

Ethnic Neighborhood Segregation and the Dynamics of Residential Mobility among Immigrants and Natives: Panel Evidence from Norway, 1993–2013

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ABSTRACT

This study examines the relationship between ethnic neighborhood composition and residential mobility among natives and immigrants in Norway. Using longitudinal panel data covering more than two decades, we measure year-to-year mobility from one neighborhood to another and estimate the effect of the initial neighborhood's ethnic composition on the probability of moving out. The panel structure of our data allows us to use fixed-effects techniques to adjust for selection biases related to unobserved characteristics at both the neighborhood and individual level. Our preliminary findings suggests that natives have a tendency to move out of neighborhoods with high concentrations of non-Western immigrants and into neighborhoods with lower immigrant concentrations (i.e., native flight). This tendency is particularly pronounced among parents of pre-school children. Among immigrants, there is a weaker relationship between neighborhood outmigration and residential concentration of non-Western immigrants. Finally, we find a tendency towards ethnic avoidance patterns in natives' residential mobility patterns.

Key words:

residential mobility; neighborhood; immigration; native flight; ethnic segregation; panel data

INTRODUCTION

The large-scale immigration over the past few decades has led to a growing public interest in how immigration affects rich host societies in Europe and North America (Coleman, 2006, Alba and Foner, 2015, Waters and Pineau, 2015). Recently arrived immigrants often settle in close proximity to earlier arrivals from their own origin country, giving rise to spatially concentrated immigrant communities—or ethnic enclaves—often located in residential areas characterized by relative social deprivation. Increased residential segregation can affect the level of generalized trust between neighbors (Dinesen and Sønderskov, 2015) and school segregation and place-based ethnic inequalities can affect the life chances of children with both immigrant and native majority background (Hermansen and Birkelund, 2015). To gain a better understanding of the temporal dynamics of ethnic neighborhood segregation, it is important to address how concentrations of immigrant populations in the immediate neighborhood of residence affect the residential decisions of both immigrants and natives.

In the United States, a large literature has focused on the temporal dynamics and drivers of racial neighborhood segregation (e.g., Massey and Denton, 1993, Charles, 2003). Using U.S. census data linked with longitudinal surveys, research shows that African Americans and Hispanics are less likely to move out of residentially segregated areas and are less likely to move into white neighborhoods (South and Crowder, 1998, Quillian, 2002, South, Crowder and Chavez, 2005, South, Crowder and Pais, 2008). By contrast, increasing shares of ethnic minorities in the original neighborhood are positively correlated with whites' out-migration, net of other neighbourhood characteristics (Quillian, 2002, Pais, South and Crowder, 2009, Crowder, Hall and Tolnay, 2011, Hall and Crowder, 2014). In Europe, immigrant-origin minorities are also less likely than natives to move out of immigrant-dense neighborhoods, are more likely to move into them and often less likely to improve neighborhood quality upon moving (Bolt, Van Kempen and Van Ham, 2008, Van Ham and Clark, 2009, Lersch, 2013, Andersen, 2017). Further, studies from several European countries find that out-migration among natives is positively related to higher neighborhood shares of immigrant minorities (e.g., for the Netherlands: Bolt, et al., 2008, Van Ham and Clark, 2009; Sweden: Bråmås, 2006, Aldén, Hammarstedt and Neuman, 2015; Denmark: Andersen, 2017; France: Rathelot and Safi, 2014, McAvay, 2018). However, few studies assess how local concentrations of immigrant populations affect the dynamics of residential mobility among immigrants and natives using population-wide panel data with annual updates across long time periods and fixed-effects techniques to adjust for selection biases related to unobserved characteristics at both the neighborhood and individual level.

In this study, we address the relation between the ethnic composition of the neighborhood of residence and residential mobility behavior among immigrants and natives in Norway. We use administrative panel data covering all residents in Norway's largest metropolitan area (i.e., the capital of Oslo and the surrounding municipalities) across a period of more than two decades. We aim at describing patterns of neighborhood out-mobility and avoidance as a function of the relative size of, and change in, local immigrant populations. The longitudinal data allow us to examine mobility dynamics in a prospective way and empirically assess theorized mechanisms driving the relationship between immigrant concentration and residential mobility. We use panel fixed-effects techniques to adjust for biases related to unobserved characteristics at both the neighborhood and individual level.

Norway constitutes an interesting case due to the combination of strong welfare institutions and a large and ethnically diverse immigrant-origin population. Norway has experienced large-scale immigration over several decades, comparable to many other European immigrant-receiving countries (Brochmann and Kjeldstadli, 2008, Dustmann and Frattini, 2013). By early 2018, immigrants and their local-born children made up 17.3% of the total population in Norway (Statistics Norway, 2018). While adult migrants often experience considerable earnings disadvantages and declining employment rates over the life course, children of immigrants often experience considerable upward socioeconomic mobility in Norway (Bratsberg, Raaum and Røed, 2014, Hermansen, 2016). Currently, levels of ethnic residential segregation are moderate and comparable to or slightly lower than levels found in other countries in Western Europe (Musterd, 2005, Rogne *et al.*, 2018).

Defining out-mobility, flight, and avoidance

While the two processes of native out-mobility and native flight are strongly related, and the terms are sometimes used interchangeably (e.g., Aldén, et al., 2015), we find it useful to distinguish between native out-mobility and native flight. We define *native out-mobility* as a pattern where the probability of moving to a different neighborhood is positively associated with the proportion of non-western (NW) immigrants and descendants (hereafter: NW proportion) in the origin neighborhood, and where this association is stronger (more positive) among natives than among NW immigrants. We focus on the relative difference in the propensity to move out because immigrants in Oslo move more frequently than natives (authors' own calculations, not shown) and immigrants tend to live in areas with a generally high residential turnover. Similarly, we define *native flight* as a pattern where the probability of moving to a neighborhood with a lower NW proportion than in the origin neighborhood is positively associated with the NW proportion in the origin neighborhood, and where this positive association is stronger among natives than among NW immigrants. Finally, we define *native avoidance* as a situation where the proportion of natives among in-movers to destination neighborhoods is negatively associated with the NW proportion in those neighborhoods.

DATA AND METHODS

We use administrative panel data covering all individuals ever registered as resident in Norway during the period 1993 to 2013 to construct a panel dataset for analyses of native out-mobility and flight. This dataset contains individual-level information on age, sex and immigrant background, in addition to annually updated information on education, income, social assistance reciprocity, family arrangements, and neighborhood of residence.

To define neighborhoods, we use the smallest geographical delineation used by Statistics Norway, so-called "*grunnkretser*" or Basic Statistical Units (Statistics Norway, 1999). These areas, commonly used in segregation and mobility research in Norway, are comparable to US census tracts. We classify individuals in the sample by their immigrant background and country of origin. Countries of origin are grouped into western (W), consisting of EU/EFTA, North America, Australia and New Zealand, and non-western (NW), consisting of all other countries. We define *natives* as people born in Norway to two Norwegian-born parents, *immigrants* as people born abroad to two foreign-born parents, and *descendants* of immigrants as people born in Norway to two foreign-born parents. Combining information on immigrant background and country of origin produces six country background groups; natives, NW immigrants, NW descendants, W immigrants and W descendants, as well as a residual category of "others" (consisting of people born in Norway to one Norwegian-born parent, born abroad to one or more Norwegian-born parents, etc.).¹ For each neighborhood, each year, we calculate the NW proportion among all residents, regardless of age. This proportion is our main independent variable.

We define *a move* occurring in year t as an individual being resident in a different neighborhood on January 1st in year $t+1$ than in year t . However, when creating an indicator for native flight, we use information on the neighborhood compositions of the origin and destination neighborhoods in year t (i.e., the composition on January 1st in the year of the move). This is done for two reasons. First, we assume that individuals' decision to move during year t is informed by the neighborhood composition of the origin and the destination neighborhood at time t . Second, since the composition of the population in the city changes over time (for instance, the share of immigrants increases), by using information from the same year, we avoid biases from overall changes in the population composition of the urban area.

¹ For immigrants, country background refers to the country of birth (specifically; the country where the mother was resident at the time of birth), while for descendants it refers to the parents' country of birth, or the mother's country of birth if the parents originate from different countries.

The panel dataset is limited to individuals resident in the catchment area each year, aged 25-65. Individual-level observations before and after this age-span are dropped, and so are years when the person lives outside the catchment area. However, provided individuals move within the country, we retain information on the destination neighborhood composition of movers, so that moves out of the catchment area to neighborhoods with a lower NW proportion than that of the origin neighborhood still count as a “flight”. The downside to this design is that counting moves out of the catchment area but not into it may bias our estimates of native flight upwards, since the catchment area has a higher NW proportion than the rest of the country. We will get back to this topic in later analyses. We also do not count emigrations or immigrations as moves. The resulting dataset contains 1,040,994 unique individuals, observed in 10,902,739 person-years, residing in 1,493 unique neighborhoods. We include a set of individual and neighborhood level controls. Educational attainment is coded into five categories. We also include a dummy indicating if the individual is currently enrolled in education. Income is defined as the sum of post-tax labor market income, income from self-employment, property income and transfers, measured in Norwegian Kroner (inflation is handled by year fixed effects). A dummy for social assistance receipt indicates whether the individual has received any social assistance in the form of cash support or social loans that year. We include information on marital status, and seven categories of family types. Additionally, we include a set of dummies for whether each individual lives with one or more own children in the age group 0-2, 3-5, ..., 15-17. These variables take the value one if the individual has one or more children in the age group, registered as resident in the same neighborhood as the individual that year, and if the individual’s family type suggests that he or she may live with a child (married with children, mother or father with children, cohabitant with children, or in a partnership). For each neighborhood, each year, we calculate the total population count, the population count for people aged 25-65, the proportions in the age groups 0-18, 19-24, 25-65 and 66 and above, the proportion of 25-65-year-olds that have completed (tertiary) education, the proportion of 25-65-year-olds that have received social assistance that year, and the mean and median income of 25-65-year-olds.

The neighborhoods as measured here (*grunnkrets*) are in close proximity to other neighborhoods, and most people will not know where the borders are. The characteristics of the adjacent neighborhoods are therefore potentially of importance for moving behavior. For this reason, we calculate the same indicators of neighborhood composition for the adjacent neighborhoods, i.e. the focal neighborhood and all neighborhoods that share a border with it.

Statistical models

To identify patterns of native out-mobility and native flight, and to assess whether these are affected by individual or neighborhood characteristics, we rely on linear probability models where the outcomes are our dichotomous indicators of out-mobility and flight, respectively, and where our main independent variables are our immigrant background indicators, interacted with the NW proportion in the neighborhood. Starting with a parsimonious model without controls (Model 1), we add controls in a stepwise fashion, beginning with year fixed effects (FEs) to account for time-variant fluctuations and trends in moving patterns caused by for instance (de)urbanization, housing market shocks etc. that correlate with the NW proportion in the catchment area (Model 2). Further, we add age FEs to account for differences in age composition between the groups (Model 3). This is followed by controls for individual sex and socioeconomic variables (education, income and social assistance, Model 4), and family characteristics (marital status, family type and the presence of children in different age groups, Model 5).

We then add neighborhood FEs to account for the fact that stable neighborhood characteristics such as geographic location and housing structure may be correlated with the ethnic composition of the neighborhood, and may induce higher or lower residential turnover regardless of the neighborhood’s ethnic composition (Model 6). The inclusion of neighborhood FEs combined with year FEs implies that we only use within-neighborhood variation from the mean in the NW proportion over the period 1993-2013, while adjusting for changes that are similar across all neighborhoods over time. This implies that the estimate for the NW proportion captures local changes in neighborhood composition

that deviate from the overall trend for all neighborhoods. Next, we add time-varying socioeconomic and demographic neighborhood controls (Model 7), followed by time-varying adjacent neighborhood controls to account for some potentially confounding large-scale neighborhood characteristics that may be correlated with the NW proportion in the neighborhood (Model 8), before we finally add individual-level fixed effects to account for all individual-level differences in moving behavior that are stable over time (Model 9). To assess whether native out-mobility may be driven by selective moves among households with children below school starting age, we expand our models of native out-mobility by also interacting the immigrant background indicators and the neighborhood NW proportion with dummies for the presence of children in different age groups.

PRELIMINARY RESULTS

We begin by addressing the relationship between the immigrant concentration in the initial neighborhood of residence and the tendency of neighborhood out-migration and neighborhood flight. Figure 1 shows the relationship between the NW proportion in the neighborhood and the probability of out-migration, for the full sample, covering all years between 1993 and 2013. The horizontal histogram shows the distribution of the NW proportion in the neighborhoods per year, weighted by the number of individuals in the neighborhood. The vertical histogram shows the proportion of individuals that move out of neighborhoods each year, weighted by the number of individuals in the neighborhood. The scatterplot shows the relationship between these two variables, with each circle representing a neighborhood in a given year, and the size of the circle representing the number of people residing in the neighborhood. Each line represents the relationship between the NW proportion in the neighborhood and the probability of out-migration, shown as separate cubic piecewise splines for each immigrant background group (breaks at .1, .2, .3 and .4).

< Figure 1 about here >

We note in Figure 1 that in the bottom left corner of the scatterplot, where the most of the data points are located, the NW proportion in the neighborhoods is positively associated with out-mobility for all groups, except for NW immigrants. In other words, all other groups tend to move out at a higher rate from neighborhoods with higher NW proportion, but NW immigrants move out at a lower rate from such neighborhoods.

Table 1 presents preliminary results from linear probability regression models on individual-level data, predicting the likelihood of moving out of the neighborhood (i.e., out-migration) as a function of the change in the share of non-Western immigrants in the initial neighborhood's average share.

< Table 1 about here >

The average change in the proportion from the mean NW is about 10%. In the final model (model 9) we note that for natives, an increase of 10 percentage point non-western immigrants would yield an expected 1 percentage point increase in the probability of out-migration.

Table 2 presents similar results from linear probability regression models predicting native flight, i.e., the likelihood of moving out of a neighborhood and into a neighborhood with a lower immigrant share, as a function of the share of non-Western immigrants in the initial neighborhood. The alternative outcome is either not moving or moving to an area with a higher proportion NWs.

< Table 2 about here >

The final model (model 9) shows that a 10 percentage point increase in NW immigrants is associated with a 6 percentage points increase in *native flight*. It is worth noting that individuals who move from an area with a high NW proportion, almost by necessity move to an area with lower NW proportions, while those moving from neighborhoods with very low NW proportions will usually move to areas

with somewhat higher concentrations. Thus, our preliminary results may be influenced by regression to the mean. We will later examine these patterns more closely using other model specifications.

Turning to our analysis of native avoidance, Figure 2 shows the NW proportion in each neighborhood-year in the horizontal (x-axis) histogram and the proportion of in-movers to each neighborhood-year that are natives in the vertical (y-axis) histogram. The scatterplot shows the relationship between these two variables, with the size of the circles representing the neighborhood population, while the line represents the trend in the data with a cubic spline (breaks at .1, .2, .3 and .4). The relationship between the NW proportion and the proportion natives among in-movers is strongly negative in the top-left area of the graph, where most of the data points are located, suggesting a strong pattern of native avoidance. Preliminary analyses suggest a strong pattern of native avoidance in Oslo, and we will present these patterns in the final paper.

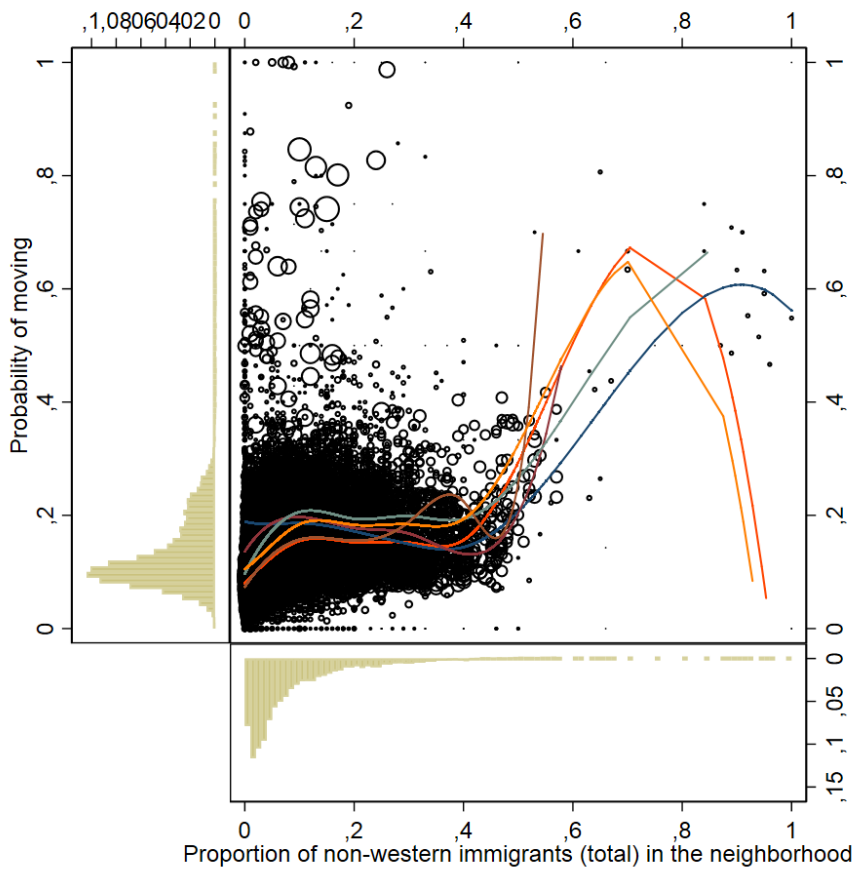
< Figure 2 about here >

To sum up, our preliminary results suggest a relationship between the local concentration of immigrant populations in the immediate neighborhood and residential mobility patterns among both immigrants and native Norwegians. Before the conference, we will address these questions in more detail by examining to what extent the results are sensitive to alternative model specifications.

References

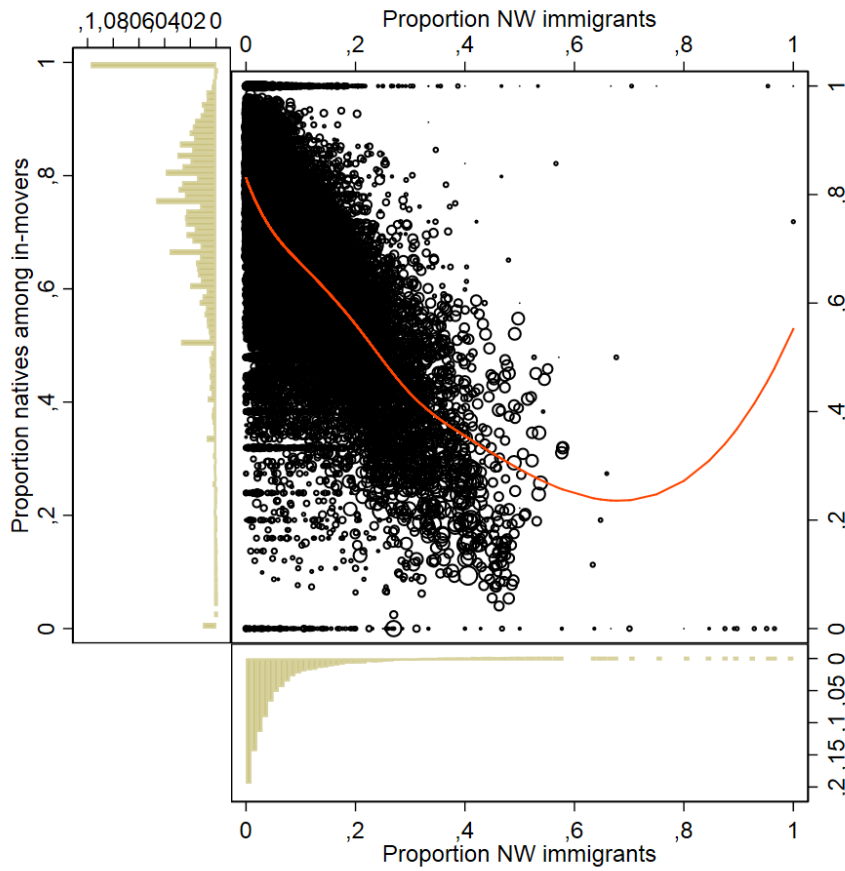
- Alba, R. and Foner, N. (2015). *Strangers No More: Immigration and the Challenges of Integration in North America and Western Europe*. Princeton: Princeton University Press.
- Aldén, L., Hammarstedt, M. and Neuman, E. (2015). Ethnic Segregation, Tipping Behavior, and Native Residential Mobility, *International Migration Review*, **49**, pp. 36-69.
- Andersen, H. S. (2017). Selective moving behaviour in ethnic neighbourhoods: white flight, white avoidance, ethnic attraction or ethnic retention?, *Housing Studies*, **32**, pp. 296-318.
- Bolt, G., Van Kempen, R. and Van Ham, M. (2008). Minority ethnic groups in the Dutch housing market: Spatial segregation, relocation dynamics and housing policy, *Urban Studies*, **45**, pp. 1359-1384.
- Bratsberg, B., Raaum, O. and Røed, K. (2014). Immigrants, Labour Market Performance and Social Insurance, *Economic Journal*, **124**, pp. F644-F683.
- Brochmann, G. and Kjeldstadli, K. (2008). *A History of Immigration: The Case of Norway, 900-2000*. Oslo: Universitetsforlaget.
- Bråmås, Å. (2006). 'White flight'? The production and reproduction of immigrant concentration areas in Swedish cities, 1990-2000, *Urban Studies*, **43**, pp. 1127-1146.
- Charles, C. Z. (2003). The Dynamics of Racial Residential Segregation, *Annual Review of Sociology*, **29**, pp. 167-207.
- Coleman, D. (2006). Immigration and Ethnic Change in Low-Fertility Countries: A Third Demographic Transition, *Population and Development Review*, **32**, pp. 401-446.
- Crowder, K., Hall, M. and Tolnay, S. E. (2011). Neighborhood Immigration and Native Out-Migration, *American Sociological Review*, **76**, pp. 25-47.
- Dinesen, P. T. and Sønderskov, K. M. (2015). Ethnic Diversity and Social Trust: Evidence from the Micro-Context, *American Sociological Review*, **80**, pp. 550-573.
- Dustmann, C. and Frattini, T. (2013) Immigration: the European experience. In Card, D. and Raphael, S. (Eds.) *Immigration, Poverty, and Socioeconomic Inequality*. New York: Russell Sage Foundation, pp. 423-456.
- Hall, M. and Crowder, K. (2014). Native Out-Migration and Neighborhood Immigration in New Destinations, *Demography*, **51**, pp. 2179-2202.
- Hermansen, A. S. (2016). Moving Up or Falling Behind? Intergenerational Socioeconomic Transmission among Children of Immigrants in Norway, *European Sociological Review*, **32**, pp. 675-689.
- Hermansen, A. S. and Birkelund, G. E. (2015). The Impact of Immigrant Classmates on Educational Outcomes, *Social Forces*, **94**, pp. 615-646.
- Lersch, P. M. (2013). Place stratification or spatial assimilation? Neighbourhood quality changes after residential mobility for migrants in Germany, *Urban Studies*, **50**, pp. 1011-1029.
- Massey, D. S. and Denton, N. A. (1993). *American apartheid: segregation and the making of the underclass*. Cambridge, Mass: Harvard University Press.
- McAvay, H. (2018). The ethnoracial context of residential mobility in France: Neighbourhood out-migration and relocation, *Population, Space and Place*, **24**, pp. e2138.
- Musterd, S. (2005). Social and Ethnic Segregation in Europe: Levels, Causes, and Effects, *Journal of Urban Affairs*, **27**, pp. 331-348.
- Pais, J. F., South, S. J. and Crowder, K. (2009). White flight revisited: A multiethnic perspective on neighborhood out-migration, *Population Research and Policy Review*, **28**, pp. 321-346.
- Quillian, L. (2002). Why is black-white residential segregation so persistent?: Evidence on three theories from migration data, *Social Science Research*, **31**, pp. 197-229.
- Rathelot, R. and Safi, M. (2014). Local Ethnic Composition and Natives' and Immigrants' Geographic Mobility in France, 1982-1999, *American Sociological Review*, **79**, pp. 43-64.
- Rogne, A. F., Andersson, E. K., Malmberg, B. and Lyngstad, T. H. (2018). Neighbourhood concentration and representation of non-European migrants: New results from Norway, *ResSegr Working Paper 2018:2*.
- South, S. J., Crowder, K. and Chavez, E. (2005). Geographic Mobility and Spatial Assimilation among US Latino Immigrants, *International Migration Review*, **39**, pp. 577-607.
- South, S. J., Crowder, K. and Pais, J. (2008). Inter-neighborhood migration and spatial assimilation in a multi-ethnic world: Comparing Latinos, Blacks and Anglos, *Social Forces*, **87**, pp. 415-443.
- South, S. J. and Crowder, K. D. (1998). Leaving the 'hood: Residential mobility between black, white, and integrated neighborhoods, *American Sociological Review*, pp. 17-26.
- Statistics Norway (1999). *Regional Classifications. A Survey of Standards in Official Statistics of Norway*. Oslo/Kongsvinger: Statistics Norway.
- Statistics Norway (2018). *Immigrants and Norwegian-Born to Immigrant Parents, January 1, 2018 [available at <<http://ssb.no/en/befolkning/statistikker/innvbe>>]*. Oslo/Kongsvinger: Statistics Norway.
- Van Ham, M. and Clark, W. A. (2009). Neighbourhood mobility in context: household moves and changing neighbourhoods in the Netherlands, *Environment and Planning A*, **41**, pp. 1442-1459.
- Waters, M. C. and Pineau, M. G. (2015). *The Integration of Immigrants into American Society*. Washington, DC: The National Academies Press.

Figure 1. Relationship between neighborhood proportion of non-Western immigrants and out-migration probability by ethnic background



Notes: Splines: Cubic splines with breaks at .1, .2, .3, .4. Scatterplot: out-migration by neighborhood*year, weighted by population count. Histograms: individuals (mean probability of moving by neighborhoods)

Figure 2. Relationship between neighborhood proportion of non-Western immigrants and the proportion of natives among in-movers at the neighborhood level



Notes: The neighborhood is the unit of analysis. Estimates the association between proportion of residents who are non-Western immigrants and the proportion of in-movers who are natives.

Table 1. Estimated relation between neighborhood proportion of non-Western immigrants and probability of out-migration by ethnic background. Linear probability models, OLS regression.

	Model 1 <i>no controls</i>	Model 2 <i>year fixed effects</i>	Model 3 <i>age fixed effects</i>	Model 4 <i>sex and socio-economic controls</i>	Model 5 <i>family controls</i>	Model 6 <i>neighbourhood fixed effects</i>	Model 7 <i>time-varying neighbourhood controls</i>	Model 8 <i>time-varying expanded neighbourhood controls</i>	Model 9 <i>individual fixed effects</i>
NW immigrants in the neighborhood (proportion)	0.266 ***	0.282 ***	0.186 ***	0.165 ***	0.104 ***	-0.023 ***	0.039 ***	0.048 ***	0.100 ***
NW immigrant x NW immigrants in the neighborhood (proportion)	-0.352 ***	-0.360 ***	-0.277 ***	-0.247 ***	-0.165 ***	-0.161 ***	-0.153 ***	-0.150 ***	-0.248 ***
NW descendant x NW immigrants in the neighborhood (proportion)	-0.376 ***	-0.387 ***	-0.353 ***	-0.329 ***	-0.237 ***	-0.197 ***	-0.194 ***	-0.188 ***	-0.023
W Immigrant x NW immigrants in the neighborhood (proportion)	-0.004	-0.006	-0.032 ***	-0.016 *	0.001	-0.014 *	-0.020 **	-0.019 **	-0.149 ***
W Descendant x NW immigrants in the neighborhood (proportion)	0.053 *	0.055 *	-0.033	-0.074 **	-0.065 *	-0.053 *	-0.050	-0.050	-0.044
Other x NW immigrants in the neighborhood (proportion)	0.045 ***	0.045 ***	0.006	0.004	0.002	0.006	0.004	0.005	-0.040 **
NW immigrant	0.084 ***	0.086 ***	0.058 ***	0.041 ***	0.044 ***	0.040 ***	0.039 ***	0.039 ***	omitted
NW descendant	0.093 ***	0.099 ***	-0.020 ***	-0.024 ***	-0.028 ***	-0.027 ***	-0.028 ***	-0.028 ***	omitted
W Immigrant	0.043 ***	0.045 ***	0.037 ***	0.029 ***	0.028 ***	0.022 ***	0.023 ***	0.023 ***	omitted
W Descendant	-0.001	-0.001	-0.006 *	-0.005	-0.006 *	-0.008 **	-0.008 **	-0.008 **	omitted
Other	0.022 ***	0.023 ***	-0.001	-0.002 *	-0.001 *	-0.005 ***	-0.005 ***	-0.005 ***	omitted
Constant	0.105 ***	0.088 ***	0.256 ***	0.258 ***	0.262 ***	0.240 ***	0.181 ***	0.180 ***	0.064 **
Year FE		yes	yes	yes	yes	yes	yes	yes	yes
Age FE			yes	yes	yes	yes	yes	yes	yes
Sex				yes	yes	yes	yes	yes	yes
Individual socioeconomic controls				yes	yes	yes	yes	yes	yes
Individual family demographic controls					yes	yes	yes	yes	yes
Neighborhood FE						yes	yes	yes	yes
Neighborhood controls							yes	yes	yes
Expanded neighborhood controls								yes	yes
Individual FE									yes
N (person-years)	10,193,065	10,193,065	10,193,065	9,747,818	9,747,805	9,747,805	9,747,805	9,747,536	9,747,536
R ²	0.0064	0.0087	0.0605	0.0664	0.0745	0.0818	0.0833	0.0834	0.0291

Notes: Individual socioeconomic characteristics include income, educational attainment, current educational enrollment, and receipt of social welfare assistance. Individual family demographic characteristics includes marital status and number of children in household by age intervals [0-2] [3-5] [6-8] [9-11] [12-14] [15-17]. Neighborhood controls include population count, population count aged 25-65, neighborhood proportion with higher education (aged 25-65), mean income in the neighborhood (aged 25-65), median income in the neighbourhood (aged 25-65), proportion that received social assistance in the neighbourhood (aged 25-65), and proportion aged... [0-18] [19-24] [25-65] [66+] in the neighbourhood. Expanded neighborhood controls include population count in expanded neighbourhood, population count aged 25-65 in expanded neighbourhood, expanded neighborhood proportion with higher education (aged 25-65), mean income in the expanded neighborhood (aged 25-65), median income in the expanded neighbourhood (aged 25-65), proportion that received social assistance in the expanded neighbourhood (aged 25-65), and proportion aged... [0-18] [19-24] [25-65] [66+] in the expanded neighbourhood.

Table 2. Estimated relation between neighborhood proportion of non-Western immigrants and probability of “flight” by ethnic background. Linear probability models, OLS regression.

	Model 1 <i>no controls</i>	Model 2 <i>year fixed effects</i>	Model 3 <i>age fixed effects</i>	Model 4 <i>sex and socio-economic controls</i>	Model 5 <i>family controls</i>	Model 6 <i>neighbourhood fixed effects</i>	Model 7 <i>time-varying neighbourhood controls</i>	Model 8 <i>time-varying expanded neighbourhood controls</i>	Model 9 <i>individual fixed effects</i>
NW immigrants in the neighborhood (proportion)	0.468 ***	0.486 ***	0.434 ***	0.435 ***	0.415 ***	0.353 ***	0.357 ***	0.435 ***	0.596 ***
NW immigrant x NW immigrants in the neighborhood (proportion)	-0.189 ***	-0.198 ***	-0.153 ***	-0.147 ***	-0.119 ***	-0.038 ***	-0.033 ***	-0.030 ***	-0.010
NW descendant x NW immigrants in the neighborhood (proportion)	-0.214 ***	-0.224 ***	-0.204 ***	-0.198 ***	-0.171 ***	-0.045 ***	-0.034 **	-0.027 *	0.436 ***
W Immigrant x NW immigrants in the neighborhood (proportion)	0.060 ***	0.059 ***	0.045 ***	0.031 ***	0.035 ***	0.010	0.011 *	0.012 *	0.091 ***
W Descendant x NW immigrants in the neighborhood (proportion)	0.030	0.033	-0.015	-0.046	-0.042	-0.031	-0.030	-0.029	0.026
Other x NW immigrants in the neighborhood (proportion)	0.109 ***	0.110 ***	0.090 ***	0.091 ***	0.091 ***	0.067 ***	0.068 ***	0.068 ***	0.032 **
NW immigrant	0.004 ***	0.006 ***	-0.009 ***	-0.013 ***	-0.013 ***	-0.027 ***	-0.028 ***	-0.028 ***	omitted
NW descendant	0.013 ***	0.021 ***	-0.042 ***	-0.042 ***	-0.045 ***	-0.057 ***	-0.057 ***	-0.058 ***	omitted
W Immigrant	0.008 ***	0.010 ***	0.006 ***	0.005 ***	0.004 ***	0.002 ***	0.002 **	0.002 **	omitted
W Descendant	-0.005 **	-0.005 **	-0.008 ***	-0.006 **	-0.006 ***	-0.008 ***	-0.008 ***	-0.008 ***	omitted
Other	0.004 ***	0.006 ***	-0.008 ***	-0.009 ***	-0.009 ***	-0.009 ***	-0.009 ***	-0.009 ***	omitted
Constant	0.036 ***	0.036 ***	0.114 ***	0.109 ***	0.107 ***	0.106 ***	0.069 ***	0.060 ***	-0.050 **
Year FE		yes	yes	yes	yes	yes	yes	yes	yes
Age FE			yes	yes	yes	yes	yes	yes	yes
Sex				yes	yes	yes	yes	yes	yes
Individual socioeconomic controls				yes	yes	yes	yes	yes	yes
Individual family demographic controls					yes	yes	yes	yes	yes
Neighborhood FE						yes	yes	yes	yes
Neighborhood controls							yes	yes	yes
Expanded neighborhood controls								yes	yes
Individual FE									yes
N (person-years)	10,193,065	10,193,065	10,193,065	9,747,818	9,747,805	9,747,805	9,747,805	9,747,536	9,747,536
R ²	0.0064	0.0087	0.0605	0.0664	0.0745	0.0818	0.0833	0.0834	0.0291

Notes: Individual socioeconomic characteristics include income, educational attainment, current educational enrollment, and receipt of social welfare assistance. Individual family demographic characteristics includes marital status and number of children in household by age intervals [0-2] [3-5] [6-8] [9-11] [12-14] [15-17]. Neighborhood controls include population count, population count aged 25-65, neighborhood proportion with higher education (aged 25-65), mean income in the neighborhood (aged 25-65), median income in the neighbourhood (aged 25-65), proportion that received social assistance in the neighbourhood (aged 25-65), and proportion aged... [0-18] [19-24] [25-65] [66+] in the neighbourhood. Expanded neighborhood controls include population count in expanded neighbourhood, population count aged 25-65 in expanded neighbourhood, expanded neighborhood proportion with higher education (aged 25-65), mean income in the expanded neighborhood (aged 25-65), median income in the expanded neighbourhood (aged 25-65), proportion that received social assistance in the expanded neighbourhood (aged 25-65), and proportion aged... [0-18] [19-24] [25-65] [66+] in the expanded neighbourhood.