Joining late, leaving early? Immigrant-native disparities in labor market exit [a]

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Abstract

Theory and empirical findings on retirement determinants suggest that we may expect differences in labor market exit between native and foreign-born workers. Despite many countries seeing rising immigrant shares in their aging populations, alongside significant labor market disparities, the issue has so far received limited attention. Population-wide administrative data for Sweden show that the hazard rate to retirement is greater among immigrants already from age 50. But approaching age 65, especially marginal migrant groups have a stronger tendency to remain in the labor force and thus not adhering to the norm of retiring at a specific age. Education and family situation explain little of the retirement gaps, whereas labor market history, health, and occupational allocations are important determinants. Immigrant-native retirement differences are greater among men than among women. Overall findings suggest economic necessity and/or opportunity rather than varying preferences as drivers of differentials.

Keywords: labor market exit, immigrants, retirement hazard.
JEL codes: J68, J64, C93

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1 Introduction

Many developed societies see a substantial and increasing share of immigrants in their aging populations, alongside significant socioeconomic disparities. While a vast literature considers how employment, wages and earnings of immigrants develop with time since immigration (Borjas, 2014; Duleep, 2015; Dustmann and Görlach, 2016), much less attention has been devoted to immigrant-native differences toward the end of working life. This may seem surprising, since besides the importance for individual workers, immigrant retirement patterns may have major implications for public finances and the economic consequences of immigration for host societies.

We study patterns and determinants of immigrant labor market exit. There are several mechanisms through which differences between immigrants and natives may arise in retirement behavior. Basic economic theory considers labor market exit a result of an individual optimization under restrictions, typically balancing consumption and non-work time. Retirement decisions may differ by earnings potential due to differences in individual characteristics, e.g., education and health. Similarly, differing job characteristics and future labor market prospects may cause disparities in exit patterns across groups. Preferences for where to spend one's time may also induce differences in labor market behavior between immigrants and natives (Dustmann and Görlach, 2016; Cobb-Clark and Stillman, 2013). Of course, welfare state institutions or expectations of discrimination may cause some individuals to leave the labor market earlier or later.

Our empirical setting is Sweden, one of many countries facing similar issues. Since the 1960s, substantial labor and later predominantly humanitarian and family-related immigration to the country has resulted in a large and diverse foreign-born population. The foreign-born today make up about 19% of 50–70-year-olds (SCB, 2020b), and the figure is projected to reach 32% by 2050 (SCB, 2020a). Due to increasing life expectancy, Statistics Sweden predicts that the old-age dependency ratio[1] will rise from about 36 to 43 in the coming fifteen years after 2023.

Many other EU countries can expect the foreign-born share in its population to increase in the coming decades (Scott and Tegunimataka, 2020). Data from Eurostat show that the fraction of migrants is substantially higher in the 30–50 age span than in the older population, and the increase between 2015 and 2020 was also concentrated to the younger age groups. Similar trends can be seen in the US, where the foreign-born population in 2016 constituted roughly 18% of the 45–64-year-olds but is expected to rise to 23% by 2030 (United States Census Bureau, 2017). Several US reports

[1]The ratio of 65+ per 20–64 year-olds.

suggest that immigration has a significant bearing on the development of the old-age-dependency ratio (Johnson, 2020; Vespa, 2018).

We use rich population-wide panel data for the period 1985–2018 to study labor market exit among immigrants from different origins arriving since the 1930s. The paper also presents evidence on retirement in the second generation. We divide immigrants into three groups originating from Africa and Asia, Eastern Europe, and Western Europe and the Americas. While broad, these categories capture major differences in labor market outcomes as well as heterogeneity in the reasons for migrating.

Our focus is on how workers with a foreign background of different origins deviate from native workers and to what extent such differences can be explained by extensive individual background characteristics and labor market history. We define retirement based on actual withdrawal from the labor market and estimate flexible regression models for retirement hazards (building on Johansson et al. (2016) and Laun and Palme (2019)).

Evidence from the US suggests that immigrants in general have lower exit rates than natives (Borjas, 2011; Johnson et al., 2017), but that more years of residence, longer employment history, and the resulting social security eligibility diminish the differences (Kaushal, 2010; Borjas, 2011). The raw data for our main sample (conditional on working at age 50) instead suggest that the foreign-born in Sweden are more likely to leave the labor market early. At age 60, the share retired (defined as never more observed working) among natives is 10 percent, 20 percent among immigrants from Africa and Asia, and even somewhat higher among Eastern European migrants. Children of immigrants exhibit smaller but still significant differences vis-a-vis other natives.[2] As most workers retire around age 64–65, the difference drops sharply. At age 70, there is a 2.7 percentage point immigrant-native gap.

Previous work on Sweden has shown a delay in retirement as well as a shift toward exit through regular pension as opposed to sickness/disability insurance or unemployment (Laun and Palme, 2019). While the broad time patterns are similar for people of different origin, immigrants are over-represented in the sickness/disability pathway and over time also in the unemployment route to retirement. This tendency is most marked among migrant groups with marginal positions, which can be seen as a first

[2]If one does not condition on employment at age 50, the difference in retirement at age 60 is much larger. For example, almost 50 percent of African and Asian migrants compared to about 20 percent of natives. As described below, we focus on retirement hazards (which are not relevant for those never employed) and therefore use the conditional sample in the baseline analysis. The hazard regression results are very similar regardless of sample, which is not unexpected given that few people are not working at age 50 but in some later year.

signal that early exit may be driven by poor labor market prospects.

A basic specification of age-specific differences in the retirement hazard (controlling only for gender and calendar year) suggests that the the foreign-born exit the labor market at a higher pace during ages 50–60. Then, as the most common retirement age of 65 approaches, the difference turns negative and substantial. The norm of retiring at age 65 thus appears to be weaker among people of foreign origin compared to natives. Controlling for very rich individual background characteristics (including education, family composition, 10-year employment and earnings histories, and three health indices based on, e.g., hospital records and drug prescriptions) decreases the estimates for ages under 60, but has little impact on the disparities around the typical retirement age.

The baseline difference to natives is greater for people born in Eastern Europe, Africa, and Asia, than for those from Western Europe and the Americas. It is also in the former groups we find the deviating retirement behavior around age 65. For Western (to a large degree Nordic) migrants and children of immigrants, retirement patterns are closer to those of natives.

Specifications addressing the average difference in the hazard in age 50–70 suggest that education and family background does little in explaining the immigrant-native differences. But earlier labor market exit is strongly linked to labor market history, and also to indicators of health. For example, African and Asian migrants have an estimated 15 percent higher baseline hazard (0.75 ppt relative to a native mean hazard of 5.01 percent). Controlling for employment and income history and health reduces the estimated difference in the hazard rate to less than 8 percent. Taking also occupation into account almost eliminates the gap. For the second generation of immigrants, the differences are smaller with an annual hazard rate to retirement during ages 50–70 about 3.6 percent higher than for natives. Exit differentials are not explained by immigrants leaving Sweden after retirement.

A recurring theme in the debate on immigrant labor market integration is that women, in particular those born outside Western countries, fare poorly relative to their native counterparts. By contrast, among those employed at age 50, our results suggest that exit differences are greater for men than women. In fact, in the richest specifications, migrant women retire at a lower pace than natives. Our results also suggest that the immigrant-native gap in labor market exit is gendered in different ways for the first and second generation. The immigrant-native differences are greater for males than for females in all specifications. But for second generation immigrants, male differences are smaller (and insignificant in the richest specifications), whereas we

find a significantly higher hazard out of employment among female second generation immigrants.

The observed differences in labor market exit aggregate into significant economic costs and opportunities. For example, had the average worker born in Africa, Asia or Eastern Europe had the same exit pattern as the average native, s(he) would have worked a full extra year between ages 50 and 65. The fraction in our sample made up by these groups increased from 6 to 10 percent during the observation period, and as discussed above the figures are expected to continue to increase significantly.

Our results relate to the limited previous literature on immigrant labor market exit. Detailed individual level administrative data allow us to provide more reliable estimations and descriptions than previous studies on the topic, which to a large extent have relied on survey and census data. Borjas (2011) finds that the labor supply of natives drops at a much higher rate compared to that of immigrants around the retirement age. But exit patterns of natives and immigrants with longer work history in the country are found to be relatively similar. Johnson et al. (2017) find that foreign-born Hispanics in the US are less likely to retire than non-Hispanic Whites also when controlling for both personal and job characteristics. Lopez and Slavov (2020) explore whether the foreign-born delay retirement decisions compared to natives in the US. Like previous studies, they find that being foreign-born is associated with a lower retirement hazard and a higher retirement age compared to natives.[3]

Several studies suggest that immigrant labor market behavior at older ages may be linked to welfare and pension systems. For the US, Borjas (2011) argues that social security eligibility makes immigrants behave more like natives, and Kaushal (2010) finds that stricter eligibility criteria for social assistance delays retirement of foreign-born men (but not for women). There is also Swedish work suggesting that benefit receipt linked to early retirement contribute to immigrant-native differentials; see, e.g., Hammarstedt (2000) and Johansson et al. (2018). Similarly, studies from Norway find that welfare state institutions are related to the labor market behavior of aging migrants (Bratsberg et al., 2010, 2014, 2020; Bratsberg and Røed, 2022).

Our analysis contributes to our understanding of retirement behavior by a detailed examination of exit differentials across origin groups, and the extent to which such differences are also present when comparing workers with very similar demographics and labor market positions. In Section 2 we discuss previous evidence on factors related to (immigrant-native differences in) labor market exit. Section 3 presents the data and

[3]Other studies on retirement are not primarily concerned with immigrants, but use foreign-born as a control variable; see, e.g., Anxo et al. (2019); Hanappi and Nagl (2019); Chen et al. (2012).

the empirical strategy and Section 4 presents a first description of employment and retirement among immigrants of different origin, children of immigrants and natives between ages 50 and 70. Section 5 presents the main results and Section 6 concludes the paper.

2 Factors related to labor market exit

Factors influencing labor market exit can be related to an immigrant-native gap in two ways: either the factor differs systematically across the groups, or the groups respond to it in different ways. Our approach builds on collecting rich information on a variety of variables potentially linked to retirement decisions. In this section, we discuss determinants identified in the previous literature.

Basic individual and family characteristics have been shown to be related to labor market exit. More years of schooling is connected to delayed retirement; see, e.g., Anxo et al. (2019) for a Swedish context. More schooling may mean less physically demanding and more enjoyable jobs, which facilitates longer careers. Another mechanism could be making up for lost years of employment at younger years, or improved health through education (Johansson et al., 2018). Family situation or marital status may also guide exit decisions. Previous studies also find that having children as well as being unmarried are correlated with wanting to work beyond retirement age, although the empirical evidence appears stronger for being unmarried (Frieze et al., 2011). However, the role of family situation and marital status seems to be gendered. Married men typically work longer than the average, whilst it is the opposite for married women. One explanation to this phenomenon is that women are typically younger than their spouse and couples prefer to retire at the same time (Frieze et al., 2011). The fact that women take more responsibility for the unpaid work within the family, which at older ages can include caring for grandchildren, can also affect exit decisions (Lumsdaine and Vermeer, 2015). Furthermore, Anxo et al. (2019) find that financial incentives appear more important in explaining female compared to male exit decisions.

Several studies point to individual health as one of the most central aspects in explaining retirement decisions (Bound et al., 2010; McGarry, 2004). Johansson et al. (2018) illustrate how the health among the elderly in Sweden has significantly improved according to both objective and subjective measures over the last decades. Despite an increase in employment of individuals above age 60, the authors argue that the health improvements provide further possibilities for prolonging work life.

As for differences in health, some studies point to a "healthy migrant effect". For

example, Kennedy et al. (2015) examine four recipient countries (US, Canada, UK, and Australia) and find that immigrants on average are healthier than natives, much due to selectivity in migration. However, the study focuses on health relatively shortly after arrival and does not pay any special attention to the health of older migrants. Some studies conducted in European contexts point to differences in the opposite direction, and, e.g., find that immigrants are more likely to suffer from mental health disorders (Tinghög et al., 2017; Ladin and Reinhold, 2013), require more health care (Solé-Auró et al., 2012), and report worse health than natives (Moullan and Jusot, 2014; Sungurova et al., 2006; Wiking et al., 2004). Other scholars emphasize the need to consider institutional factors (e.g., selectivity of migration) and health heterogeneity in the foreign-born population (Mulinari et al., 2015).

Labor market position and history are likely to be linked to exit patterns. These aspects are particularly relevant considering the persistent differences in economic outcomes between foreign-born and natives. Employment and earnings history can be seen as indicators of the rewards to additional work years and the benefits of exiting the labor market. Immigrants with shorter work history may face stronger financial incentives to prolong employment to save for retirement and increase benefit eligibility. But to the extent that previous earnings capture future earnings potential, the association with labor market exit may be the opposite (i.e., larger gains from staying employed with higher previous earnings). Historical unemployment, indicating weaker attachment to the labor market, may motivate early exit (Anxo et al., 2019). There is also evidence that the effects of job loss are greater among the foreign-born (Bratsberg et al., 2018), which may affect retirement behavior.

Occupation and industry allocation are two other relevant factors, especially considering evidence on substantial ethnic segregation (Åslund and Skans, 2010; Tomaskovic-Devey et al., 2015). Previous research suggests that poor working conditions and/or work environment increases intentions for early retirement (Carr et al., 2016; Dal Bianco et al., 2015). Studies find that those who continue to work beyond retirement age are more likely to be found in advantageous occupational positions, i.e., managers and professionals, be self-employed, and work under more favorable psychosocial conditions (Anxo et al., 2019; Wahrendorf et al., 2017).[4]

In conclusion, the literature presents a multitude of potential variables and mechanisms that are related to labor market exit. Many of these have been shown to differ

[4]Johansson et al. (2018) illustrate how working conditions have changed in Sweden – displaying clear improvements in terms of workplace deaths, physical work environment and psychosocial conditions up until the 1990s.

depending on foreign background, and there are also indications on potential differences in responsiveness. The next section describes how we utilize the richness of the Swedish administrative data to investigate the extent and determinants of immigrant-native gaps in labor market exit.

3 Data and empirical strategy

3.1 Data

Our study builds on administrative records compiled by Statistics Sweden. The data cover the entire Swedish population during 1985–2018. We focus on labor market exits in the period 2001–2016 among people aged 50–70, covering the cohorts born during 1935–1966. The age restriction is chosen to capture those nearing, reaching, and exceeding retirement age. Retirement is in some sense conditional on labor force participation; i.e., you cannot leave working life if you never worked. We therefore exclude the never-employed from the analysis. Our baseline analysis uses a sample also conditioning on employment at age 50.[5]

Data sets are linked by a unique (pseudonymized) personal identification number. Demographic and socioeconomic information are taken from the Longitudinal integrated database for health insurance and labour market studies (LISA). Data on employment spells, workplace, occupation and wages come from the Employment Register, the Occupation Register and the Wage Structure Statistics. We use health data from the National Board of Health and Welfare, including inpatient and outpatient care and drug prescriptions. We also use detailed migration information during 1961–2018 from the Migration Register. Through the combination of these public registers we construct a unique data set that allows us to provide more reliable estimations and descriptions than studies relying on survey and census data (Borjas, 2011; Lopez and Slavov, 2020).

We follow previous work (Johansson et al., 2016, 2018) and study retirement based on observed withdrawal from the labor market. Since there is no earnings test in the Swedish pension system, individuals can freely combine work and pension claiming. The latter is hence not informative about labor market status. We define an individual as employed if her labor income during the year exceeds one price base amount.[6] If

[5] As shown in the sensitivity analyses in Section 5.3, the results are qualitatively similar without this restriction.

[6] We will present robustness checks altering the threshold to 2 and 3 PBA. The price base amount is linked to the consumer price index (CPI). In 2020, the price base amount was 47,300 SEK or about

a worker is not employed in the current year and not in any later year, the worker is considered retired. Consequently, the retirement age is the age in the last year of employment. Retirement hazards are set accordingly: 1 for the retirement year, 0 all years leading up to retirement, and missing all years following. If an individual does not retire within the observed time-span, the hazard is set to 0 for all years except the last, where it is coded as missing. Should a worker be employed in the last year of observation, she has no retirement age.[7]

We divide the sample by migration background, separating natives (Sweden-born with at least one Sweden-born parent), second generation immigrants (Sweden-born with two foreign-born parents), and three groups of foreign-born by origin: Western Europe and the Americas, Eastern Europe, and Africa and Asia.[8] We use the terms immigrants, migrants, and foreign-born interchangeably. The composition of the immigrant groups naturally depends on historic migration to Sweden. In the first decades after the Second World War, Sweden received substantial inflows of labor migrants. Many came from neighboring Finland, but also from other countries such as Yugoslavia, Turkey, and Italy. Toward the end of the 1960s, restrictions on Non-Nordic labor migration came into place. From the early 1970s there was a gradual shift toward humanitarian and family related immigration. Significant numbers came from, e.g., Chile in the 1970s, Poland in the early 1980s, Iran and Iraq later during the 1980s, and Somalia, Ethiopia, and former Yugoslavia in the 1990s. In the 2000s, wars and crises continued to bring refugees also from e.g. Syria, Afghanistan, and Eritrea. Sweden was then the EU country with the highest share of refugees to population in 2014, as well as the destination for the largest per capita flows of asylum seekers in 2009–2015 (Dustmann et al., 2017). Migration from Eastern Europe has also increased after the EU enlargement in 2004.

Figure 1 shows the share of the analysis sample by origin. As seen in Figure 1a, the share of foreign-born from Western Europe and the Americas is high in our sample, but has declined somewhat over time. The fraction originating in Eastern Europe and, in particular, Africa and Asia has instead increased. Figure 1b shows that the latter

4,600 €.

[7]Since we have data until 2018 and study retirement behavior until 2016, retirement in the last observation year requires that individuals do not re-enter within two years after labor market exit. Palme and Svensson (2004) evaluate different measures of retirement in administrative data and conclude that a measure based on labor earnings is more suitable than a measure based on the main income source when assessing full-time retirement. Eyjólfsdóttir et al. (2021) evaluate different measures of retirement in Swedish administrative and survey data and conclude that defining retirement as the year after the last observation of receiving at least the PBA from employment, followed by at least two years of non-employment, well resembles measures of retirement in survey data.

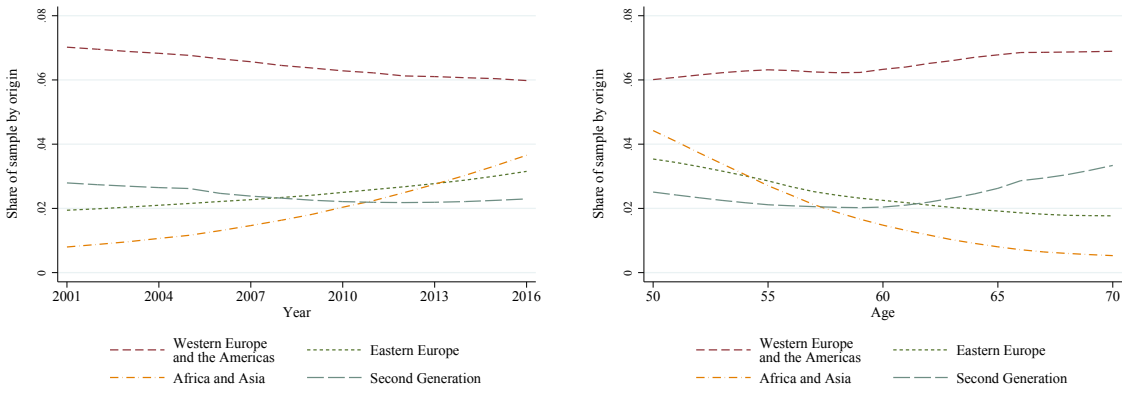
[8]Appendix Table A-1 presents the birth countries included in the broad origin groups in our analysis.

group is also more concentrated to the lower part of the age span. The patterns signal the need to control for differences in sample composition across calendar years and age also in basic specifications.

Table 1: Summary statistics at age 50 for the analysis sample

	Natives	Western Eur. & the Americas	Eastern Europe	Africa and Asia	Second Generation
Male	0.515	0.492	0.483	0.556	0.513
	(0.500)	(0.500)	(0.500)	(0.497)	(0.500)
Education level					
- Elementary	0.210	0.250	0.143	0.240	0.221
	(0.407)	(0.433)	(0.350)	(0.427)	(0.415)
- High school	0.458	0.423	0.461	0.364	0.466
	(0.498)	(0.494)	(0.499)	(0.481)	(0.499)
- College	0.326	0.295	0.358	0.375	0.298
	(0.469)	(0.456)	(0.479)	(0.484)	(0.457)
- Missing	0.006	0.031	0.038	0.021	0.014
	(0.078)	(0.173)	(0.191)	(0.142)	(0.119)
Marital status					
- Married/Cohab.	0.672	0.617	0.673	0.687	0.617
	(0.470)	(0.486)	(0.469)	(0.464)	(0.486)
- Single	0.328	0.383	0.327	0.313	0.383
	(0.470)	(0.486)	(0.469)	(0.464)	(0.486)
No. children	0.982	0.920	0.993	1.584	0.930
	(1.006)	(1.030)	(1.008)	(1.379)	(0.994)
Employed t-1	0.956	0.924	0.915	0.894	0.912
	(0.205)	(0.264)	(0.278)	(0.307)	(0.284)
Unemployment benefits t-1	0.054	0.072	0.111	0.157	0.053
	(0.227)	(0.258)	(0.314)	(0.364)	(0.224)
Earnings t-1	97,346	86,658	83,684	80,790	91,265
	(74,175)	(69,443)	(55,848)	(59,867)	(72,171)
Earnings quintile	3.039	2.755	2.763	2.706	2.936
	(1.412)	(1.395)	(1.378)	(1.415)	(1.441)
Health perc., 2-y lags	60.152	58.923	59.483	57.667	58.338
	(25.957)	(26.844)	(27.251)	(26.693)	(26.960)
Number of individuals	2,863,414	220,886	97,660	100,670	94,545

Table 1 presents summary statistics at age 50 by origin for the analysis sample. The sample contains about 2.9 million natives, 420,000 foreign-born and 95,000 second generation immigrants. The table shows that gender is relatively balanced across origin groups, although males are somewhat over-represented among migrants from Africa and Asia. Migrants from Eastern Europe and Africa and Asia have a higher share of at least college educated, but overall the educational and family characteristics are fairly similar in the different groups. However, people born in Sweden have stronger labor market attachment than the foreign-born; earnings are higher and unemployment is less prevalent.



(a) Origin and year

(b) Origin and age

Figure 1: Share of individuals in the sample by origin

3.2 Empirical strategy

We are interested in describing the differences in retirement hazard rates between foreign-born of different origins or second generation immigrants and natives. We begin by estimating the age-specific differences in retirement hazard rates in a linear probability model with interaction terms between age and the indicators for migration background:

$$R_{it} = \alpha + \sum_{o} \sum_{a=50}^{70} \beta_{o,a} O_o + \theta_y + \omega_a + \delta_g + \mathbf{x}_i' \gamma + \varepsilon, \tag{1}$$

where $R_i t$ is the retirement hazard for individual i in year t, O_o are indicator variables for individuals with different migration backgrounds o, θ_y are year dummies, ω_a are (1-year) age dummies, δ_g is a gender dummy and ε is an error term. The vector $\mathbf{x}_i'$ includes different sets of explanatory variables, as discussed below, and the vector γ contains the estimated coefficients for these variables. The coefficient vectors $\beta_{o,a}$, $o = AA, EE, WEA, SG$, $a = 50, ..., 70$ are the parameters of interest, capturing the age-specific differences for foreign-born with origin o from Africa and Asia (AA), Eastern Europe (EE), Western Europe and the Americas (WEA) and second generation immigrants (SG), respectively, compared to natives.

In addition to the age-specific model, we summarize the differences between individuals with different migration backgrounds and natives during all ages 50–70 in the following model:

$$R_{it} = \alpha + \beta_o O_o + \theta_y + \omega_a + \delta_g + \mathbf{x}_i' \gamma + \varepsilon, \tag{2}$$

where the coefficient vector β_o contains the parameters of interest, capturing the differences in the retirement hazard rate for immigrants with different origins and second

generation immigrants, respectively, compared to natives.

To analyze how different sets of covariates affect the estimated differences in the retirement hazard rate by migration background, we sequentially introduce different sets of variables. We present the results from eight different specifications based on what the literature has identified as important determinants of the labor market exit decision (see Section 2):

1. **Base**: The specification includes 1-year age dummies, calendar year dummies and gender dummies. This specification corresponds to Equations (1) and (2) without any additional explanatory variables.

2. **Education**: The base specification plus dummies for eight different education levels. These include Elementary school $<$9 years, Elementary school $\geq$9 years, High school $\leq$2 years, High School 2–3 years, College $\leq$2 years, College$\geq$3 years, PhD and a category for missing education information.

3. **Family**: The education specification plus dummies for family status (cohabiting with children, married, single, single parent) and number of children in the household (0, 1, 2, 3 or more).

4. **Employment**: The family specification plus ten years of (self-)employment history. This includes dummies for employment status and dummies for receiving unemployment benefits during each of the last ten years.[9]

5. **Income**: The employment specification plus ten years of earnings history, by including the real annual labor income during each of the last ten years.[10]

6. **Health**: The income specification plus three separate health indices, using information from the last 2 years, 5 years and 10 years, respectively. To construct the indices, we follow the approach by Johansson et al. (2016) and include the number of inpatient care days, the number of outpatient care visits, the benefits amounts received from the sickness and disability insurance, the (consumer price) monetary value of medical prescriptions, and two leads on mortality (i.e., whether the individual dies within two years from the observation year). We include the current year information as well as lags of 2, 5 and 10 years in the three differ-

[9]For years when information is missing, we code individuals as being non-employed and receiving no unemployment benefits.

[10]For years when information is missing, we code individuals as having no labor income.

ent health indices.[11] Based on this information, we construct a health index for each year between 2001 and 2016 for the entire age group 50–70 using the first principal component method. From these indices we divide the population into percentiles according to their predicted health, for each of the three health index versions.

7. **Industry**: The health specification plus industry dummies at the 5-digit level of the Swedish Industry Classification SNI, capturing 811 different industries.

8. **Occupation**: The industry specification plus occupation dummies at the 3-digit level of the Swedish Occupation Classification SSYK, capturing 168 different occupations.[12]

We will also discuss robustness checks using alternative sets of control variables and sample restrictions. One could argue that the setting would be appropriate for a more traditional duration model. However, the large number of observations and control variables, in combination with the need to estimate differences in very flexible hazards, makes standard survival models less appealing. Computing marginal effects from logit models following the same basic setup gives qualitatively similar estimates, although typically suggesting greater differences between immigrants and natives (at least until age 60).[13] To be conservative, and for the reasons outlined above, we focus on the linear probability estimates.

Sequential introduction of covariates gives an idea about how different sets of variables are related to across-group differences in labor market exit. For a more formal account we use a Blinder-Oaxaca-Kitagawa style decomposition of the richest model, based on the gap seen in the baseline specification (1) (i.e., the difference that is not attributable to age, calendar year, or gender). The analysis is performed using the user-written Stata command *oaxaca* (Jann, 2008). For a broad discussion of decomposition methods, see Fortin et al. (2011).

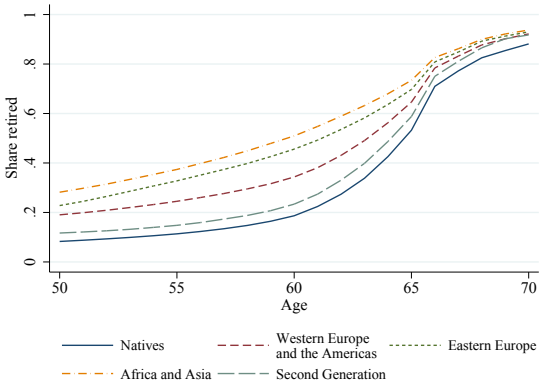
[11] Including future mortality or not implies a trade-off between the health information it brings and the principle of not conditioning on future events. The other health information available varies somewhat over the observation period. When there is complete information (from 2005), the correlation between indices with and without mortality is high (0.80–0.85), suggesting that results are not sensitive to the choice. But to get a good and consistent health indicator for all years, we include mortality throughout. Note, though, that the lagged index values do not vary due to mortality.

[12] See SCB (2001) for more information. In the cases when we are unable to observe occupation during a given year, we have imputed the occupational classification from surrounding years.

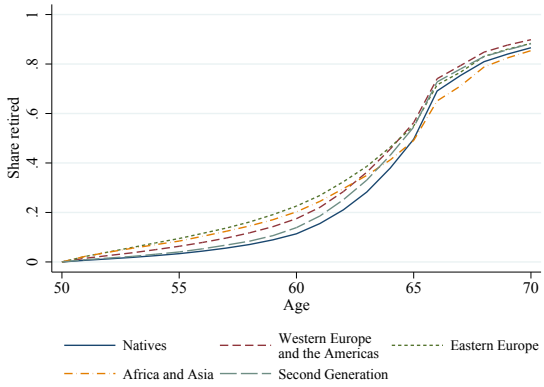
[13] This approach is in line with arguments provided by, e.g., Jenkins (2008). The logit estimations of the richest models used modified versions of the sets of control variables to achieve convergence. Results available upon request.

4 Description: Retirement patterns

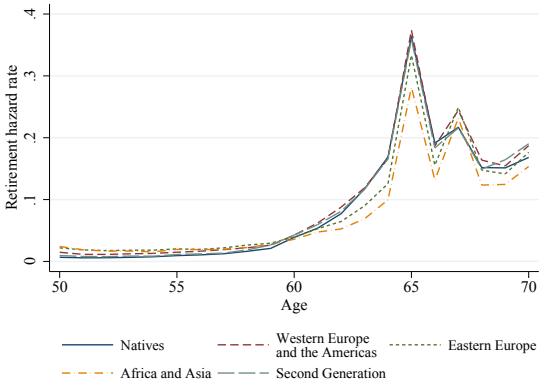
Figure 2a shows the retirement patterns among natives, foreign-born by origin and second generation immigrants in the full population during 2001–2016. The share retired already at age 50 differs substantially by migration background, with the highest share among immigrants from Africa and Asia and Eastern Europe, and a lower share among immigrants from Western Europe and the Americas. This reflects that many immigrants never enter the labor market. The differences between natives and second generation immigrants are less pronounced, although the labor market attachment is somewhat stronger among natives. The large differences between groups remain until age 60, when the gaps begin to close. The share retired among natives is lower at all ages, but the differences by migration background are limited after age 65.[14]



(a) Share retired, full population



(b) Share retired, analysis sample



(c) Retirement hazard, analysis sample

Figure 2: Retirement patterns by age and migration background 2001–2016

[14]Figure A-1 shows that non-retirement and employment are closely connected, suggesting that retirement is indeed the major determinant of employment patterns at these ages.

When conditioning the analysis sample on being employed at age 50, Figure 2b shows that differences between groups become smaller but remain. The share retired is higher among immigrants from Africa and Asia and from Eastern Europe, at least in younger ages, and lower among natives and second generation immigrants. Figure 2c shows the retirement hazard rate. It increases rapidly in ages 60–65, but more strongly so for native workers than for some of the migrant groups, in particular for those from Africa and Asia. As a consequence, the share retired in the conditional sample after age 65 is actually lowest among workers born in Africa and Asia.

What retirement based on observed labor market withdrawal implies differs depending on the age at retirement. Johansson et al. (2018) and Laun and Palme (2019) describe the public systems relevant for retirement as well as the prevalent pathways to retirement in Sweden. The old-age pension system in Sweden is a pay-as-you-go system with an early eligibility age of 61 during this period. A new defined-contribution system has gradually replaced the old defined-benefits system for the transition cohorts 1938–1953. Whereas the old system had a normal retirement age of 65 and an actuarial adjustment for early or late claiming, the new system has no normal retirement age but benefits are automatically adjusted with the cohort life expectancy at age 65. Basic pension could be claimed from age 65 and the mandatory retirement age, at which employers can ask employees to leave their employment without other reasons than age, was 67. Laun and Palme (2022) show that financial incentives to postpone retirement were strong both in the old and the new public pension system.

At younger ages the sickness and disability insurances are of key importance for labor market withdrawal. Johansson et al. (2018) and Laun and Palme (2019) argue that the screening stringency in the disability insurance is the key factor behind the changes in labor force participation at ages 60–64 over the last decades. The disability insurance belonged to the old public pension system but was transferred to the social insurance system in 2003, as part of the old-age pension reform. The calculation of benefits changed, but average benefits remained the same at about 64 percent of previous earnings, often combined with top-ups from collective agreements. Whereas the disability insurance compensates for earnings losses due to permanent impairments of working ability, sickness insurance compensates for earnings losses due to temporary impairments. Most often, individuals who end up with disability insurance begin their labor market withdrawal with sickness benefits. Another public system relevant for retirement at younger ages is the unemployment insurance, providing basic or income-related benefits for unemployment or participation in active labor market programs.

To illustrate the different pathways to retirement across age, we construct three

broad groups based on the main income source after retirement: 1) the pension pathway, including public and occupational pension; 2) the sickness/disability pathway, including sickness and disability benefits; and 3) the unemployment pathway, including unemployment benefits. Each year between retirement and age 64, we define the largest annual income source according to these three categories, and determine the pathway to retirement based on the largest annual income source that the individual has for most years between retirement and age 64. From age 64 onward, the pension pathway is the only available pathway, since eligibility for the other public transfer programs ceases at age 65.

The results in Figure 3 show that the sickness/disability pathway is by far the most common pathway in younger ages, whereas the pension pathway increases in importance by age. The unemployment pathway is less common and does not change much by age. Natives and second generation immigrants show very similar patterns, exiting through the pension pathway a bit more than foreign-born. Immigrants from Western Europe and the Americas and from Eastern Europe are over-represented in the sickness/disability pathway, whereas immigrants from Africa and Asia are much more likely than all other groups to retire through the unemployment pathway.

Previous work has documented that labor market withdrawal in Sweden has been delayed over the past decades (see, e.g., Laun and Palme (2019)). Figure 4 shows the average retirement hazard rate at ages 60 and 65 during 2001–2016 by migration background. The retirement hazard rate has declined over time at both ages, and the decrease is of similar magnitude across origin groups. One reason behind the delayed labor market withdrawal is tightened eligibility criteria to the disability insurance program (Laun and Palme, 2019). Appendix Figure A-2 shows that the decline in the sickness/disability pathway was similar across groups. The increase in the pension pathway is greater among natives, second generation immigrants and immigrants from Western Europe and the Americas, whereas the unemployment pathway has increased relatively more for immigrants from Africa and Asia and from Eastern Europe.

5 Results: Immigrant-native differences in exit hazards

We now go on to formally analyze the differences in retirement behavior by migration background. We will first present estimates of age-specific differences in the retirement hazard by birth region in the "base" and "full" specifications. Then we analyze how

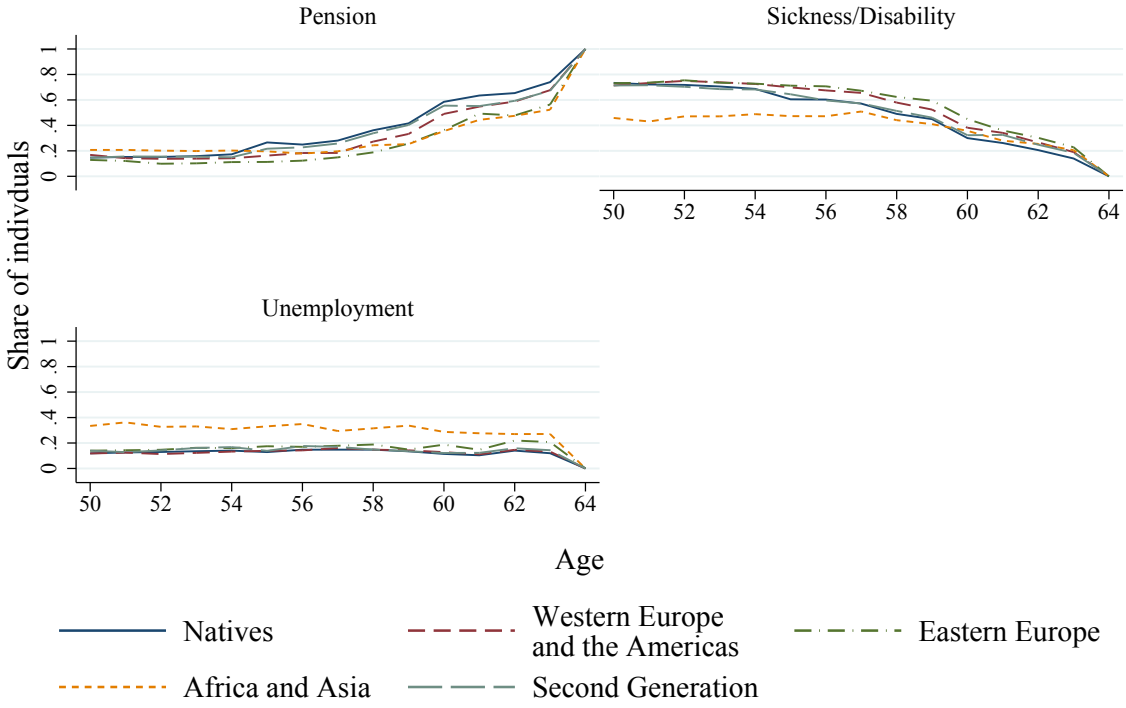


Figure 3: Pathways to retirement by retirement age and migration background

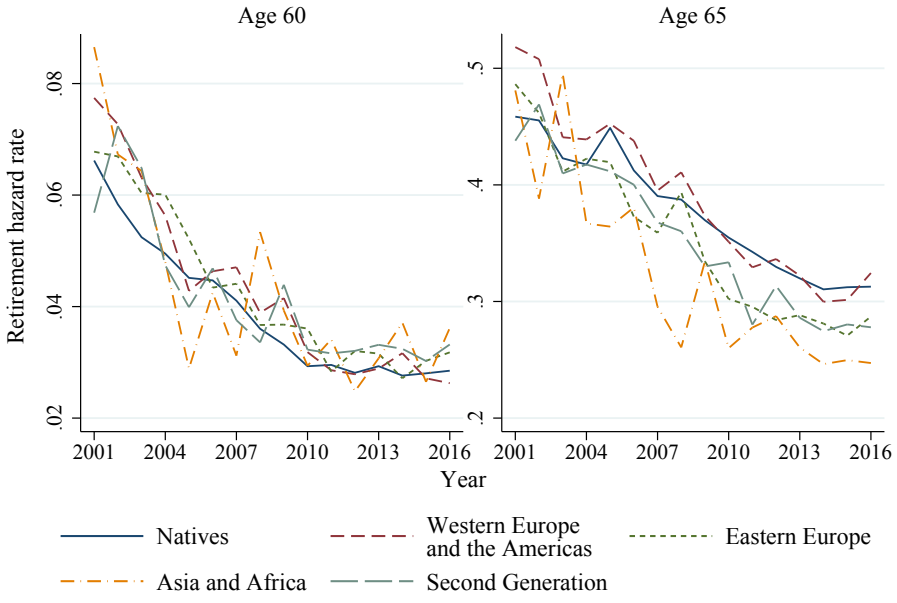


Figure 4: Retirement hazard rate by age and migration background, 2001–2016

different background characteristics are associated with average differences for the entire age span 50–70. We also investigate heterogeneity by gender, education and age at migration.

5.1 Age-specific and overall differences

Figure 5 shows the estimated difference in the retirement hazard rate between the three birth region groups and second generation immigrants relative to natives by age, based on Equation (1). The base specification in the left panel confirms that foreign-born retire to a larger extent than natives in ages 50–60, and that the differences are largest for Africa and Asia (AA) and Eastern Europe (EE). Western migrants (WEA) and the second generation immigrants (SG) are closer to the native reference category. After age 60, the patterns reverse. In these ages, immigrants from Africa and Asia and Eastern Europe retire to a much less extent than natives, and the difference is particularly large at age 65, which is the most common retirement age. One explanation may be that the norms about retirement at age 65 are less strong in these immigrant groups. One exception above age 60, in which retirement again is more likely among these immigrant groups, is age 67. It is interesting to note that this is the mandatory retirement age at which employers can ask employees to leave their employment without other reasons than age. Retirement behavior above age 60 in the WEA and SG groups is much more similar to natives, with only small negative deviations in general.

Conditioning on the full set of background characteristics in the right-hand panel of Figure 5 mitigates disparities by migration background. In particular, the differences before age 60 diminish, suggesting that these to a large extent depend on differences in socioeconomic status, health and labor market situation. It is, however, still the case that EE and AA migrants are more likely to exit the labor market at any given age before 60, also when taking a rich set of individual characteristics as well as earnings and employment history, industry, and occupation into account. For WEA migrants and SG, the differences relative to natives at ages up to 60 practically disappear when accounting for these observable differences. In contrast, the differences by migration background from age 60 largely remain when taking a full set of control variables into account. Also, the dramatic negative differences in the hazard for EE and AA relative to natives in the 62–66 age span remain in the richer specification. The results indicate that native norms regarding retirement ages are less influential on immigrants who are on average more marginalized in the host society, and typically also of more distant origin (geographic, economic, linguistic).

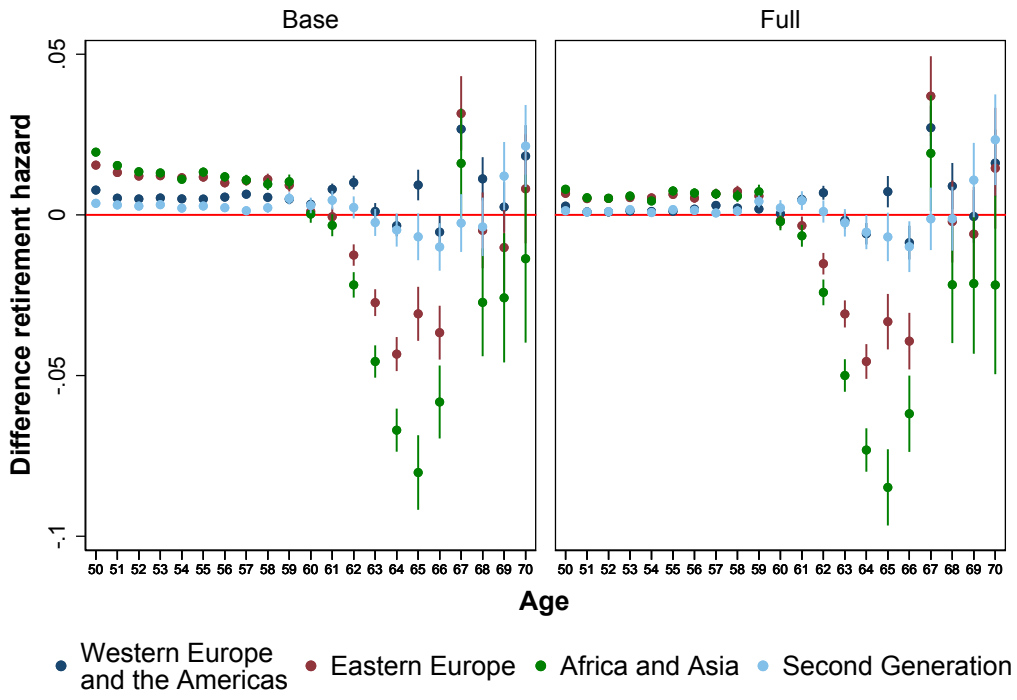


Figure 5: Estimated difference in retirement hazard by age compared to natives, base and full specifications

Notes: Estimates and 95% CI from equation (1). See Section 3.2 for descriptions of the different specifications.

How do the age-specific differences translate into averages for the overall observation age span? Figure 6 presents estimates of the model in Equation (2), and the various extensions described in Section 3.2 (see also Table A-2). The Base specification suggests that all immigrant groups, and the children of immigrants, have a significantly elevated retirement hazard in ages 50–70 compared to natives, when controlling for age, gender and calendar year. The estimated difference for the AA group is 0.75 percentage points, or 15 percent relative to the native baseline. For the WEA and EE groups the corresponding figures are 0.55 percentage points or 11 percent.

When expanding the model with additional sets of control variables, the estimated difference in the retirement hazard rate between the groups of foreign-born and natives remains positive and statistically significant in most specifications. But the gaps are reduced with the introduction of additional covariates. Education and family controls do not explain much of the differences in retirement hazard rates (in fact they tend to increase the unexplained difference). Controlling for previous employment and take-up of unemployment benefits reduces the difference compared to natives, and adding individual income history further shrinks the unexplained gap. Differences in health status across origin groups also appear be related to differences in exits.

Adding industry and, in particular, occupation to the controls further reduces differences in the retirement hazard rate across the groups. In the richest specification, it is actually the Western migrants who exhibit the clearest deviation from native workers. While one should obviously be cautious in the interpretation given potential differential selection into workplaces and occupations, the results are at least indicative that economic status and labor market position play a major role in determining immigrant-native disparities in labor market exit. This role also seems to be greater in the group with the poorest average outcomes, i.e., among African and Asian immigrants.

For second generation immigrants, the estimates are smaller already in the baseline, but remain statistically significant throughout all specifications. The patterns are qualitatively similar to those for foreign-born workers in the sense that health, industry and occupation reduce the differences in hazard rates the most. In contrast to foreign-born, however, employment and income history explain little of the gap in the average hazards for the 50–70 age span.

Sequential introduction of potentially correlated sets of controls could be misleading if earlier sets pick up associations actually attributable to factors introduced later. Table A-4 presents output from an Oaxaca-Blinder-Kitigawa decomposition, using the full model to explain the differences not accounted for in the baseline model. As in Figure 6, the overall message is that if anything, the foreign-born have education and

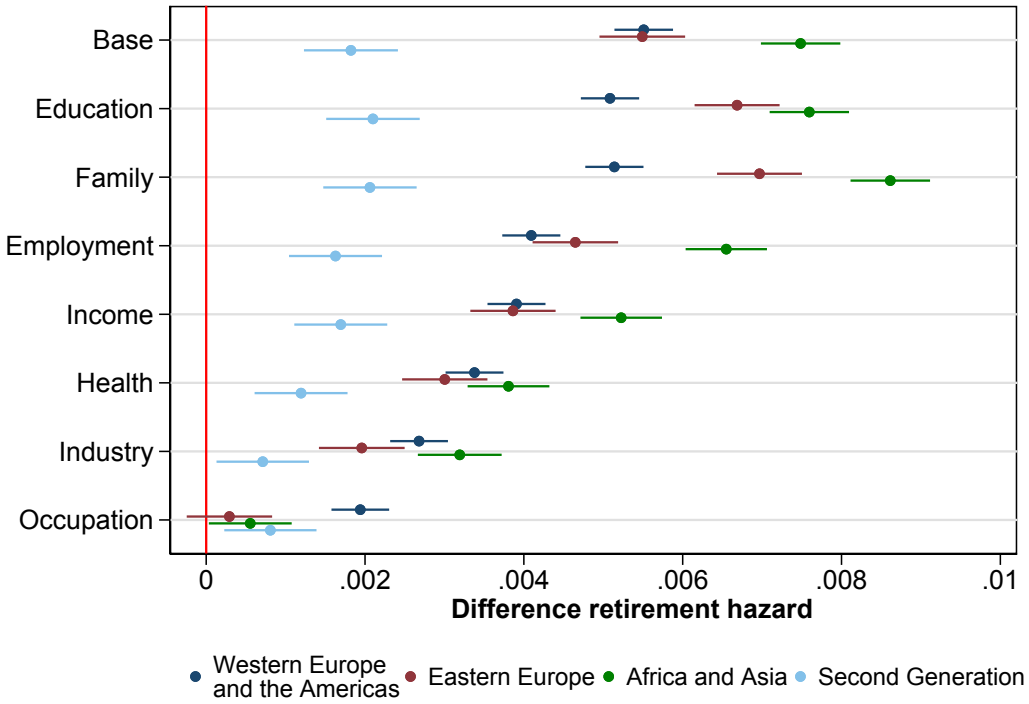


Figure 6: Estimated difference in retirement hazard compared to natives in different specifications

Note: Estimates and 95% CI from equation (2). See Section 3.2 for descriptions of the different specifications.

family characteristics associated with later retirement, whereas current and historical labor market characteristics (employment, income, occupation) in a statistical sense all offer some explanation to the immigrant-native gap in labor market exit.

5.2 Heterogeneity by gender, education, and age at migration

The results presented above show that labor market withdrawal among immigrants varies systematically by region of origin. We now turn to document heterogeneity also in other dimensions: gender, education, and age at migration.

The Swedish labor market is gendered in general, and the pace of immigrant integration varies between men and women (Åslund et al., 2017; Hernes et al., 2019). Our analysis suggests that the differences extend into the end of the working life. Figure 7 shows that whereas male foreign-born workers retire to a much larger extent than male natives, retirement patterns of foreign-born women is more similar to that of native women. While the gradient across specifications closes the gap for women, it remains significant for all groups of foreign-born males also in the richest specification. Interestingly, within industries and occupations, EE and AA women have lower hazards out of the labor market than their native counterparts with similar characteristics and labor market history. In other words, the absence of differences in the full model of Figure 6 masks significant gender heterogeneity.

Somewhat opposite patterns are found for the second generation. Males in this group deviate less from other natives than the foreign-born categories, and the estimates in the more extensive specifications are not statistically significant. Females in the second generation look roughly similar in the sparse specifications, but is the only group with a statistically significant increase in the full (Occupation) model.

Age-specific hazards by gender (Figures A-3 and A-4) reveal that up to age 60, group-specific patterns of higher hazards are similar among men and women (although less pronounced for women in the full model). The magnitude of the difference in the hazard rates between 61 and 66 is even greater among women than men from the EE and AA groups. Taking the point estimates literally, WEA men adhere even more than native men to the norm of retirement at age 65, and EE men seem to behave like natives in this particular year. Both men and women in the second generation deviate less than the foreign-born from other natives, but clearer differences among women at early ages contribute to the more significant deviation from natives seen over the entire age span discussed above.

A similar exercise by level of education (see Figures A-5 and A-6), suggests that the

elevated exit probabilities before age 60 are present among both high and low educated immigrants, but that the lower hazard out of employment around age 65 is primarily driven by foreign-born with at least high school education (and most clearly so among AA migrants).

As discussed in the introduction, the literature on immigrant labor market integration often considers years-since-migration (YSM) as a proxy for, e.g., acquisition of country-specific human capital and behavioral norms. In our setting, age at migration is a better operationalization to capture the influence of overall host country experience on retirement behavior.[15] Figure A-7 shows that the baseline difference in the retirement hazard rate compared to natives tends to be greater among those arriving at a higher age (and thereby more recently). But the overall picture is that the age-at-migration gradient is limited when it comes to labor market exit. Also, in the full model there is no significant difference for the EE and AA migrants even for those immigrating at relatively high ages.

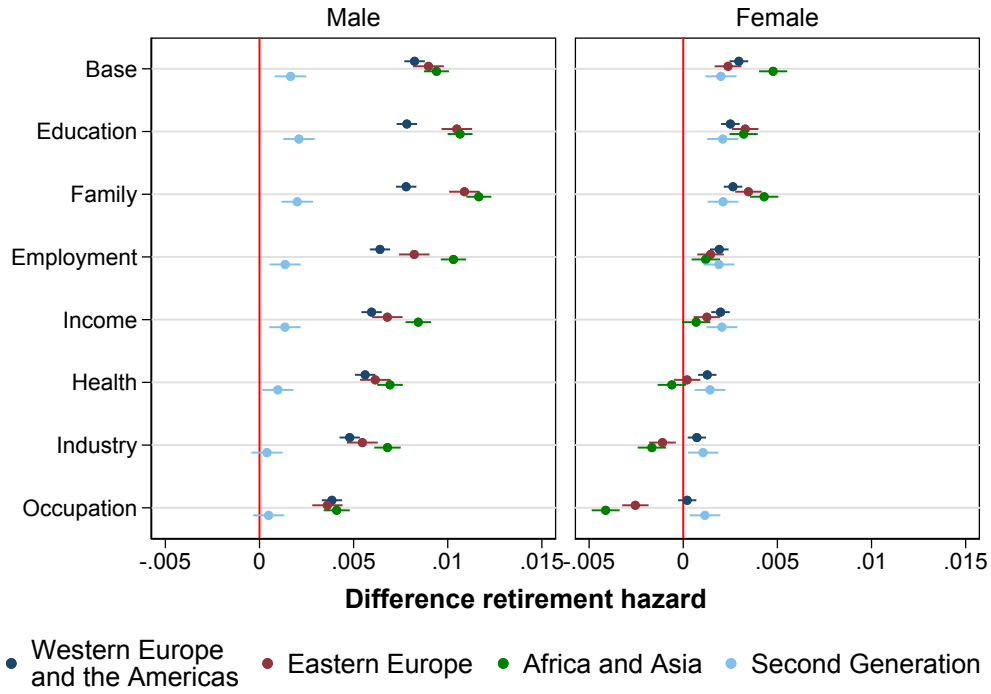


Figure 7: Estimated differences in retirement hazard, by gender

[15]With the age 50–70 observation window, using YSM would imply systematic variations in age composition across groups. Given the strongly varying hazards, results could be misleading.

5.3 Sensitivity analysis

This section discusses some further variations and robustness checks: alternative sample restrictions and specifications; higher earnings/income thresholds for the outcome variables, and the potential association between early labor market exit and emigration. Results are presented in the appendix (Tables A-6, A-7, A-3, Figure A-8) or available upon request.

As discussed in Section 3, inclusion in the main analysis sample is conditional on being employed at age 50. Not imposing this restriction (but implicitly requiring employment in any given year to identify the hazard) does not change the overall results.

The "full" model discussed above does not condition on geography. Adding (290) municipality fixed effects has little impact on most of the estimates, but somewhat sharpens the difference between natives and African and Asian migrants.

The 1 PBA threshold for being considered employed is quite low. We therefore tested using 2 and 3 PBA limits, retrieving similar although somewhat smaller estimates in the base specification. With the "full" set of controls, estimates for Eastern Europe and Africa and Asia become negative (after being very small in the baseline results reported above).[16] Adding unemployment benefits to the baseline income criterion yields a similar conclusion.[17]

Self-employment rates vary by birth region and gender; e.g., 16 percent of AA men had self-employment income at age 50, compared to 9 percent among native men. Among women in our sample, self-employment is less common (5–6 percent) and does not differ as much across groups. Excluding the self-employed does not affect the results. Origin-based differences in hazard rates are smaller among the self-employed, in particular after age 60.

We also considered the possibility that differences in early labor market exit are related to higher rates of emigration among people of foreign descent (Klinthäll, 2006; Cobb-Clark and Stillman, 2013). While it is not obvious how to consider such a correlation (whether emigration is driving exit or vice versa), it turns out that excluding individuals leaving Sweden during the observation period does not alter the results.[18]

[16]Recall that the analysis is conditional on being employed at some point. Imposing a higher threshold may affect sample composition differentially across groups. One should therefore be cautious in interpreting the differences in the results.

[17]I.e., an individual is defined as employed if earnings+unemployment benefits exceeds 1 price base amount. Note that this addition only matters for the exit timing among individuals leaving the labor market through UB. Anyone re-entering employment is considered non-retired also in the main analysis.

[18]Recall that mortality is already considered through the leads included in the health specification.

Finally, we have tried using logit instead of linear probability models. As discussed in Section 3, a non-linear model more closely resembles a traditional duration analysis. It can also be a more appealing alternative when the probability in any given period is low. On the other hand, linear models may be preferable when there is a lot of covariates. Figure A-8 and Table A-3 show that the qualitative patterns are similar, although the logit models typically suggest greater differences between natives and the different groups of foreign-born. To avoid exaggerating our findings, we choose to focus on the linear probability estimates.

6 Conclusions

This paper studies labor market exit of foreign-born individuals and children of immigrants in Sweden. We argue that given general immigrant-native labor market disparities and increasing shares of people of immigrant origin in overall aging populations, this topic has received surprisingly little scholarly and policy attention.

Our findings suggest significantly higher rates of withdrawal from the labor market among the foreign-born already from age 50. Approaching the typical retirement age of 65, we then see a reversal with a stronger peak in exits among native workers. This shift from higher to lower exit rates is particularly strong among African and Asian migrants, whereas immigrants from Western countries are closer to natives. Seen over the 50–70 age span, the annual hazard to retirement is 11–14 percent higher among the foreign-born. The second generation is closer to native workers, but have about a 4 percent higher hazard in a basic specification. Much, but not all, of the differences can (in a statistical sense) be explained by rich sets of background characteristics. In particular, differences in employment and earnings history, health, and occupations contribute to immigrant-native differences in labor market exit.

Crude classifications on region of origin capture substantial heterogeneity in overall labor market positions. Our findings indicate that economic necessity and/or opportunity are also an important component for understanding retirement patterns. Descriptions show that the share retired already at age 50 (in the sense never seen working again) is substantially higher in groups characterized by refugee related migration. Selection into employment at age 50 (a criterion for inclusion in the main analysis) is thus potentially stronger in more marginal groups, but we still see higher outflows before age 60. However, the differences toward natives are to a very large degree accounted for by observed characteristics, most prominently labor market history. Another indication of involuntary exit rather than planned retirement is seen in the AA migrants being more

likely than other groups to exit the labor market through unemployment. Furthermore, the tendency to stay on longer among those managing to remain in the labor market points in the same direction, as does the elevated hazard at age 67.[19]

The results conform to previous research in the sense that there are substantial immigrant-native differences, but also significant heterogeneity within the foreign-born population as well as between men and women. Broadly, our findings indicate that more work considering also the later stages of the working life of migrants is motivated. The dynamics we uncover, suggesting differences at relatively young ages shifting sign when workers approach the typical retirement age, signal that understanding the underlying mechanisms coming from preferences, possibilities, incentives, and institutions is important.

Our analysis shows that early labor market exit adds to overall immigrant-native economic disparities. At the individual level, one can of course discuss how to consider differences driven by, e.g., health and labor market history, and the role of work-leisure preferences. But at the societal level, the observed differences in labor market exit aggregate into significant economic costs and opportunities. Our baseline estimates suggest that more frequent exits between 50 and 65, lead to slightly more than one year less of work among Eastern European, African and Asian migrants. In magnitude, this is comparable e.g to the increase in the actual retirement age between 2010 and 2020 (Fondberg and Wikmark Kreuger, 2022).[20] Since the factors revealed to affect the gap are strongly linked to economic factors also associated with the lower labor force participation at the start of the observation window, the work-year reduction is arguably a lower bound for the impact of improved labor market integration. In societies with 20–30% of the older workforce being foreign-born, closing these gaps would mean a substantial increase in labor supply.

[19]We acknowledge the fact that age-specific hazards should be interpreted with caution especially at higher ages, where previous outflow differences may affect sample composition.

[20]We calculate the differences in work years compared to natives by computing the survival curves for the respective groups implied by the estimated hazard coefficients (controlling for background characteristics), integrating the area below the survival curve, and finally taking the difference in the integral compared to natives for the different groups.

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Appendix A: Additional Tables and Figures

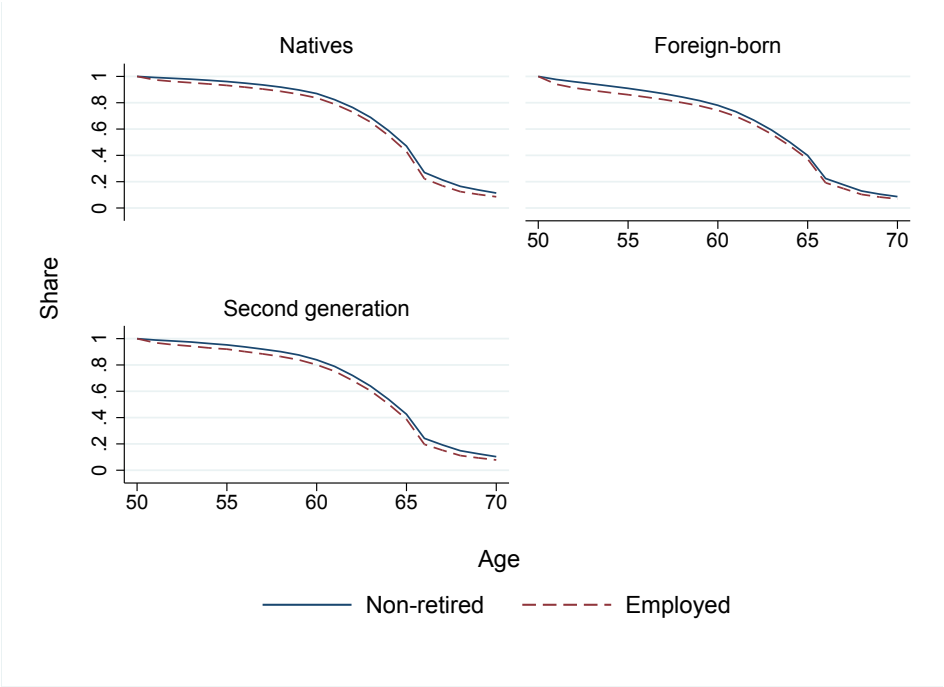

Figure A-1: Share non-retired and share employed in the analysis sample by age and migration background

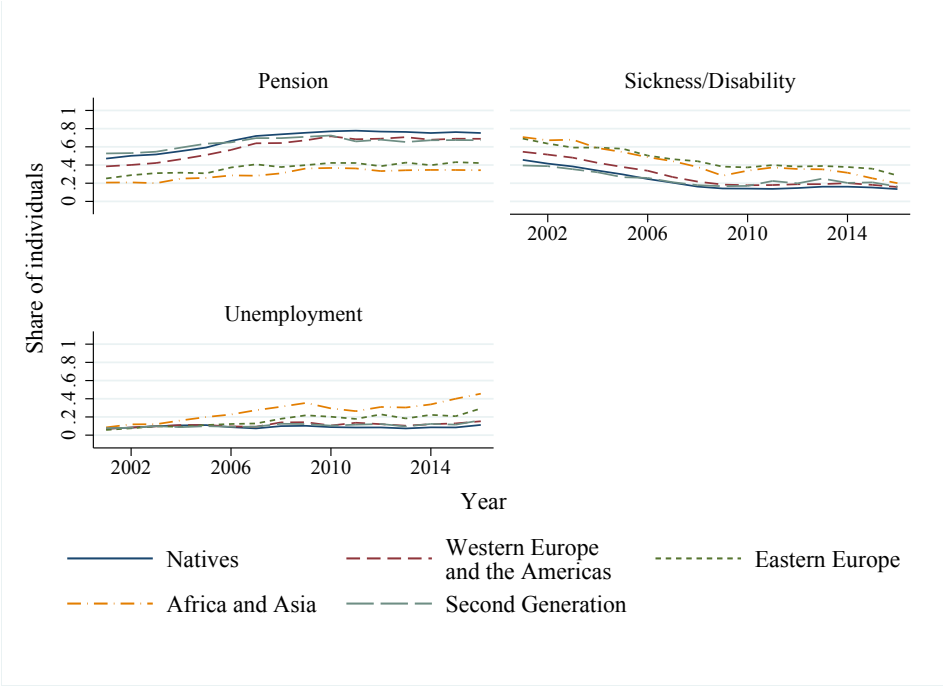

Figure A-2: Pathways to retirement at ages 50–64 by retirement year and migration background

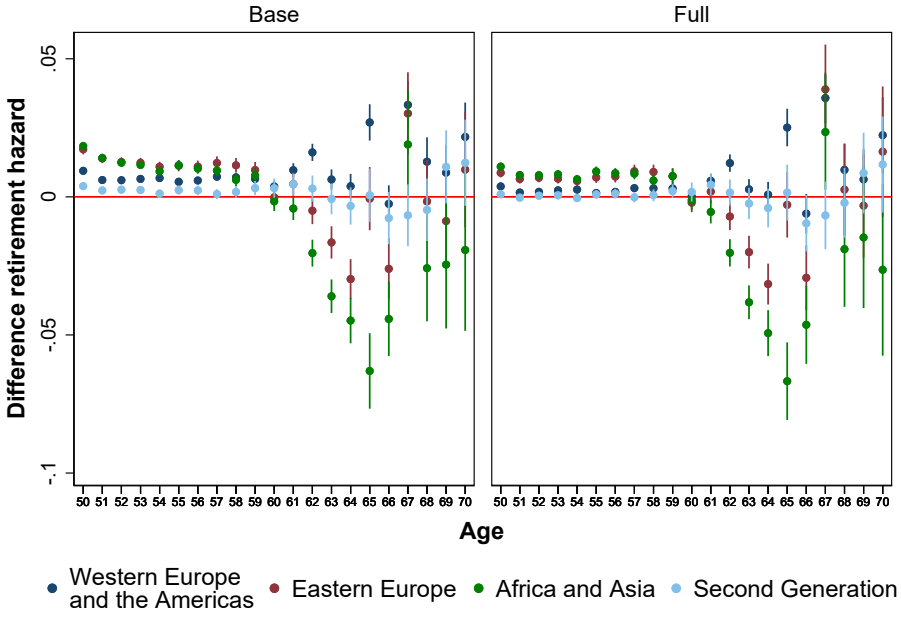

Figure A-3: Men, estimated difference in retirement hazard by age compared to natives, base and full specifications

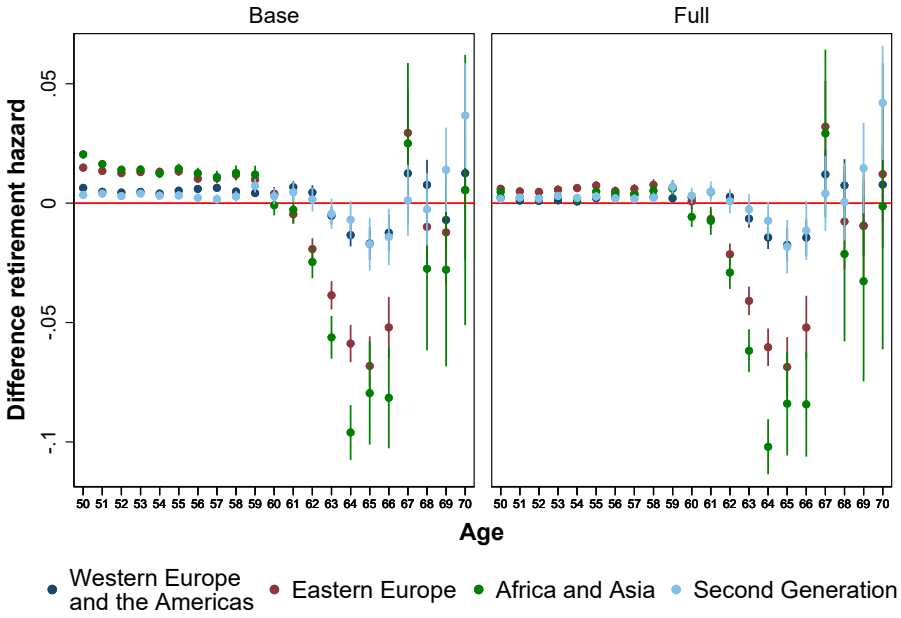

Figure A-4: Women, estimated difference in retirement hazard by age compared to natives, base and full specifications

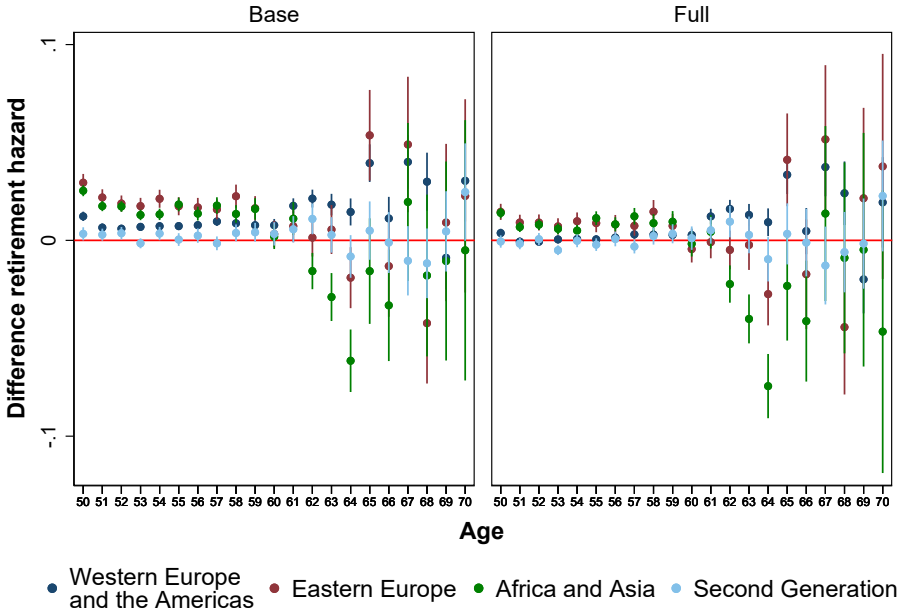

Figure A-5: Less than high school, estimated difference in retirement hazard by age compared to natives, base and full specifications

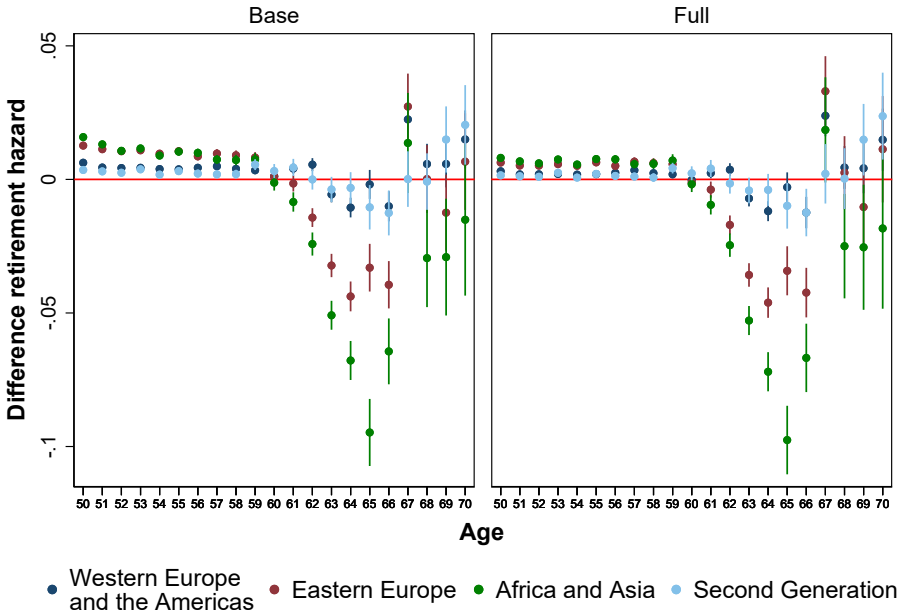

Figure A-6: At least high school, estimated difference in retirement hazard by age compared to natives, base and full specifications

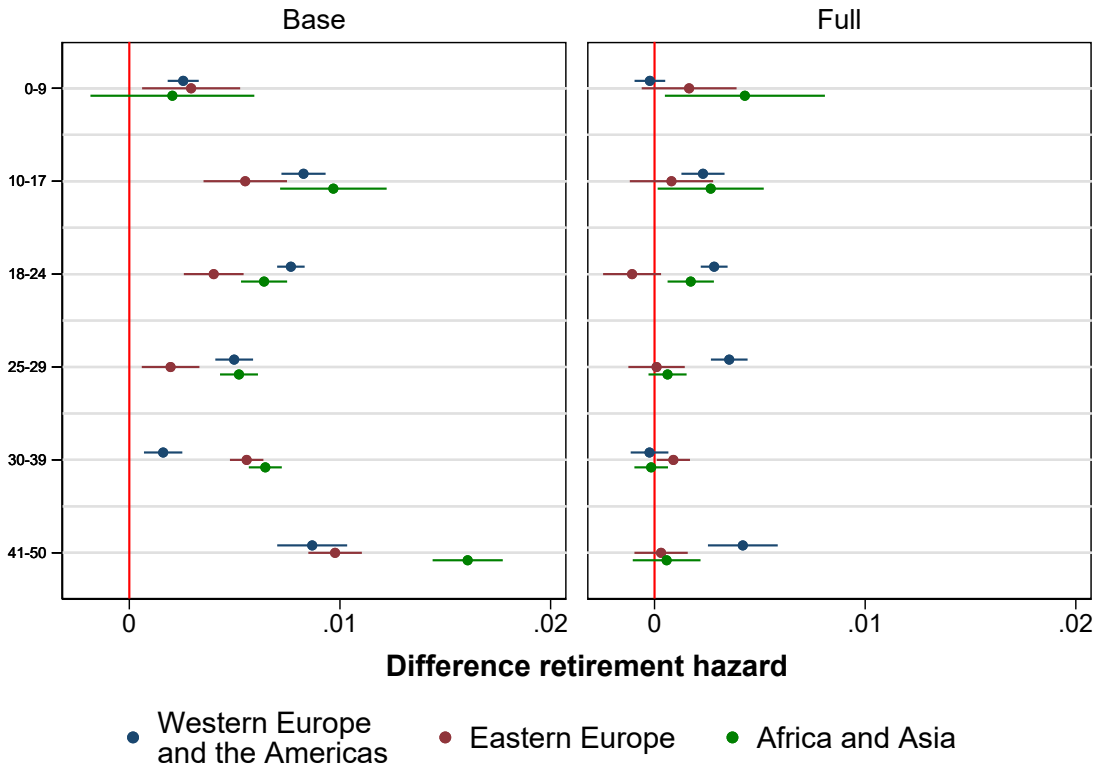

Figure A-7: Estimated difference in retirement hazard by age at migration

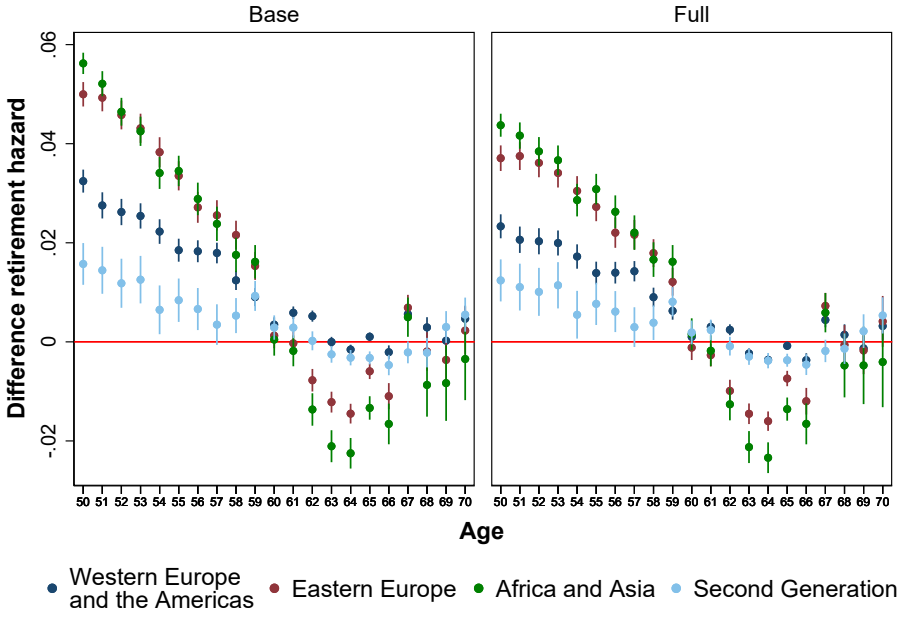

Figure A-8: Marginal effects from logit estimates, age-specific differences in hazards

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Table A-1: Origin groups

Region	Countries included
Western Eur. & the Americas	Nordic (Denmark, Finland, Iceland, Norway); Great Britain; Ireland; Germany; Central Europe (Andorra, Austria, Belgium, France, Liechtenstein, Luxembourg, Netherlands, Switzerland); South Europe (Greece, Italy, Malta, Monaco, Portugal, San Marino, Spain, Vatican City); USA; Canada; Latin America (Antigua and Baruda, the Bahamas, Barbados, Belize, Chile, Costa Rica, Cuba, Dominican Rep, El Salvador, Grenada, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, St. Lucia, St. Vincent, St. Dig and Nevis and Anguil, Trinidad and Tobago, Argentina, Bolivia, Brazil, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela); Oceania (Australia, Fiji, Kiribati, Micronesia, Nauru, New Zealand, Palau, Papua New Guinea, Salomon Islands, Tonga Vanutua, West Samoa)
Eastern Europe	Former Yugoslavia (Croatia, Yugoslavia, Macedonia, Slovenia); Albania; Armenia; Azerbaijan; Belarus; Bosnia-Herzegovina; Bulgaria; Estonia; Georgia; Hungary; Kazakhstan; Kyrgyzstan; Latvia; Lithuania; Moldova; Poland; Romania; Russia; Slovakia; Czech Republic; Tajikistan; Turkmenistan; Ukraine; Uzbekistan
Africa and Asia	Africa (Djibouti, Eritrea, Ethiopia, Somalia, Sudan, Libya, Angola, Benin, Botswana, Burkina Faso, Burundi, Central African Republic, Comoros, Equatorial Guinea, Ivory Coast, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Cameroon, Cape Verde, Kenya, Congo, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Pr, Senegal, Seychelles, Sierra Leone, Swaziland, South Africa, Tanzania, Togo, Uganda, Zaire, Zambia, Zanzibar, Zimbabwe); Middle East (Lebanon, Syria, Morocco, Tunisia, Egypt, Algeria, Israel, the Gaza area, Palestine, Jordan, South Yemen, Yemen, the United Arab Emirates, Kuwait, Bahrain, Qatar, Saudi Arabia, Cyprus, Iran, Iraq, Turkey); Asia (Hong Kong, Japan, China, Taiwan, North Corea, South Corea, Myanmar, the Philippines, Indonesia, Laos, Malay Federation, Singapore, Thailand, Vietnam, Afghanistan, Bangladesh, Bhutan, Brunei, India, Kampuchea, Maldives, Mongolia, Nepal, Oman, Pakistan, Sikkim, Sri Lanka)

Table A-2: Baseline results, difference in retirement hazard compared to natives

VARIABLES	(1) Base	(2) Education	(3) Family	(4) Employment	(5) Income	(6) Health	(7) Industry	(8) Occupation
- Western Europe and the Americas	0.0055***	0.0051***	0.0051***	0.0041***	0.0039***	0.0034***	0.0027***	0.0019***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
- Eastern Europe	0.0055***	0.0067***	0.0070***	0.0046***	0.0039***	0.0030***	0.0020***	0.0003
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
- Africa and Asia	0.0075***	0.0076***	0.0086***	0.0065***	0.0052***	0.0038***	0.0032***	0.0006**
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Second Generation	0.0018***	0.0021***	0.0021***	0.0016***	0.0017***	0.0012***	0.0007**	0.0008***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Observations	22,885,000	22,885,000	22,885,000	22,885,000	22,885,000	22,885,000	22,880,771	22,278,643
Education controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Family controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Employment history	No	No	No	Yes	Yes	Yes	Yes	Yes
Income history	No	No	No	No	Yes	Yes	Yes	Yes
Health controls	No	No	No	No	No	Yes	Yes	Yes
Industry controls	No	No	No	No	No	No	Yes	Yes
Occupation controls	No	No	No	No	No	No	No	Yes
Mean natives	0.0501	0.0501	0.0501	0.0501	0.0501	0.0501	0.0501	0.0492
Adjusted R-square	0.124	0.126	0.126	0.128	0.128	0.130	0.133	0.140

All regressions include year, gender and age dummies. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A-3: Comparison logit vs OLS specifications

	(1) Base logit	(2) Base OLS	(3) Full logit	(4) Full OLS
Western Europe and the Americas	0.0052***	0.0055***	0.0025***	0.0023***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Eastern Europe	0.0061***	0.0055***	0.0029***	0.0009***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Africa and Asia	0.0108***	0.0075***	0.0075***	0.0016***
	(0.0004)	(0.0003)	(0.0004)	(0.0003)
Second Generation	0.0002	0.0018***	-0.0004	0.0010***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Adjusted R-squared		0.124		0.137
Observations	22885000	22885000	22280010	22280026

Standard errors in parentheses. To achieve convergence, the "full" specifications (logit and OLS) do here not include historical labor earnings.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A-4: Decomposition of baseline retirement difference

	(1) W Eur and Americas	(2) Eastern Europe	(3) Africa and Asia
Differential			
Prediction_1	0.0046***	0.0041***	0.0048***
	(0.0002)	(0.0003)	(0.0002)
Prediction_2	-0.0004***	-0.0004***	-0.0004***
	(0.0000)	(0.0000)	(0.0000)
Difference	0.0050***	0.0045***	0.0052***
	(0.0002)	(0.0003)	(0.0003)
Explained			
Education	0.0002***	-0.0006***	-0.0001**
	(0.0000)	(0.0000)	(0.0000)
Family	-0.0002***	-0.0004***	-0.0006***
	(0.0000)	(0.0000)	(0.0000)
Employment	0.0008***	0.0017***	0.0011***
	(0.0000)	(0.0001)	(0.0001)
Income	0.0005***	0.0009***	0.0013***
	(0.0000)	(0.0000)	(0.0001)
Health	0.0008***	0.0010***	0.0012***
	(0.0000)	(0.0000)	(0.0000)
Industry	0.0001*	-0.0001**	-0.0007***
	(0.0000)	(0.0001)	(0.0001)
Occupation	0.0007***	0.0014***	0.0013***
	(0.0000)	(0.0001)	(0.0001)
Total	0.0030***	0.0038***	0.0034***
	(0.0001)	(0.0001)	(0.0001)
Observations	20748269	19962241	19909608
Fraction expl.	0.60	0.84	0.65

Oaxaca-Blinder-Kitigawa decomposition of retirement hazards
(residuals from regressions including year, gender and age dummies).
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A-5: Decomposition of baseline retirement difference–unexplained components

	(1) W Eur and Americas	(2) Eastern Europe	(3) Africa and Asia
Unexplained			
Education	-0.0031***	-0.0039***	-0.0040***
	(0.0004)	(0.0005)	(0.0005)
Family	0.0013***	-0.0020***	-0.0021***
	(0.0002)	(0.0004)	(0.0003)
Employment	-0.0224***	-0.0209***	-0.0291***
	(0.0022)	(0.0026)	(0.0021)
Income	-0.0046***	-0.0121***	-0.0057***
	(0.0009)	(0.0009)	(0.0009)
Health	-0.0030***	-0.0010	0.0090***
	(0.0005)	(0.0007)	(0.0006)
Industry	0.0009	-0.0028**	-0.0007
	(0.0009)	(0.0013)	(0.0013)
Occupation	-0.0032**	-0.0076***	-0.0035*
	(0.0014)	(0.0028)	(0.0021)
Constant	0.0361***	0.0510***	0.0380***
	(0.0027)	(0.0040)	(0.0032)
Total	0.0020***	0.0007***	0.0018***
	(0.0002)	(0.0003)	(0.0003)
Observations	20748269	19962241	19909608

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A-6: Sensitivity analyses - base specification

	(1) Baseline	(2) Excl. leavers	(3) Mun. FE	(4) 2PBA	(5) 3PBA	(6) Incl. unemp.
Western Europe and the Americas	0.0055***	0.0047***	0.0058***	0.0045***	0.0031***	0.0055***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Eastern Europe	0.0055***	0.0049***	0.0059***	0.0034***	0.0016***	0.0045***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Africa and Asia	0.0075***	0.0067***	0.0090***	0.0060***	0.0049***	0.0054***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0002)
Second Generation	0.0018***	0.0017***	0.0021***	0.0015***	0.0011***	0.0020***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Mean natives	0.050	0.052	0.050	0.054	0.056	0.050
Adjusted R-squared	0.124	0.125	0.125	0.142	0.156	0.142
Observations	22,885,000	22,785,946	22,885,000	21,312,620	19,566,501	23,754,280

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A-7: Sensitivity analyses - full specification

	(1) Baseline	(2) Excl. leavers	(3) Mun. FE	(4) 2PBA	(5) 3PBA	(6) Incl. unemp.
Western Europe and the Americas	0.0019***	0.0013***	0.0022***	0.0011***	0.0002	0.0015***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Eastern Europe	0.0003	-0.0001	0.0005*	-0.0014***	-0.0026***	-0.0014***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Africa and Asia	0.0006**	0.0000	0.0013***	-0.0009***	-0.0016***	-0.0036***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0002)
Second Generation	0.0008***	0.0008**	0.0009***	0.0007**	0.0006*	0.0004
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Mean natives	0.049	0.047	0.049	0.053	0.055	0.049
Adjusted R-squared	0.140	0.140	0.140	0.157	0.169	0.157
Observations	22,278,643	22,183,870	22,278,643	20,880,245	19,260,650	23,035,547

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$