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Abstract

Studies on the integration of the descendants of migrants—the second generation—show a mismatch between their educational achievements and labor market outcomes compared to ancestral native population. This descriptive study focuses on overqualification—a downward educational mismatch—as an indicator of the labor market integration of second generations. Using the Swedish total population register from 2001 to 2016, I investigate the pattern of overqualification among second generations and compare them to the ancestral native counterparts. I further investigate heterogeneities in overqualification between ancestral Swedish population and 10 second generation ancestry groups. The descriptive findings show that second generations report a lower prevalence of overqualification than immigrants and a similar prevalence compared to ancestral natives. Yet, the differences between ancestral Swedes and second generations widened over time. The results from logistic regression analyses confirm second generation's improvements and the remaining gaps between second generations and ancestral Swedes. Further analyses stratified by ancestry report that the differences between ancestral natives and second generations are driven by non-Western G2 women and men, such as Iranian, Middle-Eastern, and Yugoslavian/Bosnian second generation individuals. This paper concludes by elaborating on the potential explanations of the findings while highlighting future research suggestions.

Keywords: Overqualification, educational mismatch, second generation, integration, Sweden

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Introduction

This study investigates educational mismatch —the discrepancy between a worker's educational level and the requirement of a worker's job (McGuinness, 2006) —among the descendants of migrants born in the host country—the second generation (G2) —as an indicator of labor market integration. While many migrant groups face greater socioeconomic disadvantage than the native population, second generations are generally better off than their parents, according to the classical assimilation theory (Alba & Nee, 1997). Still, the second generations are more disadvantaged than the ancestral natives—natives with two native parents—in the labor market. In Western Europe, the G2 converge in educational outcome, yet lag behind the ancestral natives in employment and occupational attainment (Heath et al., 2008; OECD, 2017). This inequality may occur when the G2 is more less likely to be employed, or more likely to be employed in a job not commensurate with their educational qualification than ancestral natives with the same level of qualification. Therefore, this disagreement between educational and occupational attainment motivates studying the G2's educational mismatch, particularly overqualification, i.e., downward educational mismatch.

Overqualification is associated with underutilization of worker's human capital (Mavromaras et al., 2015), which leads to other labor market disadvantages: Overqualification decelerates wage growth (Korpi & Tåhlin, 2009; McGuinness, 2006), hampers career mobility (Baert et al., 2013), and increases the unemployment risk (Esposito & Scicchitano, 2022). Studying educational mismatch of the G2 highlight an important dimension of labor market integration because it indicates how their human capital acquired in the host country is assessed and utilized in the labor market. Furthermore, the G2's educational mismatch can be a barometer of long-term ethnic inequalities in return to human capital investment. The G2 do not encounter the same challenges as their parents such as human capital transferability or lack of host country language proficiency. Therefore, the difference in educational mismatch is likely due to the factors contributing to persistent ethnic stratification in educational mismatch in the host society, such as employer discrimination and residential/school segregation (Falcke et al., 2020). Previous research has shown that foreign-born migrants (G1) are overrepresented in the overqualified workforce and disproportionately disadvantaged by overqualification (Chiswick & Miller, 2009; Joona et al., 2014). Despite its theoretical and empirical relevance in understanding the G2's labor market

integration, G2's overqualification has not received equal attention compared to the G1's overqualification or other labor market disadvantages that the G2 experience.

I aim to examine overqualification among the G2, and compare it to that of the ancestral natives and the G1 using Swedish total population register data from 2001 to 2016. Sweden provides a distinctive case since it features a growing number of G2 with diverse ancestry. This study focuses on overqualification. While underqualification is also prevalent among the G1 or the G2, there is little evidence of its negative impact. Rather, a recent study found income advantages of the underqualified immigrants (Schaeffer et al., 2016). I also focus on heterogeneity within the G2. Previous research found heterogeneity in labor market integration associated with the G2's ancestral origin (OECD, 2017), following the segmented assimilation theory (Portes & Zhou, 1993; Zhou, 1997). This heterogeneity may be found in overqualification patterns across ancestry groups, often referred to *ethnic penalty* in educational mismatch (Falcke et al., 2020).

This study contributes to the existing literature on educational mismatch and immigrant labor market integration in three ways: First, this study is one of the first studies which investigate heterogeneity in overqualification associated with several sociodemographic factors, such as ancestry, gender, and education level, to see which ancestry groups are more vulnerable to overqualification (cf. Larsen et al., 2018). Second, this study examines observations from recent years. As a result, this study contains a substantial amount of non-Western origin groups compared to previous research (Dahlstedt, 2015). Third, this study overcomes prevalent data issues by utilizing the whole population registered during the study period. Previous studies were limited by misclassification of immigrant generation status (e.g., Fernández-Reino et al., 2018), or by focusing on the selected subgroups of the G2 available from survey data (e.g., Falcke et al., 2020).

The main findings point to substantial improvements in job matching of the G2 compared to the G1, yet unexplained differences in overqualification between the G2 and the ancestral Swedish workforce. The G2 have a lower predicted probability of overqualification than the G1, indicating integration regarding overqualification. However, compared to ancestral Swedes, the G2 are still more likely to be overqualified. In addition, non-Western second generation men with an upper secondary education degree and non-Western second generation women are more likely to be overqualified. The observed heterogeneity in overqualification may reflect employer discrimination or other structural differences in labor market integration.

Literature review

Labor market integration of the second generations

Unlike the G1, the G2 are born, raised, and educated in the host society together with the ancestral native population. Therefore, they generally do not encounter the same challenges for labor market integration as their parents, such as lack of host country language skills and imperfect transferability of foreign educational qualifications (Alba & Foner, 2015a). Likewise, unobserved heterogeneity with respect to selection into immigrant plays a smaller role in determining the G2's labor market outcome, compared to the G1. As such, their labor market integration is a significant indicator of persistent ethnic stratification in host societies (Aradhya et al., 2023).

A recent study on the integration of the second generations in Western Europe implies a trend towards intergenerational socioeconomic assimilation over time (Drouhot & Nee, 2019). The most significant convergence is reported in educational achievements. Most G2 groups feature higher educational attainment compared to their parents, and in some cases, they surpass ancestral native peers (Crul et al., 2012; Jackson et al., 2012; Jonsson & Rudolphi, 2011). However, the heterogeneity in intergenerational integration, e.g., European and Asian-origin students converge with or even outperform the ancestral native peers while North African and Turkish students lag behind (Alba & Foner, 2015b; Baysu et al., 2018), indicate the segmented assimilation takes place (Portes & Zhou, 1993; Zhou, 1997).

The existing literature on labor market outcomes of the G2 has reported mixed results. Although the G2 generally show improved outcomes compared first generation immigrants, they are disadvantaged in transition from education to employment and occupational attainment (Heath et al., 2008; OECD, 2017). Evidence from Sweden corroborates that from other Western European countries. Rooth and Ekberg (2003) showed that non-Western, Southern European, and Eastern European origin individuals show higher unemployment compared to Nordic or Western European origin individuals. Hammarstedt and Palme (2012) also found an overall convergence in earnings between ancestral Swedes and the G2, with relative disadvantages among non-European origin groups. More recent studies regarding unemployment dynamic of the second generations in the Swedish labor market found that non-Western origin second generations show higher persistence of unemployment (Aradhya et al., 2023), and higher risk of entering unemployment (Grotti et al., 2023), which indicates segmented labor market integration ethnic penalty in unemployment.

Comparing the second generation's overqualification with that of ancestral population adds to the literature on immigrant integration in two ways: first, investing overqualification will contribute to the existing literature on the second generation's occupational attainment patterns. A previous study reported that the once employed, the G2 do not show systematic differences in terms of occupational attainment (Hermansen, 2013). However, education-occupation mismatch may still occur within the broadly defined occupation class schemes. Since the second generations are exempt from the most evident determinants of overqualification which their parents would face, their overqualification is likely to be realized in a subtle way, e.g., hired in a position requiring a BA in Economics with an MA in Economics, rather than an explicit way, e.g., working as a taxi driver with an MA in Economics. Therefore, examining overqualification pattern unveils more nuanced inequalities in occupational attainment that previous research may fail to address.

Second, the G2' s overqualification may have more detrimental effects due to their stronger state-dependence in overqualification compared to ancestral natives. A previous study found that non-Western first generation immigrants disproportionately face more stickier overqualification (Joona et al., 2014). If the mechanisms for stronger state dependence in overqualification extend to their descendants, the risks and negative consequences of overqualification may be concentrated to non-Western ancestry groups, contributing to wider ethnic inequalities in other labor market disadvantages such as slower wage growth, lower job satisfaction, and higher risk of unemployment (Baert et al., 2013; Esposito & Scicchitano, 2022; Korpi & Tåhlin, 2009).

Overqualification and immigrant population

The initial attention to overqualification, also referred to as overeducation, emerged in the light of a surge in the number of university graduates in the early 1970's in the United States and a subsequent decline in the economic returns to higher education (Leuven & Oosterbeek, 2011). This concern was first expressed by Freeman (1976). A few years later, a seminal paper by Duncan and Hoffman (1981) started a scholarly discussion on overqualification and the first wave of research was mainly established in the US until the early 2000s. During this period, a number of theoretical frameworks to explain the mechanism of overqualification/underqualification were proposed by labor market economists (see Leuven and Oosterbeek (2011) for an overview). Later, in the early 2000s, the center of the research on this topic shifted to Europe as many European labor markets witnessed increasing trends in overqualification (Korpi & Tåhlin, 2009). Recently,

many studies have focused on overqualification among immigrant populations both in American and European context (Aleksynska & Tritah, 2013; Lu & Hou, 2020).

The major causes of educational mismatch can be divided into labor supply-side, or labor demand-side determinants (see Ghignoni and Verashchagina (2014) for an overview). The determinants of overqualification specific to immigrant population and their descendants can be sorted together within this framework, as presented in Table 1.

Table 1. Determinants of overqualification for general population and migrants

	Supply-side	**Demand-side**
General	-Individual heterogeneity in productivity, educational quality, and job search	-Labor market institution -Structural changes -Discrimination based on non-migrant specific traits
Specific to G1	-Language proficiency -Transferability of skills	-Transferability of foreign degrees -Discrimination based on foreign qualification
Specific to G1 and G2	-Ego's job search networks	-Discrimination based on ethnicity
Specific to G2	-Social capital of migrant parents -Friendship networks (peer effect on education/career)	

Source: Author's own elaboration

The labor supply-side explanations generally address individual heterogeneity: First, Individual heterogeneity in productivity traits is emphasized by explanations based on the neoclassical human capital theory (Becker, 1964), which demonstrates that overqualification is a result of individual choice to compensate for their lack of productivity by excessive formal qualification. Lack of host country language proficiency is also one of the most important determinants of overqualification for first generation immigrants (Aleksynska & Tritah, 2013; Budría & Martínez-de-Ibarreta, 2021). Having a good command in host country language increases productivity by facilitating efficient communications and socio-cultural workplace integration (Chiswick & Miller, 2003; Lai et al., 2017). Therefore, sufficient language proficiency is often a prerequisite for job openings requiring a higher education degree (Chiswick & Miller, 2013). Previous research also highlighted that pre-migration mismatch is associated with post-migration mismatch (Kalfa & Piracha, 2017).

Regarding the G2, group-level differences in language skills or heterogeneity in human capital compensation are not expected between the G2 and ancestral natives. Therefore, these determinants are not likely to be valid dynamics for explaining systematic differences in overqualification.

Second, another line of literature highlighted that the differences in educational quality, e.g., differences in university education quality, contribute to overqualification (Ordine & Rose, 2009; Verhaest & Omey, 2006). With respect to the immigrant population, heterogeneity in education is associated with imperfect human capital transferability (Chiswick & Miller, 2009). Limited human capital transferability occurs for two reasons: limited transferability of skills and limited transferability of foreign degrees (Lancee & Bol, 2017). Transferability of skills occurs because some types of human capital embedded in education are highly context-specific, e.g., an immigrant in Sweden holds a degree in law in South Korea. In this case, educational qualification associated with country-specific skills/knowledge is likely to be undervalued in another context (Reitz, 2001). Meanwhile, transferability of foreign degrees is more related to the employer's insufficient information to access a foreign qualification, together with the signaling effect. Foreign human capital transferability s not likely to be a valid explanation for the G2 since they are as much likely to be educated in the host countries as the ancestral natives are.

Third, previous literature on worker's job search behavior discussed how spatial mobility and individual tolerance of internal migration/commuting effects overeducation risks (McGoldrick & Robst, 1996; Quinn & Rubb, 2011). Regarding immigrant population, previous studies found that coethnic environment affects overqualification risks mediated by job search network/behavior. There are two contradicting arguments regarding the direction of the effect: on the one hand, informal job search based on coethnic networks or networks with concentration of immigrants may lead to provide employment opportunity from labor market segments featuring higher concentrations of migrants, often referred to *employment niches*, which is associated with higher risk of overeducation (Kracke & Klug, 2021). On the other hand, coethnic networks also provide immigrants with support positively correlated with employability and better job match (Zwysen & Demireva, 2020). Coethnic environment is an important determinant of overqualification for both the G1 and the G2. Especially, it affects different layers of second generations' social network such as parent's social networks, friendship networks, and later job search networks (Hällsten et

al., 2017; Roth & Weißmann, 2022). Furthermore, since these effects are expected to differ across origin group's size and socio-economic resources (e.g., Bygren & Szulkin, 2010), coethnic environment may contribute to heterogeneity across ancestry groups.

The demand-side explanations address the mechanisms that employers intentionally hire overqualified candidates. Early studies on overqualification attempted to model overqualification as a result of employers' job assignment, e.g., Job competition model by Thurow (1975), or job seeker's utility maximization taking job characteristics into account, e.g., Assignment model by Sattinger (1993). Later research also addressed the role of labor market institution and structural changes in the labor market, such as "low-skill, low-technology trap" induced by stringent employment protection legislation (Di Pietro, 2002, p. 886) and higher demands for skilled workers due to the skill-biased technical change (Croce & Ghignoni, 2012).

Employer discrimination against foreign qualification or immigrant background ancestry also affects both first and second generations. Statistical discrimination, together with taste-based discrimination contributes to labor market inequalities (Aigner & Cain, 1977; Becker, 1971). Concerning immigrants, taste-based discrimination refers to an employer's preference against certain ethnicity or foreign background while statistical discrimination takes place when employers without sufficient information on individual's true productivity discriminate based on their prior stereotypes about foreign qualification or foreign background (Leuven & Oosterbeek, 2011). There are two potential pathways that labor market discrimination is associated overqualification for migrants. On the one hand, migrants may apply for a position they are formally overqualified to offset depreciation of their human capital or employer's preference against hiring migrants/ethnic minorities. On the other hand, labor market discrimination lowers immigrant's employability (see Lippens et al., 2022 for a systematic review) and it may increase their risks of long-term unemployment. In turn, immigrants with long unemployment duration possibly lower their reservation wages and therefore becomes more willing to accept a job which they would be overqualified. Employer's discrimination against foreign qualification mainly applies to the G1, and discrimination regarding foreign ancestry applies to both the G1 and G2. Furthermore, it is reasonable to expect heterogenous effect of discrimination on overqualification by ancestral origin because labor market discrimination is associated with visual characteristics, such as ethnicity

(Hersch, 2011), and perceived social and cultural distances between ancestral population and migrants with different ancestry (Polek et al., 2010).

Other sources of heterogeneity in overqualification

Higher educated individuals are expected to have a higher probability of overqualification. Regardless of the measure of overqualification, it is unlikely for those with primary or lower-secondary educational degree to be overqualified. For this reason, previous literature predominantly focused on overqualification for university graduates or postgraduates (e.g., Verhaest & Van Der Velden, 2013). The role of gender in generating heterogeneity in overqualification among migrants is less predictable. Apart from geographical mobility and time constraints (McGoldrick & Robst, 1996), female workers may compete with lower-educated male workers due to gender discrimination in promotion (Karakaya et al., 2007). However, empirical findings generally did not find a significant gender gap in overqualification (Groot & Maassen Van Den Brink, 2000; Karakaya et al., 2007). Particularly in the Swedish context, previous research found a higher probability of overqualification among the G1 males (Joona et al., 2014). Furthermore, previous correspondence testing in Sweden found that ethnic discrimination in hiring may be more severe among male applicants with Middle Eastern background (Arai et al., 2016). Therefore, females with ethnic minority backgrounds may not necessarily face more severe discrimination in the Swedish context.

Overqualification of the second generations

Most previous findings agree that the G2 show a lower probability of overqualification than G1, yet there is no consensus on systematic difference between the G2 and the ancestral natives (e.g., Dahlstedt, 2015; Falcke et al., 2020; Fernández-Reino et al., 2018; Larsen et al., 2018). Dahlstedt (2015) is the only published study addressing the overqualification of the G2 in Sweden, which highlights the G2 male's higher risk of overqualification than ancestral natives. Yet, this study overlooked most non-European origin G2 groups associated with stronger labor market integration challenges in Sweden (Rooth & Ekberg, 2003). The role of having one native-born parent and one foreign-born parent, i.e., being the 2.5 generation (Rumbaut, 2004) or the G2.5 has also been understudied. Theoretically, having one native-born parent can facilitate the second generation children's job search by adding more native contract to their/parental networks. Previous research found an advantage of having a native-born parent in educational outcomes (Levels et al., 2008;

Ramakrishnan, 2004). However, the effect of having a native parent on educational mismatch has been largely unexplored.

Taken together, the second generations in the Swedish labor market are expected to show convergence in overqualification with ancestral Swedes, especially the G2 with Nordic or Western origins. Yet, non-Western origin G2 with a higher educational degree may still show a higher probability of overqualification.

Data, sample, and variables

This study uses Swedish total population register data. More specifically, I use the collection of registers, *Migrant Trajectories* (MT) organized at Stockholm University. Statistics Sweden (SCB) stores the data and gives access to users via SCB's online microdata access system (MONA). The MT data contain those who were resident in Sweden from 1968 to 2017. The registered individuals are given a unique personal identity number (*personnummer*), which is available in the study data through anonymization by SCB. By using this anonymized personal identity number, researchers can link children to their parents.

Figure 1 presents the flow diagram of study population selected. The study population includes all individuals who are between the age of 18 and the age of 65, registered in Sweden between 2001 and 2016, employed (i.e., having with non-zero labor income and less than 90 days of registered unemployment (Aradhya et al., 2023)) with at least an upper secondary education degree. This study follows a complete case analysis design, i.e., any observations with missing variables required to measure educational mismatch status or immigrant generation/ancestry are excluded. I did not conduct any imputation on these variables to avoid potential misclassifications in main independent and dependent variables. As a result, 45,435,244 observations in person-years were included in the analytic sample.

Education and Occupation measure

I measured educational attainment using annually recorded information on the highest completed education degree from the Educational Register (UREG, *utbildningsregistret*). The educational register uses the Swedish educational classification 2000 (*Svensk utbildningsnomenklatur*, SUN 2000) which indicates the level and field of the individual's highest educational degree registered. SUN 2000 is based on the International Standard Classification of Education 97 (ISCED 97) with some adaptation to the Swedish context. The highest completed degree refers to the end of spring semester of a given year (SCB, 2019). Based on this information, the years of schooling are approximated to operationalize educational mismatch measure. I measured occupation using annually recorded individual's occupation from the Swedish Occupational Register (*yrkesregistret*). The Swedish Occupational Register started from 2001 onwards, and it uses the Swedish Standard Classification of Occupations (SSYK) to assess the skill level and degree of specialization of an individual's registered occupation. SSYK is based on the International

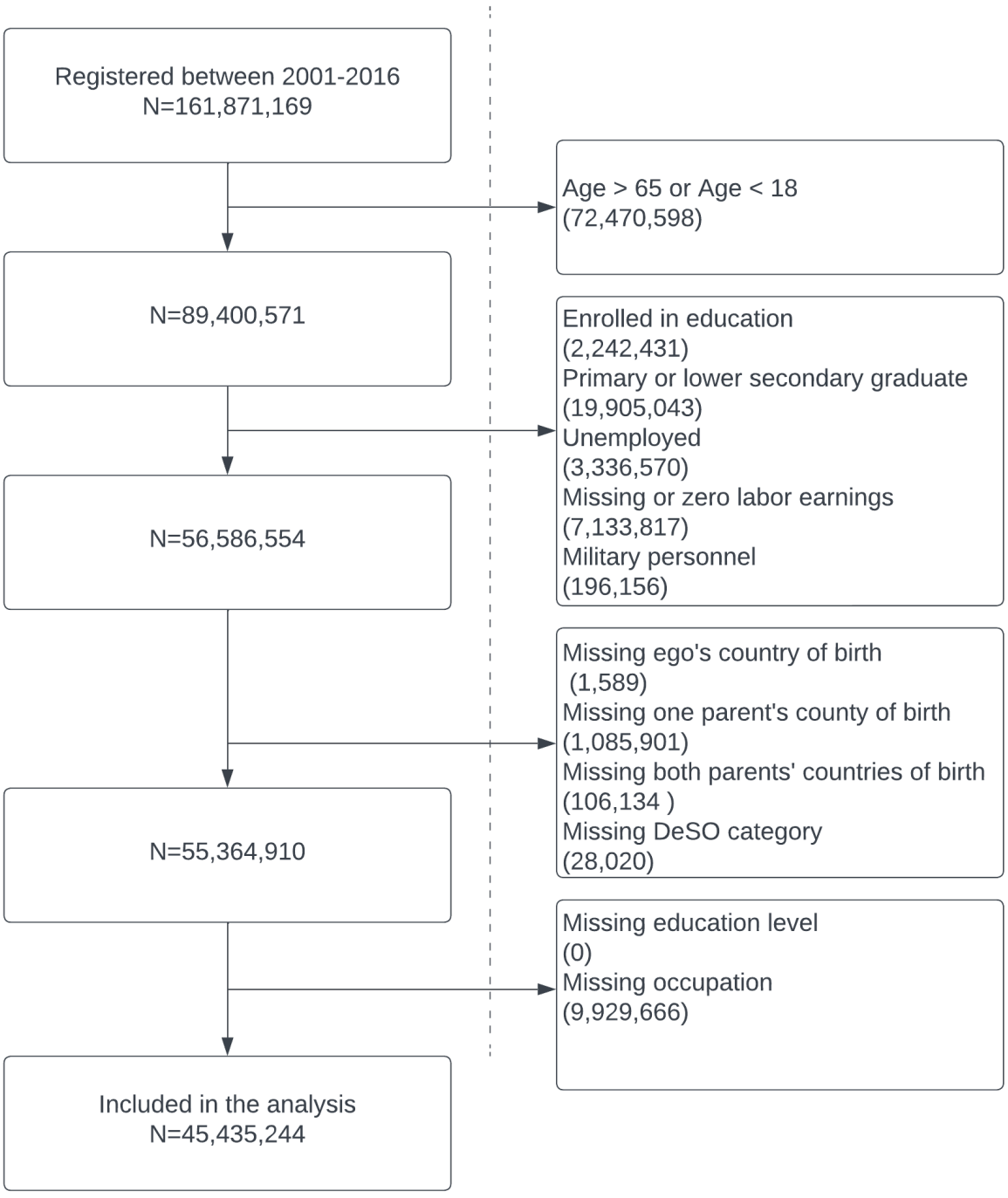

Figure 1. Flow chart of the selection of study population (observations in person-years)

Classification of Occupations (ISCO) 88 (2001-2013) and ISCO-08 (2014-2016). Most occupation data which covers private and governmental sectors refers to September 1 of each year. Occupation data for the services in county councils, municipalities, and Church refer to November 1 (SCB, 2011).

Overqualification measure

Previous research has used three common methods to operationalize and measure educational mismatch: job analysis, worker self-assessment, and realized matches (see Hartog (2000) for a discussion). Among them, realized matches approach (Verdugo & Verdugo, 1989) is the most appropriate for the study data and purpose. This method shows the degree of relative overqualification, and easily take compositional factors into account. I use the modal value of years of schooling within an occupation block, defined by four digits of SSYK code, and calculated by year, age, and gender. By using the fourth digit of the occupational code, this overqualification measure account for differences across industries to a large extent. A worker is defined as overqualified/underqualified if their years of schooling are higher/lower than the modal value. If the mode value is not a unique value, a worker is identified as overeducated when a worker's years of schooling exceeds the highest number of modal years of schooling, and as undereducated when their years of schooling are smaller than the lowest number of modal years of schooling. I calculated modal values only using the Swedish-born workers to prevent immigrant's occupational segregation from distorting the distribution of years of schooling.

Immigrant generation and ancestry

Immigrant generation is identified by using country of birth and parental country of birth. The ancestral Swedes are defined as a resident in Sweden who were born in Sweden to two Swedish-born parents. First generation immigrants are defined as a resident in Sweden who are born outside Sweden. Second generations are defined as a resident in Sweden who are born in Sweden with foreign-born parents. A Swedish-born with one native and one foreign-born parent makes a separate category as 2.5 generation immigrants or the G2.5. Ancestry is assigned to the Swedish-born individuals, and defined as father's country of birth. The reason for following father's ancestry is that it is more likely for the second generation to follow father's surname, and the surname is associated with ethnic identity in the Swedish context (Bursell, 2012). In case of the 2.5 generations, ancestry follows a foreign-born parent's country of birth. I distinguish between

11 ancestries: Sweden, Finland, Other Nordic, Other Western (including both European and non-European Western countries, such as the United States and Australia), Eastern Europe, Yugoslavia and Bosnia, Southern Europe, Middle East, Iran, Turkey, and Other (non-Western).

Control variables

This study adjusted for several compositional factors. First, age and square term of it is included for two reasons: because previous studies found that the risk of overqualification is associated with age due to correlation with work experience (Joona et al., 2014); and the G2 groups may have different age distribution compared to the ancestral natives. Second, I add a variable indicating regional differences as previous literature suggested that the size of the labor market and geographical mobility affects job matching behavior (Büchel & van Ham, 2003). The variable is based on Demographic Statistical Areas (DeSO) categorization provided by SCB. DeSO categorization corresponds to rural, suburban, and urban area (SCB, 2023). Third, I include year-fixed terms to adjust for overall trend in overqualification incidence driven by structural changes, e.g., skill-biased technical change (SBTC), or any impact of business cycle fluctuations (Croce & Ghignoni, 2012). Fourth, I run separate models for female and male because of potential gender difference in educational mismatch, and possible interaction of gender and immigrant generation/ancestry, as discussed in the previous section. Finally, I also run separate models for upper secondary graduates (including those who attended post-secondary education but did not finish the degree program) and university graduates—those who registered their higher education degrees—to see if higher-educated individuals drive the general patterns of overqualification. Summary statistics of the control variables by immigrant generation status and by ancestry can be found in Table 1 and 2 in the Appendix.

Analytic Strategy

This study reports main results in two steps: first, I present unadjusted prevalence of overqualification and underqualification in Sweden by immigrant generation and ancestry separately for male and female samples. I report the results from five representative years: 2004, 2007, 2010, 2013, and 2016. Second, I focus on the differences in risk of overqualification. Therefore, the following regression models use a binary outcome, aggregating the matched and underqualified into a single category and overqualification as the other one. I conducted multiple logistic regressions stratified by gender and education level to estimate adjusted risk ratios (RR)

and average predicted probabilities of overqualification across immigrant generation and ancestry. As described above, the analyses concerning ancestry only include observations from the Swedish born. I choose to present both RR and predicted probabilities as describing the relative differences and absolute levels of overqualification risks are equally important for this paper's aim. I report RR as it is easy to interpret. RR are calculated based on predicted probabilities from the logistic regression models, following Cummings (2011)'s suggestion.

Results

Descriptive findings

Table 2. Prevalence of overqualification and underqualification by immigrant generation and gender

	Overqualification					Underqualification				
	2004	2007	2010	2013	2016	2004	2007	2010	2013	2016
Men										
Ancestral Swede	31.8	31.5	30.9	30.4	27.8	14.3	14.0	13.8	13.2	13.7
2.5 generation	31.2	31.2	31.2	31.3	28.9	14.5	14.2	14.0	13.8	14.3
Second generation	29.5	29.8	30.2	30.8	29.8	13.9	14.0	13.8	13.5	13.7
First generation	47.1	46.6	46.1	46.6	45.0	15.2	16.5	18.1	19.7	22.6
Women										
Ancestral Swede	29.3	29.0	28.5	28.4	27.0	13.8	14.8	15.6	14.9	15.0
2.5 generation	30.6	30.6	30.2	30.2	29.0	15.1	15.3	16.8	15.2	15.2
Second generation	29.4	29.8	30.6	31.1	31.5	15.0	15.0	17.1	14.6	14.3
First generation	45.4	45.8	46.2	46.7	46.2	15.0	16.2	18.8	17.0	18.2

Table 2 reports the unadjusted prevalence of an educational mismatch for the study population by immigrant generation status and gender in the 5 representative years. The first five columns on the left side show trends in overqualification. Overall, the descriptive findings indicate the G2 and G2.5's assimilation in terms of educational mismatches as they show significant convergence with the ancestral natives in overqualification and underqualification while the G1 stand out with the highest prevalence in educational mismatches. The proportion of overqualified workers decreases over time for ancestral Swedes, and remains stable for all other groups. Among men, the G2 show lower prevalence (29.5% – 30.2%) than the G2.5 (31.2%) and ancestral Swedes (30.4% – 31.8%) during the first three years of observation. However, due to asymmetric trends in overqualification, in 2013 and 2016, the G2 and the G2.5 show higher prevalence compared to ancestral Swedes. As expected, the G1 show the highest proportion of the overqualified workers (45.0% – 47.1%). The results for women generally show similar trends compared to men, except that G2 (29.4% – 31.5%) and G2.5 (29.0% – 30.6%) women show higher prevalence than ancestral native women (27.0% – 29.3%). The next 5 columns on the right side in Table 2 show trends in underqualification. In general, the prevalence of underqualification is substantially lower than that of overqualification for every group (13.2% – 22.6%). In general, ancestral Swedes report the lowest proportion of the underqualified (13.2% – 14.3% for men, and 13.8% – 15.6% for women) while the G1 show the

highest prevalence (15.2% – 22.6% for men, and 15.0% – 18.8% for women). The G2 and the G2.5 are situated between the G1 and the ancestral natives, and the level of underqualification is similar between the two groups.

Table 3 reports the unadjusted prevalence of an educational mismatch for the Swedish-born by ancestry and gender. It reveals substantial level of heterogeneity between the ancestral Swedes and the G2, and within the G2 for men and women which was not observable in earlier results. First, concerning overqualification, Iranian (38.0% – 40.9%), Eastern European (34.6% – 36.8%), and Other non-Western G2 (32.1% – 36.8%) male G2 groups constantly show a higher prevalence compared to ancestral Swedes (27.8% – 31.8). Meanwhile, Turkish (26.5% – 28.4%), Yugoslavian/Bosnian (26.8% – 28.1%), and Finnish (25.7% – 27.7%) male G2 groups show a lower prevalence than ancestral Swedes. Female G2 groups show similar patterns to male groups as well. Regarding underqualification, the variation across ancestry groups is smaller in absolute term with some differences in terms of relative differences between groups. Other Nordic (14.6% – 15.2% for men and 15.6% – 16.6% for women) and Southern European (14.8% – 15.8% for men and 15.4% – 15.9% for women) G2 generally show a higher prevalence of underqualification compared to female and male ancestral Swedes. Meanwhile, Iranian G2 group, featuring the highest level of overqualification reports the lowest level of underqualification (6.7% – 9.9% for men, and 5.2% – 7.4% for women) than ancestral Swedes. Taken together, these findings show that the G2's overall convergence in job matching seen in Table 2 is not uniform across ancestry. Especially for overqualification, the G2 groups with Nordic and Turkish origin outperformed the ancestral Swedes while non-Western origin group report substantially higher prevalence. Since the former groups outnumber the latter groups in Sweden (see Table A2 in the Appendix), the comparison across immigrant generation status masked heterogeneity within the G2.

Table 3. Prevalence of overqualification and underqualification among the Swedish born observations by ancestry and gender

	Overqualification (%)					Underqualification (%)				
Men	2004	2007	2010	2013	2016	2004	2007	2010	2013	2016
Sweden	31.8	31.5	30.9	30.4	27.8	14.3	14.0	13.8	13.2	13.7
Finland	27.2	27.4	27.4	27.7	25.7	14.4	14.1	13.9	13.9	14.9
Other Nordic	29.5	29.6	29.7	29.3	27.0	15.2	14.8	14.9	14.6	14.9
Other Western	35.5	35.5	36.0	35.9	33.6	14.2	14.3	14.0	13.9	14.4
Eastern Europe	36.4	36.6	36.8	37.1	34.6	13.8	13.9	14.1	14.0	14.1
Yugoslavia/Bosnia	26.8	27.3	28.1	28.0	27.7	14.7	15.5	15.2	14.1	13.6
Southern Europe	31.3	30.9	30.6	31.8	29.4	14.8	15.5	15.5	15.5	15.8
Middle East	31.8	32.3	32.5	32.5	31.2	12.2	10.4	10.0	9.1	9.8
Iran	40.9	37.5	39.9	40.8	38.0	8.1	8.7	6.7	8.8	9.9
Turkey	28.0	26.5	27.0	28.4	27.8	11.6	12.4	12.0	12.7	13.9
Other	36.8	35.5	34.1	34.9	32.1	11.2	11.4	11.2	10.6	11.1
Women										
Sweden	29.3	29.0	28.5	28.4	27.0	13.8	14.5	14.8	14.9	15.0
Finland	28.3	28.2	28.3	28.0	27.1	15.9	16.2	16.1	16.1	16.4
Other Nordic	28.6	28.7	28.4	28.3	27.0	15.6	16.3	16.3	16.4	16.6
Other Western	32.6	32.9	32.7	32.8	31.8	14.8	15.5	15.5	15.7	15.6
Eastern Europe	33.1	33.8	33.6	33.7	32.3	13.9	14.3	14.5	14.9	14.6
Yugoslavia/Bosnia	27.9	28.1	27.9	28.7	30.8	15.3	16.2	15.9	15.3	14.1
Southern Europe	32.6	31.3	30.5	29.8	29.4	15.4	15.5	15.9	16.5	15.9
Middle East	36.5	34.1	34.1	35.4	35.9	9.9	9.9	9.6	8.2	10.1
Iran	43.2	46.5	44.2	43.7	40.5	6.2	5.2	5.5	6.5	7.4
Turkey	28.0	26.9	28.7	28.7	29.1	11.7	12.7	12.8	13.1	14.5
Other	38.1	36.4	35.4	35.6	33.3	10.9	10.0	10.3	9.9	10.2

Differences in overqualification by immigrant generation

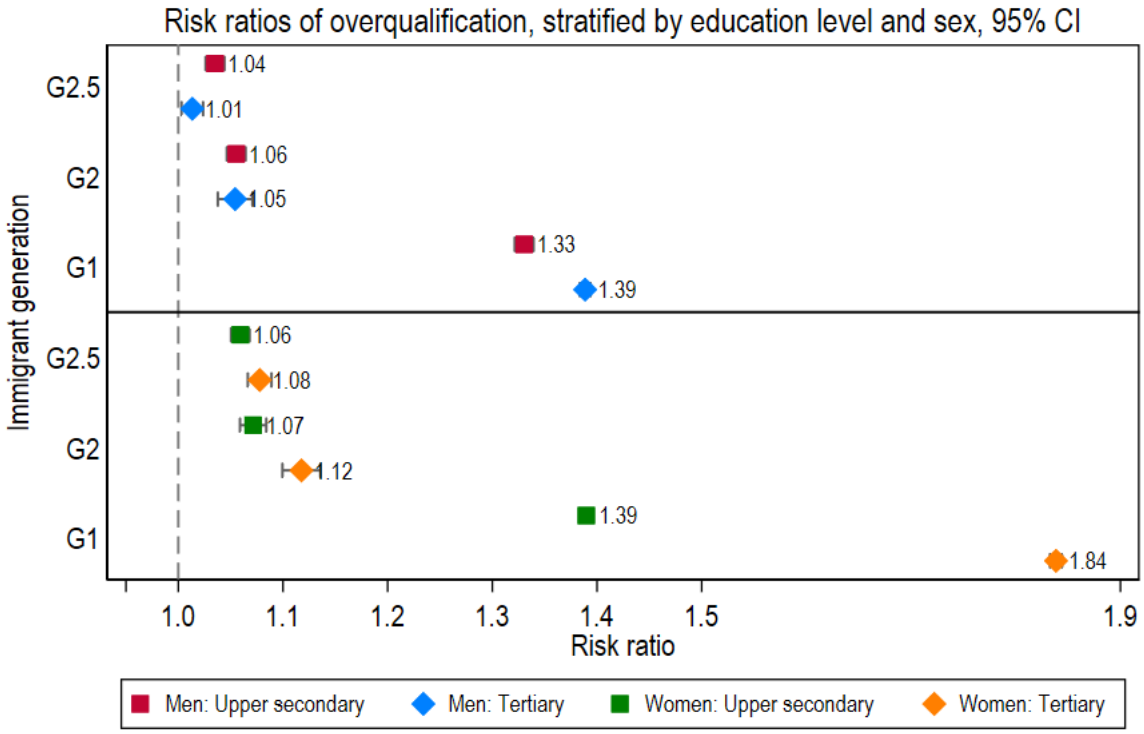

Figure 2. Risk ratios of being overqualified by immigrant generation status and education level with 95% CI, for men and women, adjusting for age, year, and region

Figure 2 presents the estimated likelihood of overqualification from multiple logit models, in risk ratios calculated based on the average predicted probabilities, by immigrant generation and educational attainment, for men and women, respectively. The estimates are predicted from models adjusting for age, year, and region of residence (as fully presented in Table 3 and 5 in the Appendix). The results confirm both the G2's improvements in job matching compared to the G1, and remaining gap between the G2 and ancestral Swedes. The G1 show larger risk ratios compared to the G2 and the G2.5 for men and women, regardless of education level. For instance, the RR for highly-educated G1 males (RR=1.39, 95% CI=1.384 – 1.394) indicate that they show a 39% increase in overqualification risk than the ancestral Swedes. Although the G2 and the G2.5's RRs are closer to 1 compared to the G1 groups, they are constantly higher than 1, and this pattern is

more pronounced among G2 males with an upper secondary degree (RR=1.06, 95% CI=1.046 – 1.064), and G2 females with a tertiary degree (RR=1.12, 95% CI=1.100 – 1.136). The small gaps between the G2 and the G2.5 indicates that they are similar in terms of overqualification, especially among the secondary graduates.

Table 4. Average predicted probability of overqualification by immigrant generation status, gender, and educational attainment. Multiple logit model, s.e. in parentheses

	Male		Female	
	Upper secondary	Tertiary	Upper secondary	Tertiary
Ancestral Swedes	0.258	0.473	0.270	0.304
	(0.000)	(0.001)	(0.000)	(0.000)
G2.5	0.266	0.479	0.283	0.322
	(0.001)	(0.002)	(0.001)	(0.002)
G2	0.270	0.491	0.286	0.331
	(0.002)	(0.004)	(0.002)	(0.003)
G1	0.339	0.639	0.370	0.528
	(0.001)	(0.001)	(0.001)	(0.001)
N	16719428	5179581	14675335	8860900

Table 4 presents the average predicted probability of overqualification across immigrant generation by gender and education level. The results feature clear differences in probabilities between upper secondary and tertiary graduates, as well as gender difference. The predicted probabilities range from 25.8% (ancestral Swedish men with an upper secondary degree) to 65.2% (G1 men with a tertiary degree). It also shows that the risk of overqualification is higher among university graduates compared to upper secondary graduates. Due to the difference in baseline risks of overqualification for ancestral Swedes by education level, the absolute difference in probability between ancestral Swedes and the G2, as well as between ancestral Swedes and the G1, is larger among the higher educated. For instance, the difference between ancestral Swedes and G2 among females with upper secondary graduates is 1.6 % point, while the difference is 2.7% point among females with university graduates. Comparing the upper secondary graduates, female groups show higher probabilities of overqualification meanwhile the opposite is true when comparing the tertiary graduates. To summarize, the G1 and G2 women are more disadvantaged

in relative terms compared to female ancestral Swedish counterparts, while G1 and G2 men are more disadvantaged in absolute terms, showing the highest predicted overqualification risks.

Differences in overqualification by ancestry

Figure 3 and 4 present the estimated likelihood of overqualification from multiple logit models, in risk ratios, by ancestry and educational attainment, for men and women, respectively. The regression models adjust for age, year, and region of residence (as fully presented in Table 4 and 6 in the Appendix). The results support heterogeneity in overqualification within the G2 groups presented in Table 3. On the one hand, some groups such as Nordic origin (including Finnish and Other Nordic) men and women with an upper-secondary degree and Turkish origin individuals show similar or lower risks compared to ancestral Swedish counterparts. On the other hand, non-Western origin men and women show substantially higher risks compared to Swedes with native ancestry. As seen in Figure 3, among men, the G2's higher risk of overqualification compared to ancestral Swedes are mainly concentrated among the upper-secondary graduates. Iranian (RR=1.58, 95% CI=1.539 —1.621), Other (RR=1.31, 95% CI=1.288—1.329), and Middle Eastern (RR=1.29, 95% CI=1.251—1.322) origin individuals show considerably higher risks, compared to ancestral Swedish counterparts. On the contrary, Finnish ((RR=0.92, 95% CI=0.911—0.938) and Other Nordic (RR=0.93, 95% CI=0.910—0.948) G2 men with an upper-secondary degree show lower risks of overqualification compared to the reference group, and these results are both statistically significant at the 5% level.

As seen in Figure 4, there is one notable difference among women: most G2 groups with a tertiary degree also report higher risks of overqualification, together with upper-secondary graduates. For instance, Iranian (RR=1.52, 95% CI=1.482—1.552 for upper-secondary graduates, and RR=1.28, 95% CI=1.192—1.361 for tertiary graduates), Other (RR= 1.24, 95% CI=1.224—1.261 for secondary graduates, and RR=1.24, 95% CI=1.224—1.261 for tertiary graduates), and Middle Eastern (RR=1.23, 95% CI=1.201—1.258 for upper-secondary graduates, and RR=1.19, 95% CI=1.120—1.258 for tertiary graduates) origin women reported 23% to 52% higher risks of overqualification compared to ancestral Swedish peers. Similar to the previous findings in Figure 3, there also exist outperforming subgroups such as Nordic, Yugoslavian/Bosnian, and Turkish G2 women with an upper-secondary degree, yet only Turkish G2 women ((RR=0.95, 95% CI=0.918––0.992) shows statistically significant results at the 5% level.

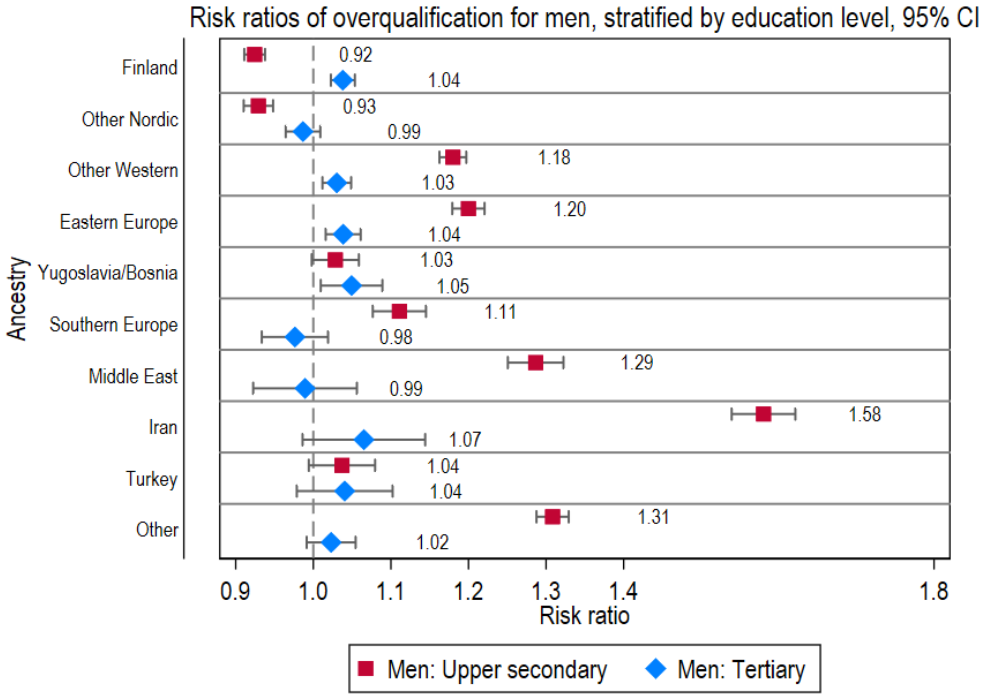

Figure 3. Risk ratios of being overqualified for those who were born in Sweden, by ancestry and education level with 95% CI, for men, adjusting for age, year, and region

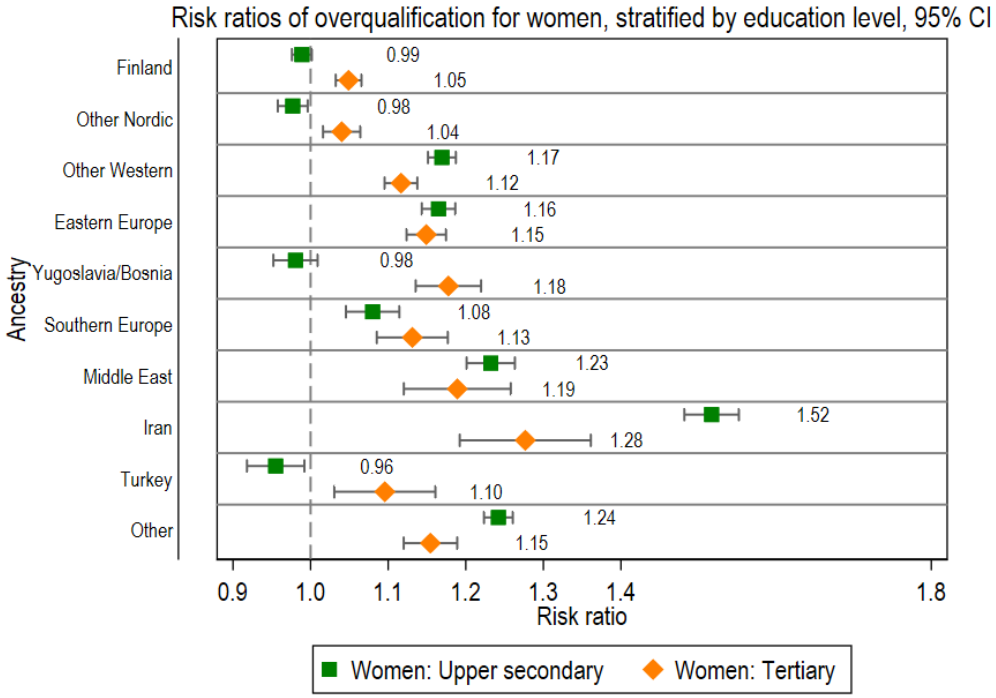

Figure 4. Risk ratios of being overqualified for those who were born in Sweden, by ancestry and education level with 95% CI, for women, adjusting for age, year, and region

Table 5 reports the average predicted probability of overqualification across ancestry origin group by gender and educational attainment. The absolute predicted probability is higher among tertiary graduates, while the differences are larger among the upper secondary graduates. Also, among upper-secondary graduates, women generally report higher risks, while the opposite is true among tertiary graduates. Iranian G2 men with a tertiary degree and Iranian G2 women with a secondary degree stand out as they report the highest overqualification risks among men and women, respectively. Middle Eastern, Other non-Western, and Yugoslavian G2 men and women also shows higher risks compared to ancestral Swedes and Nordic G2 individuals.

Table 5. Average predicted probability of overqualification by ancestry origin, gender, and educational attainment. Multiple logit model, s.e. in parentheses

	Male		Female	
	Upper secondary	Tertiary	Upper secondary	Tertiary
Sweden	0.257	0.469	0.269	0.300
	(0.000)	(0.001)	(0.000)	(0.000)
Finland	0.238	0.490	0.266	0.314
	(0.002)	(0.004)	(0.002)	(0.003)
Other Nordic	0.239	0.466	0.263	0.312
	(0.002)	(0.005)	(0.003)	(0.004)
Other Western	0.301	0.478	0.309	0.322
	(0.003)	(0.004)	(0.003)	(0.003)
Eastern Europe	0.306	0.478	0.308	0.331
	(0.003)	(0.005)	(0.003)	(0.004)
Yugoslavia/Bosnia	0.264	0.487	0.263	0.351
	(0.004)	(0.009)	(0.004)	(0.007)
Southern Europe	0.282	0.461	0.285	0.327
	(0.005)	(0.009)	(0.005)	(0.008)
Middle East	0.322	0.462	0.325	0.347
	(0.006)	(0.015)	(0.005)	(0.012)
Iran	0.388	0.505	0.389	0.366
	(0.008)	(0.019)	(0.007)	(0.016)
Turkey	0.263	0.477	0.256	0.321
	(0.006)	(0.015)	(0.005)	(0.010)
Other	0.327	0.477	0.325	0.330
	(0.003)	(0.007)	(0.003)	(0.006)
N	15155936	4281759	13211199	7670848

Discussion and Conclusion

This study analyzed overqualification among the second generations, as well as ancestral Swedes and migrants. This study used the collection of Swedish population register data, and examined the relative and absolute differences in overqualification by estimating risk ratios and the predicted probability across immigrant generation and ancestry, by gender and education level. While the G1 men and women reported high probabilities of overqualification, the G2 and the G2.5 showed similar risks compared to ancestral Swedes, indicating assimilation. Yet, the G2, especially tertiary educated women group, showed a moderately higher probability of overqualification compared to ancestral Swedes. This study also found heterogeneities across ancestry groups. Nordic and Turkish G2 men and women generally showed similar or lower risks compared to ancestral Swedes. Meanwhile, non-Western origin G2 individuals often reported higher risks, such as Iranian, Middle Eastern, Yugoslavian/Bosnian, and Other non-Western origin men and women.

The G2's lower overqualification risks compared to the first generation was in line with the theoretical prediction: Since the second generations are exempt from major challenges such as human capital transferability and lack of language skills, their overqualification risk is expected to be lower than the first generations. This result also corroborates previous findings on the G2's advancement in terms of job match compared to their parents (Fernández-Reino et al., 2018; Larsen et al., 2018). However, the remaining gaps between the G2/G2.5 and ancestral natives, net of the adjusted compositional difference, also indicate that the determinants of overqualification which affects the G2, such as ethnic labor market discrimination, coethnic environment, or other unobserved heterogeneity still affect their job match quality.

The minor differences in overqualification risks between the G2.5 and the G2 for both genders was anticipated by previous study (Dahlstedt, 2015). The G2.5's lower risk corroborates with previous literature on the role of the immigrant parent's on migrant and native contacts on second generation's employment entry since having a Swedish parent is likely to be associated with having more native contacts (Kracke & Klug, 2021; Roth & Weißmann, 2022). However, the small risk differences make it difficult to make a substantive interpretation.

The main findings also indicate that there exists heterogeneity within the G2 by ancestry, education level, and gender. Non-Western origin groups constantly reported higher probabilities overqualification while Nordic origin groups did not present higher risks of overqualification,

implying that the risk is concentrated on origin groups with more perceive social and cultural distance (Polek et al., 2010). This finding is in line with previous research reporting ethnic penalties in educational mismatch (Falcke et al., 2020). This result may be due to heterogeneity among the G2 such as coethnic environment's influence on social networks or ethnic discrimination.

Yet, perceived social and cultural differences associated with ancestry do not fully explain the results. For instance, Finnish and Other-Western origin G2 females with tertiary education degrees and Other Western origin G2 females and males with an upper secondary degree showed relatively higher risks of overqualification. At the same time, Turkish second generations showed lower or similar risks compared to ancestral Swedes. The result from Finnish origin individuals is in line with other labor market disadvantages they experience (e.g., Aradhya et al., 2023). However, Other Western origin group are generally considered well-integrated origin group whereas Turkish origin group are considered the opposite in the Swedish context (Grotti et al., 2023). One explanation is selection into higher education. As seen in Table 2 in the Appendix, the Other Western group showed a higher proportion of the university graduates compared to other groups. Therefore, those who remained as upper secondary graduates may be more negatively selected in terms of unmeasured productivity traits. For the Turkish group, two selections may simultaneously take place: positive selection into employment due to their higher unemployment risk (Aradhya et al., 2023), and positive selection into university education (as seen in Table 2 in the Appendix).

Men's higher probability of overeducation supports previous finding in the Swedish context (Joona et al., 2014). In addition, there exists an unanticipated gender difference in the relationship between overqualification and education level. A university degree seems to be protective against overqualification only for men. One possible explanation is that the mechanism of gender discrimination in promotion (Karakaya et al., 2007) is more detrimental to job match of the higher educated G2 women. Since this study does not provide any further empirical evidence to support this hypothesis, it calls for future research explaining the reason for poorer job matches among the higher educated G2 women.

The study's main findings have two implications for understanding the overqualification of immigrants and their descendants in high-income host countries. First, second generations still face some disadvantages in education-occupation matching compared to ancestral population

especially for those with minority background. This finding indicates that some level of inequalities in earnings, career progression, and other dimensions of life may occur due to the difference in overqualification risks across ancestry groups. In addition, those who experience the highest risks are relatively well-educated and employed, who are considered well integrated into the host country in the literature, whose disadvantages have not received sufficient attention to date. Second, from a policy perspective, individuals with immigrant background need more support in assuring adequate job match. Their higher risks of overqualification prevent them from achieving what they expect from their educational investment and prevent the host country from utilizing its human capital efficiently, indicating a potential productivity loss (Serikbayeva & Abdulla, 2022).

This study is one of the first to examine second-generation immigrants' overqualification patterns and highlight the heterogeneity by ancestry. Nonetheless, this study comes with limitations. First, even if the Swedish Occupational register has been extensively used and considered as a reliable data source, it does not necessarily report up-to-date information, and some information may have been imputed by the data provider, Statistics Sweden (SCB). Therefore, my overqualification measure is subject to misclassification. Second, the Swedish occupation register did not cover every worker who was registered as employed. During the early 2000s when the registration system started and between 2013 and 2014 when new scheme of SSYK introduced, the occupational register report considerably lower coverage compared to other years. Since I also observed changes in prevalence of educational mismatch between 2013 and 2014, the missing in occupation is not likely to be random. Thus, there may be selection into study population. However, there is no evidence that missing in occupation occurs differently between the ancestral population and second generations. Also, this study included all available years from the study data to alleviate this coverage issue.

I conclude with three future research suggestions: First, this paper did not investigate the mechanisms underlying such heterogeneities. Future research should seek empirical evidence of the suggested mechanisms. Second, this study only examined vertical educational mismatch, not horizontal educational mismatch across immigrant generations or ancestry. This topic requires independent research as the mechanisms and consequences of horizontal mismatch may differ from vertical mismatch. Third, like most previous research on educational mismatch, this study

focused on employed workers. As recent literature has examined the relationship between overqualification and unemployment (Baert & Verhaest, 2019; Esposito & Scicchitano, 2022), future research should address how interrelationship between overqualification and unemployment influences second generation's labor market integration over career.

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Disclosure statement

I report there are no competing interests to declare.

Data availability statement

Data may be obtained from a third party and are not publicly available. Aggregated data can be made available by the author, conditional on ethical vetting. I access the individual-level data through Statistics Sweden's micro-online access system MONA. The analyses have been approved by the Swedish ethical-vetting authority, Dnr 2017/1980-31/5.

References

Aigner, D. J., & Cain, G. G. (1977). Statistical Theories of Discrimination in Labor Markets. *ILR Review*, *30*(2), 175–187. https://doi.org/10.1177/001979397703000204

Alba, R., & Foner, N. (2015a). Economic Well-Being. In *Strangers No More: Immigration and the Challenges of Integration in North America and Western Europe* (pp. 47–67). Princeton University Press. https://www.jstor.org/stable/j.ctt1h4mjf4.6

Alba, R., & Foner, N. (2015b). Educating the Second Generation. In *Strangers No More: Immigration and the Challenges of Integration in North America and Western Europe* (pp. 169–196). Princeton University Press. https://www.jstor.org/stable/j.ctt1h4mjf4.11

Alba, R., & Nee, V. (1997). Rethinking Assimilation Theory for a New Era of Immigration. *The International Migration Review*, *31*(4), 826–874. https://doi.org/10.2307/2547416

Aleksynska, M., & Tritah, A. (2013). Occupation-education mismatch of immigrant workers in Europe: Context and policies. *Economics of Education Review*, *36*, 229–244. https://doi.org/10.1016/j.econedurev.2013.06.001

Aradhya, S., Grotti, R., & Härkönen, J. (2023). Unemployment persistence among second-generation immigrants. *European Sociological Review*, jcac071. https://doi.org/10.1093/esr/jcac071

Arai, M., Bursell, M., & Nekby, L. (2016). The Reverse Gender Gap in Ethnic Discrimination: Employer Stereotypes of Men and Women with Arabic Names,. *International Migration Review*, *50*(2), 385–412. https://doi.org/10.1111/imre.12170

Baert, S., Cockx, B., & Verhaest, D. (2013). Overeducation at the start of the career: Stepping stone or trap? *Labour Economics*, *25*, 123–140. https://doi.org/10.1016/j.labeco.2013.04.013

Baert, S., & Verhaest, D. (2019). Unemployment or Overeducation: Which is a Worse Signal to Employers? *De Economist*, *167*(1), 1–21. https://doi.org/10.1007/s10645-018-9330-2

Baysu, G., Alanya, A., & de Valk, H. A. (2018). School trajectories of the second generation of Turkish immigrants in Sweden, Belgium, Netherlands, Austria, and Germany: The role of school systems. *International Journal of Comparative Sociology*, *59*(5–6), 451–479. https://doi.org/10.1177/0020715218818638

Becker, G. (1964). *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education*. Columbia University Press.

Becker, G. (1971). *The Economics of Discrimination* (2nd ed.). University of Chicago Press.

Büchel, F., & van Ham, M. (2003). Overeducation, regional labor markets, and spatial flexibility. *Journal of Urban Economics*, *53*(3), 482–493. https://doi.org/10.1016/S0094-1190(03)00008-1

Budría, S., & Martínez-de-Ibarreta, C. (2021). Education and skill mismatches among immigrants: The impact of host language proficiency. *Economics of Education Review*, *84*. https://doi.org/10.1016/j.econedurev.2021.102145

Bursell, M. (2012). Name change and destigmatization among Middle Eastern immigrants in Sweden. *Ethnic and Racial Studies*, *35*(3), 471–487. https://doi.org/10.1080/01419870.2011.589522

Bygren, M., & Szulkin, R. (2010). Ethnic Environment During Childhood and the Educational Attainment of Immigrant Children in Sweden. *Social Forces*, *88*(3), 1305–1329. https://doi.org/10.1353/sof.0.0298

Chiswick, B. R., & Miller, P. W. (2003). The complementarity of language and other human capital: Immigrant earnings in Canada. *Economics of Education Review*, *22*(5), 469–480. https://doi.org/10.1016/S0272-7757(03)00037-2

Chiswick, B. R., & Miller, P. W. (2009). The international transferability of immigrants' human capital. *Economics of Education Review*, *28*(2), 162–169. https://doi.org/10.1016/j.econedurev.2008.07.002

Chiswick, B. R., & Miller, P. W. (2013). The impact of surplus skills on earnings: Extending the over-education model to language proficiency. *Economics of Education Review*, *36*, 263–275. https://doi.org/10.1016/j.econedurev.2013.07.008

Croce, G., & Ghignoni, E. (2012). Demand and supply of skilled labour and overeducation in Europe: A country-level analysis. *Comparative Economic Studies*, *54*(2), 413–439. https://doi.org/10.1057/ces.2012.12

Crul, M., Schnell, P., Herzog-Punzenberger, B., Wilmes, M., Slootman, M., & Gómez, R. A. (2012). School careers of second-generation youth in Europe. In *The European second generation compared* (Vol. 101).

Cummings, P. (2011). Estimating adjusted risk ratios for matched and unmatched data: An update. *The Stata Journal*, *11*(2), 290–298.

Dahlstedt, I. (2015). Over-Education Amongst the Children of Immigrants in Sweden. *Nordic Journal of Migration Research*, *5*(1), 36–46. Social Science Database. https://doi.org/10.1515/njmr-2015-0003

Di Pietro, G. (2002). Technological change, labor markets, and 'low-skill, low-technology traps'. *Technological Forecasting and Social Change*, *69*(9), 885–895. https://doi.org/10.1016/S0040-1625(01)00182-2

Drouhot, L. G., & Nee, V. (2019). Assimilation and the Second Generation in Europe and America: Blending and Segregating Social Dynamics Between Immigrants and Natives. *Annual Review of Sociology*, *45*(1), 177–199. https://doi.org/10.1146/annurev-soc-073117-041335

Duncan, G. J., & Hoffman, S. D. (1981). The incidence and wage effects of overeducation. *Economics of Education Review*, *1*(1), 75–86. https://doi.org/10.1016/0272-7757(81)90028-5

Esposito, P., & Scicchitano, S. (2022). Educational mismatch and labour market transitions in Italy: Is there an unemployment trap? *Structural Change and Economic Dynamics*, *61*, 138–155. https://doi.org/10.1016/j.strueco.2022.02.011

Falcke, S., Meng, C., & Nollen, R. (2020). Educational mismatches for second generation migrants. An analysis of applied science graduates in the Netherlands. *Journal of Ethnic and Migration Studies*, *46*(15), 3235–3251. https://doi.org/10.1080/1369183X.2020.1738211

Fernández-Reino, M., Radl, J., & Ramos, M. (2018). Employment outcomes of ethnic minorities in Spain: Towards increasing economic incorporation among immigrants and the second generation? *Social Inclusion*, *6*(3), 48–63. https://doi.org/10.17645/si.v6i3.1441

Freeman, R. (1976). *The Overeducated American*. Academic Press.

Ghignoni, E., & Verashchagina, A. (2014). Educational qualifications mismatch in europe. Is it demand or supply driven? *Journal of Comparative Economics*, *42*(3), 670–692. https://doi.org/10.1016/j.jce.2013.06.006

Groot, W., & Maassen Van Den Brink, H. (2000). Overeducation in the labor market: A meta-analysis. *Economics of Education Review*, *19*(2), 149–158. https://doi.org/10.1016/S0272-7757(99)00057-6

Grotti, R., Aradhya, S., & Härkönen. (2023). *Hiring or firing? The dynamics of unemployment inequality among the children of immigrants*. 910275 Bytes. https://doi.org/10.17045/STHLMUNI.21915228.V1

Hällsten, M., Edling, C., & Rydgren, J. (2017). Social capital, friendship networks, and youth unemployment. *Social Science Research*, *61*, 234–250. https://doi.org/10.1016/j.ssresearch.2016.06.017

Hammarstedt, M., & Palme, M. (2012). Human capital transmission and the earnings of second-generation immigrants in Sweden. *IZA Journal of Migration*, *1*(1), Article 1. https://doi.org/10.1186/2193-9039-1-4

Hartog, J. (2000). Over-education and earnings: Where are we, where should we go? *Economics of Education Review*, *19*(2), 131–147. https://doi.org/10.1016/S0272-7757(99)00050-3

Heath, A. F., Rothon, C., & Kilpi, E. (2008). The Second Generation in Western Europe: Education, Unemployment, and Occupational Attainment. *Annual Review of Sociology*, *34*(1), 211–235. https://doi.org/10.1146/annurev.soc.34.040507.134728

Hermansen, A. S. (2013). Occupational Attainment Among Children of Immigrants in Norway: Bottlenecks into Employment—Equal Access to Advantaged Positions? *European Sociological Review*, *29*(3), 517–534. https://doi.org/10.1093/esr/jcr094

Hersch, J. (2011). The persistence of skin color discrimination for immigrants. *Social Science Research*, *40*(5), 1337–1349. https://doi.org/10.1016/j.ssresearch.2010.12.006

Jackson, M., Jonsson, J. O., & Rudolphi, F. (2012). Ethnic Inequality in Choice-Driven Education Systems: A Longitudinal Study of Performance and Choice in England and Sweden. *Sociology of Education*, *85*(2), 158–178. https://doi.org/10.1177/0038040711427311

Jonsson, J. O., & Rudolphi, F. (2011). Weak Performance—Strong Determination: School Achievement and Educational Choice among Children of Immigrants in Sweden. *European Sociological Review*, *27*(4), 487–508. https://doi.org/10.1093/esr/jcq021

Joona, P. A., Gupta, N. D., & Wadensjö, E. (2014). Overeducation among immigrants in Sweden: Incidence, wage effects and state dependence. *IZA Journal of Migration*, *3*(1). https://doi.org/10.1186/2193-9039-3-9

Kalfa, E., & Piracha, M. (2017). Immigrants' educational mismatch and the penalty of over-education. *Education Economics*, *25*(5), 462–481. https://doi.org/10.1080/09645292.2017.1298728

Karakaya, G., Plasman, R., & Rycx, F. (2007). Overeducation on the Belgian labour market: Evaluation and analysis of the explanatory factors through two types of approaches. *Compare*, *37*(4), 513–532. https://doi.org/10.1080/03057920701366317

Korpi, T., & Tåhlin, M. (2009). Educational mismatch, wages, and wage growth: Overeducation in Sweden, 1974-2000. *Labour Economics*, *16*(2), 183–193. https://doi.org/10.1016/j.labeco.2008.08.004

Kracke, N., & Klug, C. (2021). Social Capital and Its Effect on Labour Market (Mis)match: Migrants' Overqualification in Germany. In *JOURNAL OF INTERNATIONAL MIGRATION AND INTEGRATION* (Vol. 22, Issue 4, pp. 1573–1598). SPRINGER HEIDELBERG. https://doi.org/10.1007/s12134-021-00817-1

Lai, D. W. L., Shankar, J., & Khalema, E. (2017). Unspoken Skills and Tactics: Essentials for Immigrant Professionals in Integration to Workplace Culture. *Journal of International Migration and Integration*, *18*(3), 937–959. https://doi.org/10.1007/s12134-017-0513-5

Lancee, B., & Bol, T. (2017). The Transferability of Skills and Degrees: Why the Place of Education Affects Immigrant Earnings. *Social Forces*, *96*(2), 691–716. https://doi.org/10.1093/sf/sox058

Larsen, E. N., Rogne, A. F., & Birkelund, G. E. (2018). Perfect for the Job? Overqualification of Immigrants and their Descendants in the Norwegian Labor Market. In *SOCIAL INCLUSION* (Vol. 6, Issue 3, pp. 78–103). COGITATIO PRESS. https://doi.org/10.17645/si.v6i3.1451

Leuven, E., & Oosterbeek, H. (2011). Overeducation and Mismatch in the Labor Market. In E. A. Hanushek, S. Machin, & L. Woessmann (Eds.), *Handbook of the Economics of Education* (Vol. 4, pp. 283–326). Elsevier. https://doi.org/10.1016/B978-0-444-53444-6.00003-1

Levels, M., Dronkers, J., & Kraaykamp, G. (2008). Immigrant Children's Educational Achievement in Western Countries: Origin, Destination, and Community Effects on Mathematical Performance. *American Sociological Review*, *73*(5), 835–853. https://doi.org/10.1177/000312240807300507

Lippens, L., Baert, S., Ghekiere, A., Verhaeghe, P.-P., & Derous, E. (2022). Is labour market discrimination against ethnic minorities better explained by taste or statistics? A systematic review of the empirical evidence. *Journal of Ethnic and Migration Studies*, *48*(17), 4243–4276. https://doi.org/10.1080/1369183X.2022.2050191

Lu, Y., & Hou, F. (2020). Immigration System, Labor Market Structures, and Overeducation of High-Skilled Immigrants in the United States and Canada. *International Migration Review*, *54*(4), 1072–1103. https://doi.org/10.1177/0197918319901263

Mavromaras, K., Sloane, P., & Wei, Z. (2015). The scarring effects of unemployment, low pay and skills under-utilization in Australia compared. *Applied Economics*, *47*(23), 2413–2429. https://doi.org/10.1080/00036846.2015.1008762

McGoldrick, K., & Robst, J. (1996). Gender differences in overeducation: A test of the theory of differential overqualification. *The American Economic Review*, *86*(2), 280. Social Science Database. https://ezp.sub.su.se/login?url=https://www.proquest.com/scholarly-journals/gender-differences-overeducation-test-theory/docview/233026682/se-2?accountid=38978

McGuinness, S. (2006). Overeducation in the labour market. *Journal of Economic Surveys*, *20*(3), 387–418. https://doi.org/10.1111/j.0950-0804.2006.00284.x

OECD. (2017). *Catching Up? Intergenerational Mobility and Children of Immigrants*. OECD. https://doi.org/10.1787/9789264288041-en

Ordine, P., & Rose, G. (2009). Overeducation and Instructional Quality: A Theoretical Model and Some Facts. *Journal of Human Capital*, *3*(1), 73–105. https://doi.org/10.1086/599836

Polek, E., Wöhrle, J., & Pieter van Oudenhoven, J. (2010). The Role of Attachment Styles, Perceived Discrimination, and Cultural Distance in Adjustment of German and Eastern European Immigrants in the Netherlands. *Cross-Cultural Research*, *44*(1), 60–88. https://doi.org/10.1177/1069397109352779

Portes, A., & Zhou, M. (1993). The New Second Generation: Segmented Assimilation and its Variants. *The ANNALS of the American Academy of Political and Social Science*, *530*(1), 74–96. https://ideas.repec.org//a/sae/anname/v530y1993i1p74-96.html

Quinn, M. A., & Rubb, S. (2011). Spouse Overeducation and Family Migration: Evidence from the US. In *Journal of Family and Economic Issues* (Vol. 32, Issue 1, pp. 36–45). Springer Science and Business Media, LLC. https://doi.org/10.1007/s10834-010-9213-4

Ramakrishnan, S. K. (2004). Second-Generation Immigrants? The "2.5 Generation" in the United States*. *Social Science Quarterly*, *85*(2), 380–399. https://doi.org/10.1111/j.0038-4941.2004.08502013.x

Reitz, J. G. (2001). Immigrant skill utilization in the Canadian labour market: Implications of human capital research. *Journal of International Migration and Integration / Revue de l'integration et de La Migration Internationale*, *2*(3), 347–378. https://doi.org/10.1007/s12134-001-1004-1

Rooth, D.-O., & Ekberg, J. (2003). Unemployment and earnings for second generation immigrants in Sweden. Ethnic background and parent composition. *Journal of Population Economics*, *16*(4), 787–814. https://doi.org/10.1007/s00148-003-0163-0

Roth, T., & Weißmann, M. (2022). The Role of Parents' Native and Migrant Contacts on the Labour Market in the School-to-Work Transition of Adolescents in Germany. *European Sociological Review*, *38*(5), 707–724. https://doi.org/10.1093/esr/jcac022

Rumbaut, R. G. (2004). Ages, Life Stages, and Generational Cohorts: Decomposing the Immigrant First and Second Generations in the United States1. *International Migration Review*, *38*(3), 1160–1205. https://doi.org/10.1111/j.1747-7379.2004.tb00232.x

Sattinger, M. (1993). Assignment Models of the Distribution of Earnings. *Journal of Economic Literature*, *31*(2), 831–880. https://www.jstor.org/stable/2728516

SCB. (2011). *Bakgrundsfakta: Yrkesregistret med yrkesstatistik – En beskrivning av innehåll och kvalitet (The Swedish Occupational Register)* (Arbetsmarknads- och utbildningsstatistik 2011:5).

SCB. (2019). *LISA, Longitudinell integrationsdatabas för Sjukförsäkringsoch Arbetsmarknadsstudier* (Bakgrundsfakta Arbetsmarknads- och utbildningsstatistiken 2019:1).

SCB. (2023). *DeSO – Demografiska statistikområden*. Statistiska Centralbyrån. https://www.scb.se/hitta-statistik/regional-statistik-och-kartor/regionala-indelningar/deso---demografiska-statistikomraden/

Schaeffer, M., Höhne, J., & Teney, C. (2016). Income Advantages of Poorly Qualified Immigrant Minorities: Why School Dropouts of Turkish Origin Earn More in Germany. *European Sociological Review*, *32*(1), 93–107. https://doi.org/10.1093/esr/jcv091

Serikbayeva, B., & Abdulla, K. (2022). Education-Job Mismatch: Implications for Individual Earnings and Aggregate Output. *Social Indicators Research*, *163*(2), 723–752. https://doi.org/10.1007/s11205-022-02912-x

Thurow, L. (1975). *Generating Inequality*. Basic Books.

Verdugo, R. R., & Verdugo, N. T. (1989). The Impact of Surplus Schooling on Earnings: Some Additional Findings. *The Journal of Human Resources*, *24*(4), 629. Social Science Database. https://ezp.sub.su.se/login?url=https://www.proquest.com/scholarly-journals/impact-surplus-schooling-on-earnings/docview/202694036/se-2?accountid=38978

Verhaest, D., & Omey, E. (2006). The impact of overeducation and its measurement. *Social Indicators Research*, *77*(3), 419–448. https://doi.org/10.1007/s11205-005-4276-6

Verhaest, D., & Van Der Velden, R. (2013). Cross-country differences in graduate overeducation. *European Sociological Review*, *29*(3), 642–653. https://doi.org/10.1093/esr/jcs044

Zhou, M. (1997). Segmented Assimilation: Issues, Controversies, and Recent Research on the New Second Generation. *The International Migration Review*, *31*(4), 975–1008. https://doi.org/10.2307/2547421

Zwysen, W., & Demireva, N. (2020). Ethnic and migrant penalties in job quality in the UK: the role of residential concentration and occupational clustering. *Journal of Ethnic and Migration Studies*, *46*(1), 200–221. https://doi.org/10.1080/1369183X.2018.1498777

Appendices

Table A1. Descriptive statistics by immigrant generation

	Ancestral Swedes	G2.5	G2	G1	Total
2004					
N	2,194,219	174,184	62,160	260,917	2,691,480
(%)	81.5	6.5	2.3	9.7	100.0
Gender					
Male	48.0	48.8	49.4	47.0	48.0
Female	52.0	51.2	50.6	53.0	52.0
Highest Degree attained					
Upper secondary	71.2	72.9	78.0	63.9	70.8
University or higher	28.8	27.1	22.0	36.1	29.2
Employment sector and status					
Employed in Public sector	39.0	35.7	30.6	38.2	38.5
Employed in private sector	56.0	59.7	65.5	57.6	56.6
Unincorporated self-employment	1.9	1.6	1.4	2.2	1.9
Incorporated self-employment	3.2	3.0	2.6	2.1	3.1
Not specified	0.0	0.0	0.0	0.0	0.0
Region					
Urban	72.6	78.3	84.1	87.5	74.7
Suburban	9.3	7.5	6.6	5.3	8.8
Rural	18.1	14.1	9.4	7.2	16.5
Age	41.9	38.9	36.2	42.3	41.6
(Std. dev.)	12.0	10.8	9.8	11.2	11.9
2007					
N	2,521,117	211,937	80,031	327,856	3,140,941
(%)	80.3	6.8	2.6	10.4	100.0
Gender					
Male	49.8	50.2	50.4	48.9	49.7
Female	50.3	49.8	49.6	51.2	50.3
Highest Degree attained					
Upper secondary	71.5	73.0	77.8	62.6	70.8
University or higher	28.5	27.0	22.2	37.5	29.2
Employment sector and status					
Employed in Public sector	32.6	29.7	25.2	31.7	32.1
Employed in private sector	57.1	59.9	64.4	57.3	57.5
Unincorporated self-employment	2.4	2.3	2.0	2.7	2.4

Incorporated self-employment	3.2	3.0	2.6	2.0	3.0
Not specified	4.8	5.2	5.8	6.4	5.0
Region					
Urban	72.6	78.5	84.6	87.7	74.9
Suburban	9.2	7.6	6.3	5.2	8.6
Rural	18.2	14.0	9.1	7.1	16.5
Age	42.0	39.5	36.8	42.1	41.7
(Std. dev.)	12.5	11.4	10.5	11.5	12.3
2010					
N	2,556,102	225,365	89,181	361,287	3,231,935
(%)	79.1	7.0	2.8	11.2	100.0
Gender					
Male	49.8	49.9	49.9	49.1	49.7
Female	50.2	50.1	50.1	50.9	50.3
Highest Degree attained					
Upper secondary	70.7	72.0	76.7	59.8	69.7
University or higher	29.3	28.0	23.3	40.2	30.3
Employment sector and status					
Employed in Public sector	30.6	28.2	24.3	29.4	30.1
Employed in private sector	57.4	59.6	63.4	57.9	57.8
Unincorporated self-employment	3.0	2.9	2.6	3.7	3.0
Incorporated self-employment	3.5	3.4	3.0	2.1	3.3
Not specified	5.6	6.0	6.8	7.0	5.8
Region					
Urban	72.6	78.7	85.3	88.1	75.1
Suburban	9.2	7.5	6.0	5.0	8.5
Rural	18.2	13.9	8.8	6.9	16.4
Age	42.3	40.3	37.7	42.3	42.1
(Std. dev.)	12.6	11.8	11.2	11.5	12.4
2013					
N	2,623,217	243,879	104,378	420,568	3,392,042
(%)	77.3	7.2	3.1	12.4	100.0
Gender					
Male	49.7	49.7	49.4	49.9	49.7
Female	50.3	50.3	50.7	50.1	50.3
Highest Degree attained					
Upper secondary	70.2	71.4	76.0	56.9	68.8
University or higher	29.8	28.7	24.0	43.1	31.2
Employment sector and status					
Employed in Public sector	29.9	27.9	24.5	28.4	29.4

Employed in private sector	57.8	59.3	62.5	58.2	58.1
Unincorporated self-employment	3.2	3.2	2.7	4.7	3.4
Incorporated self-employment	3.8	3.8	3.2	2.4	3.6
Not specified	5.3	5.9	7.2	6.4	5.5
Region					
Urban	72.8	78.9	86.5	88.5	75.6
Suburban	9.1	7.4	5.5	4.9	8.4
Rural	18.1	13.7	8.0	6.6	16.1
Age	42.3	40.8	37.7	42.4	42.1
(Std. dev.)	12.7	12.3	12.0	11.4	12.5
2016					
N	2,454,005	237,152	113,335	456,525	3,261,017
(%)	75.3	7.3	3.5	14.0	100.0
Gender					
Male	49.2	49.0	48.6	49.5	49.2
Female	50.8	51.0	51.4	50.5	50.8
Highest Degree attained					
Upper secondary	68.7	69.6	74.5	53.8	66.9
University or higher	31.3	30.5	25.5	46.2	33.1
Employment sector and status					
Employed in Public sector	32.5	31.0	28.0	31.9	32.2
Employed in private sector	58.6	59.9	62.2	58.4	58.8
Unincorporated self-employment	2.6	2.4	1.8	3.5	2.7
Incorporated self-employment	2.8	2.7	2.3	1.9	2.6
Not specified	3.5	4.1	5.8	4.4	3.8
Region					
Urban	72.9	79.1	87.6	88.4	76.0
Suburban	9.2	7.5	5.2	5.0	8.3
Rural	18.2	13.6	7.1	6.4	15.8
Age	42.2	41.0	37.1	42.1	41.9
(Std. dev.)	12.8	12.7	12.5	11.4	12.6

Table A2. Descriptive table by ancestry, the Swedish-born

	SW	FI	O.N.	O.W.	E.E.	Y/B	S.E.	M.E.	IR	TU	OT	Total
2004												
N	2,194,219	88,453	46,184	42,250	27,625	10,172	8,176	1,522	567	2,760	8,635	2,430,563
(%)	90.28	3.64	1.9	1.74	1.14	0.42	0.34	0.06	0.02	0.11	0.36	100
Gender												
Male	47.98	48.98	48.93	49.52	48.83	49.88	50.07	47.31	45.68	43.66	47.15	48.07
Female	52.02	51.02	51.07	50.48	51.17	50.12	49.93	52.69	54.32	56.34	52.85	51.93
Highest Degree attained												
Upper secondary	71.24	77.57	73.97	67.1	67.87	82.27	77.57	82	84.83	88.08	77.04	71.53
University or higher	28.76	22.43	26.03	32.9	32.13	17.73	22.43	18	15.17	11.92	22.96	28.47
Employment sector and status												
Employed in Public sector	38.95	34.01	38.16	34.95	34.95	26.98	28.8	28.06	25.4	23.77	30.76	38.5
Employed in private sector	55.98	62.3	56.86	59.39	59.8	69.98	66.63	68.66	71.96	72.25	66.66	56.49
Unincorporated self-employment	1.85	1.32	1.68	1.91	1.74	1.41	1.64	1.64	1.06	2.39	1.15	1.82
Incorporated self-employment	3.23	2.37	3.3	3.75	3.51	1.64	2.92	1.64	1.59	1.59	1.44	3.19
Not specified												
Region												
Urban	72.62	77.58	75.23	79.34	82.88	88.44	89.95	94.35	96.12	96.67	92.06	73.33
Suburban	9.33	7.8	8.79	7.27	6.84	5.57	4.42	2.17	2.47	1.52	3.27	9.13
Rural	18.05	14.62	15.98	13.38	10.28	5.99	5.64	3.48	1.41	1.81	4.68	17.54
Age	41.9	37.1	42.4	40.2	40.6	30.6	32.9	27.4	26.2	26.5	29.9	41.5
(Std. dev.)	12.0	9.8	10.8	10.4	10.7	6.0	8.2	7.1	7.5	5.8	9.5	12.0
2007												
N	2,521,117	108,304	53,170	49,688	32,902	13,929	10,927	2,866	1,390	4,814	13,978	2,813,085
(%)	89.62	3.85	1.89	1.77	1.17	0.5	0.39	0.1	0.05	0.17	0.5	100
Gender												
Male	49.75	50.37	50.58	50.76	50.03	50.94	50.91	48.46	44.46	44.95	48.31	49.8
Female	50.25	49.63	49.42	49.24	49.97	49.06	49.09	51.54	55.54	55.05	51.69	50.2
Highest Degree attained												

Upper secondary	71.52	76.97	74.39	67.33	67.88	80.44	76.17	83.57	86.26	86.41	78.03	71.81
University or higher	28.48	23.03	25.61	32.67	32.12	19.56	23.83	16.43	13.74	13.59	21.97	28.19
Employment sector and status												
Employed in Public sector	32.58	28.69	32.44	29.36	29.47	22.57	23.37	20.34	16.76	18.24	22.48	32.15
Employed in private sector	57.08	62.52	57.44	59.26	59.61	67.71	64.76	63.36	61.44	67.01	62.19	57.5
Unincorporated self-employment	2.36	1.95	2.3	2.62	2.25	2.15	2.42	1.71	1.01	3.01	1.65	2.34
Incorporated self-employment	3.2	2.43	3.39	3.84	3.51	2.01	2.98	1.64	0.86	1.74	1.45	3.16
Not specified	4.79	4.41	4.44	4.92	5.16	5.56	6.47	12.94	19.93	9.99	12.23	4.84
Region												
Urban	72.56	77.36	74.74	79.25	82.97	88.48	89.91	94.38	95.61	96.63	92.51	73.35
Suburban	9.24	7.83	8.96	7.38	6.74	5.8	4.46	2.62	2.52	1.27	3.33	9.03
Rural	18.19	14.81	16.3	13.37	10.29	5.72	5.63	3	1.87	2.1	4.16	17.62
Age	42.0	38.1	43.3	41.0	41.4	32.0	33.8	27.0	25.1	27.2	29.5	41.7
(Std. dev.)	12.5	10.3	11.5	10.9	11.5	6.7	8.7	7.1	6.4	6.1	9.0	12.4
2010												
N	2,556,102	114,924	53,544	51,366	34,359	15,648	12,168	4,591	2,433	6,636	18,877	2,870,648
(%)	89.04	4	1.87	1.79	1.2	0.55	0.42	0.16	0.08	0.23	0.66	100
Gender												
Male	49.79	50.08	50.38	50.45	50.06	50.1	50.46	47.79	46.2	45.68	47.39	49.8
Female	50.21	49.92	49.62	49.55	49.94	49.9	49.54	52.21	53.8	54.32	52.61	50.2
Highest Degree attained												
Upper secondary	70.68	75.54	73.57	66.47	66.5	78.51	73.84	84.27	85.33	84.01	77.53	70.97
University or higher	29.32	24.46	26.43	33.53	33.5	21.49	26.16	15.73	14.67	15.99	22.47	29.03
Employment sector and status												
Employed in Public sector	30.6	27.54	30.79	28.18	28.32	22.83	23.38	19.15	16.69	17.87	20.89	30.21
Employed in private sector	57.4	62.05	57.34	58.72	58.83	65.9	63.43	61.62	59.15	66.06	62.27	57.75
Unincorporated self-employment	2.95	2.53	2.9	3.31	3.02	2.61	3.11	2.42	1.32	3.38	2.15	2.93
Incorporated self-employment	3.48	2.88	3.74	4.26	3.97	2.5	3.52	1.85	1.44	2.17	1.73	3.46
Not specified	5.57	5	5.23	5.53	5.87	6.15	6.57	14.96	21.41	10.52	12.97	5.64
Region												
Urban	72.6	77.2	74.5	79.4	83.0	88.5	89.5	95.0	95.4	96.5	92.8	73.5

Suburban	9.2	7.8	8.9	7.2	6.7	5.8	4.8	2.3	2.5	1.5	3.3	8.9
Rural	18.2	15.0	16.6	13.3	10.3	5.7	5.8	2.7	2.1	2.0	4.0	17.6
Age	42.33	39.57	44.47	42.23	42.67	33.60	35.44	26.83	25.20	28.24	29.63	42.03
(Std. dev.)	12.58	10.77	11.97	11.19	12.07	7.56	9.21	7.13	5.97	6.28	8.90	12.52
2013												
N	2,623,217	123,276	54,867	53,914	35,838	19,290	13,730	7,996	4,172	8,816	26,358	2,971,474
(%)	88.28	4.15	1.85	1.81	1.21	0.65	0.46	0.27	0.14	0.3	0.89	100
Gender												
Male	49.73	49.86	50.25	50.35	49.79	49.2	50.5	46.25	46.81	46.05	47.23	49.71
Female	50.27	50.14	49.75	49.65	50.21	50.8	49.5	53.75	53.19	53.95	52.77	50.29
Highest Degree attained												
Upper secondary	70.24	74.35	73.3	66.05	65.56	78.46	71.75	83.19	81.16	80.56	76.58	70.53
University or higher	29.76	25.65	26.7	33.95	34.44	21.54	28.25	16.81	18.84	19.44	23.42	29.47
Employment sector and status												
Employed in Public sector	29.9	27.77	30.13	28.01	28.08	23.63	24.01	20.81	18.79	20.52	21.13	29.54
Employed in private sector	57.79	61.38	57.07	58.3	58.27	64.73	61.98	60.97	59.37	65.6	62.12	58.08
Unincorporated self-employment	3.24	2.73	3.34	3.65	3.49	2.64	3.55	1.76	1.94	2.78	2.1	3.21
Incorporated self-employment	3.78	3.36	4.05	4.69	4.23	2.69	4.14	2	1.27	2.71	1.88	3.76
Not specified	5.28	4.76	5.42	5.34	5.93	6.31	6.33	14.46	18.62	8.39	12.77	5.4
Region												
Urban	72.76	77.19	74.38	79.36	83.18	89.18	89.32	95.31	95.95	96.31	92.97	73.75
Suburban	9.11	7.9	9.08	7.17	6.59	5.43	4.73	2.41	2.01	1.54	3.16	8.85
Rural	18.13	14.9	16.54	13.46	10.23	5.4	5.95	2.28	2.04	2.14	3.87	17.4
Age	42.3	40.8	45.1	43.1	43.2	34.0	36.9	26.4	25.6	29.2	29.6	42.0
(Std. dev.)	12.7	11.3	12.6	11.8	12.5	8.9	9.8	6.8	5.7	6.8	8.8	12.7
2016												
N	2,454,005	118,245	49,784	50,831	33,259	23,282	13,535	12,128	5,768	10,512	33,143	2,804,492
(%)	87.5	4.22	1.78	1.81	1.19	0.83	0.48	0.43	0.21	0.37	1.18	100
Gender												
Male	49.16	49.23	49.54	49.75	48.9	48.28	49.75	46.26	47.17	46.41	47.44	49.12
Female	50.84	50.77	50.46	50.25	51.1	51.72	50.25	53.74	52.83	53.59	52.56	50.88

Highest Degree attained												
Upper secondary	68.68	72.14	72.35	64.17	63.68	78.48	68.45	79.95	74.84	75.88	74.68	68.99
University or higher	31.32	27.86	27.65	35.83	36.32	21.52	31.55	20.05	25.16	24.12	25.32	31.01
Employment sector and status												
Employed in Public sector	32.51	31.06	32.96	31.12	30.81	27.56	28.16	26.57	23.82	25.34	25.49	32.19
Employed in private sector	58.6	61.24	57.83	58.91	59.21	63.33	62.02	60.85	60.7	64.45	62.99	58.85
Unincorporated self-employment	2.58	2.11	2.65	2.8	2.6	1.62	2.72	1.1	1.11	1.73	1.32	2.53
Incorporated self-employment	2.79	2.52	2.85	3.42	3.13	1.94	3.31	1.39	1.66	2.54	1.28	2.76
Not specified	3.53	3.07	3.71	3.75	4.25	5.55	3.78	10.09	12.71	5.94	8.92	3.66
Region												
Urban	72.89	76.82	74.23	79.54	83.51	89.43	88.93	95.33	96.03	96.01	92.92	74.01
Suburban	9.15	8.08	9.34	7.31	6.55	5.48	4.91	2.55	1.86	1.7	3.29	8.85
Rural	17.97	15.1	16.43	13.15	9.93	5.09	6.16	2.12	2.12	2.28	3.8	17.14
Age	42.2	42.0	45.0	43.8	43.2	33.5	38.2	26.4	26.4	30.1	29.5	41.9
(Std. dev.)	12.8	11.6	13.0	12.4	12.8	10.2	10.3	6.5	5.6	7.2	8.7	12.8

Note: SW=Sweden, FI=Finland, O.N.=Other Nordic, O.W.=Other Wester, E.E.=Eastern Europe, Y/B=Yugoslavia/Bosnia, S.E.=Southern Europe, M.E.=Middle Eastern, IR=Iran, TU=Turkey, OT=Other non-Western

Table A3. Association between immigrant generation status and overqualification. Multiple logit model, OR, s.e. in parentheses.

	male secondary	male tertiary	female secondary	female tertiary
Immigrant generation (ref. Ancestral Swedes)				
2.5 generation (G2.5)	1.049***	1.026*	1.084***	1.115***
	(0.007)	(0.010)	(0.007)	(0.010)
second generation (G2)	1.078***	1.108***	1.102***	1.177***
	(0.010)	(0.019)	(0.010)	(0.016)
first generation (G1)	1.516***	2.126***	1.632***	2.877***
	(0.008)	(0.014)	(0.009)	(0.017)
Age	0.938***	1.072***	0.911***	1.044***
	(0.001)	(0.002)	(0.001)	(0.001)
Age squared	1.001***	0.999***	1.001***	1.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Year (ref. 2001)				
2002	0.993**	1.070***	1.041***	1.044***
	(0.002)	(0.004)	(0.002)	(0.002)
2003	1.005	1.117***	1.053***	1.087***
	(0.003)	(0.004)	(0.002)	(0.003)
2004	0.973***	1.373***	1.100***	1.258***
	(0.003)	(0.006)	(0.003)	(0.004)
2005	0.948***	1.429***	1.073***	1.303***
	(0.003)	(0.007)	(0.003)	(0.004)
2006	0.929***	1.451***	1.034***	1.321***
	(0.003)	(0.007)	(0.003)	(0.005)
2007	0.916***	1.482***	1.024***	1.337***
	(0.003)	(0.007)	(0.003)	(0.005)
2008	0.904***	1.510***	1.016***	1.311***
	(0.003)	(0.008)	(0.003)	(0.005)
2009	0.882***	1.464***	1.000	1.305***

	(0.003)	(0.007)	(0.003)	(0.005)
2010	0.865***	1.484***	0.997	1.303***
	(0.003)	(0.008)	(0.003)	(0.005)
2011	0.850***	1.528***	0.992**	1.323***
	(0.003)	(0.008)	(0.003)	(0.005)
2012	0.834***	1.550***	0.967***	1.341***
	(0.003)	(0.008)	(0.003)	(0.005)
2013	0.815***	1.560***	0.951***	1.361***
	(0.003)	(0.008)	(0.003)	(0.005)
2014	0.710***	1.296***	0.810***	1.212***
	(0.003)	(0.007)	(0.003)	(0.005)
2015	0.694***	1.309***	0.807***	1.254***
	(0.003)	(0.007)	(0.003)	(0.005)
2016	0.708***	1.388***	0.856***	1.325***
	(0.003)	(0.008)	(0.003)	(0.005)
Region (ref. Urban)				
Suburban	0.771***	0.990	0.789***	0.876***
	(0.004)	(0.010)	(0.005)	(0.007)
Rural	0.744***	1.059***	0.804***	0.911***
	(0.003)	(0.008)	(0.004)	(0.005)
Observations	16719428	5179581	14675335	8860900
r2_p	0.020	0.018	0.013	0.027

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, Secondary=Upper Secondary graduate

Table A4. Association between ancestry origin and overqualification. Multiple logit model, OR, s.e. in parentheses.

	male secondary	male tertiary	female secondary	female tertiary
Acnestry (ref. Sweden)				
Finland	0.899***	1.075***	0.985	1.072***
	(0.008)	(0.017)	(0.009)	(0.013)
Other Nordic	0.905***	0.975	0.968*	1.058**
	(0.012)	(0.021)	(0.013)	(0.019)
Other Western	1.264***	1.059**	1.250***	1.175***
	(0.016)	(0.019)	(0.017)	(0.019)
Eastern Europe	1.296***	1.075**	1.243***	1.228***
	(0.020)	(0.024)	(0.020)	(0.024)
Yugoslavia and Bosnia	1.039	1.098*	0.973	1.275***
	(0.022)	(0.044)	(0.019)	(0.042)
Southern Europe	1.159***	0.956	1.114***	1.199***
	(0.029)	(0.039)	(0.028)	(0.042)
Middle East	1.439***	0.980	1.352***	1.294***
	(0.040)	(0.063)	(0.033)	(0.071)
Iran	2.008***	1.131	1.888***	1.449***
	(0.072)	(0.092)	(0.058)	(0.101)
Turkey	1.051	1.079	0.939*	1.143**
	(0.032)	(0.067)	(0.024)	(0.057)
Other	1.477***	1.044	1.369***	1.237***
	(0.024)	(0.032)	(0.020)	(0.033)
Age	0.933***	1.071***	0.906***	1.033***
	(0.001)	(0.002)	(0.001)	(0.001)
Age squared	1.001***	0.999***	1.001***	1.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Employment sector/status (ref. Employed in Public sector)				
Employed in private sector	1.192***	3.358***	1.310***	2.693***
	(0.006)	(0.020)	(0.005)	(0.012)

Unincorporated self-employment	1.501***	3.775***	1.281***	2.702***
	(0.013)	(0.058)	(0.014)	(0.038)
Incorporated self-employment	1.326***	2.848***	1.245***	2.656***
	(0.011)	(0.035)	(0.017)	(0.042)
Not specified	3.358***	3.261***	3.543***	2.458***
	(0.020)	(0.037)	(0.015)	(0.019)
Year (ref. 2001)				
2002	0.995	1.069***	1.043***	1.038***
	(0.003)	(0.004)	(0.002)	(0.003)
2003	1.011***	1.121***	1.058***	1.084***
	(0.003)	(0.005)	(0.003)	(0.003)
2004	0.976***	1.373***	1.104***	1.256***
	(0.003)	(0.007)	(0.003)	(0.004)
2005	0.953***	1.425***	1.074***	1.302***
	(0.003)	(0.007)	(0.003)	(0.005)
2006	0.935***	1.438***	1.035***	1.318***
	(0.003)	(0.007)	(0.003)	(0.005)
2007	0.925***	1.463***	1.025***	1.330***
	(0.003)	(0.008)	(0.003)	(0.005)
2008	0.915***	1.487***	1.018***	1.297***
	(0.003)	(0.008)	(0.003)	(0.005)
2009	0.892***	1.449***	1.000	1.292***
	(0.003)	(0.008)	(0.003)	(0.005)
2010	0.876***	1.463***	0.997	1.287***
	(0.003)	(0.008)	(0.003)	(0.005)
2011	0.861***	1.497***	0.994	1.299***
	(0.003)	(0.008)	(0.003)	(0.005)
2012	0.847***	1.512***	0.969***	1.312***

	(0.003)	(0.008)	(0.003)	(0.006)
2013	0.827***	1.525***	0.955***	1.333***
	(0.003)	(0.009)	(0.003)	(0.006)
2014	0.716***	1.265***	0.804***	1.184***
	(0.003)	(0.008)	(0.003)	(0.005)
2015	0.700***	1.263***	0.802***	1.217***
	(0.003)	(0.008)	(0.003)	(0.006)
2016	0.718***	1.334***	0.862***	1.286***
	(0.003)	(0.008)	(0.003)	(0.006)
Region (ref. Urban)				
Suburban	0.772***	0.982	0.792***	0.862***
	(0.005)	(0.010)	(0.005)	(0.007)
Rural	0.747***	1.064***	0.810***	0.905***
	(0.003)	(0.009)	(0.004)	(0.006)
Observations	15155936	4281759	13211199	7670848
r2_p	0.018	0.004	0.010	0.002

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A5. Risk ratio of overqualification by immigrant generation, gender, and educational attainment, Multiple logit model, s.e. in parentheses.

	Male		Female	
	Upper secondary	Tertiary	Upper secondary	Tertiary
Immigrant generation (ref. Ancestral Swedes)				
G2.5	1.035***	1.013*	1.059***	1.078***
	(0.005)	(0.005)	(0.005)	(0.006)
G2	1.055***	1.054***	1.072***	1.118***
	(0.007)	(0.009)	(0.007)	(0.010)
G1	1.330***	1.389***	1.390***	1.838***
	(0.005)	(0.004)	(0.005)	(0.005)
N	16719428	5179581	14675335	8860900

$^{*}\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

Table A6. Risk ratio of overqualification by ancestry, gender, and educational attainment, Multiple logit model, s.e. in parentheses.

	Male		Female	
	Upper secondary	Tertiary	Upper secondary	Tertiary
Ancestry (ref. Sweden)				
Finland	0.924***	1.038***	0.989	1.049***
	(0.006)	(0.008)	(0.006)	(0.009)
Other Nordic	0.929***	0.987	0.977*	1.040**
	(0.009)	(0.011)	(0.010)	(0.013)
Other Western	1.180***	1.030**	1.169***	1.116***
	(0.010)	(0.010)	(0.011)	(0.012)
Eastern Europe	1.200***	1.039**	1.165***	1.149***
	(0.013)	(0.012)	(0.013)	(0.015)
Yugoslavia/Bosnia	1.028	1.049*	0.981	1.178***
	(0.016)	(0.021)	(0.014)	(0.025)
Southern Europe	1.111***	0.976	1.080***	1.131***
	(0.019)	(0.021)	(0.019)	(0.026)
Middle East	1.287***	0.989	1.232***	1.189***
	(0.024)	(0.034)	(0.020)	(0.042)
Iran	1.580***	1.065	1.517***	1.277***
	(0.033)	(0.043)	(0.027)	(0.055)
Turkey	1.037	1.040	0.955*	1.096**
	(0.023)	(0.033)	(0.018)	(0.036)
Other	1.308***	1.023	1.242***	1.154***
	(0.014)	(0.016)	(0.012)	(0.020)
N	15155936	4281759	13211199	7670848

$^{*}\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

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