Entry to homeownership among immigrants. The contribution of economic and demographic factors to the gap with the natives.

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Abstract
This article contributes to research on the homeownership gap between immigrants and natives in Western countries, extending earlier research by using longitudinal data and studying a country with a short history of immigration. We compare the duration of entry to homeownership between non-Western immigrants and natives migrating to the Helsinki metropolitan area in Finland, using individual-level register-based data from 1990 to 2008 for 10,390 immigrants and 23,063 natives. We apply discrete-time survival analysis methods and statistical decomposition. We find considerable differences between groups in the speed of entry to homeownership. A majority of these differences can be explained by observed differences in economic and demographic characteristics during the follow-up. Therefore, differences in the degree of economic assimilation are an important explanation for the homeownership gaps. For some groups, considerable gaps remain, requiring additional explanations. Reasons relating to the longitudinal design, the short immigration history of Finland, economic cycles and the Nordic welfare state context might explain the large gaps and the large contributions of economic resources to the gaps.

Performance at the housing market is often considered as a part of the process of integration of immigrants into their host countries. Buying a home can generally be considered a sign of a secure economic situation and an indicator of long-term economic well-being, and among immigrants it is also thought to signify attachment to the host country (e.g. Constant et al. 2009). Homeownership may also reflect status attainment, a higher rank in the housing hierarchy, as far as housing tenure is considered. Despite individual differences in tenure preferences, there is often a clear hierarchy between the different tenure types at the aggregate level (Clark et al. 2003). Homeownership is also an important means of accumulating household wealth and transferring it between generations.

Studies in the U.S. have demonstrated that there is generally a gap between natives and immigrants in the extent of homeownership (Borjas 2002; DeSilva and Elmelech 2012; Krivo 1995; Painter and Yu 2010). Similar findings have been reported for European countries (e.g.

Bråmå and Andersson 2010; Nygaard 2011; Sinning 2010), while the gap relates only to *recent* immigrants in Canada and Australia (Chua and Miller 2009; Kim and Boyd 2009). Existing research suggests that differences in the general determinants of homeownership − demographic and socioeconomic characteristics − do not explain the gaps between immigrants and natives totally, and therefore, homeownership rates among immigrants need additional explanations (see Explanations for Disparities...).

The duration of stay in the host country is known to be an important predictor of homeownership rates. Immigrants often initially settle in the least desirable segments of the housing market (van Kempen and Özüekren 1998), but they have been found to catch up with the natives in the extent of homeownership in a couple of decades on average in the U.S. (Borjas 2002; Painter and Yu 2010) and slightly faster in the U.K. (Nygaard 2011). In Canada, immigrants have been shown to overtake the natives in homeownership in two decades (Kim and Boyd 2009), some groups even faster (Haan 2007). Catch-up does not always happen, however. For example, in the U.S. and Canada, homeownership rates have remained low especially among Black immigrants in the more recent immigration cohorts (Haan 2007).

The insufficiency of sociodemographic differences as explanations for the gaps and the apparent importance of the duration of stay might relate to the research methods applied. Existing research has mostly relied on cross-sectional designs, whereby the current housing tenure is typically explained by the current sociodemographic characteristics and the duration of stay in the country. The current characteristics may have weak explanatory power, because the current housing conditions tend to reflect "the lagged effects of past choices" (Painter 2000:198). The duration-of-stay variables might simply capture the cumulative effects of the past sociodemographic characteristics. Explanation may also be hampered by confounding of several separate processes that have influenced the rates. These include, in addition to recent rates of immigration, the homeownership rates among immigrants at arrival to the country, entry to and exit from homeownership during the stay in the country, and emigration. Each of these can also differ between immigration cohorts.

The significance of the rates-at-arrival effect versus the rest of the processes by immigration cohort can be assessed by applying quasi-panel designs that combine cross-sectional datasets from several time points (Myers 1999). Using such a design, Haan (2007) has emphasized the significance of the low homeownership rates among immigrants at arrival in the U.S. and Canada. However, quasi-panel designs do not enable separation between the rest of the processes − entry, exit and emigration. Additionally, the sociodemographic determinants are still typically measured only cross-sectionally. Therefore, true panel data, containing longitudinal information on the same individuals, offer the best chances for focusing on individual processes influencing the homeownership rates and for assessing the significance of sociodemographic determinants (cf. Raya and Garcia 2012). The need for longitudinal analyses has been long acknowledged in the research on housing conditions of immigrants (e.g. Myers 1999; Özüekren and van Kempen 2002; Painter 2000), but due to inadequate data longitudinal research has so far been scarce.

In this article, we contribute to the literature by basing our analysis on a rich longitudinal dataset which enables us to follow the housing careers of immigrants and natives annually from their move to the Helsinki metropolitan area (HMA), the capital region of Finland. For most immigrants this means starting the follow-up from their year of immigration. We focus on one process affecting the homeownership rates, the *entry* to homeownership. We contribute to the literature also by extending the variety of national contexts studied, as we analyze the housing

careers in Finland, a Nordic country with a short history of immigration. Most of the previous research on immigrants and homeownership has been conducted in countries with long immigration histories, and relatively large migrant communities. There is less research on contexts where larger-scale immigration is a new phenomenon, and where migrant communities are still relatively small (however, see e.g. Vono-de-Vilhena and Bayona-Carrasco 2012).

We limit our analysis to a single urban region, which eliminates the potentially confounding effects of differences in housing market structures between cities and regions (see e.g. Alba and Logan 1992; Kim and Boyd 2009; Painter 2000).We follow how long it takes for new migrants to enter homeownership once they have moved to the Helsinki metropolitan area, and how well especially economic resources explain the differences between natives and immigrant groups.

Our research questions are:

1   What differences are there by country of birth in how long it takes to enter homeownership after a move to the Helsinki metropolitan area?
2   How much of the differences between immigrants and natives can be explained by differences in composition, especially by differences in the economic resources?
3   What differences are there by country of birth in the effects of background characteristics, especially in the effects of the economic resources?

Explanations for Disparities in Homeownership between Immigrants and Natives

Entry to homeownership is generally known to be closely connected to the level of income and the situation in the life cycle (Clark et al. 2003; Dieleman et al. 1994; Nygaard 2011). Changes in the family composition, namely the shift in household status from a couple to a family with children, increase the likelihood of homeownership (e.g. Clark et al. 1997; Dieleman et al. 1994). Similarly, increases in the level of income and progress in the labour market career predict mobility from rental to owner-occupancy (Dieleman et al. 1994).

The simplest explanation for a lower risk of entry to homeownership among immigrants would refer to disparity in these general determinants. This type of explanation puts emphasis on the socioeconomic dimension of immigrant *assimilation* (see e.g. Alba and Logan 1992; Alba and Nee 1997; Massey 1985), i.e. on the resources. A lower rate of entry to homeownership might indicate incomplete socioeconomic assimilation or assimilation to a socioeconomically lower segment of the society. The 'traditional' version of assimilation theory expected that upon arrival, deficient cultural and social capital, weak financial standing, and poor knowledge of the housing market restrict immigrants' entry to homeownership, but that immigrants adjust to their host societies financially, culturally, and socially over the course of time. Consequently, their housing situation would be expected to start to resemble that of the natives, or at least of those with comparable demographic and socioeconomic characteristics. More recent formulations are more critical regarding these expectations (e.g. Alba and Nee 1997), but assimilation can still be seen as one possible incorporation pathway, and the degree of socioeconomic assimilation, defined as the difference in socioeconomic resources between an immigrant group and the natives, can be an important explanation for a differing rate of entry to homeownership.[1]

Studies analyzing the homeownership gaps between immigrants and natives, with varying designs, have mostly found that differences in the demographic and socioeconomic characteristics are important but insufficient explanations for the gaps (Bråmå and Andersson 2010; Davidov and Weick 2011; Haan 2007; Kim and Boyd 2009; Krivo 1995; Painter and Yu 2010; Sinning 2010). However, some cross-sectional studies have not found these differences to

be important, emphasizing instead the significance of locational decisions (Borjas 2002) or the duration of stay in the country (Bourassa 1994; Chua and Miller 2009).

As differences in rates of entry to homeownership cannot usually be completely explained by differences in demographic and socioeconomic characteristics, additional explanations are needed. These might relate to cultural differences, i.e. attachment to the culture and society of origin in addition to or instead of the host society (Constant et al. 2009). For example, immigrants may prefer to live close to their family and friends for cultural reasons and neighborly help (Tomlins et al. 2002), or they may be inclined to use their financial resources to other purposes besides housing, such as investing in small businesses, sending remittances and making investments in their home country (Owusu 1998; Vono-de-Vilhena and Bayona-Carrasco 2012). There may also be religious customs to avoid taking a mortgage with an interest (Bowes and Sim 2002; Dhalmann 2011), or entry to homeownership might be impeded by expectations of returning to one's home country (Murdie 2002; Owusu 1998).

Lower rate of entry to homeownership may also result from *stratification* processes which sort people's opportunities according to ethnic and social lines (e.g. Alba and Logan 1992). Discriminatory practices of mortgage lenders, the steering practices of real estate agents, and fear of racial or ethnic harassment outside the initial neighborhoods are some examples of the sorting processes that may restrict some groups' access to homeownership (Aalbers 2007; Ahmed and Hammarstedt 2008; Galster and Godfrey 2005; Bowes and Sim 2002). Some of these processes operate at the macro level, for instance if legislation limits foreign citizens' rights to buy property, or if there are other specific policies that confine or steer immigrants' housing choices.

Immigration history of the country is another relevant macro-level factor. Established co-ethnic communities can be important sources of financial, cultural, and social capital for new migrants as they proceed in their housing careers (Borjas 2002; Murdie and Ghosh 2010; Painter et al. 2004; Painter and Yu 2010; but see Krivo 1995 for opposite results). In new immigration countries, strong ethnic communities may not yet be established, which may leave immigrants more on their own in their housing search. They may also face constraints specific to the first wave of immigration, such as stronger prejudices against immigrants.

Overview of Immigrants' Housing Position in the Helsinki Metropolitan Area
Finland is a Nordic country in the northeastern corner of the European Union. It used to be predominantly a country of emigration, but with the disintegration of the neighboring Soviet Union and the subsequent changes in the geopolitical map of Europe, immigration to Finland started to increase in the beginning of the 1990s. This immigration was first mostly not work-related, as immigrants arrived through a specific return migrant scheme (see below), or as asylum-seekers, refugees and students, or for family reasons. In the 2000s the immigration policies changed and the amount of work-related immigration has increased substantially. The change in the immigrant population has been noticeable. Prior to 1990, there were less than 26,300 foreign nationals in Finland, whilst by the end of 2010, the number was more than six-fold. Most immigrants have, thus, settled in the country rather recently.

Immigration to Finland has been urban-bound: most of the newly-arrived immigrants have settled in the major urban areas, especially in the Helsinki Metropolitan Area (HMA) which makes up the biggest urban region in Finland, housing a fifth (1.0 million) of Finland's total population of 5.4 million, and almost a half (44%) of Finland's entire immigrant population. In 2013, 12% of the residents in the HMA had an immigrant background.

There are differences in the main reasons for immigration by national origin. Russians and Estonians are the biggest immigrant groups in the HMA. A large portion of them has arrived through a return migrant scheme that was in effect from 1990 to 2011 for Russians and Estonians who could claim to have Finnish ancestry (so-called Ingrian Finns' return migrant programme). In the 2000s, the immigration of Russians and Estonians has been more work- and family-related. Somalis, who constitute the third biggest immigrant group, as well as the biggest refugee group, have arrived to Finland as asylum-seekers, or through family reunification. Other Africans have migrated to Finland for varying reasons. Chinese constitute the biggest immigrant group from Asia, and many of them have migrated to Finland for study or work reasons. Immigrants from West Asia (the Middle East), on the other hand, have commonly arrived as refugees or for family reasons.

These differences in the main reasons to migrate to Finland are reflected in the tenure-type segmentation of immigrant groups (Table 1). Although the legal rights to housing are not restricted by permanency of residence or by citizenship, there are specific housing practices that influence the housing choices of certain immigrant groups. For example, refugees receive special assistance in their housing search. The municipalities are obliged to assist refugee households to find accommodation upon arrival, and they usually assign them dwellings in social housing estates. Prior to 2003, returnee migrants from Russia and Estonia were also entitled to similar assistance upon arrival. Those arriving to Finland as international students are entitled to apply for student (social) housing. Other immigrant categories do not receive special help in their housing search.

Table 1 gives an overall cross-sectional picture of the immigrants' housing position in the HMA. Immigrants are generally greatly underrepresented in owner-occupancy. The majority (71%) live in rented dwellings, and slightly more than a half are living in social rented accommodation. Differences are clear among the immigrant groups, however. The tenure-type distribution among West Europeans, most of whom have arrived to Finland for work, study or family reasons, resembles most closely that of the natives: 43% of the residents of western origin own their homes, compared to 60% of the natives. At the other end of the spectrum, only 3% of Sub-Saharan Africans, of whom Somalis make up the biggest group, own their homes and a vast majority live in social rental accommodation. Social-rented dwellings are the most common tenure type also among the immigrants from North Africa and the Middle East, and the migrants from Russia and the Baltic countries.

<Table 1 here>

Table 1 shows that social housing provides an important housing option for immigrants in the HMA. Social rented dwellings are generally in good condition, their rents are usually cheaper than in the private sector, and they are a rather secure option. Households can stay in the social rented dwellings even if their incomes increase. Social housing may therefore be seen as a satisfactory means of reaching a stable and secure housing situation. However, the overrepresentation of social housing may also reflect first-generation immigrants' weaker socioeconomic standing, and their difficulties to get access to other forms of housing tenure, particularly homeownership. Immigrants face challenges in the Finnish labour market (e.g. Valtonen 2001), which limits their income: the immigrant-native gap in employment, especially at arrival to Finland, has been considerably larger than in Australia, Canada or the U.S., and also wage growth has been slower than in Canada and the U.S. (Sarvimäki 2011).

Dependency on rental dwellings affects immigrants' spatial distribution in the HMA (Kauppinen 2002; Vilkama 2011). Highest concentrations of immigrants are found in neighborhoods with high proportions of rental dwellings. However, the segregation levels are not very high. Due to extensive social and tenure mixing, the housing stock of the HMA neighborhoods tends to be rather mixed, i.e. there is a considerable amount of owner-occupied and rental dwellings in almost all neighborhoods. The spatial distribution of owner-occupied dwellings is therefore unlikely to affect immigrants' entry to homeownership to a large extent.

Study Design
Focus on migrants starting as renters
We restrict our analysis to migrants to the Helsinki metropolitan area (HMA). This enables us to start the follow-up in a similar way for all cases: from the arrival to the HMA. We also see native migrants to the HMA as a better comparison group than the whole native population. Our second restriction is to focus on those migrants who did not immediately end up living in owner-occupation. This is done for three reasons. First, this helps us further to define the baseline of the follow-up unambiguously: having just arrived to the HMA but not yet living in owner-occupation. We could not otherwise observe everyone in the same baseline situation, especially since many immigrants have moved to the HMA directly from abroad. Second, some of those immediately ending up in owner-occupation, especially among refugee groups, may be living temporarily for example with their relatives while searching for housing. Third, this allows us to measure lagged explanatory variables already in the first year of the follow-up for everyone.

These restrictions might cause some bias to our estimates, but sample-selection models were not feasible, because for immigrants moving directly to the HMA from abroad we did not have data preceding the move. We do not claim that our results can be generalized to the whole population of the HMA or to all *potential* migrants to the HMA.

Data
The dataset is based on data from various administrative registers, such as the population and tax registers, linked together in Statistics Finland (contract TK-52-1520-10). It represents those individuals who moved to the HMA during the years 1991–2005 while being 18–49 years old.[2] We use individuals as analytic units, as households cannot be easily followed through time. We restrict our analysis to natives and non-Western immigrants (see the definition of Western immigrants in Appendix table 1), as Western immigrants often stay in Finland only temporarily and their income data may be less reliable. A stratified random sample consisting of a 10-per-cent sample of Finnish-born and a 33-per-cent sample of foreign-born is used. As the data are based on comprehensive official registers, we avoid the problems of non-response and attrition inherent in survey-based data, although some under- and over-coverage of immigrants can be expected. The dataset includes 10,390 foreign-born and 23,063 native-born persons, with data from all years between 1990 and 2008, if they were living in Finland. The persons were followed until the move to homeownership or the year 2008. If the person left the larger Uusimaa region around the HMA (a proxy for a housing market region), the follow-up ended in right-censoring, so only those years were included when the person lived within this region. Those who lived in Finland for less than two years after the year of the migration to the HMA were not included in the data at all.[3]

The dependent variable is *entry to homeownership*. We measure, whether the housing tenure in the end of the follow-up year is owner-occupation (0=no, 1=yes).

Immigrant status is measured by *country of birth*. Because some ethnically Finnish persons are born in other countries, we removed the native speakers of Finnish, Swedish, and Sami languages from the remaining immigrant groups (with the exception of Finnish speakers born in Russia and Estonia, see Overview of Immigrants' Housing Position…). The categories of the variable are shown in Appendix table 1.

Our explanatory variables are typical to studies explaining differences in homeownership rates: we measure especially economic resources and demographic characteristics. We exploit the longitudinal structure of the data, however, by measuring the variables in a dynamic way, by including information from several years. Some of the explanatory variables include measurements from the same year as the dependent variable, which may cause uncertainty regarding the direction of causality. However, our first priority was to measure the differences in the economic and demographic characteristics between the country-of-birth groups as comprehensively as possible.

The analyses focus on the role of *economic resources*. These include household income and the individual's recent employment history and earnings (work income). Household income is a basic determinant of homeownership. Employment history and earnings partially determine the household income, but they also enable a more accurate measurement of the economic resources and their dynamics.[4] The exact way of measuring these variables is shown in Appendix table 1. Magnitudes of the correlations between the income variables vary mostly between 0.04 and 0.43, but lagged household income and current earnings have correlations of 0.61 with the current household income. We have used correlated measures, because we aimed for the most comprehensive measurement of the economic resources, even though this affects the easiness of the interpretation of the estimates.

Demographic characteristics are important determinants of housing needs. Our analyses do not focus on them, but we control for the age and sex of the person, and the numbers of adults and children in the household (see Appendix 1, Table 6). We did not include marital status, as we prioritized the measurement of the dynamics in the household size, and changes in marital status are strongly linked to these dynamics.

Temporal variables include the *follow-up year* (a dummy variable for each year) and the *period* (1992–1994 / 1995–1996 / 1997–1998 / 1999–2000 / 2001–2002 / 2003–2004 / 2005–2006 / 2007–2008). We do not measure the duration of stay in Finland before moving to the HMA, because it would not make sense to explain the difference to natives by something that is relevant almost solely to immigrants. Furthermore, this variable does not have much variation: most immigrants do not have any years of residence in Finland before migrating to the HMA (63% to 84%, depending on the country of birth, average number of years varying between 0.8 and 1.5 years).

Some relevant characteristics, such as language abilities and housing prices, could not be measured, as we were dependent on data recorded in official registers.

Methods

Survival curves are used to depict the duration of entering homeownership in each country-of-birth group. These curves show, how quickly the proportion still having not entered homeownership declines. Survival curves are constructed as syntheses of all the migration cohorts in the data.

The impact of the explanatory variables on the risk of entry to homeownership during a single year of the follow-up is analysed by means of discrete-time survival analysis. We apply logistic regression to a person-year dataset. The effects of explanatory variables are shown as average marginal effects (see e.g. Mood 2010). For categorical variables, these show the average difference in the predicted probability of entering homeownership between each category and the reference category, conditional on the other variables in the model. For the continuous income variables they show the average 'instantaneous rate of change', approximating the effect of a unit change in the variable. We show them multiplied by 100, i.e. as percentage points. Stata 12.1 was used for the analyses.[5]

The models are run separately for each country-of-birth group. Therefore, as the Finnish-born and the foreign-born strata were not combined in the analyses, we did not need to take the stratified sampling design into account.

We apply statistical decomposition when looking at how much the different compositions of the foreign-born groups and the natives explain the differences in the rate of entry to homeownership. Some earlier studies have applied decomposition methods in cross-sectional designs (Bourassa 1994; Chua and Miller 2009; DeSilva and Elmelech 2012), but these are not suitable for survival modeling, so we apply a new method designed for survival analysis. The Stata module DThazdecomp (Yoshioka 2010) was used for the decomposition. It is based on the methods proposed by Powers and Yun (2009, see pp. 257–258) and on the Stata module mvdcmp (Powers et al. 2011, see p. 18), which does multivariate decomposition for nonlinear response models. These methods are extensions of the widely used Oaxaca-Blinder decomposition method for linear regression.

The decomposition analysis utilizes output from discrete-time survival models (from a specification omitting intercept terms i.e. with a dummy for each follow-up year). It shows, how much the gap in the probability to enter homeownership between the Finnish-born and each foreign-born group would be reduced, if the Finnish-born group were given the foreign-born group's distribution of explanatory variables. The effects of these variables are expected to remain as they are observed among the Finnish-born. If no gap remains after this operation, the compositional differences might be the only reason for the observed gap. The gap is decomposed into contributions of the temporal variables, demographic characteristics, and economic resources.

Results
Differences in the Duration until Entering Homeownership
Table 2 shows the proportion in each country-of-birth group attaining homeownership immediately in the year of migration to the HMA. This proportion is highest (22%) among Finnish-born and varies between 12% and 21% among non-Western immigrants. The proportion is lowest among those born in Sub-Saharan Africa. In all groups, a clear majority of the new migrants start their housing careers from other tenures than homeownership. In the rest of the analyses, we follow only these 'typical' migrants who did not immediately end up living in owner-occupation.

<Table 2 here>

Figure 1 provides the answer to the first research question. It shows, by follow-up year and country of birth, what proportion of those persons who started from other tenures has still

not entered homeownership. The curves are drawn for each group up to the last follow-up year with still at least 100 persons in the follow-up.

<Figure 1 here>

Clear differences between the groups can be observed. The Finnish-born proceed to homeownership most rapidly. In the other extreme, those born in Sub-Saharan Africa are a distinct group with an estimated 15% entering homeownership in 15 years of follow-up. Within this group, this proportion is only 5% for those born in Somalia. Among the Finnish-born, the median number of years that it takes to enter homeownership (the follow-up year when at least 50% have entered) is seven. Among the fastest progressing immigrant group, Other Asia, the median duration is 11 years. In addition, almost half (49.8%) of the Russians have entered homeownership after 16 follow-up years. For other groups, the follow-up is not long enough or there are too few cases to make reliable estimations on the median duration until entering homeownership.

As 14% of the follow-ups among immigrants and 4% among the natives end in emigration (or death), those planning to emigrate might cause bias in Figure 1. However, when the figure was created for only those who remained in Finland for at least five years after the year of migration to the HMA, very little changed. The proportion having not entered homeownership by the 10th follow-up year increased by 2–3 percentage points in the Eastern European groups and by 0–1 percentage points in the other groups.

Differences in the Composition
Figure 1 showed that in all groups, there is progression towards homeownership, but there are clear differences between the groups in the speed of the progression. These differences can be expected to be related especially to differences in the demographic and socioeconomic characteristics.

Table 3 shows that there are indeed such differences. It shows the distributions of the categorical explanatory variables and means of the income variables in each group. The distributions and means have been calculated from person-years in the data.

Stable employment history is much less common in all immigrant groups than among the Finnish-born. This observation is most pronounced among those born in Africa or West Asia, who were also the slowest to move to homeownership. Among immigrants, Estonians have been employed the most, which is at odds with their rather slow progression to homeownership. The Finnish-born have, on average, higher earnings and household income than any immigrant group, while East Europeans have higher earnings and household income than the Africans and Asians. Immigrants seem to have, on average, a more positive recent earnings development than the Finnish-born, but as earnings are measured on the log scale, this reflects *relative* changes in earnings. When measured in euros, the natives have the most positive development.

All immigrant groups, but especially the East European groups, have an older age structure than the Finnish-born migrants. All immigrant groups also have larger households than the Finnish-born.

These compositional differences suggest that immigrants have less economic resources available. In addition, immigrants have on average more household members to share these resources. We will now turn to examine whether these differences are enough to explain the observed differences in entering homeownership.

<Table 3 here>

Do Differences in Composition Explain the Differences in the Entry to Homeownership?
The analysis for our second research question was conducted by decomposing the contributions of explanatory variables on the explanation of the gap in the average predicted probability of entering homeownership between the Finnish-born group and each of the immigrant groups (see Methods).

Table 4 shows how much the gap between the Finnish-born and each foreign-born group would be reduced if the Finnish-born migrants were given the foreign-born migrants' distribution of explanatory variables. Contributions of temporal, demographic, and economic variables are shown separately in addition to the total contribution of all explanatory variables. The contributions are shown both as percentages of the original gap (the '%' columns) and as absolute probability values (the 'P' columns). For example, if we look at the 'Russia' column, we can see that the gap between the Finnish-born and the Russian-born migrants would be reduced by 73% (4.0 percentage points of the observed 5.5 percentage-points gap) if the Finnish-born had the same distributions of the measured background characteristics as the Russian-born. Furthermore, if only economic resources were changed, 55% of the gap would be 'explained'.

<Table 4 here>

The decomposition analysis (Table 4) produces five main results. First, in all groups except the Estonians, a majority of the gap can be explained by different distributions of the measured background characteristics. Second, the explanation is mostly related to economic resources. The demographic differences explain more of the gap among the East-Europeans than among the African and Asian groups. Third, the explained part varies between groups, from 46% among the Estonian-born to 73% among the Russian-born, and there remains a statistically significant unexplained gap in all groups. Fourth, differences in the temporal characteristics do not matter much. Fifth, the remaining unexplained gap is largest in terms of probability units among those born in Sub-Saharan Africa and Estonia.[6]

A variable-specific inspection of the decomposition results is not done for the economic variables due to high interdependencies of the variables. In the case of the demographic variables, it is mostly the differences in the age structure that contribute to the demographic explanation of the gap among the Russian- and Estonian-born. These migrant groups have a clearly older age structure than the Finnish-born migrants or the other foreign-born groups (Table 3), and that partly explains their lesser entry to homeownership (cf. Borjas 2002). In the other groups, the contribution of the demographic variables is more equally related to the age structure and the household size variables.

As most of the immigrants have immigrated directly to the HMA, and an initial adjustment period can be expected after immigration, a part of the gap observed in Table 4 could be caused by this initial 'shock'. We tested this by running the analyses with a shorter five-year follow-up, whereby we expected the economic and demographic characteristics to have less explanatory power. We found that the explained share was indeed reduced in all groups, the least in the Sub-Saharan group and the most in the Other Asia group.[7] This indicates that the 'initial shock' explanation is somewhat relevant, especially for the Other Asia group. The small change among the Sub-Saharan group may be due to a high share of this group coming as refugees and settling initially to other parts of Finland due to a refugee dispersal policy. An alternative

explanation for the lesser explanatory power in the shorter follow-up might be that the data include more such immigrants that plan to emigrate from Finland. This does not seem to be the primary reason, however, as the highest share of follow-ups ending in emigration (26%) is found among the Sub-Saharan group and the Other Asia group does not have a particularly high proportion of emigrants (16%).

Variation in the Effects of Explanatory Variables
Decomposition analysis shows that the differences in entering homeownership cannot be explained entirely by the compositional differences. This indicates that the economic and demographic background characteristics do not predict entry to homeownership in the same way for all groups. Table 5 illustrates this by showing the results from models run separately for all groups. The effects are shown as average marginal effects.

<Table 5 here>

The results for the *Finnish-born* migrants show that higher household income predicts increased probability of entering homeownership. Employment history also has an effect, even when household income is controlled for: continuous employment increases the chances to enter homeownership. Interpretation of the effects of other income variables besides the current household income is rather complicated due to the inter-dependencies between these variables.[8] Our interpretation is that recent increases of earnings and household income predict increased probability of entering homeownership, as does having other income sources in the household besides own earnings.

Demographic variables, particularly age, also have strong effects. The 25–29-year-olds have the highest probability of entering homeownership and the 50-year-olds and older the lowest. Finnish-born migrants enter homeownership more commonly when they have underage children in the household. The effects of previous year's numbers of adults and children have to be interpreted by taking into account that the current year's numbers are controlled for: therefore, these effects indicate that increases in the numbers of adults or children predict increased probability of entering homeownership, i.e. as households get bigger they tend to enter homeownership.

When looking at the results among the *foreign-born* migrant groups, differences with the Finnish-born can be observed. Among all immigrant groups, except the Sub-Saharan immigrants, the recent employment history seems to matter more than among the Finnish-born. On the other hand, household income seems to have a much weaker effect among non-Western immigrants than among natives, being weakest in the Sub-Saharan group and strongest among the Other East Europe and Other Asia groups. As income is measured on the log scale, this means that among natives, the same *relative* difference in household income has a stronger effect than among immigrants. If *absolute* values are used for all income variables instead, the order between the groups is the same but the difference between the natives and the immigrants is much smaller.[9] Therefore, the household income effect is stronger among natives than among immigrants, but the apparently large difference in the magnitude is partly due to different income distributions, natives having higher income on average.

Considering the demographic variables, the Sub-Saharan group is, again, an exception. In other immigrant groups, age either has a similar effect as among the natives or not much of an effect, but older age seems to *increase* the probability of entering homeownership among those

born in Sub-Saharan Africa, at least in our sample. Both African groups are also exceptions regarding the household structure, as those with children are *less* likely to enter homeownership.

Conclusions

The main aim of this paper was to extend the research on the homeownership gap between natives and immigrants in Western countries by using a longitudinal design. We set out to assess especially the explanatory power of economic resources considering the gaps in the entry to homeownership between natives and non-Western immigrants. Due to the short immigration history in Finland, we were able to follow all cases from the year of migration to the Helsinki metropolitan area and still incorporate most of the immigration to the area.

The results show, that in all country-of-birth groups there is progression towards homeownership. The speed of the progression varies across groups, however, and it is slower among all immigrant groups than among the natives. Immigrants from Asia (excluding West Asia) are the fastest progressing non-Western group, similarly to many previous studies (see e.g. DeSilva & Elmelech 2012; Painter et al. 2004), and Sub-Saharan Africans are a distinct group with clearly the slowest progression. Therefore, disparities in homeownership are not only due to differences at arrival (cf. Haan 2007), but entry rates differ as well. The results from decomposition analysis show that the majority of the gaps in entry to homeownership between the natives and non-Western immigrants can be explained by the observed differences in economic and demographic characteristics. Economic resources are especially important: over half of the gap with the natives can be explained by the lesser economic resources in all other groups except Estonians.

If differences in economic resources between an immigrant group and the natives are considered as an indicator of economic assimilation, we can conclude that the gaps in the risk of entry to homeownership are to a large extent a function of economic assimilation. However, we could not explain everything. Additional explanations are needed especially for the Sub-Saharan Africans and the Estonians. The gaps in their rates of entry to homeownership compared to the natives remain considerable even when demographic and economic characteristics are controlled for.

The immigrants from Sub-Saharan Africa have entered homeownership clearly less than those from North Africa and West Asia, even though their economic resources have been similar. Especially among Somalis, this may reflect plans to re-migrate or a lack of religiously sensitive mortgage alternatives.[10] Also ethnic discrimination might have a role, but there are no studies in the Finnish context on the constraining effects of discrimination on homeownership. Previous Finnish studies have suggested that preferences for homeownership do not generally differ much between the immigrants and the natives (Dhalmann 2011; Kepsu et al. 2009).

In the case of Estonians, intentions to return to Estonia may be an important explanation for the gap with the natives. Estonia is a smaller neighboring country and many Estonians travel frequently across the border. Some may have a home and family in Estonia, and they may have intentions to return there.[11] In this respect, their housing market behavior seems to parallel that of New Zealanders in Australia (Bourassa 1994; Chua and Miller 2009).

Direct comparison of our results with previous studies is complicated, as earlier studies have mostly explained the current tenure, using cross-sectional data without retrospective data on socioeconomic and family dynamics, and only few studies have directly assessed how much for example economic resources contribute to the homeownership gap. However, the contribution of economic resources seems to be pronounced in our analysis. This is clear especially when our

results are compared to the two Australian studies (Bourassa 1994; Chua and Miller 2009) that have conducted a similar decomposition analysis with cross-sectional data. In these studies, the number of years since immigration has turned out as much more important than the current sociodemographic characteristics. However, the number of years since immigration is a proxy for something unobserved. Additionally, it is a rather rough proxy, assuming a uniform effect within an immigrant group, and not taking into account the heterogeneity in the economic and demographic trajectories. We measured the economic and family dynamics throughout the housing career, and we were able to explain majority of the gaps in entry to homeownership by differences in these dynamics. In cross-sectional studies with years since immigration as an explanatory variable, the significance of these dynamics may be underestimated, if the effect of the years since immigration is interpreted in terms of *cultural* assimilation. This is a danger also when this variable is used in longitudinal studies, if left-censoring is present, i.e. when many immigrants have been in the country for a long time before the baseline year (e.g. Davidov and Weick 2011). Furthermore, although variation in immigration experiences can explain differences between *ethnic groups* (e.g., DeSilva and Elmelech 2012), differences between *immigrants and natives* should not be explained by something applicable only for immigrants.

In addition to methodological questions, reasons relating to the short immigration history of Finland, economic cycles, and the welfare state context might explain why there are considerable differences in the entry to homeownership between groups and why differences in economic resources explain so much. Lack of established co-ethnic communities as a resource, i.e. lack of one potential incorporation pathway (Haan 2007), may have slowed down the progress to homeownership in some groups. Furthermore, economic assimilation of immigrants may be expected mostly during economic growth (Alba and Nee 2003), but there was a deep recession in Finland in the 1990s, and most immigration especially during the 1990s was not work-related. Therefore, starting a work career has been a challenge for many immigrants, leading to low economic resources. Sarvimäki (2011) connects the comparatively poor labor market performance of immigrants in Finland also to the highly regulated labor market and extensive welfare system, echoing the claims that the Nordic welfare states have been unsuccessful in integrating immigrants to the labor market (see Hjerm 2005; Nannestad 2007; Brochmann and Hagelund 2011).

Regarding the local context, the relatively large social housing sector in the Helsinki metropolitan area may be an important contextual factor. This is a more important sector for immigrants than for example in the U.K. (Nygaard 2011). As the region lacks a cheap semi-dilapidated owner-occupied sector, and some groups are concentrated in the urban core of the region, where housing prices are high (cf. DeSilva and Elmelech 2012; Kim and Boyd 2009; Sinning 2010), social housing may be an attractive way of reaching a secure housing situation.

Our results suggest that increases in homeownership among most non-Western immigrant groups in the Helsinki metropolitan area can be expected to largely reflect the rate of immigration and the accumulation of economic resources. However, our follow-ups were rather short, and we analyzed the contributions of different factors to the *average* gaps between immigrants and natives in entry to homeownership during the follow-ups. The contributions might depend on the duration of stay in the region. They might also differ by immigration cohort (cf. Haan 2007). These questions and analysis of *exits* from homeownership are left for further studies. Further longitudinal studies in other contexts would also help in assessing, how much our results are affected by the methodological choices and how much by contextual factors.

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Notes

1. The socioeconomic resources can themselves be influenced for instance by cultural factors, stratification processes in the labor market, and welfare state arrangements, but we focus here on the housing market processes.

2. Each individual's *first* move to the HMA between the years 1991 and 2005 was selected. The data include only those migrants, who were not in a child's position in a family in the end of the year of their migration to the HMA.

3. In the remaining sample, 4% of the natives' follow-ups and 14% of the immigrants' follow-ups end in emigration (or death). This share is highest among those born in Sub-Saharan Africa (26%) and lowest in the Eastern European groups, notably Russia (9%).

4. Educational level is often used as a proxy of expected long-term income (cf. Alba and Logan 1992; DeSilva and Elmelech 2012), but we do not use it, as it is not measured reliably for immigrants in the Finnish registers. We did not have data on wealth available, either.

5. We also tried models with random effects at the individual level, but statistically significant random effects were identified only among the natives, and these models yielded almost exactly the same coefficients and significance levels than the models reported here.

6. When the decomposition was done separately by sex, with 10-year follow-ups, it turned out that a higher share of the gap can be explained in the case of *females* in all groups (55–77% among females, 36–68% among males), with both demographic and economic characteristics explaining more. The order of the groups is approximately the same for both sexes.

7. Explained share: Russia 59%, Estonia 33%, Other East Europe 45%, North Africa and West Asia 60%, Sub-Saharan Africa 58%, Other Asia 23%.

8. As the household income of the current year is controlled for, the effect of the household income of the previous year actually shows the effect of a *decrease* in household income between the previous and the current year. This is because increasing the previous year's income while keeping the current year's income fixed means that between the years, income decreases. Similarly, the effect of current earnings shows the effect of increasing the share of the total household income that comes from this person's earnings.

9. With absolute income values, a 1,000 EUR higher household income has an average marginal effect of 0.16 percentage-points among natives and between 0.04 (Sub-Saharan Africa) and 0.12 (Other East Europe) among immigrants.

10. 26% of the Sub-Saharan group and 32% of Somalis left Finland – or died – during the follow-up.

11. However, only 13% of the Estonians included in our sample left Finland during the follow-up. Pungas et al. (2012) found that 24% of the Estonians in Finland have intentions to return, with 'income migrants' working in jobs below their educational qualifications especially prone to having such intentions.

Table 1. Tenure Distribution of Residents in the Helsinki Metropolitan Area by Native Language, December 31, 2008 (Statistics Finland 2010).

Native language	Owner-occupied house %	Owner-occupied condomi-nium %	Private rental %	Social rental %	Other %	Total %	N
Finnish or Swedish	12	48	15	19	5	100	908,153
Foreign-language-speaking in total	3	21	19	52	5	100	83,733
West European languages	7	36	23	26	8	100	13,556
Russian[1]	3	22	17	53	5	100	19,078
Baltic languages	3	14	25	52	6	100	10,399
Other East European languages	3	24	19	50	4	100	6,003
North African and West Asian languages	2	15	17	61	4	100	10,622
Sub-Saharan African languages	0	3	13	82	2	100	10,185
Other Asian languages[2]	3	27	19	46	5	100	12,267
Other or unknown	1	16	14	66	3	100	1,623
Residents in total	11	46	16	22	5	100	991,886

[1] including native speakers of other languages from the former Soviet Union, except Baltic languages

[2] excluding West Asian languages

Table 2. Housing Tenure by Country of Birth in the End of the Year of Migration to the Helsinki Metropolitan Area, 18–49-years-old Migrants during 1991–2005.

Country of birth	Total N (sample)	Owner-occupation			Other tenure		
		N	%	95% C.I.	N	%	95% C.I.
Finland	23,063	4,974	22	(21 - 22)	18,089	78	(78 - 79)
Non-Western countries	10,390	1,711	16	(16 - 17)	8,679	84	(83 - 84)
Russia	2,751	480	17	(16 - 19)	2,271	83	(81 - 84)
Estonia	1,599	228	14	(13 - 16)	1,371	86	(84 - 87)
Other East Europe	1,082	205	19	(17 - 21)	877	81	(79 - 83)
North Africa and West Asia	1,662	239	14	(13 - 16)	1,423	86	(84 - 87)
Sub-Saharan Africa	1,387	162	12	(10 - 13)	1,225	88	(87 - 90)
Other Asia	1,909	397	21	(19 - 23)	1,512	79	(77 - 81)

Note: Only those migrants are included, who were not in a child's position when migrating, and who lived in Finland at least for the next two years.

Table 3. Distributions of the Categorical Explanatory Variables and Means of the Income Variables by Country of Birth.

		Finland	Russia	Estonia	Other East Europe	N. Africa and W. Asia	Sub-Saharan Africa	Other Asia
Period	1992-1994	5	7	8	4	5	7	5
	1995-1996	8	9	9	5	7	10	6
	1997-1998	11	11	10	8	9	11	8
	1999-2000	14	13	11	11	11	13	10
	2001-2002	16	15	13	15	13	14	13
	2003-2004	17	17	16	19	17	15	18
	2005-2006	16	17	18	20	20	17	22
	2007-2008	12	13	14	17	18	14	17
Age	18-24	21	5	7	7	8	10	8
	25-29	31	14	15	20	20	23	24
	30-34	20	18	18	24	26	26	27
	35-39	11	19	18	20	22	21	20
	40-44	7	17	16	14	13	12	12
	45-49	5	14	14	9	7	6	6
	50+	4	12	11	6	4	3	3
Sex	Female	53	64	57	47	36	46	59
	Male	47	36	43	53	64	54	41
# adults in the household, current year [1]	1	33	22	19	15	20	20	14
	2	58	59	56	66	64	55	56
	3	6	14	17	12	10	15	15
	4+	3	5	8	6	5	9	15
# children in the household, current year [1]	0	74	41	45	38	39	33	48
	1	13	33	27	20	20	15	27
	2	9	21	20	21	21	13	17
	3	3	4	6	12	11	12	5
	4+	1	1	2	9	9	27	2
Employed now or previously? (this and the previous two years)	Not now or previously	13	41	29	44	53	56	43
	Now, not previously	7	9	9	9	9	8	8
	Now and one year ago	11	9	11	10	8	7	11
	Now and one and two years ago	57	28	40	25	19	16	25
	Other one year employed	6	7	7	7	7	8	7
	Other two years employed	7	5	5	5	5	5	5
TOTAL, %		100	100	100	100	100	100	100
Means of the income variables:								
Change in log earnings in the previous year		0.207	0.302	0.275	0.306	0.380	0.411	0.337
Change in log earnings in the current year		0.130	0.280	0.247	0.289	0.317	0.324	0.314
Log earnings, current year		9.967	9.120	9.267	9.053	8.784	8.948	8.096
Log household income, previous year		10.461	9.959	10.180	9.999	9.747	9.758	9.758
Log household income, current year		10.588	10.114	10.353	10.178	9.897	9.936	9.882
N (follow-up years)		85,379	16,419	9,363	5,399	8,657	8,376	7,999

1 Similar variable referring to the previous year is omitted from the table due to very similar distributions.

Table 4. Decomposition of the Gap between the Finnish-born and the Foreign-born Groups in the Average Probability of Entering Homeownership during a Single Year in the Follow-up, Contribution of Each Variable Group to the Gap in Terms of Probability Units (P) and Percentage of the Gap (%).

	Russia		Estonia		Other East Europe		North Africa and West Asia		Sub-Saharan Africa		Other Asia	
P(enters homeownership)	0.038		0.030		0.047		0.029		0.013		0.060	
Gap to natives	0.055		0.062		0.046		0.064		0.080		0.033	
Variable group	P	%	P	%	P	%	P	%	P	%	P	%
Follow-up year	-0.002	-4	-0.003	-5	-0.002	-4	-0.002	-4	-0.003	-3	-0.001	-2
Period	-0.002	-3	-0.004	-7	-0.004	-10	-0.004	-6	-0.002	-2	-0.002	-6
Demographic characteristics	0.014	26	0.018	28	0.009	20	0.008	12	0.009	11	0.003	9
Economic resources	0.030	55	0.018	29	0.026	56	0.043	66	0.043	54	0.019	55
TOTAL EXPLAINED GAP	0.040	73	0.029	46	0.029	62	0.044	69	0.048	60	0.019	55
Remains unexplained	0.015		0.033		0.017		0.019		0.032		0.014	
95% confidence interval	(0.011 - 0.019)		(0.029 - 0.038)		(0.011 - 0.024)		(0.015 - 0.024)		(0.028 - 0.036)		(0.007 - 0.022)	

Table 5. Effects of Explanatory Variables on the Entry to Homeownership by Country-of-birth Group, Average Marginal Effects (*100).

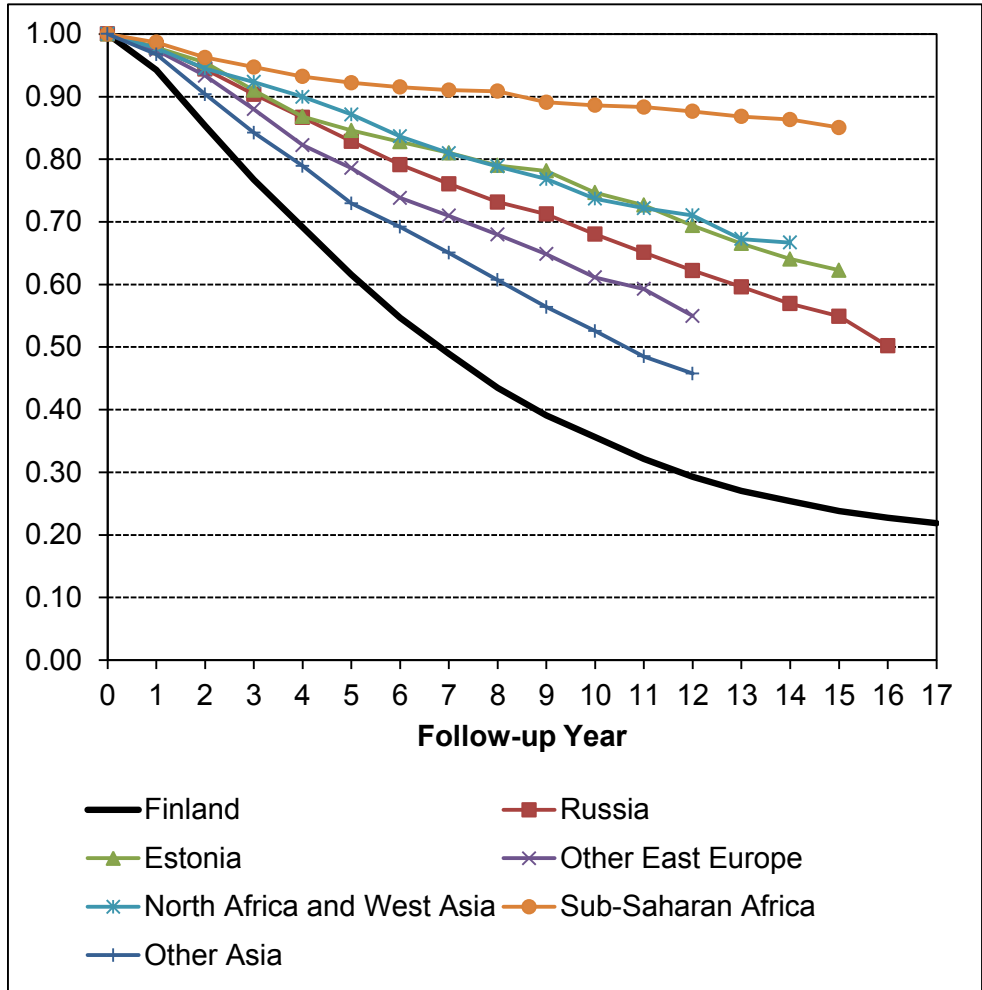|	Finland	Russia	Estonia	Other East Europe	N. Africa and W. Asia	Sub-Saharan Africa	Other Asia
Follow-up year (ref.=1)							
2	4.08 ***	1.34	0.04	2.58 *	0.74	1.23 **	3.67 **
3	4.15 ***	1.95 **	2.21 **	3.21 *	-0.18	0.65	3.59 **
4	3.61 ***	1.69 *	2.55 **	3.88 **	0.09	0.69	2.95 *
5	3.85 ***	1.93 *	1.00	2.02	0.62	0.15	3.84 **
6	3.76 ***	2.06 **	0.83	3.90 **	1.32	-0.24	1.79
7	3.14 ***	1.56	0.76	1.40	0.84	-0.55	2.70
8	3.89 ***	1.70 *	1.02	2.83	0.36	-1.70	3.66 *
9	3.36 ***	0.12	-1.43	3.22	0.10	1.09	4.52 **
10	2.37 **	1.94 *	2.50 *	3.82 *	1.33	-0.37	3.96 *
11	3.37 ***	1.64	0.83	1.00	-0.49	-1.37	4.33 *
12	3.18 ***	1.43	2.13 *	5.31 **	-1.33	-0.16	1.85
13	2.31 *	0.97	1.88	2.79	2.16	-0.04	4.09
Period (ref.=2007-2008)							
1992-1994	-2.66 ***	-3.28 ***	-0.92	-2.52	0.25	0.57	-4.93 **
1995-1996	-3.36 ***	-2.05 **	-2.91 **	-4.71 *	0.28	0.31	-1.67
1997-1998	-3.15 ***	-1.51 *	-3.98 ***	-4.06 **	-0.18	0.20	-1.41
1999-2000	-3.56 ***	-2.66 ***	-2.79 **	-4.60 ***	-1.05	-0.65	-3.93 **
2001-2002	-1.11 **	-2.19 ***	-1.08	-3.85 ***	-0.51	-0.80	-1.79
2003-2004	-1.11 **	-1.36 **	-1.02	-2.30 **	-0.34	0.21	-2.75 **
2005-2006	2.11 ***	0.55	0.67	0.26	1.18 *	0.10	1.30
Age (ref.=18-24)							
25-29	2.43 ***	-0.50	1.06	1.72	-0.95	0.21	-0.56
30-34	1.21 **	0.42	0.33	2.10	0.04	0.49	-0.12
35-39	-1.06 *	-0.53	-0.84	1.01	0.57	0.19	-0.50
40-44	-3.41 ***	-0.83	-1.33	0.48	0.11	0.63	-0.45
45-49	-4.01 ***	-1.76 *	-1.87 *	0.19	-1.85	0.88	0.62
50+	-7.03 ***	-3.21 ***	-3.12 **	-7.51 **	-0.73	0.36	-1.52
Sex (ref.=Female)							
Male	-0.29	-0.38	-0.42	-1.13	-0.53	0.26	-1.01

(continues)

Table 5. *(continued)*

	Finland	Russia	Estonia	Other East Europe	N. Africa and W. Asia	Sub-Saharan Africa	Other Asia
# adults in the household, previous year (ref.=1)							
2	-0.89 **	-0.14	-1.02	-0.17	-0.81	-0.19	1.60
3	-1.61 **	-0.15	-0.87	0.19	-1.46	0.02	0.54
4+	-1.30	0.13	-0.66	-0.54	-1.61	-0.08	1.65
# children in the household, previous year (ref.=0)							
1	-3.43 ***	-1.46 *	-1.38	0.38	1.29	0.74	-2.04 *
2	-5.27 ***	-2.20 *	-2.65 **	-1.06	0.77	1.29 *	-1.86
3	-7.18 ***	0.44	-3.02	-4.71 *	0.04	1.13	-5.88 *
4+	-5.08 **	1.94	1.50	-1.14	-1.67	1.35	1.19
# adults in the household, current year (ref.=1)							
2	-0.46	-0.73	0.57	-2.34	0.62	-0.10	-1.77
3	-0.74	-1.11	-0.92	-2.70	1.05	-0.43	-1.11
4+	-2.28 **	-1.46	-1.24	-1.49	1.83	-1.91 *	-3.91 *
# children in the household, current year (ref.=0)							
1	3.44 ***	1.35 *	1.55 *	-0.51	-1.54 *	-0.47	1.78 *
2	4.08 ***	1.51	2.23 *	-0.07	-2.32 *	-1.89 **	2.15
3	5.90 ***	-2.55	0.69	2.19	-2.00	-1.32	2.67
4+	4.57 **	-4.91	-1.56	-3.56	-1.73	-3.06 **	-0.85
Employed now or previously? (ref.=Not employed now or during the two previous years)							
Now, not previously	0.49	-0.95	0.80	2.13	1.19	0.29	1.55
Now and one year ago	0.61	1.63 **	0.98	2.64 *	1.30	0.78	2.78 *
Now and one and two years ago	1.85 ***	2.56 ***	1.92 *	2.88 **	2.23 ***	0.60	3.88 ***
Other one year employed	0.01	0.90	1.78 *	-0.63	0.73	-0.42	-0.24
Other two years employed	1.62 **	0.48	1.61	1.75	2.28 **	0.02	4.29 **
Change in log earnings, previous year	0.31 **	0.20	0.13	-0.08	0.10	-0.05	-0.01
Change in log earnings, current year	0.29	0.08	-0.11	0.21	0.03	0.25 **	0.24
Log earnings, current year	-0.76 ***	-0.42 ***	-0.05	-0.45 *	-0.16	-0.16	-0.12
Log household income, previous year	-1.29 ***	-0.30	-0.59 **	-0.76 **	-0.17	0.06	-0.38
Log household income, current year	11.03 ***	3.59 ***	2.91 ***	5.56 ***	2.49 ***	1.54 ***	5.01 ***
N (person years)	85,379	16,419	9,363	5,399	8,657	8,376	7,999
Pseudo R square	0.10	0.11	0.12	0.17	0.11	0.16	0.12

* $p < .05$; ** $p < .01$; *** $p < .001$

Figure 1. Proportion Having Not Entered Homeownership by Follow-up Year, by Country of Birth.

Appendix table 1. Measurement of the country-of-birth, household size, and economic variables.

Country of birth
We group countries into the following categories:
1) Finland
2) Other Western countries (other West Europe, America, Oceania) (Europe is divided into West and East Europe by defining the countries belonging to the eastern bloc during the Cold War as East Europe, while the rest of Europe belongs to the West Europe)
3) Russia (including the former Soviet Union)
4) Estonia (including also all those with Russia or former Soviet Union as country of birth, if either citizenship or native language was Estonian when moving to Finland)
5) Other East Europe
6) North Africa and West Asia (North Africa = Morocco, Tunisia, Algeria, Egypt, Sudan, Libya; West Asia = Afghanistan, Armenia, Azerbaidzhan, Bahrain, Georgia, Iraq, Iran, Israel, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Lebanon, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Syria, Tajikistan, Turkey, Turkmenistan, United Arab Emirates, Uzbekistan, Yemen)
7) Sub-Saharan Africa
8) Other Asia

Household size variables
We measure the numbers of adults and children in the household in the current and previous years. Persons 18 years old or older are considered adults and all persons less than 18 years old are considered children. The variables are used as categorical variables, and the categories are shown in tables 3 and 5. Please note that the previous year's household is not necessarily the same household as the current one.

Recent employment history
We measure the 'main type of activity' in the end of the current year and the two previous years (employed / not employed) and combine the values from the three years into one composite variable (categories shown in tables 3 and 5).

Income variables
All income values were adjusted by the consumer price index to the 2008 prices.
We measure the current year's earnings and household income and the recent changes with the following variables:
Log earnings, current year = natural logarithm of (earnings of the current year in EUR + 1)
Change in log earnings in the current year = (log earnings in the current year) - (log earnings in the previous year)
Change in log earnings in the previous year = (log earnings in the previous year) - (log earnings two years ago)
Log household income, current year = natural logarithm of (taxable household income of the current year in EUR + 1)
Log household income, previous year = natural logarithm of (taxable household income of the previous year in EUR + 1)