effects Linear Probability Models

In addition to the fixed-effects multinomial logit models we also used fixed-effects LPMs as a robustness check (see Appendix Table A1). The LPM is a linear regression model with a dichotomous outcome, including individual fixed effects. In this type of model, also persons with no variation in the outcome variable are included (in contrast to the fixed-effects multinomial model). This allows us to investigate the effects of dropped cases (the consequence of using the fixed-effects multinomial logit analysis).

We ran the LPM analyses both with the outcome 'moving to non-poor areas versus other outcomes', and with the outcome 'moving to non-poor areas versus not moving at all'. The effect estimates from these models cannot be directly compared to those obtained from the multinomial logit analysis, as the outcomes are different

(dichotomous versus polytomous) and the estimates are on a different scale (probability scale in the LPM analyses). The main purpose of the additional LPM analyses was to investigate whether the sample selection affects the results, by comparing results using either the full sample or the restricted sample that was used in the multinomial model. The second purpose is to check whether it matters for the conclusions regarding the order of the groups in the strength of the income effect, whether the analysis is on the log odds scale of the femlogit model or on the probability scale.

Overall, the results point to the same conclusions as the multinomial fixed-effects analysis did, irrespective of the sample used. The income effect appears to be stronger when the restricted sample is used, as compared to the total sample, especially among the native-born population. However, the order between the groups in the strength of the effect is the same in both samples (and the same as in the multinomial fixed-effects analyses).[6] When using either the restricted or the full sample, we find statistically significantly weaker income effects for East European and non-Western groups compared to the native-born population among both men and women. Additionally, we found that the second generation deviates significantly from the native-born group only in the restricted sample. Together with the findings on the comparison of distributions of variables in the restricted and full samples (see Appendix Table A2), we conclude that the sample selection in the fixed-effects multinomial model does not alter our main findings. Furthermore, the income effects are stronger on average among the native-born population than in the foreign-born groups also when the effects are analysed on the probability scale.

Discussion

This study focussed on ethnic differences in the impact of income mobility on residential moves from low-income to higher-income neighbourhoods. This evidence is important for our understanding of the patterns of both socio-economic and ethnic segregation, and more generally of the impact of place on stratification and socio-economic outcomes of individuals. Those groups which are the least likely to translate income gains into upward residential mobility are the most likely to experience long-term exposure to deprived neighbourhoods, which could affect particularly their children's later outcomes (see e.g. Chetty and Hendren, 2018). The increasing number of immigrants in European societies have brought the questions of ethnic segregation and economic integration to the fore of public policies both at national and local levels. This study provides evidence on the extent to which labour market integration and a reduction of poverty among immigrants can help in the spatial integration of immigrants in cities.

We examined the impact of income mobility on residential mobility patterns away from low-income neighbourhoods among native-born Finns and people with an immigrant background. We used rich longitudinal register data of the total population in the three largest urban regions in Finland spanning from 2004 to 2014. This allowed a robust analysis even when investigating specific population groups. The panel design of the data allowed us to take into account various changes in individual circumstances as well as unobserved time-invariant characteristics of the individuals, taking us closer to a causal explanation.

In a descriptive analysis, we found that in general immigrants have lower chances of moving from low- to higher-income neighbourhoods than native-born Finns, but such moves are rather similarly associated with income increases among immigrants and native-born Finns. However, using a fixed-effects design that takes into account the constant unobserved differences between individuals, we found that the effects of income mobility are stronger for the native-born Finns than for the other groups. This suggests that immigrants face more constraints in the housing market, which would support the strong version of the place stratification model (South, Crowder, Chavez, 2005), or that there are different residential preferences among immigrants and the native-born population.

Since our fixed-effects modelling design controls for unobserved constraints and preferences that directly affect income and residential mobility, our findings suggest that mechanisms specifically affecting the *translation* of increased income into 'upward' residential moves matter. Such mechanisms leading to a weak effect of income increase could include, for example, other preferred uses of increased income besides housing (e.g. sending remittances back to country of origin), different impact on residential preferences among immigrants and native-population, lack of religiously sensitive mortgage alternatives (Skovgaard Nielsen *et al.*, 2015), a lack of accumulated wealth to be used as a down payment for a mortgage or as a rent deposit, or income levels still being too low after an income increase due to lower initial level among the immigrants on average. Particularly, the low likelihood of non-Western women to move to a non-low-income neighbourhood even after an income increase needs explanations. These might be related to partners' characteristics as well, for example to the low

propensity of partnerships with native Finns among non-Western women.

Using register data it is not possible to distinguish further between the underlying mechanisms, which merits further research. Existing studies, based on qualitative interviews with immigrants, suggest that intentions to move closer to their own ethnic communities among immigrants have not been an important driver of ethnic segregation in the Helsinki metropolitan area. On the other hand, it has been found that dependence on the social networks within the own ethnic community for information on housing options, dependence on social housing, and anticipations of discrimination may have influenced the locational outcomes of immigrants (Beqiri, 2008; Dhalmann and Vilkama, 2009). A recent field experiment also demonstrated discrimination in the private rental market against prospective tenants with Arabic-sounding names (Öblom and Antfolk, 2017).

Our findings are in contrast with those of Bolt and van Kempen (2003, 2010), who found similar or stronger income effects among ethnic minorities as compared to the native population in the Netherlands. Similarly, Andersson (2013) concluded in the case of ethnic segregation in Stockholm, Sweden, that those who experience upward income mobility are, irrespective of their ethnic origin, more prone to leave stigmatized neighbourhoods. However, such conclusions might be biased regarding the estimation of *causal* effects of income. In our descriptive analysis, we found similar results as in these earlier studies. However, when we use a design taking into account constant unobserved heterogeneity at the individual level in a fixed-effects model, we find that natives are more likely to translate income increases into upward residential moves. Therefore, further analyses applying stricter causal designs should be conducted also in other national contexts.

From a policy viewpoint, our findings suggest that economic integration is an important determinant of spatial integration and income increases among immigrants can contribute to decreasing ethnic segregation in cities. However, based on our findings, different spatial trajectories in different ethnic groups could be expected even if income trajectories were similar. Although policies affecting the economic resources of immigrants can be expected to affect their spatial concentration, ethnic segregation may deepen even amid conditions of positive income development among immigrants. This is due to weaker effects of income mobility on residential mobility among them. Some effects of policies focusing on economic conditions may take a long time to lead to more visible outcomes, as more equal opportunities on the housing market require accumulation of wealth among the ethnic minorities. Therefore, in addition to improving the labour market opportunities and income development among low-income immigrants, policies improving the availability of affordable housing in non-low-income areas and decreasing potential discrimination on different sectors of the housing market could be effective ways to prevent ethnic segregation. For some immigrant groups, education about existing possibilities on the housing market might also be needed to alleviate the dependency on own social networks concerning housing market information (Krysan and Crowder, 2017).

Notes

1 According to Migrant Integration Policy Index 2015 (www.mipex.eu, accessed 16 June 2017).
2 Individuals who moved to other regions in Finland are excluded from the analysis.
3 The biggest group in the second category is people born in Russia or ex-USSR (almost half of the entire group), in Estonia (31 per cent) and in ex-Yugoslavia (11 per cent). Among non-Western immigrants, the biggest group is people born in Somalia (15 per cent), Iraq (11 per cent), Turkey (8 per cent), Vietnam (7 per cent), and Iran and China (both around 6 per cent).
4 Among the second generation immigrants, the majority were born abroad but arrived to Finland before the age of 12 (57 per cent of the group) and 40 per cent have mixed parents (i.e. one parent being a Finn). This means that only a minority (3.6 per cent in our study sample) are born in Finland to foreign parents.
5 HICP from Eurostat database: http://ec.europa.eu/eurostat/web/hicp/data/database (accessed 4 April 2018).
6 Furthermore, the LPM results in the full sample are not necessarily more correct than those obtained with the restricted sample, as in the full sample, the effect of income mobility on people with a constant observed residential mobility outcome is assumed to be zero. This is not necessarily true, as might be observed in longer follow-ups. Therefore, results from the full sample may imply artificially weak effects (Beck, 2018).

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Appendix

Table A1. Results from fixed-effects linear probability models

		Men 20–49				Women 20–49			
		Outcome: moved to a non-low-income area vs. all others		Outcome: moved to a non-low-income area vs. no move		Outcome: moved to a non-low-income area vs. all others		Outcome: moved to a non-low-income areas vs. no move	
		Restricted femlogit sample	Whole study population	Restricted femlogit sample	Whole study population	Restricted femlogit sample	Whole study population	Restricted femlogit sample	Whole study population
Log income	*b*	0.136***	0.077***	0.163***	0.082***	0.154***	0.093***	0.187***	0.101***
	SE	(0.004)	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)	(0.005)	(0.002)
East European ## log income	*b*	−0.061***	−0.034***	−0.071***	−0.036***	−0.076***	−0.051***	−0.093***	−0.057***
	SE	(0.011)	(0.006)	(0.013)	(0.007)	(0.010)	(0.006)	(0.013)	(0.006)
Non-Western ## log income	*b*	−0.066***	−0.043***	−0.076***	−0.048***	−0.102***	−0.069***	−0.120***	−0.075***
	SE	(0.009)	(0.005)	(0.012)	(0.005)	(0.011)	(0.006)	(0.014)	(0.006)
Second generation ## log income	*b*	−0.040*	−0.007	−0.054*	−0.008	−0.005	0.001	−0.024	−0.007
	SE	(0.018)	(0.012)	(0.022)	(0.013)	(0.018)	(0.011)	(0.022)	(0.012)
Number of children under 18	*b*	0.031***	0.021***	0.041***	0.026***	0.032***	0.020***	0.038***	0.022***
	SE	(0.002)	(0.001)	(0.003)	(0.002)	(0.002)	(0.001)	(0.003)	(0.001)
Unemployed	*b*	0.007	0.004	0.008	0.005	−0.002	−0.000	0.001	0.001
	SE	(0.005)	(0.003)	(0.006)	(0.003)	(0.005)	(0.003)	(0.006)	(0.003)

(continued)

Table A1. (Continued)

		Men 20–49				Women 20–49			
		Outcome: moved to a non-low-income area vs. all others		Outcome: moved to a non-low-income area vs. no move		Outcome: moved to a non-low-income area vs. all others		Outcome: moved to a non-low-income areas vs. no move	
		Restricted femlogit sample	Whole study population	Restricted femlogit sample	Whole study population	Restricted femlogit sample	Whole study population	Restricted femlogit sample	Whole study population
Married	*b*	0.089***	0.064***	0.102***	0.069***	0.073***	0.051***	0.088***	0.058***
	SE	(0.005)	(0.003)	(0.005)	(0.003)	(0.004)	(0.003)	(0.005)	(0.003)
Home-owner	*b*	−0.076***	−0.055***	−0.121***	−0.083***	−0.078***	−0.055***	−0.121***	−0.080***
	SE	(0.004)	(0.003)	(0.005)	(0.003)	(0.004)	(0.003)	(0.006)	(0.004)
Crowded dwelling	*b*	0.078***	0.055***	0.126***	0.077***	0.086***	0.062***	0.145***	0.091***
	SE	(0.010)	(0.006)	(0.013)	(0.007)	(0.011)	(0.007)	(0.014)	(0.008)
Constant	*b*	−1.109***	−0.598***	−1.330***	−0.629***	−1.273***	−0.723***	−1.540***	−0.776***
	SE	(0.033)	(0.018)	(0.040)	(0.020)	(0.035)	(0.020)	(0.042)	(0.022)

Notes: $^{*}P < 0.05$, $^{**}P < 0.01$, $^{***}P < 0.001$. SE indicates standard errors. All explanatory variables are measured in *t-1*.

Table A2. Characteristics in the study population and in the femlogit sample by immigration background (men and women aged 20–49)

		With no income increase		Average age		Average number of children		Average disposable income (EUR)	
	Share in the femlogit sample	Whole study population	Femlogit sample	Whole study population	Femlogit sample	Whole study population	Femlogit sample	Whole study population	Femlogit sample
Native-Finns	49.9 per cent	39.9 per cent	38.8 per cent	34.8	32.8	0.5	0.5	25,827	25,742
East European	51.2 per cent	40.6 per cent	39.6 per cent	36.5	35.5	0.9	1.0	20,308	20,809
Non-Western	50.4 per cent	43.3 per cent	42.5 per cent	35.7	35.2	1.3	1.4	17,124	17,890
Second generation	57.6 per cent	39.1 per cent	38.6 per cent	26.6	26.2	0.5	0.5	21,297	21,637

	Share living alone		Average share of immigrants in the area where lives		Share of owner-occupiers		Share living in crowded housing	
	Whole study population	Femlogit sample	Whole study population	Femlogit sample	Whole study population	Femlogit sample	Whole study population	Femlogit sample
Native-Finns	72.4 per cent	74.3 per cent	13.6 per cent	13.5 per cent	40.9 per cent	36.4 per cent	0.8 per cent	0.9 per cent
East European	48.1 per cent	45.3 per cent	18.0 per cent	18.3 per cent	22.6 per cent	23.0 per cent	3.3 per cent	3.2 per cent
Non-Western	38.2 per cent	35.4 per cent	17.6 per cent	18.0 per cent	17.1 per cent	17.0 per cent	7.9 per cent	7.2 per cent
Second generation	80.0 per cent	76.9 per cent	17.1 per cent	17.1 per cent	24.1 per cent	22.9 per cent	2.1 per cent	1.8 per cent