LUND UNIVERSITY
School of Economics and Management

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Immigrant Occupational Mobility and the Role of Educational Mismatches in the Home Country: Longitudinal Evidence from Sweden

Matthias Rosenbaum-Feldbrügge
int13mr2@student.lu.se

Abstract: This thesis examines the occupational mobility of a sample of immigrants who arrived in Sweden between 1971 and 1985. The data includes information on pre-immigration occupation and on up to four occupations in Sweden. The empirical analysis supports a U-shaped pattern of occupational mobility from home country to host country which is in line with the theory of imperfect transferability of skills. Immigrants experience a drop in occupational status from the origin to the host country, with a subsequent increase with years since migration. The unique feature of this study is that it relates the labor market performance in Sweden to the educational mismatch in the home country. The evidence shows that after having controlled for the level of education, immigrants who were overeducated in their home countries have weaker labor market outcomes than their correctly matched counterparts. Undereducated individuals, however, perform better than correctly matched immigrants with the same level of education. Therefore, the thesis suggests that educational mismatch matters when it comes to immigrants' occupational status in the destination country. The explanations for this phenomenon may be linked to ability or the signal provided by the home country work experience.

Key words: *Immigration, Education-occupation mismatch, Occupational mobility*

Acknowledgements

Table of Contents

List of Tables

List of Figures

1   Introduction

The current refugee crisis constitutes one of the major political challenges in today's Europe. Large concerns are related to the cultural and economic integration of immigrants in general and refugees in particular. With regard to the labor market integration of immigrants in Sweden, research has shown that they generally perform worse than the native population. Until the 1970s, foreign citizens had higher or equal employment rates than the native Swedes. Thereafter, however, the employment rates of immigrants have decreased sharply and are considerably lower than the rates for natives (Bevelander, 1999; Bevelander & Nielsen, 2001; Bevelander, 2005; Bengtsson et al., 2005; Rosholm et al., 2006). The analysis of relative earnings reveals a similar picture with immigrants having lower income than Swedes (Scott, 1999; Hammarstedt & Shukur, 2006; Gustafsson & Zheng, 2006). Moreover, foreigners tend to consume more sickness benefits and have higher proportions of early retirement pensions than natives (Scott & Bengtsson, 2006; Hammarstedt, 2000; Persson, 2015). Differences in labor market performance between natives and foreigners are typically explained by lower educational attainment, non-perfect transferability of skills, organizational change and discrimination (Borjas, 1985; Chiswick, 1978; Rosholm et al., 2006; Carlsson & Rooth, 2007).

Most often, studies on labor market outcomes of immigrants do not consider the period before migration because detailed pre-migration labor market information is not available. However, having access to data on the last job before migration makes it possible to investigate the occupational mobility from home to host country. Taking pre-migration information into account helps to identify the labor market transition from home country to host country. With respect to occupational mobility in Sweden, Rooth and Ekberg (2006) have shown that refugees face sharp declines in occupational status in their first job after migration but gradually improve their occupational position over time. This is described as a U-shaped pattern. The initial drop in occupational prestige immediately after migration is also observed by Helgertz (2013).

This thesis contributes to the existing literature on occupational mobility in two ways. Firstly, studies conducted so far observe immigrants' occupations at most twice in the host country. In this paper, however, access to data about up to four occupations in Sweden is available. Immigrants are also followed over a period of up to twenty years. Secondly, it is unique in the sense that it links the literature on occupational mobility of immigrants with the economics of overeducation. More specifically, it poses the question whether having been overeducated or undereducated in the home country has an impact on the occupational trajectories after arrival in Sweden.

The results support the main hypothesis stated by the theory of imperfect transferability of skills, namely that immigrant occupational mobility follows a U-shaped pattern. Moreover, they provide evidence that immigrants who were overeducated in their home countries have occupations with significantly lower status than correctly matched workers with the same acquired level of education. Furthermore, immigrants who were undereducated in their country of origin perform better than their properly matched and equally educated counterparts. These

findings suggest that the occupational (mis)match in the home country contains information that helps to predict the occupational prestige in the host country. This may be explained by the signals provided by the last job before migration or by the lower overall ability of overeducated workers.

The thesis is structured as follows. Section 2 summarizes and discusses the previous research and theory with respect to occupational mismatch and occupational mobility. In Section 3, the data is introduced and the relevant variables and methods are discussed. This is followed by the empirical analysis in Section 4 which presents descriptive evidence, regression results as well as robustness checks. Section 5 discusses the results and the limitations of the study. Section 6 establishes conclusions from the drawn analysis.

2   Theory and Previous Research

This section is divided into three parts. The first part explains the general concept of overeducation/undereducation. In the second part, it will be discussed to what extent the occupational status of immigrants changes between their last job in their home country and their first job in the host country. The third part addresses the scarce literature about the impact of home country occupational mismatches on the performance in the destination country's labor market.

2.1   Occupational Mismatches

In a nutshell, the subfield of economics of overeducation deals with the impact of occupational mismatch on individual earnings. A mismatch occurs if the workers' level of education does not correspond to the education required for their job. Two mismatch outcomes are possible: On the one hand, an individual is regarded as overeducated if his/her level of schooling is higher than what is required for his/her job. On the other hand, a worker is undereducated when his/her acquired education is lower than required.

The original motivation for studying the incidence of overeducation were worries about a large increase in the amount of college graduates in the United States during the 1970s. There was concern that the supply of highly skilled individuals would exceed the demand for skilled workers, which, in turn, would increase the number of overeducated individuals in the labor force. A high incidence of overeducation is considered problematic because income returns to schooling for overeducated individuals are assumed to be lower than for correctly matched individuals (Leuven & Oosterbeek, 2011). Moreover, since education is often heavily subsidized by governments, it is important to know whether education pays off from a policy perspective (Leuven & Oosterbeek, 2011). Other areas of concern are that overeducated individuals underuse their competences as well as their human capital and that they are more likely to be unproductive than correctly matched individuals (Piracha et al., 2012). In that sense, overeducation is regarded as being both costly to individuals and to society.

In order to test the hypothesis that overeducated individuals in fact get lower income returns to education, the literature in the economics of overeducation so far has mainly focused on the impact of years of overeducation and undereducation on earnings. The findings are remarkably consistent over time and space and indeed support the hypothesis that income returns to years of overeducation are lower than the returns to years of required education (Leuven & Oosterbeek, 2011). The work by Hartog (2000) identifies three main findings which are essential in this context. First, income returns to years of overeducation are positive, but they are smaller than the returns to required education. Therefore, years of overeducation are less valuable than years of required education, but are still rewarded. Second, returns to years of

undereducation are negative. This means that undereducated workers earn less than overeducated workers that have the same occupational positions. However, the coefficient of years of undereducation is not always significantly different from zero, so there are sometimes no differences between the earnings of undereducated and correctly matched individuals. Finally, these results are not sensitive with regard to the method chosen to define required education.

To exemplify, these findings are based on a model first applied by Duncan and Hoffman (1981), which compares matched and mismatched individuals working in the same occupation. A taxi driver with a university degree earns more than a taxi driver with primary education, but he/she earns much less when compared to working in a position that actually requires a university degree. In contrast, Verdugo and Verdugo (1989) established a model that compares individuals who acquired the same level of education. So, a taxi driver with a university degree is compared to workers with university degrees that hold adequately matched jobs. Most studies that apply this method have found that overeducated individuals earn less and undereducated individuals earn more than properly matched workers with the same level of education. So, when controlling for occupation, overeducation is related to higher returns of income. On the other hand, when controlling for education, overeducation is associated with an income penalty.

As stated above, the earnings effects are not sensitive to the measurement method chosen to define required years of education. Nevertheless, one is often interested in the actual number of overeducated and undereducated workers in the labor market. The estimated incidence of overeducation and undereducation, however, largely depends on the applied measurement method. In the literature, three methods for estimating job education requirements are suggested. *Job analysis* refers to the systematic evaluation of occupations provided by professional job analysts and (inter)national classifications of occupations. The advantages of this method are objectivity, clear definitions and detailed measurement instructions. However, updates are infrequent and costly which means that up-to-date information is often not available (Hartog, 2000).

The second method used is known as *worker self-assessment*. Here, workers are directly asked to assess the years of schooling required for their jobs. This method is for example used in the pioneering study of Duncan and Hoffman (1981) who asked the question "How much formal education is required to get a job like yours?". This approach brings the advantage that it is based on all the information necessary to evaluate schooling requirements, as it is assumed that workers know about their job requirements. Nevertheless, it is questioned if workers are in fact perfectly informed and are able to assess job requirements correctly, especially with job requirements evolving over time (Leuven & Oosterbeek, 2011). Moreover, Hartog (2000) mentions that the subjective character of the method leads to upward bias because workers tend to inflate the standing of their jobs. In addition, Green et al. (1999) showed empirically that the answers heavily depend on the question framing since same workers give different answers to differently formulated questions.

The last method is statistical and uses information about *realized matches*. It calculates the mean or, alternatively, the mode education for each job title specifically by looking at the educational level of all the individuals actually working in the occupation. The mean method defines overeducation or undereducation through having an education that is at least one standard deviation above or below the mean value (Verdugo & Verdugo, 1989). However, this

threshold is often criticized as being arbitrary (Bauer, 2002; Green et al., 1999). The mode method improves the mean method with respect to arbitrariness because it does not rely on a cutoff point. Workers with a higher level of education than the modal value are simply regarded as overeducated, while those with less education are considered as undereducated (Kiker et al., 1997). This approach suffers from the same methodological issues as the job analysis method because it ignores variations in required education across jobs (Hartog, 2000). For instance, the required education for a secretary can vary with regard to the jobs he/she has to perform. Simply assigning one specific number of years of required education ignores this variation.

The choice of the method used does not only depend on the specific advantages and drawbacks but is often dictated by the availability of the data. For instance, information about worker self-assessment might not be available. Data limitations also explain the popularity of the realized matching method because in most data sets it is possible to calculate occupational mean and mode values.

In a recent paper, Leuven and Oosterbeek (2011) reviewed the overall mismatch literature conducted so far from many countries. The mean incidence of overeducation in all studies taken together is 30 percent and the mean incidence of undereducation is 26 percent. This implies that three out of ten workers are overeducated and that more than every fourth worker is undereducated. The share of mismatched workers, however, varies significantly with the method chosen to define required education. For example, the share of overeducated individuals using the job analysis and the mode method is slightly above 30 percent. The self-assessment method reports 37 percent which might be interpreted as support for Hartog's (2000) concerns about upward bias originating from the subjective character of the method. Most strikingly however, is the low incidence of overeducation of only 16 percent found by the mean method. These findings are similar for the proportion of undereducated individuals. The different shares of overeducation reported by the discussed methods raise questions about the severity of measurement errors in the mismatch literature. Therefore, the influence of measurement error is further addressed in Section 4.3 when sensitivity analysis is conducted. For a more general discussion see Leuven and Oosterbeek (2011).

In their review of the immigrant mismatch literature, Piracha and Varian (2012) looked at the incidence of occupational mismatch among immigrants after migration and compared it to the incidence among natives. According to the researchers, most studies indicate that the immigrant population generally tends to experience higher incidences of education-occupation mismatches. In Sweden, for example, immigrants are more likely to be overeducated than natives (Joona et al., 2014; Dahlstedt, 2011). However, Chiswick and Miller (2008; 2009) report no differences in the share of overeducation among immigrants and natives in the USA. On the contrary, they find much higher shares of undereducated immigrants. Again, it is important to emphasize that comparing different studies is complicated since the incidence of mismatch is extremely sensitive to the method chosen to measure required years of education. However, coherent findings indicate that more recent immigrants, those with less host country language proficiency and those coming from countries which are culturally and economically different are more likely to be overeducated (Piracha & Varian, 2012).

Whereas the incidence of occupational mismatch differs considerably between natives and immigrants, the earnings effect of occupational mismatches between those groups is rather consistent. Piracha and Varian (2012) find that the earning trajectories for immigrants are in

line with the general findings for the whole population mentioned previously. However, immigrants tend to get less return from overeducation, but also experience lower penalties for undereducation.

2.2   Occupational Mobility of Immigrants

When it comes to explaining and interpreting the occupational mobility of immigrants, the theory of imperfect transferability of skills plays an important role. The theory of imperfect transferability of skills was first proposed in a pioneering study by Chiswick (1978). He argued that newly arrived immigrants often lack characteristics associated with labor market productivity and that human capital is often not easily transferable between countries. For instance, not having knowledge of the language and the culture of the host country is a big obstacle for fast and successful labor market integration. Economic differences between country of origin and destination play an additional role due to the different structure and demand of the labor market. Furthermore, it is more difficult for employers to assess immigrants' productivity level. Another significant factor is that certain jobs present special barriers (Akresh, 2008). Some occupations require specific certification documents in the host country and even if available, it often takes a while until they are certified by the responsible authorities. So, compared to their last job in their country of origin, immigrants often face a more or less serious downgrading of their occupational status in their first host country job. An initial decline is assumed for all immigrant groups independent of their home country, age, sex, education and admission criteria (Chiswick et al., 2005).

With an increased time spent in the destination country, however, it is claimed that immigrants experience upward mobility in the labor market. Living in the host country increases their country specific skills such as knowledge of culture and language, which makes it easier for them to transfer the skills obtained in their home country. Therefore, it is argued that the long-run mobility trajectory of immigrants follows a U-shaped pattern with an initial decline followed by a gradual recovery of the occupational status (Chiswick et al., 2005).

According to Chiswick et al. (2005), the degree of occupational mobility differs considerably between certain groups of immigrants. Firstly, the reason for migration matters. Refugees experience the steepest decline in occupational status since their main reason for arriving in the destination country is the situation in their country of origin. Therefore, before arriving in the host country, they invest much fewer resources in host country specific skills than labor migrants who usually plan their emigration in advance and are much more prepared for the destination country's labor market. The occupational mobility of family unification migrants (also called tied movers) lies somewhere in between. Their main reason for emigration is not characterized by economic factors, but by personal connections to and networks in the destination country; usually they prepare themselves to a certain degree for their emigration.

Second, it is suggested that the U-shaped pattern is shallow for those immigrants who come from countries with similar wage distributions and for those who share a common language or cultural background as their skills are more easily transferable. Lastly, the risk of downgrading is more severe for high-skilled workers than for low-skilled workers. This is however

tautological since unskilled workers cannot experience a large downgrading of their occupational status by definition.

So far, little research exists that investigates the occupational mobility of immigrants *before and after* migration. This lack can be attributed to the data requirements. In order to examine immigrant occupational mobility, it is necessary to have available data about the last occupation in the home country. Furthermore, being able to follow the occupational history of individuals over time is crucial for meaningful analysis.[1] Therefore, longitudinal information on immigrants are needed that is scarce. Testing the claimed U-shaped mobility additionally requires that at least three occupational observations are available, one in the home country and two in the destination country. Ideally, information about the very first permanent job in the host country is accessible in order to measure the status degradation immediately after the event of migration.

To the author's best knowledge there have only been six papers published so far which exploit longitudinal data that contain information about home and host country occupations (Bauer & Zimmermann, 1999; Chiswick et al., 2005; Rooth & Ekberg, 2006; Akresh, 2008; Helgertz, 2013; Simon et al., 2014). Chiswick et al. (2005) analyzed occupational mobility of Australian immigrants. Their findings suggest that occupational status from the last job in the home country to the first job in the host country decreased for all immigrant groups under consideration. As expected according to the theory, the initial decline was largest for refugees and tied movers, as well as for those immigrants who are non-English native speakers. However, with a longer residence in Australia, occupational statuses improved with particularly high growth rates for high-skilled immigrants, refugees and family migrants, hereby finding support for the U-shaped relationship. Other studies supporting the U-shape hypothesis were conducted for refugees in Sweden (Rooth & Ekberg, 2006) and immigrants in the United States (Akresh, 2008). The initial decline directly after migration is also found by Helgertz (2013) as well as Bauer and Zimmermann (1999).

Interestingly, the U-shaped pattern of occupational trajectories was not confirmed in the case of Spain. Simon et al. (2014) found that the occupational status decline of immigrants in Spain is much larger when compared to that of other studies. Additionally, recovery with years since migration is extremely slow for many groups, especially for women and immigrants from Latin America and Eastern Europe. As a result, these findings seriously challenge the theory of steady recovery of occupational status with time spent in the destination country. The authors explain their results with the nature of the Spanish labor market. In contrast to countries such as Australia and the United States, the Spanish labor market is characterized by a significant size of the secondary sector that contains mostly unstable and unskilled jobs (for more information, see Piore, 1979 and Massey et al., 1998). Once an individual is situated in the secondary sector, it is very hard to move upwards to the primary sector. As a result, occupational mobility for immigrants in countries with a large secondary labor market is a lot more restricted because recovery is often limited. To identify whether the occupational trajectories of immigrants that came to Sweden in the 1970s and early 1980s follow closer to the Australian or Spanish

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[1] However, longitudinal data does not have to be available in order to explore how immigrant outcomes differ with duration in the host country. See for example Barrett and Duffy (2008) who use synthetic cohort data.

example, the following four hypotheses stated by Chiswick et al. (2005) will be tested. The first one is general, while the others are group-specific.

H1: The occupational mobility of immigrants in Sweden follows a U-shaped pattern.

H2: The U-shaped pattern is shallow for immigrants coming from countries which are similar to Sweden and whose skills are therefore comparatively more transferable.

H3: This pattern is steepest for refugees, less steep for family migrants and least steep for labor migrants.

H4: The pattern is steepest for high-educated immigrants and shallowest for low-skilled or unskilled immigrants.

2.3   The Impact of Home Country Job Mismatches

Thus far, studies analyzing occupational mobility of immigrants have implicitly assumed that there is no education-occupation mismatch in the immigrant's country of origin and that high-educated individuals also had high-skilled jobs at home. This thesis extends the previous literature on immigrant occupational mobility by controlling for the incidence of occupational mismatch in the home country. Specifically, it will be explored to what extent this mismatch variable is associated with the occupational trajectories of immigrants in Sweden.

There is only one study that has dealt with the impact of home country occupational mismatches on the performance in the host country labor market so far. Piracha et al. (2012) account for home country mismatches in their analysis about incidence of mismatches among immigrants in Australia. Their results show that mismatch in the home country plays an important role in predicting immigrant mismatches in the host country. For instance, immigrants who were overeducated in the country of origin had a nearly 50 percent higher probability of being overeducated after having lived five months in Australia. Having been undereducated in the home country increased the likelihood of being undereducated five months after arrival by more than 60 percent.

The authors explain their findings by arguing that not only acquired level of education, but also the last job held prior to migration contains a strong signal of the immigrant's ability to a host country's employer. Hence, they summarize their results by claiming that "Australian employers seem to take into consideration signals about the immigrants' labour market abilities from the education mismatch incidence in the last job in the home country" (p. 13). Therefore, with their explanation Piracha et al. (2012) focus on the demand side of the labor market.

The impact of occupational mismatches on labor market performance can also be interpreted in a more direct way. Overeducated workers do not only appear to be less able; it might also be the case that they actually have lower ability. Less able workers may simply be less likely to get a job that matches their level of schooling. Studies having access to ability scores such as test results indeed find that ability and overeducation are negatively correlated (Leuven & Oosterbeek, 2011). For example, Green et al. (1999) discovered that individuals with low

quantitative skills are more likely to be overeducated. Tsai (2010) estimated the standard undereducation-overeducation model described previously with panel data and fixed effects, controlling for unobserved time-invariant factors such as motivation and ability. She found that the magnitudes of the effects for years of overeducation and undereducation decline substantially when compared to regular estimation using OLS. She interprets her results by arguing that overeducation occurs because workers "have relatively lower ability or some other unobserved characteristics that contribute to lower earnings" (p. 611). Therefore, overeducation may stem from the lack of other components of human capital such as lower ability (Sicherman 1991). That leads to the assumption that,

H5: Compared to other immigrants with the same acquired level of schooling, immigrants who were overeducated in their home country perform worse in the Swedish labor market than those who were properly matched or undereducated.

Moreover, provided that the pre-migration occupation contains a strong signal on the labor market, it can be assumed that it is easier for employers to evaluate the occupational background of immigrants from countries whose wage distributions and labor markets are similar to Sweden. For instance, assessing the performance of an undereducated German architect is easier compared to an undereducated architect coming from Iran. Therefore, it is assumed that the pre-migration job signal is stronger for economically similar countries which are characterized by similar labor market structures:

H6: The effect of occupational mismatch is stronger for immigrants coming from countries that are economically similar to Sweden.

As mentioned above, Piracha et al. (2012) claim that the last job before migration contains an important signal for host country employers. The question is if the job signal is equivalent to the signal provided by the acquired education. Therefore, immigrants who worked in jobs that had the same educational requirements but who acquired different levels of schooling are compared. This will be done by looking at the probability of maintaining the original occupational status. For instance, if the probability of maintaining a job in the tertiary sector is lower for individuals with secondary education, it may be interpreted as education containing an important signal on the Swedish labor market, leading to:

H7: Compared to other immigrants with high-skilled jobs, undereducated immigrants are more likely to experience occupational downgrading. Accordingly, compared to other immigrants with low-skilled jobs, overeducated immigrants are more likely to experience occupational upgrading.

3   Methodology

3.1   Data Collection

The data used in order to test the above listed hypotheses is extracted from a subsample of the Swedish Longitudinal Immigrant database (SLI). The SLI contains individual level longitudinal information on demographic, economic, and health-related variables on immigrants and natives who lived in Sweden between 1968 and 2001. In the subsample, detailed pre-migration information for a selection of immigrants from different birth countries is provided. Those countries are Germany, United States, Poland, former Yugoslavia, Greece, Turkey, Iran and Chile.

The subsample data was collected from the records of the Swedish immigration authority and was declared by the migrant whilst applying for various permits in Sweden such as residence and work permits. This data includes information on formal and vocational education, language ability and working experience. Moreover, the subsample also contains data on the last occupation in the country of origin. Combined with the data on home country education, it is possible to identify home country mismatches, which are of key interest in this study. In order to follow immigrants' occupational trajectories, individual data on occupational status after migration is derived from the four Swedish censuses conducted in 1975, 1980, 1985 and 1990.

Pre- as well as post-migration data was self-reported. As already mentioned, pre-migration information was gathered by the Swedish immigration authorities when immigrants applied for various permits in Sweden. The information reported did not affect the decisions of the application process. However, if the immigrants believed that the information provided may have influenced the application process and that stating high levels of education increases the chances of being granted a certain permit, they had a strong incentive to state higher occupational status and education than they had actually acquired. Therefore, home country occupation and level of schooling might be biased upwards to an unknown degree. With regard to the post-migration information collected from the Swedish censuses the incentive to provide inflated information should be low because of the high degree of anonymity (Helgertz, 2010).

3.2   Sample

The final sample size for the analysis presented in this thesis was created in three steps. First, individuals who did not report occupation or education in the home country were excluded as were those whose jobs could not be matched to the job title register available from Statistics Sweden. Some of the examples for unsuccessfully matched job titles are 'import and export', 'works at a hospital', 'guerilla soldier' or 'member of Krishna movement'. Moreover,

sportsmen, musicians, housewives, military personnel, interns, students and self-employed were excluded because assigning educational requirements to these groups turned out to be too cumbersome. At the end of step one, 8,119 individuals remained in the sample.

In step two, the total sample size was restricted to individuals with certain demographic characteristics. Since the transferability of skills hypothesis can only be tested when at least two occupation observations in the destination country are available, since the last census in Sweden was conducted in 1990, immigrants arriving after 1985 are excluded from the sample. Moreover, immigrants arriving before 1971 are not included either. This is due to the fact that there are more than five years between their migration and the 1975 census, and only those individuals are considered in the sample who were observed for the first time between zero and four years after arrival in Sweden. The sample is also restricted to individuals that arrived in Sweden between the ages of 18 and 54. The lower limit was chosen to make sure that individuals had a reasonable amount of time to complete their (job) education in their home country. The upper limit was set in order to exclude those immigrants who are likely to directly enter into retirement. The sample after step two contained 5,228 individuals.

In the final step, only those individuals were included who satisfied the conditions necessary to test if immigrant occupational mobility in fact follows a U-shaped pattern. Therefore, all the immigrants that did not appear with an occupation in the first two censuses after their arrival were excluded. Finally, individuals were not considered who stated a job but reported zero income in the specific census year as they are considered to be unemployed. Only a small fraction of the original sample satisfied all of these conditions and the final sample consists of 1,279 individuals with 3,451 census observations. The implications following from the small sample size will be further discussed in Section 5.

3.3   Variables

3.3.1   Demographic Covariates

The analysis controls for a number of demographic covariates. Variables included are age, civil status, gender, education level, years since migration, region of origin, migration cohort and visa category. Education is measured in three broad categories, primary, secondary and tertiary. With respect to years since migration, the year of immigration is regarded as year zero. Due to rather small numbers of observations for each of the eight countries considered, three region-of-origin groups were constructed. Following Scott (1999) and Helgertz (2010), Germany and the USA are grouped together due to their close cultural, economic and linguistic ties to Sweden. Poland, former Yugoslavia and Greece form a group which is called European in the following analysis. The last group consists of the remaining countries Turkey, Iran and Chile and is called Non-European.[2]

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[2] It is questionable to pool Iranian, Turkish and Chilean immigrants together as they differ in many aspects. However, this was the best classification possible given the birth countries available.

Åslund and Rooth (2007) have shown that business-cycles have an effect on immigrants' labor market performance in Sweden and therefore the timing of an immigration is important. Hence, it is also controlled for the three arrival cohorts (1971-75, 1976-80, 1981-85). Moreover, visa category is taken into consideration. Both Chiswick et al. (2005) and Duleep and Regets (1996a; 1996b) discovered that the original reason of migration matters with respect to labor market integration in the host country. Therefore, immigrants were classified into three groups, namely worker migrants, family unification migrants and refugees.

3.3.2   International Socio-Economic Index (ISEI)

The first key variable is occupational prestige measured using the International Socio-Economic Index (ISEI). It is an internationally standardized measure of occupational status developed by Ganzeboom and Treiman (1996) using information from 16 countries. For ISEI, both educational requirements and income information are taken into account. It is a continuous variable and ranges from 16 (e.g., restaurant cleaners, domestic helpers) to 90 (e.g., judges) which means that a higher score is associated with higher occupational prestige. The ISEI is calculated both for the jobs in the home country and in Sweden even though there might be small cultural differences with regard to the prestige of some specific jobs.[3] In general, however, occupational prestige is assumed to be extremely similar across countries. For instance, the prestige of a medical doctor in Sweden is comparable to the prestige of a medical doctor in Turkey.

The ISEI score was constructed by using Table A.1 depicted in Appendix A. It translates the 1-digit major groups of the Swedish Standard Classification of Occupations (SSYK) into ISEI scores. Using the major groups instead of the minor (2 digits) or even unit groups (3 digits) was determined by the imprecise home country occupation information. For instance, some immigrants reported that they were lecturers (*adjunkt*) in their home country. However, the SSYK occupation register lists 13 different lecturer occupations. All of them are part of the same major group, but they are classified in three different minor groups. Therefore, the rough classification method was chosen which is also used by Simon et al. (2014). The researchers showed in their analysis that rough measurement provides enough variation to generate useful ISEI scores.

3.3.3   Required Education and Mismatch

The second key variable is the occupational (mis)match in the home country. Defining the level of schooling required for home country occupations turned out to be difficult. As explained in Section 2.1, there are three methods to define job education requirements and occupational mismatches. Worker self-assessment cannot be applied in this study due to the lack of data. Job analysis is possible, but highly problematic, as can be seen by looking at Table 3.1. It shows the occupational match and mismatch in the country of origin using job analysis based on Statistic Sweden's Swedish Standard Classification of Occupations (SSYK 2012, see Table A.1

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[3] To give a famous example from Piore (1979), assembly-line jobs in the automobile industry had a much higher prestige in the United States than in Europe.

in Appendix A). Only 3 percent of the total sample are classified as working in the sector in which not more than primary education is required while roughly every other immigrant stated that they had only acquired primary education. As a direct result, only 5 percent of the primary educated individuals and 37 percent of the total population are correctly matched, whereas 58 percent of the whole sample are considered as undereducated in their country of origin. This high degree of mismatch is caused by the fact that the SSYK job analysis is based on the Swedish labor market. For instance, working as a fisherman in today's Sweden requires secondary education according to SSYK. In 1970s Turkey, however, secondary education was not the typical education among fishermen. In that sense, using the SSYK method strongly overestimates the required education for jobs in the home countries and therefore leads to misleading results.

Table 3.1 Match and mismatch status estimated with SSYK job analysis method

| Education | Required education for home country occupation, SSYK method | | | |
	Primary	Secondary	Tertiary	Total
Primary	**5**	84	11	51 (652)
Secondary	2	**55**	43	22 (282)
Tertiary	-	19	**81**	27 (345)
Total	3 (40)	60 (766)	37 (473)	100 (1,279)
Overeducated				5 (70)
Correctly matched				37 (469)
Undereducated				58 (740)

Note: Percentages in each education group are calculated and the number of individuals in each category is given within parentheses. Percentages may not add up to 100 due to rounding errors. Numbers in bold refer to those who are correctly matched. To state an example, 5 percent of those with primary education had a job in their home country which required not more than primary education, whereas 84 percent had a job that required secondary education.

In general, the job analysis method based on SSYK seems to generate questionable outcomes when it comes to analyzing the occupational match of immigrants.[4] As reported in Table A.1 in Appendix A, less than 4 percent of the SSYK unit groups require a low level of education (16 out of 429). This leads to surprising results and questionable interpretations as can be seen in Rooth and Ekberg (2006). In their sample of refugees coming to Sweden, the authors find that 96 percent had an occupation in the home country that required at least secondary education. They interpret it as a sign that the "investigated group was well educated" (p. 62). However, it could also be the case that the SSYK method simply inflates the class of jobs that require secondary education. Therefore, the alternative interpretation is that individuals mainly worked in occupations that require secondary or higher education in Sweden, but much less education in their home country. Following this alternative interpretation, immigrants are not necessarily well educated.

Since the SSYK method is deemed to be inappropriate to measure home country mismatch, a new estimation method was developed. It takes information about the level of education in the respective home country and home region into account. Its calculations are based on the

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[4] This is actually not only true for immigrants. Dahlstedt (2011) applies the SSYK method to native Swedes with general (in contrast to vocational) education and finds that in total 48.4% of them are undereducated. This is a remarkably large figure when compared to the 30% found by Leuven and Oosterbeek (2011) in their overview.

previously mentioned 8,119 individuals who reported occupations that were successfully matched to Swedish job titles.

The method is carried out in three steps. First, it considered occupations that occurred ten times or more per country of origin.[5] For those occupations, the mode education per country of origin was calculated. For instance, more than ten teachers from Iran are in the sample and the mode level of education reported was secondary. Therefore, the required education for Iranian teachers was set to secondary. Iranian teachers who have tertiary education are therefore considered as overeducated, those who have primary education as undereducated.

In a second step, occupations with less than ten observations from a country of origin, but more than ten observations from a given country group are considered. Then, the same method as in step one was applied. To give an example, there are eight American and four German architects in the sample. They were not classified after step one because their total number per country is less than ten. In step two, however, they are added up to twelve and therefore exceed the ten observations boundary. Their mode education is tertiary, so architects from USA/Germany having less than tertiary education are considered undereducated. After completion of steps one and two, more than 5,000 out of the 8,119 individuals were assigned a required education.

In the last step, all remaining individuals with less frequently reported jobs were classified according to the nine SSYK major groups. Then the mode education by region of origin in each major group was calculated. For instance, there are only six biochemists in the total sample that come from the group USA/Germany. According to SSYK, they belong to major group number 2 called "Professionals". Since the mode education for professionals coming from USA/Germany is tertiary, biochemists from those countries were classified as requiring tertiary education. Biochemists with less education are therefore regarded undereducated.

The (mis)match results of this method are depicted in Table 3.2 below. The total share of correctly matched individuals nearly doubled from 37 percent to 72 percent. In total, 12 percent are undereducated and 16 percent are overeducated. Compared to previous literature on occupational mismatch, the incidence of overeducation and undereducation in this study is lower than in studies using job analysis and the mode calculation, but similar to the realized matches mean method (Leuven & Oosterbeek, 2011). It is lower than the mode calculation because previous papers deal with years of education, while this paper uses three education categories. Using the mode method with broad education categories obviously reduces the incidence of mismatch as there are only two alternatives to being correctly matched.

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[5] The threshold of ten observations per occupation is certainly arbitrary. However, robustness checks in Section 4.3 show that choosing different values does only slightly affect the results.

Table 3.2 Match and mismatch status estimated with own method

| Education | Required education for home country occupation, own method | | | |
	Primary	Secondary	Tertiary	Total
Primary	**85**	10	6	51 (652)
Secondary	37	**42**	21	22 (282)
Tertiary	12	16	**72**	27 (345)
Total	55 (698)	19 (237)	27 (344)	100 (1,279)
Overeducated				16 (201)
Correctly matched				72 (919)
Undereducated				12 (159)

Note: Percentages in each education group are calculated and the number of individuals in each category is given within parentheses. Percentages may not add up to 100 due to rounding errors. Numbers in bold refer to those who are correctly matched.

This method has a very interesting implication. Immigrants may change their occupational status between their home country and Sweden even though they do not change the job they are working in. For example, being a shoemaker in Chile requires primary education according to the new method. In Sweden however, secondary education is required. As a result, a Chilean shoemaker with secondary education who now works as a shoemaker in Sweden has automatically changed their status from overeducated to correctly matched.

The incidence of (mis)match among immigrants after their arrival in Sweden is of interest as well. Defining the education required for a job in Sweden was much easier as it is based on the Swedish socio-economic classification (*socioekonomisk indelning, SEI*) reported in the census years 1980, 1985 and 1990. It classifies occupations into socioeconomic groups that require different levels of education (see Table A.2 in Appendix A). The SEI was not available in the 1975 census but it was constructed with the help of the other three census years by calculating the mode SEI values for each occupation in the job register and applying them to the 1975 jobs.

Table 3.3 reports the sample means of the variables by region of origin. In general, the sample features a gender imbalance, so are only 41 percent female. This effect is strongest for the non-European group, with only every third immigrant from Chile, Iran and Turkey being female. 45 percent of the total sample arrived in the period 1971-75 and the fewest number of people are found in the 1981-85 cohort. Age at migration as well as civil status does not differ strongly between the groups, even though immigrants from the USA and Germany tend more likely to be unmarried. Refugees to a large extend come from the non-European countries and the share of worker migrants is relatively small compared to the tied movers in all country groups. In fact, nearly two out of three migrants are family unification migrants. Best educated are the immigrants coming from the USA and Germany, the most unskilled are the migrants arriving from the European countries Poland, Greece and former Yugoslavia. This is also reflected in the home country ISEI score, which is by far the highest for German and American immigrants and lowest for European migrants. Finally, European immigrants seem to be more likely matched in their home country than other immigrants. While Americans and Germans are more likely to be undereducated, Non-European immigrants are more likely to be overeducated in their home countries.

Table 3.3 Sample means by region of origin

	European	Non-European	USA/Germany	Total
Female	0.46	0.33	0.39	0.41
Married	0.76	0.77	0.66	0.74
Cohort				
71-75	0.55	0.29	0.40	0.45
76-80	0.25	0.39	0.33	0.30
81-85	0.21	0.31	0.27	0.25
Age at Migration	34	34	33	34
Immigrant Status				
Worker	0.24	0.17	0.33	0.24
Tied Mover	0.71	0.38	0.67	0.62
Refugee	0.06	0.45	0.00	0.14
Education				
Primary	0.59	0.48	0.39	0.51
Secondary	0.21	0.24	0.21	0.22
Tertiary	0.20	0.28	0.40	0.27
Occupational Status in home country				
Undereducated	0.10	0.13	0.17	0.12
Correctly Matched	0.76	0.68	0.68	0.72
Overeducated	0.14	0.20	0.15	0.16
ISEI in home country	42.16	44.70	51.36	45.11
Total N	632	328	319	1,279

3.4   Methods

Both descriptive and multivariate methods are used in this study in order to test the hypotheses stated in the end of Section 2. The descriptive section first examines the incidence of occupational (mis)match in Sweden over time. This is done by comparing the educational requirements of the jobs reported in the census years in Sweden with the level of education. The first census is defined as the census which occurs zero to four years after immigration. For instance, the first census of an immigrant arriving in 1971 is the 1975 census and for an individual arriving in 1980 is the 1980 census. The second census is defined as the census which occurs five to nine years after immigration, and so on.

Secondly, the occupational mobility is explored in the descriptive analysis. This is done in two ways. The first one follows Rooth and Ekberg (2006) and is called occupational position. It is

calculated by assigning a value of "3" to tertiary occupations, "2" to secondary occupations and "1" to jobs requiring primary education. Concrete examples will be provided in Section 4.1. This paper will deviate from their method in two ways. First, instead of using home country occupation as the reference, educational level will be used. This allows for control of occupational mismatches in the home country. Second, an occupational position for individuals with primary education is constructed. Rooth and Ekberg (2006) do not explain why they ignored this group, but it is probably due to their low sample size of only 15 individuals who have a low status occupation in their home country. The sample size in this study is much larger so individuals with primary education are also analyzed. The second way to examine occupational mobility is by comparing the average continuous ISEI scores of the total immigrant population and certain subgroups over time. This method is also applied by Akresh (2008), Helgertz (2013) and Simon et al. (2014).

The occupational prestige measured by the ISEI score is also the key dependent variable in the multivariate analysis. Multiple regressions (OLS) with robust standard errors are used to investigate the level of occupational prestige attained in Sweden and to examine the determinants of occupational mobility. Thereby, a particular focus lies on undereducation and overeducation. Another specification explores the downgrading and upgrading between the occupation observations. Upgrading is defined as having a higher prestige score in the more recent occupation compared to the previous one, while downgrading is defined as having a lower score in the current position. Therefore, the dependent variable is the difference in the ISEI score between two consecutive job observations. This specification is also estimated by applying OLS with robust standard errors.

The final model tests whether mismatched immigrants are more likely to experience occupational movement when compared to their properly matched counterparts who have jobs with the same requirements. In order to do that, a dummy variable was constructed that takes the value one if the immigrant maintains a job with the same occupational prestige in Sweden and zero otherwise. The probabilities of maintaining an occupation with the same prestige are estimated with a binary probit model.

4 Empirical Analysis

This section is divided into three parts. First, descriptive statistics with respect to the incidence of immigrant mismatch and occupational mobility in Sweden are presented. This is followed by an econometric part that explores the determinants of occupational mobility and the probability that immigrants maintain their home country occupation. Lastly, robustness checks are provided in order to support the findings of the multivariate analysis.

4.1 Descriptive Statistics

4.1.1 Immigrant Mismatch

This subsection follows the incidence of occupational mismatch over time. Due to the fact that the last census in Sweden was conducted in 1990, only individuals arriving before 1981 can appear in more than two censuses and only individuals arriving before 1976 can appear in all four censuses. This automatically leads to significant declines in the sample size of censuses three and four.

Table 4.1 shows the relation between home country education and occupation in the first census in Sweden. Remember that this is not necessarily the very first occupation in Sweden, but the first observed one. The sample size of 1,235 is a little smaller than the total sample size of 1,279. This is because immigrants who stated that they were self-employed were excluded in this part (however, those self-employed individuals will be included in the analyses based on the ISEI score in Sections 4.1.2 and 4.2). The investigated group is not very well educated with more than every second individual having primary education and only around one fourth reporting have acquired tertiary education. Overall, far fewer individuals are correctly matched in their first job in Sweden (52 percent) than in their last job in the home country (72 percent, see Table 3.2). The share of overeducated people nearly doubled compared to home country occupation which can be explained by the imperfect transferability of skills. Interestingly, even the share of undereducated increased by 5 percentage points.

When looking at each education group specifically, it emerges that only three out of ten high-skilled individuals are correctly matched and that the remaining 70 percent are overeducated. One third of the high-skilled immigrants were even found to be working in low status occupations which is considered a significant downgrading. More than every second immigrant with secondary education is overeducated while only 4 percent are undereducated. The highest share of correctly matched individuals is among those with primary education (69 percent) but interestingly this is lower than in the home country (85 percent). Nearly every third individual in this group had a job which actually required secondary education and are therefore undereducated.

Table 4.1 Occupational match and mismatch after 0 to 4 years in Sweden

Education	Required education for occupation in first census in Sweden			
	Primary	Secondary	Tertiary	Total
Primary	**69**	31	-	51 (631)
Secondary	55	**40**	4	22 (274)
Tertiary	33	38	**30**	27 (330)
Total	56 (693)	35 (430)	9 (112)	100 (1,235)
Overeducated				31 (384)
Correctly matched				52 (641)
Undereducated				17 (210)

Note: Percentages in each education group are calculated and the number of individuals in each category is given within parentheses. Percentages may not add up to 100 due to rounding errors. Numbers in bold refer to those who are correctly matched.

The thesis also examines the changing pattern of occupational mismatch developed with increasing time spent in Sweden. This is investigated in Table 4.2 which reports the occupation in the second census. The sample size decreased to 1,192 individuals meaning the share of self-employed increased by a small margin. The overall educational composition of the investigated group, however, was not affected at all. According to the imperfect transferability of human capital theory, it is expected that the incidence of overeducation decreases over time because immigrants gain country specific knowledge. There is weak evidence for this theory since the incidence of overeducation did decrease by 4 percentage points.

Looking at each education group in particular reveals a very remarkable picture. Both immigrants with secondary and tertiary education experienced considerable upgrading, while the lowest education group did not change their composition substantially. After five to nine years in Sweden, 36 percent of the tertiary educated immigrants were working in high status jobs translating into an increase of 6 percentage points. However, the share of the correctly matched is much smaller compared to the pre-migration information and more than 60 percent in this group are still overeducated. Additionally, the share of the tertiary educated who work in the primary sector decreased by 10 percentage points to 23 percent. The secondary education group also upgraded its position and their share of overeducated decreased by 9 percentage points to 46 percent.

Table 4.2 Occupational match and mismatch after 5 to 9 years in Sweden

Education	Required education for occupation in second census in Sweden			
	Primary	Secondary	Tertiary	Total
Primary	**70**	29	1	51 (605)
Secondary	46	**47**	7	22 (263)
Tertiary	23	40	**36**	27 (324)
Total	52 (618)	36 (433)	12 (141)	100 (1,192)
Overeducated				27 (327)
Correctly matched				56 (663)
Undereducated				17 (202)

Note: Percentages in each education group are calculated and the number of individuals in each category is given within parentheses. Percentages may not add up to 100 due to rounding errors. Numbers in bold refer to those who are correctly matched.

Table 4.3 depicts the relationship for the third census which is between ten and fourteen years after the migrant's arrival in Sweden. The sample size shrank by around fifty percent to 599 observations. The obvious reason for this decline is the fact that immigrants arriving between 1981 and 1985 are no longer included as they cannot be observed a third time. However, this does not explain the whole drop-out rate since there are only 319 individuals in the last cohort. Even though the educational composition did not change remarkably when compared to the first and the second census, the results with regard to censuses 3 and 4 should be handled with caution due to the potential thread of selective emigration (Lindstrom & Massey, 1994).

After ten to fourteen years, the incidence of undereducation increases substantially while the share of overeducation only decreases by 2 percentage points. As a result, every second person is matched correctly, while exactly one in four individuals are overeducated, meaning one in four immigrants are undereducated. The increase in undereducation is mainly caused by the primary educated workers whom experienced a remarkable upward mobility in occupational status. The mismatch incidence of secondary educated workers does not change considerably compared to the second census. However, workers with tertiary education upgraded their status once again and the proportion of correctly matched increased by 4 percentage points.

Table 4.3 Occupational match and mismatch after 10 to 14 years in Sweden

| Education | Required education for occupation in third census in Sweden | | | |
	Primary	Secondary	Tertiary	Total
Primary	**56**	43	2	53 (319)
Secondary	46	**45**	9	20 (119)
Tertiary	19	41	**40**	27 (161)
Total	44 (264)	43 (257)	13 (78)	100 (599)
Overeducated				25 (151)
Correctly matched				50 (297)
Undereducated				25 (151)

Note: Percentages in each education group are calculated and the number of individuals in each category is given within parentheses. Percentages may not add up to 100 due to rounding errors. Numbers in bold refer to those who are correctly matched.

Finally, the development after fifteen to nineteen years in Sweden is considered (Table 4.4). Again, the sample size decreased significantly and there are only 229 individuals left who reported an occupation in the fourth census. This is of course mainly caused by the fact that immigrants arriving between 1976 and 1980 did not report a fourth occupation. Again, the overall educational composition is not very different, even though there are slightly fewer secondary educated workers in the sample.

Compared to the first census (Table 4.1), the share of overeducated decreased and the share of undereducated increased by 13 percentage points, respectively. Compared to the pre-migration situation (Table 3.2), after more than fifteen years in Sweden the share of correctly matched individuals is still much lower. However, this is mainly caused by the large amount of primary educated individuals who improved their occupational position through increased duration in Sweden. Whereas 16 percent in this group were undereducated at home, nearly every second worker is undereducated after having lived a long time in Sweden.

Table 4.4 Occupational match and mismatch after 15 to 19 years in Sweden

| Education | Required education for occupation in fourth census in Sweden | | | |
	Primary	Secondary	Tertiary	Total
Primary	**52**	48	1	56 (128)
Secondary	39	**45**	16	17 (38)
Tertiary	13	30	**57**	28 (63)
Total	39 (89)	42 (97)	19 (43)	100 (229)
Overeducated				18 (42)
Correctly matched				52 (119)
Undereducated				30 (68)

Note: Percentages in each education group are calculated and the number of individuals in each category is given within parentheses. Percentages may not add up to 100 due to rounding errors. Numbers in bold refer to those who are correctly matched.

Compared to their home country occupations, the share of correctly matched tertiary educated workers is still 15 percentage points lower. Therefore, one can conclude that even after more than fifteen years in Sweden, not all of the highest skilled reach their pre-migration level of employment. Nevertheless, compared to the first census, the share of correctly matched tertiary educated individuals increased by 27 percentage points to 57 percent which is a quite remarkable upgrading. Interestingly, the share of well-educated who work in the primary sector after more than fifteen years in Sweden is as small as the respective share in the pre-migration data.

All in all, the descriptive evidence supports the expectation that the incidence of overeducation is much higher in the first job in Sweden compared to the last job in the home country. However, with duration in the destination country, the share of overeducation decreases substantially among immigrants which implies that there is a gradual recovery of occupational attainment. In general, the analysis of occupational mismatch therefore suggests that immigrants constantly upgrade their occupational position during time since migration. This will be further tested by investigating the occupational mobility over time.

4.1.2 Occupational Mobility

As explained in Section 3.4, the occupational mobility is analyzed in two different ways. First, Table 4.5 depicts the estimations of the method called "occupational position". It refers to the findings made in the previous section and is calculated by assigning a value of "3" to occupations with high educational requirements, "2" to occupations with secondary occupational requirements and "1" to jobs requiring low-status education.[6]

The occupational mobility of tertiary and secondary educated immigrants follows a clear U-shaped relationship. For instance, the occupational position of immigrants with tertiary education decreases by 0.61 points between the last job in the home country and the first observation in Sweden. The corresponding decline for people with secondary education is 0.37 points. However, both groups improve their position in the second census by 0.12 and 0.14

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[6] For example, the value 2.60 for home country occupation for those with tertiary education is calculated as (0.72*3)+(0.16*2)+(0.12*1), with the weights being given in Table 3.2.

points, respectively. After more than fifteen years in Sweden (Census 4), their position recovers even more. Whereas those with a secondary education nearly regain their original occupational status, tertiary educated have on average a 0.16 lower occupational position even after 15 to 19 years in Sweden.

Table 4.5 Occupational mobility estimated by occupational position method

Education	Home Country	Census 1	Census 2	Census 3	Census 4
Primary	1.23	1.31	1.31	1.45	1.51
Secondary	1.84	1.47	1.61	1.63	1.77
Tertiary	2.60	1.99	2.11	2.21	2.44
Number of individuals	1,279	1,235	1,192	599	229

The occupational mobility of individuals with primary education follows a different pattern. They do not experience a decline in the first census, but actually experience a slight increase of 0.08 points. Their occupational position increases steadily and after more than 15 years in Sweden they reach 1.51 points. The low skilled workers manage to reduce the gap to the secondary educated from 0.61 points to 0.26 points after 15 years in Sweden, something extremely remarkable. To conclude, the U-shaped pattern of occupational mobility is clearly supported for individuals with secondary and tertiary education. However, low-skilled individuals benefit from migration after having only spent fewer than five years in Sweden and improve constantly. Therefore, the U-shaped pattern is not supported for this group of individuals who apparently perform very well in the Swedish labor market giving their low level of education.

Another way to illustrate the U-shaped relationship is to use the continuous International Socio-Economic Index (ISEI). Figure 4.1 depicts the occupational mobility of immigrants. The first observation is the mean ISEI score in the home country, the following observations contain the ISEI information for the censuses in Sweden. Since the sample size in the fourth census is very small, only those values that are based on at least fifty observations are reported.

According to the first hypothesis, the occupational trajectory of immigrants follows a U-shaped pattern. This is supported by the descriptive evidence. First, the total sample population experiences a downgrading by roughly 6 points from 45.1 to 39.4. However, this is followed by a gradual recovery over time. After fifteen years in Sweden, they gain a score of 44.8 and nearly reach their original occupational prestige again.

Figure 4.1 also shows the occupational mobility of certain subgroups. On average, female immigrants acquired higher occupational prestige in their home countries, but they experienced a sharper drop in their first job in Sweden than male immigrants did. When considering increased duration in Sweden, the prestige for both groups recovers slowly but continuously. While male immigrants slightly improve their occupational attainment compared to their home country after more than 15 years in Sweden, women do not reach their original level even after the fourth census.
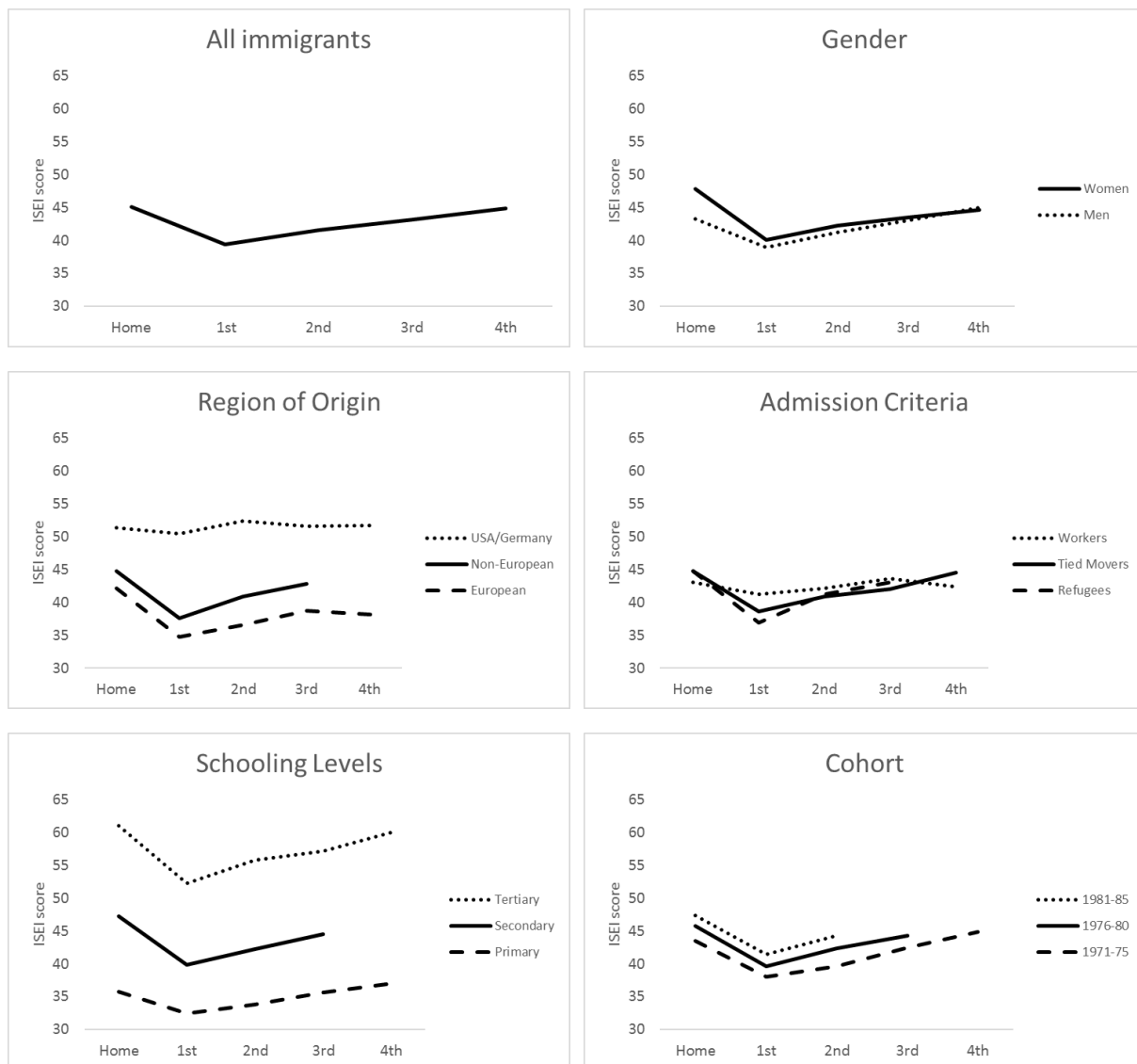
Figure 4.1 Occupational mobility estimated with ISEI score

According to the second hypothesis, immigrants from culturally similar countries experience a less steep pattern. This is supported in Figure 4.1. The ISEI score for American and German immigrants drops by only one point, whereas the decline for both European and Non-European immigrants is much more emphasized. Furthermore, Americans and Germans had much higher occupational status in their home countries compared to the other two groups. With time spent in Sweden, however, the Non-Europeans in particular upgraded their status very fast.

According to the descriptive statistics, both family migrants and refugees experience deeper declines and faster recovery than worker migrants, which is in accordance with the third hypothesis. As a result, after ten to fourteen years in Sweden all groups have nearly identical ISEI scores.

All educational categories experience clear U-shaped patterns of occupational mobility. The fourth hypothesis additionally states that highly-educated immigrants face deeper occupational trajectories than their low-educated counterparts. Occupational prestige decreases indeed strongest for tertiary educated and secondary educated individuals, with declines of 9 points

(14%) and 7 points (16%), respectively. This initial drop is coherent with the occupational position method described previously. The decline of primary educated workers is a lot more shallow with 3 points (9%). This decrease was not observed when the occupational position method was applied. Over time, both tertiary educated and primary educated immigrants regain their occupational status.

The differences between both methods may stem from the different measurement units. Occupational position uses the socioeconomic classification (SEI) available in the censuses, while the presented method calculates occupational mobility by applying the continuous ISEI score. Additionally, the occupational position method is much more approximated as it only relies on three different categories. Nevertheless, both methods basically support H4.

Finally, it is important to have a closer look at the three cohort groups. Obviously, it is not possible to follow the 1981-85 cohort over more than two censuses and the 1976-80 cohort over more than three censuses. Following the famous discussion between Barry Chiswick and George Borjas (see Chiswick, 1978, 1986; Borjas, 1985; 1987; 1994), it is crucial to investigate if the overall "quality" of the cohorts changed over time. If the cohort groups differed too much, that would definitely bias the results. Additionally, if the economic situation at time of arrival was different, this would have an influence on the observed cohort quality as well. The U-shaped relationship is nearly identical for all the considered cohort groups and the lines are nearly parallel. However, later cohorts tend to have higher ISEI scores in Sweden. Since this is also true for the home country score, one can infer that the economic situation in Sweden is not responsible for the cohort differences, but is due to the slightly higher overall quality of later cohorts.

This paper has a special focus on the performance of immigrants who were mismatched before their migration to Sweden. Therefore, Figure 4.2 depicts the occupational mobility by occupational (mis)match. Since grouping overeducated or undereducated workers with different educational levels together makes interpretation more difficult, the outcomes are also divided by acquired level of schooling. By definition, highly educated individuals can never be undereducated and immigrants with primary education can never be overeducated. Again, in the last census only those values are depicted which are based on more than fifty observations.

The observed relationships between overeducated, undereducated and correctly matched individuals are similar for all education groups and are in accordance with H5. When controlling for the level of schooling, undereducated immigrants have higher ISEI scores in their home country than their properly matched counterparts. Moreover, properly matched have higher home country scores than the overeducated individuals. The picture is identical for the situation in Sweden. Even though workers who have been undereducated in their home countries experience the deepest drops in occupational prestige (25% for those with secondary education and 27% for those with primary education), they always have higher scores than their correctly matched and overeducated counterparts. Due to this steeper initial decline, the gap between matched and mismatched individuals decreases substantially between the final job in their home country and their first job in the host country. Nevertheless, even with longer duration in Sweden overeducated individuals never manage to converge to those who were properly matched and the same applies for the properly matched who do not manage to decrease the distance to the undereducated ones. Therefore, the descriptive statistics suggest that home country mismatches indeed matter with regard to host country labor market performance.

Overeducated immigrants always perform worse in the Swedish labor market than correctly matched and those perform worse than the undereducated ones.
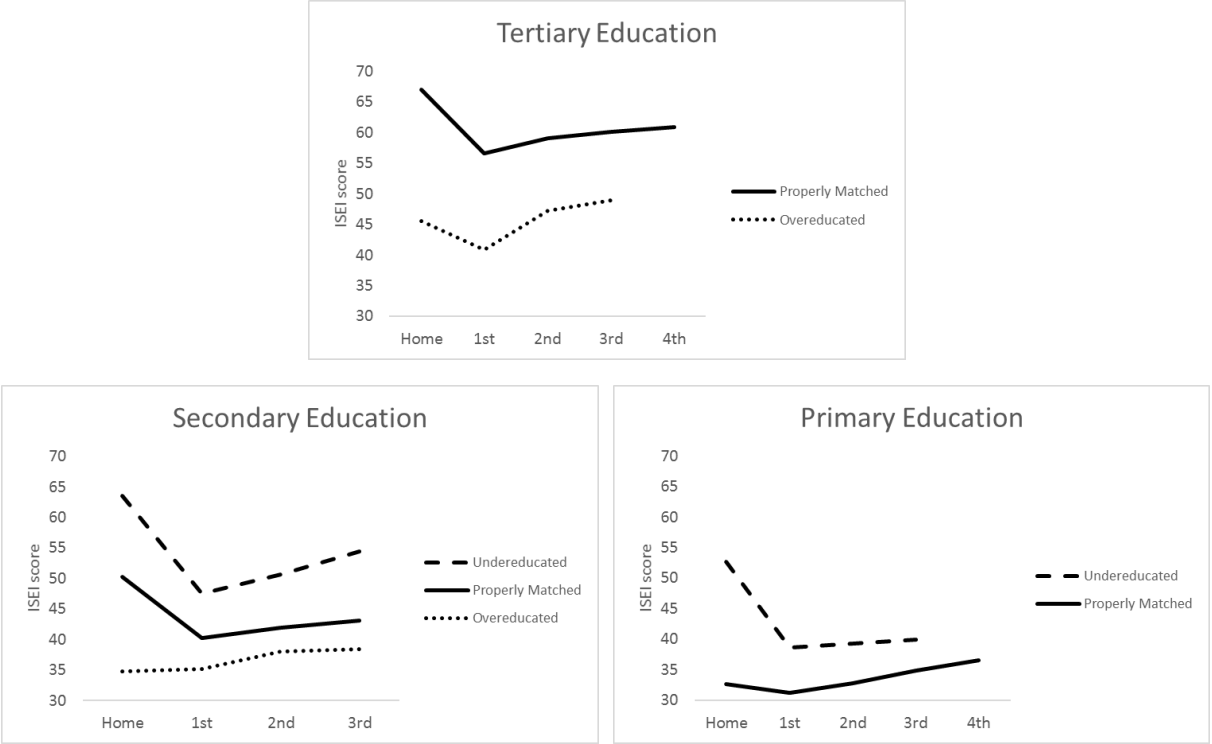
Figure 4.2 Occupational mobility and home country mismatch by level of education

In summary, the descriptive statistics have shown that the occupational mobility measured by the ISEI score follows a U-shaped pattern for all immigrant groups under consideration. The only exception is the group of overeducated individuals with secondary education who managed to slightly improve their occupational prestige in the first five years after migration. In general, most groups recover their occupational status over time which is a strong indicator for positive economic integration of immigrants.

Compared to their respective reference groups, the initial decline is steeper for women, tied movers, refugees, immigrants coming from the non-European and European region-of-origin groups, highly-educated individuals and those who were undereducated in their home countries. The recovery of occupational attainment with duration in Sweden is again strongest for non-Europeans, tied movers, refugees, and for tertiary educated immigrants. On average, male immigrants, Germans and Americans, primary educated and labor migrants manage to improve their original home occupational status after a long time in Sweden. The same applies for all overeducated immigrants as well as for properly matched low-skilled individuals. Those who were undereducated in their home countries came nowhere near close to their original home country prestige even after having lived in Sweden for a long time. Yet, they perform best in their reference group. All in all, hypotheses H1 to H5 are supported by descriptive evidence.

4.2 Multivariate Analysis

4.2.1 Determinants of Occupational Mobility

This subsection deals with the determinants of occupational mobility of immigrants and examines the main factors which drive this phenomenon. Table 4.6 shows the multiple regression (OLS) analysis with the occupational ISEI score in Sweden as the dependent variable.

Table 4.6 Determinants for ISEI occupation status in Sweden

VARIABLES	(1) ISEI, census 1	(2) ISEI, census 2	(3) ISEI, census 3	(4) ISEI, census 4
Constant	29.41**	34.54**	39.72**	54.17**
	(1.739)	(2.885)	(6.246)	(13.98)
Female	2.173*	2.021*	2.810*	2.435
	(0.843)	(0.832)	(1.249)	(2.006)
Age	0.00421	-0.123**	-0.122	-0.164
	(0.0394)	(0.0409)	(0.0639)	(0.108)
Years since Migration	0.576*	0.319	-0.158	-0.822
	(0.293)	(0.295)	(0.434)	(0.723)
Married	-0.103	-1.024	-0.249	-1.387
	(0.827)	(0.825)	(1.164)	(1.854)
Migration Cohort				
71-75	ref	ref	ref	na
76-80	-0.430	0.209	0.361	na
	(0.946)	(0.977)	(1.252)	
81-85	0.165	0.597	na	na
	(1.097)	(1.077)		
Region of Birth				
European	ref	ref	ref	ref
NonEuropean	1.879	2.481*	2.725	8.100**
	(1.082)	(1.063)	(1.533)	(2.589)
USA/Germany	12.32**	11.98**	10.61**	11.36**
	(1.019)	(1.024)	(1.396)	(2.165)
Visa Category				
Labor migrant	ref	ref	ref	ref
Family unification migrant	-3.025**	-2.092*	-1.807	-0.777
	(0.988)	(0.990)	(1.367)	(2.147)
Refugee migrant	-3.675*	-1.014	-1.914	2.294
	(1.745)	(1.670)	(2.540)	(7.167)
Unknown status	1.252	1.701	3.763	6.470*
	(1.502)	(1.514)	(2.042)	(2.627)
Level of Education				
Primary	ref	ref	ref	ref
Secondary	6.587**	7.419**	7.772**	6.519*
	(0.998)	(1.060)	(1.567)	(2.866)

Tertiary	17.42**	19.73**	20.18**	20.89**
	(1.095)	(1.041)	(1.443)	(2.401)
Observations	1,279	1,279	643	250
R-squared	0.350	0.377	0.354	0.420

Robust standard errors in parentheses, ** p<0.01, * p<0.05

In general, the multivariate analysis is in line with the findings of the descriptive statistics. First of all, it is noteworthy that the cohort of arrival does not matter with regard to the occupational score acquired in Sweden. Therefore, time effects do not play a role in this specification. In all four censuses considered, immigrants with tertiary education have a much higher occupational status than immigrants with secondary education and the latter have significantly higher scores than immigrants with primary education. Immigrants from non-European countries perform better than their European counterparts in census two and four. Germans and Americans, however, are the high-performers and score more than 10 ISEI points higher in every census compared to the European reference group.

Men tend to have a slightly lower occupational prestige while age is only negatively associated with the ISEI score in the second census. Civil status does not have any effect. Years since migration matter only in the first census where those are considered who have already lived between zero and four years in Sweden. This means that it makes a significant difference if one just arrived in Sweden or has already lived there for four years. Having been in Sweden for four years is associated with a more than 2 points higher occupational prestige. In the later censuses, the effect of years since migration becomes negligible. This implies that the differences within the first five-year period are more accentuated than in the following five-year periods.

With regard to the visa category, in the first census observed, both family migrants and refugees have ISEI scores which are lower by more than 3 points compared to the worker reference group. However, in all following censuses the coefficient for refugees is not significant anymore meaning that they manage to catch up with labor migrants. This process takes longer for family migrants who are still worse off than labor migrants in census number two, but after having spent ten to fourteen years in Sweden they perform as good as labor migrants and refugees.

So far, only the total ISEI score in Sweden was considered. To investigate the actual downgrading and upgrading between the occupations and to test H2 to H4, a specification with another dependent variable was added to the regression analysis. As mentioned in Section 3.4, the new variable covers the change in status by deducting the ISEI score for the job in the previous census from the score for the job in the subsequent census. Table 4.7 reports the regression estimates. Applying this, the dependent variable of column (1) and (2) pictures the score for the first job in Sweden minus the score of the last job in the country of origin. Model 1 presented in the first column explains around 10 percent of the variance of the change in status between country of origin and first observation in Sweden. It suggests that women, older individuals and immigrants with less years since migration experience a steeper downgrading between home country occupation and host country occupation, whereas civil status and again cohort effects do not deliver significant results. Compared to immigrants from the European and non-European group, Germans and Americans are less affected by a drop in occupational

status which supports the second hypothesis that immigrants from countries with close cultural ties have higher transferability of skills (Chiswick et al, 2005). According to the third hypothesis, the downgrading is steeper for refugees and tied movers than for labor migrants. In Model 1 this is only supported for family migrants whose initial downgrading is larger by 2.6 points. Immigrants with tertiary and secondary education experience stronger downgrading compared to the primary educated which was expected by H4.

Table 4.7 Changes in job status over time

VARIABLES	(1) Home to 1st	(2) Home to 1st	(3) 1st to 2nd	(4) 2nd to 3rd	(5) 3rd to 4th
Constant	-0.763	16.24**	7.367**	4.317*	3.009
	(1.822)	(1.896)	(1.857)	(2.172)	(1.779)
Female	-2.431**	0.164	0.0427	0.290	-0.123
	(0.891)	(0.804)	(0.744)	(0.896)	(0.936)
Age	-0.108**	-0.0447	-0.117**	-0.0668	-0.0119
	(0.0409)	(0.0359)	(0.0349)	(0.0463)	(0.0558)
Years since Migration	0.777*	0.664*	-0.240	-0.279	-0.388
	(0.306)	(0.272)	(0.264)	(0.301)	(0.364)
Married	0.923	0.344	-1.351*	0.708	-1.032
	(0.847)	(0.759)	(0.684)	(0.787)	(0.752)
Migration Cohort					
71-75	ref	ref	ref	ref	na
76-80	-0.264	-0.357	0.572	0.400	na
	(0.943)	(0.852)	(0.833)	(0.839)	
81-85	0.560	0.337	0.253	na	na
	(1.142)	(1.023)	(0.847)		
Region of Birth					
European	ref	ref	ref	ref	ref
NonEuropean	0.479	1.268	0.693	0.633	0.0384
	(1.161)	(1.020)	(0.866)	(0.999)	(0.868)
USA/Germany	7.304**	10.13**	-0.270	1.815	-0.482
	(0.968)	(0.932)	(0.863)	(0.986)	(1.141)
Visa Category					
Labor migrant	ref	ref	ref	ref	ref
Family unification migrant	-2.646**	-2.859**	1.105	-0.283	0.290
	(0.990)	(0.887)	(0.831)	(0.925)	(0.960)
Refugee migrant	-2.245	-3.051	2.666*	1.025	4.460
	(1.706)	(1.575)	(1.288)	(1.308)	(4.184)
Unknown status	-3.172*	-0.678	0.674	1.351	0.665
	(1.582)	(1.414)	(1.409)	(1.360)	(0.937)
Level of Education					
Primary	ref	ref	ref	ref	ref
Secondary	-3.610**	2.138*	1.252	1.175	0.244
	(1.075)	(0.951)	(0.922)	(1.010)	(1.065)
Tertiary	-6.426**	7.014**	3.354**	0.653	-1.389
	(1.077)	(1.277)	(1.212)	(1.379)	(1.190)
Occupational Status in Home Country	-	-0.564**	-0.0418	-0.0546	-0.00657
		(0.0349)	(0.0308)	(0.0316)	(0.0345)
Observations	1,279	1,279	1,279	643	250
R-squared	0.097	0.294	0.029	0.019	0.042

Robust standard errors in parentheses, ** p<0.01, * p<0.05

Model 2 presented in column (2) additionally controls for the ISEI score in the home country. The R-squared nearly triples to around 29 percent which makes Model 2 the preferred model. The coefficient of this variable is -0.564 and highly significant. The negative sign suggests that having a high home country ISEI score is associated with a larger drop in occupational prestige in Sweden. This is not surprising as immigrants with high occupational prestige in their home country face a higher risk of severe downgrading in absolute terms than immigrants with low-prestige jobs.

Two differences can be observed when comparing Model 1 and 2. First, the female coefficient changed signs and is no longer significant. Second, both the coefficients of secondary and tertiary education changed signs and are again significantly different from the low-educated group. This suggests that the degradation suffered by immigrants with high educational levels can be explained by their higher occupational status in the country of origin. After controlling for this factor, higher education is associated with less severe downgrading in occupational status. The same applies for women, yet to a much lower degree.

Model 3 examines the change from the first job in Sweden to the second job in Sweden. The R-squared decreases dramatically meaning that other factors but the variables in the model explain variances in the change from first to second job in Sweden. Same effects have already been noted by Chiswick et al. (2005) who also reported an extremely low R-squared. In line with that, most coefficients are insignificant. For instance, the ISEI score in the home country does not longer play a role in predicting the transition from the first to the second job. Both age and being married are negatively associated with occupational upgrading. Having tertiary education leads to higher improvement rates. Refugees improve their occupational position more rapidly compared to labor migrants. Therefore, with duration in Sweden refugees recover much faster from their original decline than other migrants. This is in accordance with H3 which assumed a steeper trajectory for refugees than for family and labor migrants. All the other groups seem to experience similar rates of occupational upgrading which was already observed in the descriptive statistics.

Models 4 and 5 investigate the change from the second to the third and from the third to the fourth occupation in Sweden. The sample sizes decreased drastically as measuring a third or fourth job in Sweden was in many cases not possible. As a result, the standard errors increase and all coefficients become insignificant. These models therefore suggest that the changes in occupational mobility do not differ between the groups considered in the specifications.

Having examined the basic determinants of occupational mobility, the effect of overeducation and undereducation is analyzed. This is done by conducting separate regressions by level of schooling. Table 4.8 reports the regression results for immigrants with tertiary education (345 observations) and Table 4.9 for immigrants with primary education (652 observations). Immigrants with secondary education are exempt from the analysis because their size is relatively small. Results for the third and fourth job in Sweden are not depicted because these models do not deliver significant results.

Table 4.8 Determinants for ISEI occupation status, by tertiary education

VARIABLES	(1) ISEI census 1	(2) ISEI census 1	(3) ISEI census 2	(4) ISEI census 2
Constant	50.23**	49.96**	62.39**	62.75**
	(5.965)	(5.982)	(7.220)	(7.214)
Female	2.064	1.927	1.723	1.607
	(1.952)	(1.939)	(1.746)	(1.732)
Age	0.0647	0.0451	-0.249*	-0.279*
	(0.126)	(0.128)	(0.115)	(0.116)
Years since Migration	0.857	0.847	0.721	0.729
	(0.674)	(0.670)	(0.614)	(0.605)
Married	2.685	2.434	0.372	0.222
	(2.250)	(2.260)	(1.930)	(1.957)
Migration Cohort				
71-75	ref	ref	ref	ref
76-80	-1.037	-0.895	-0.827	-0.556
	(2.234)	(2.245)	(2.091)	(2.101)
81-85	0.990	0.870	0.820	0.783
	(2.268)	(2.296)	(2.035)	(2.025)
Visa Category				
Labor migrant	ref	ref	ref	ref
Family migrant	-8.300**	-8.695**	-5.997**	-6.465**
	(2.295)	(2.328)	(2.073)	(2.121)
Refugee migrant	-9.983*	-9.258*	-4.617	-4.547
	(4.045)	(4.201)	(3.502)	(3.620)
Unknown	-1.336	-1.727	0.268	-0.244
	(3.123)	(3.160)	(2.829)	(2.897)
Region of Birth				
European	ref	ref	ref	ref
NonEuropean	3.663	6.030	6.087*	7.670**
	(2.915)	(3.322)	(2.486)	(2.792)
USA/Germany	8.709**	10.98**	8.345**	10.56**
	(2.128)	(2.417)	(2.004)	(2.184)
Occupational Match				
Correctly Matched in Home Country	ref	ref	ref	ref
Overeducated in Home Country	-13.08**	-7.983*	-11.40**	-6.977*
	(2.201)	(3.258)	(2.145)	(3.268)
Overeducation*Region of Birth				
Overeducated*European	-	ref	-	ref
Overeducated*NonEuropean	-	-7.991	-	-5.446
		(5.296)		(4.843)
Overeducated*USA/Germany	-	-10.33*	-	-11.16*
		(4.907)		(5.551)
Observations	345	345	345	345
R-squared	0.239	0.250	0.203	0.216

Robust standard errors in parentheses, ** p<0.01, * p<0.05

Model 1 and 3 in Table 4.8 control for overeducation in the first and second census, respectively. According to H5, overeducated immigrants gain lower occupational status than their correctly matched counterparts. The estimates support the hypothesis. In fact, the magnitudes of the coefficients are very high in absolute values (-13.1 and -11.4) meaning that overeducated individuals experience much lower occupational prestige in Sweden. Model 2 and 4 additionally include interactions between being overeducated and the region of birth in order to examine the validity of H6. It claims that the effect of occupational mismatch is stronger for immigrants coming from economically similar countries. The coefficients of being overeducated are still negative but the magnitudes decreased slightly to -8.0 and -7.0, respectively. The coefficients of being from the Non-European and the USA/Germany group increased by around two points.

The interaction coefficients reveal that being overeducated as an American or German academic is indeed associated with a much stronger downgrading than for Europeans and non-Europeans. Moreover, whereas correctly matched Americans and Germans score higher than European immigrants by around 11 points, there are no significant differences between overeducated immigrants from USA/Germany, Europe and non-Europe.

Table 4.9 presents estimates for immigrants with primary education. There are two noteworthy differences when comparing tertiary and primary education (Tables 4.8 and 4.9). First, the constant in all models of Table 4.9 is lower by around 20 to 25 points revealing that primary educated individuals have jobs with lower occupation prestige. Second, the coefficients for tertiary educated refugees and family unification migrants are negative and highly significant, whereas the specifications for primary educated refugees and family migrants do not deliver significant results. Therefore, highly skilled refugees and tied movers find it harder to transfer their skills on the labor market (compared to labor migrants) than primary educated refugees and tied movers.

With regard to occupational mismatch, the estimates suggest that undereducated immigrants score between 4 and 6 points higher which also supports H5. Controlling for interactions between having been undereducated in the home country and region of origin does not change the coefficients of destination region and undereducation considerably. The only significant interaction is presented for the USA/Germany group in the first census. The positive interaction effect suggests that undereducated immigrants from USA/Germany perform much better than correctly matched people from that group. Furthermore, compared to Europeans and Non-Europeans, both correctly matched and undereducated Americans and Germans gain significantly higher scores. The magnitudes are 10.39 for correctly matched individuals and 18.03 (10.39 +7.64) for undereducated ones. Again, the labor market signal seems to be stronger for immigrants coming from countries with close cultural and economic ties to Sweden as was assumed by H6.

Table 4.9 Determinants for ISEI occupation status, by primary education

VARIABLES	(1) ISEI census 1	(2) ISEI census 1	(3) ISEI census 2	(4) ISEI census 2
Constant	31.26**	31.87**	34.02**	34.68**
	(1.610)	(1.618)	(3.234)	(3.235)
Female	0.912	0.760	-0.529	-0.724
	(0.923)	(0.918)	(1.021)	(1.009)
Age	-0.0977*	-0.0954*	-0.0920*	-0.0915*
	(0.0378)	(0.0376)	(0.0440)	(0.0439)
Years since Migration	0.596*	0.554	0.123	0.0893
	(0.301)	(0.297)	(0.345)	(0.340)
Married	-0.183	-0.406	-0.948	-1.185
	(0.810)	(0.807)	(0.976)	(0.976)
Migration Cohort				
71-75	ref	ref	ref	ref
76-80	0.127	-0.00404	0.596	0.404
	(1.010)	(0.992)	(1.157)	(1.149)
81-85	-1.443	-1.784	-0.322	-0.612
	(1.316)	(1.323)	(1.403)	(1.406)
Visa Category				
Labor migrant	ref	ref	ref	ref
Family migrant	-0.442	-0.618	0.238	0.0876
	(1.006)	(0.988)	(1.124)	(1.116)
Refugee migrant	-0.0794	0.104	1.034	1.323
	(1.759)	(1.809)	(1.941)	(1.985)
Unknown	2.268	1.950	-0.519	-0.765
	(1.672)	(1.696)	(1.727)	(1.745)
Region of Birth				
European	ref	ref	ref	ref
NonEuropean	0.480	1.145	0.215	1.188
	(1.075)	(1.058)	(1.102)	(1.059)
USA/Germany	12.28**	10.39**	12.85**	11.40**
	(1.276)	(1.407)	(1.475)	(1.661)
Occupational Match				
Correctly Matched in Home Country	ref	ref	ref	ref
Undereducated in Home Country	5.611**	4.366*	4.559**	4.656*
	(1.312)	(1.803)	(1.473)	(2.033)
Undereducation*Region of Birth				
Undereducated*European	-	ref	-	ref
Undereducated*NonEuropean	-	-3.219	-	-5.522
		(2.996)		(3.367)
Undereducated*USA/Germany	-	7.641*	-	5.395
		(3.071)		(3.546)
Observations	652	652	652	652
R-squared	0.242	0.260	0.206	0.220

Robust standard errors in parentheses, ** p<0.01, * p<0.05

Table 4.10 below shows the change in job status for the immigrant group with tertiary education. It explores the role of occupational mismatch on change in job status. In Model 1, correctly matched individuals experience a drastically deeper initial decline between home and host country than their overeducated counterparts. This is in line with the trajectories depicted in Figure 4.2 above. However, after controlling for the occupational status in the home country in Model 2, the effect vanishes completely. This leads to the conclusion that correctly matched immigrants do not experience a large drop because of their mismatch status but due to their much higher occupational prestige in the home country. The same picture is observed for the primary educated group and the effect of having been undereducated in the country of origin. After controlling for ISEI score in the home country, the negative coefficient for having been undereducated becomes insignificant. The regression table for this specification is reported in Appendix B.

The coefficients for overeducation in Models 3, 4 and 5 are not significant meaning that occupational mismatch does not explain later changes in occupational status in Sweden. Moreover, especially the last two models suffer from extremely low sample sizes. Insignificant findings are also made for the primary education specification (see Appendix B).

Table 4.10 Changes in job status over time, by tertiary education

VARIABLES	(1) Home to 1st	(2) Home to 1st	(3) 1st to 2nd	(4) 2nd to 3rd	(5) 3rd to 4th
Constant	-13.50*	13.45	22.79**	1.326	4.969
	(5.789)	(8.246)	(7.069)	(6.984)	(4.712)
Female	-2.553	-0.600	0.228	2.105	-1.382
	(1.897)	(1.968)	(1.611)	(2.042)	(1.540)
Age	-0.0166	0.0178	-0.288**	-0.0522	0.165
	(0.126)	(0.122)	(0.107)	(0.144)	(0.166)
Years since Migration	1.293	1.108	-0.0879	-0.252	-0.832
	(0.672)	(0.651)	(0.597)	(0.710)	(0.826)
Married	2.976	2.853	-3.936*	4.486*	-1.753
	(2.248)	(2.196)	(1.975)	(2.206)	(2.002)
Migration Cohort					
71-75	ref	ref	ref	ref	na
76-80	-2.066	-1.630	0.130	1.060	na
	(2.227)	(2.160)	(1.988)	(1.883)	
81-85	0.229	0.551	-0.175	na	na
	(2.209)	(2.149)	(1.770)		
Region of Birth					
European	ref	ref	ref	ref	ref
NonEuropean	2.757	3.140	2.523	-2.815	-0.614
	(2.840)	(2.816)	(1.956)	(2.222)	(0.843)
USA/Germany	11.54**	10.35**	-0.653	0.0597	-2.210
	(2.115)	(2.068)	(1.932)	(2.418)	(2.134)
Visa Category					
Labor migrant	ref	ref	ref	ref	ref
Family unification migrant	-7.475**	-7.824**	2.433	-0.875	-0.411
	(2.246)	(2.185)	(2.061)	(1.990)	(0.827)
Refugee migrant	-10.47**	-10.26**	5.669	0.710	-3.759
	(4.007)	(3.917)	(2.913)	(2.438)	(3.704)
Unknown status	-4.754	-3.308	2.080	-0.841	-0.278
	(3.013)	(3.031)	(2.941)	(2.924)	(1.117)
Occupational Match					
Correctly matched in home country	ref	ref	ref	ref	ref
Overeducated in home country	9.273**	-0.178	-1.011	1.626	-1.066
	(2.152)	(2.994)	(2.584)	(2.894)	(1.945)
Occupational Status in home country	-	-0.423**	-0.126	-0.0347	-0.103
		(0.0953)	(0.0816)	(0.0801)	(0.0946)
Observations	345	345	345	174	70
R-squared	0.185	0.224	0.090	0.057	0.131

Robust standard errors in parentheses, ** $p<0.01$, * $p<0.05$

4.2.2 The Probability of Maintaining Occupational Status

So far, overeducated and undereducated immigrants were compared to properly matched individuals that have the same level of schooling. In this subsection, the perspective is changed and undereducated as well as overeducated individuals are compared to those who have a job with the same required level of schooling. To give an example, until now a primary educated person who worked as an engineer in the country of origin was compared to other individuals with primary education. In the following, this undereducated engineer will be compared to engineers and other people with jobs that require tertiary education.[7]

When comparing matched and mismatched workers within the same occupation, it is assumed that overeducated have higher earnings than the properly matched and that the latter earn more than undereducated individuals (Chiswick & Miller, 2008; 2010). In line with that assumption, the seventh hypothesis states that undereducated engineers find it harder to maintain their high occupational status in Sweden than engineers who actually have a university degree. Furthermore, it is expected that overeducated people working in the low-skilled sector are more likely to improve their occupational position once they are in Sweden. In the following, H7 is tested by running a binary probit model with a dummy for maintaining the home country occupational status as the dependent variable. It takes the value one if the immigrant maintains a job with the same status in Sweden and zero otherwise. The analysis is limited to the high-skilled sector and the low-skilled sector. Medium-skilled occupations are not being considered for two reasons. First, this sector has with 237 by far the lowest number of observations (see Table 3.2). Second, people working in the medium-skilled sector can be either overeducated, undereducated or correctly matched. These three outcomes cannot be covered by a binary variable and grouping two of them together makes the interpretation less meaningful.

The marginal effects of the probit regressions are depicted in Table 4.11. First, Models 1 and 2 are discussed which investigate immigrants who had an occupation in their home country that required tertiary education. In this group, it is additionally controlled for the type of home country occupation. The dependent variable in Model 1 is maintaining the occupational status in the first observed census, while in Model 2 it is maintaining the home country status in the second observed census. A negative sign means that the specific variable is negatively associated with maintaining the occupational status, thus it increases the probability of status downgrading. The risk of downgrading is higher for female migrants, tied movers and refugees. Interestingly, arriving between 1980 and 1985 is associated with a higher likelihood of keeping a high-skilled job. Transferring their skills to the Swedish labor market is easier for scientists and doctors than for engineers and teachers. The key variable of interest is having been undereducated. It is associated with an 18.8 percent (first census) and 18.3 percent (second census) lower probability of keeping a job that requires tertiary education. Therefore, undereducated immigrants with a high-status job in the home country are more likely to experience a drop in occupational status compared to those who are correctly matched. Having acquired the required level of education therefore helps to maintain a job in the high-skilled sector.

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[7] For a more comprehensive discussion of this matter, see Chiswick and Miller (2008).

Table 4.11 Probability of maintaining home country occupational prestige, marginal effects

VARIABLES	Tertiary		Primary	
	(1)	(2)	(3)	(4)
	Census 1	Census 2	Census 1	Census 2
Female	-0.157**	-0.136**	0.172**	0.228**
	(0.0433)	(0.0479)	(0.0380)	(0.0363)
Age	0.00305	0.00201	0.00468**	0.00573**
	(0.00260)	(0.00277)	(0.00172)	(0.00169)
Years since Migration	-0.0302*	-0.0329*	-0.0314*	-0.0380**
	(0.0146)	(0.0163)	(0.0131)	(0.0128)
Married	0.0736	-0.00728	0.0222	0.00360
	(0.0478)	(0.0495)	(0.0356)	(0.0373)
Migration Cohort				
71-75	ref	ref	ref	ref
76-80	0.0519	0.0154	0.0532	-0.0155
	(0.0457)	(0.0522)	(0.0427)	(0.0427)
81-85	0.177**	0.140*	0.0355	0.00516
	(0.0495)	(0.0568)	(0.0494)	(0.0482)
Region of Birth				
European	ref	ref	ref	ref
NonEuropean	0.0742	0.160*	0.0187	0.0113
	(0.0544)	(0.0630)	(0.0456)	(0.0450)
USA/Germany	0.103*	0.132**	-0.290**	-0.339**
	(0.0451)	(0.0504)	(0.0505)	(0.0474)
Visa Category				
Labor migrant	ref	ref	ref	ref
Family migrant	-0.151**	-0.155*	0.0451	0.0345
	(0.0576)	(0.0622)	(0.0454)	(0.0443)
Refugee migrant	-0.255**	-0.227*	0.0177	-0.0837
	(0.0792)	(0.0926)	(0.0750)	(0.0725)
Unknown	-0.103	-0.170*	-0.00807	-0.0905
	(0.0724)	(0.0772)	(0.0696)	(0.0676)
Home Country Occupation				
Engineers/Technicians	ref	ref	na	na
Health Services	0.522**	0.443**	na	na
	(0.0722)	(0.0794)		
Teachers	0.00990	0.00537	na	na
	(0.0595)	(0.0680)		
Scientists	0.304**	0.412**	na	na
	(0.0883)	(0.0934)		
Others	0.00870	0.0314	na	na
	(0.0536)	(0.0626)		
Occupational Match				
Correctly Matched in Home Country	ref	ref	ref	ref
Undereducated in Home Country	-0.188**	-0.183**	-	-
	(0.0493)	(0.0520)		
Overeducated in Home Country	-	-	-0.0818	-0.138**
			(0.0420)	(0.0401)
Observations	344	344	698	698

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

Models 3 and 4 consider only immigrants who had a job in the primary sector in the home country. In this case, a negative sign is associated with a lower probability of maintaining the occupational status and a higher probability of upgrading (to a job which either requires secondary or tertiary education). Both women and older immigrants are more likely to keep their original job in the low sector, while years since migration are related to a higher probability of upgrading in both censuses. Moreover, German and American immigrants are more likely to experience occupational improvement. Having been overeducated in the country of origin increases the likelihood of occupational upgrading by 13.8 percent in the second census. The first census, however, does not deliver significant results on the 5%-level. The estimates therefore suggest that the role of acquired education in predicting occupational movement plays a less important role in case of primary educated immigrants than tertiary educated ones. All in all, however, H7 is supported.

4.3   Sensitivity Analysis

In order to demonstrate that the findings are reliable, two different sensitivity tests are applied. First, the method used to define the required level of education in the home country is reconsidered. Second, even though many individuals stated an occupation in the census years, their income was extremely low. This questions whether the workers were full-time employed. In order to exclude part-time workers from the regression model, the individuals with an average income lower than the 25 percentile were dropped in the sensitivity analysis. The average income was measured by immigration cohort in order to control for inflation effects.

4.3.1   Changing the Threshold Defining Required Education

In section 3.3, the method for defining the required amount of education for the home country jobs was presented. Those occupations which appeared ten or more times were assigned a required education, first by birth country and then by region of origin. The remaining occupations were pooled in the SSYK major groups and the most frequent acquired education per major group and region of origin was defined as the required level of education.

A serious concern in overeducation literature is the potentially large impact of measurement errors on the outcomes. Therefore, the results are checked for their robustness by changing the threshold which was set arbitrarily to the value of 10. The model was first run at a value of 5 and at a value of 20. Additionally, in a last model, all observations were classified in the SSYK groups without applying steps one and two and therefore without defining a threshold at all. In this alternative model, mode values were calculated by country of origin.

The changes in required schooling between the four models are depicted in Figure 4.3. Increasing the value of the boundary is associated with a steady growth in primary and with a corresponding drop in secondary education requirements. Tertiary education does not change considerably. The differences between the models, however, are relatively small. Similar

findings are made for the change in occupational (mis)match which is reported in Figure 4.4. The incidence of overeducation is positively related with the value of the threshold, whereas the share of properly matched individuals decreases constantly. Again, the total effect of the change in the boundary is small.

Changes in Required Schooling

	Primary	Secondary	Tertiary
▨ 5	692	240	347
▨ 10	698	237	344
▨ 20	730	199	350
■ Only country	749	180	350

Number of Individuals|

Required Level of Education for Home Country Occupation
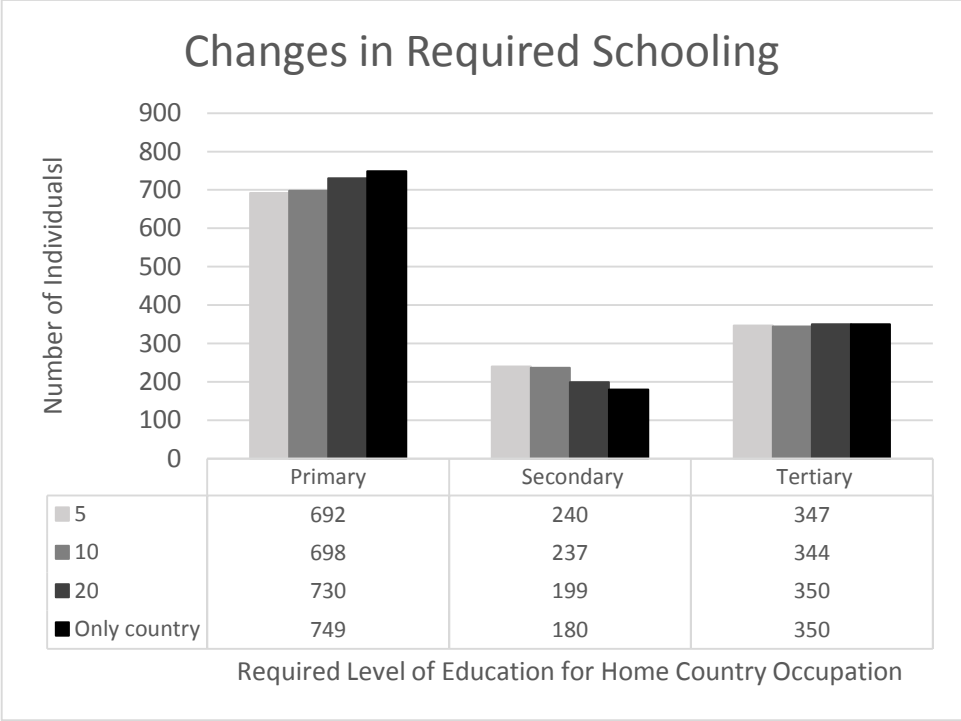
Figure 4.3 Changes in required schooling between different models

Changes in (Mis)match

	Undereducated	Properly Matched	Overeducated
▨ 5	156	935	188
▨ 10	159	919	201
▨ 20	156	906	217
■ By country	146	907	226

Number of Individuals

Mismatch Category
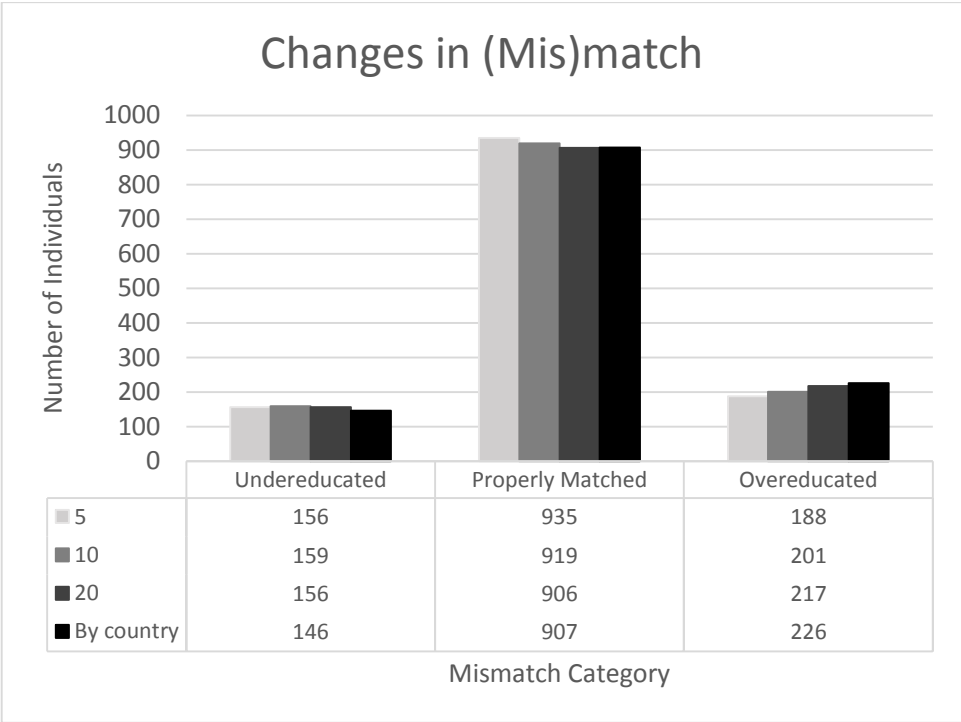
Figure 4.4 Changes in (mis)match between different models

The regression results for the last model which are equivalent to the ones in Table 4.8 and Table 4.11 are depicted in Appendix C. This model was chosen because it deviates most from the original model. The estimates show that the interactions between being overeducated and the region of origin are sensitive to the chosen threshold. On the one hand, the interaction coefficients for USA/Germany keep the negative sign but are not significant anymore. On the other hand, the coefficient for Non-Europeans is now statistically significant. This questions the validity of H6 which assumed that the effect is strongest for immigrants from culturally similar countries.

The results of the probit model are only slightly affected. The probability of upgrading if overeducated in the home country increases and becomes statistically significant also in case of the first census. To conclude, the data suggests that different measurement models deliver different results and that measurement errors bias the outcome to a certain degree.

4.3.2   Income Restrictions

In the main specification, individuals who reported a job but zero income in the census years were excluded. In order to check the robustness of the results, also those individuals are ignored who belonged to the 25% with the lowest average income per immigration cohort. This is done in order to exclude part-time workers who might bias the results. The regression outputs equivalent to the ones in Table 4.8 and 4.11 are reported in Appendix C. The results are basically identical in all models. The only exceptions are the interaction coefficients. They have the same signs but are no longer significant. However, this may also be attributed to the smaller sample size. Therefore, it is concluded that part-time workers do not bias the results considerably.

5 Discussion and Limitations

In this study, the first aim is to test the hypotheses based on the theory of imperfect transferability of skills by investigating the occupational mobility of immigrants. This is done by exploiting both job data from the specific home countries and from Sweden. The second aim of the paper is to assess the relationship between occupational mismatches in the home country and immigrant's labor market status in Sweden over time.

The study has found support for the theory of imperfect transferability of skills, both using descriptive evidence and multivariate analysis. In general, the occupational mobility of immigrants follows a U-shaped pattern. The depth of the U is much smaller for immigrants coming from countries that are culturally and economically similar to Sweden. It is steeper for well-educated immigrants but this is mainly attributed to their high pre-migration occupational prestige. Finally, worker migrants experience a more shallow pattern when compared to family migrants and refugees. The regression analysis suggests that the initial decline is steepest for family migrants and that the recovery of status in Sweden is strongest for refugees. To summarize, the depth of the U-shaped pattern is greatest for immigrants that are assumed to have lower transferability of skills such as refugees and non-Europeans. These results are consistent with the major trends in the literature found by Chiswick et al. (2005), Akresh (2008) and Helgertz (2013). In general, immigrants integrate very well into the Swedish labor market as the occupational status of most groups recovers with time spent in Sweden.

This is the first study that examines the relationship between home country mismatches and occupational mobility in the destination country. After controlling for the level of education, immigrants who were overeducated in their home countries perform worse on the Swedish labor market than their properly matched counterparts. The opposite is observed for undereducated individuals who achieve higher occupational prestige in Sweden when compared to correctly matched immigrants. According to the regression analysis, this effect is more accentuated for immigrants originating from countries similar to Sweden. This finding, however, is sensitive to the performed robustness checks and should be handled with caution. Finally, when compared to individuals working in jobs with the same educational requirements in their home countries, undereducated immigrants face an 18 percent higher risk of occupational downgrading than properly matched individuals. The effect is less emphasized in the case of overeducation. All in all, the results suggest that occupational mismatches in the home country matter when explaining labor market performance in the destination country. This is in accordance with the findings of Piracha et al. (2012) who found significant results when investigating the relationship between occupational mismatch in the home country and occupational mismatch in the host country.

However, it is extremely important to mention that this study does not draw direct causal conclusions. Having been overeducated in the home country does not cause lower occupational status in Sweden. The relationship operates through other channels. Two possible channels have been proposed in this paper. While the first one focusses on the supply side of the labor market,

the second one concentrates on the demand side. Firstly, lower ability may lead both to a higher probability of being overeducated and to a weaker performance on the labor market (Tsai, 2010). Following this argumentation, overeducation may be treated as a proxy for ability. Secondly, having been overeducated in the home country may provide an indirect signal of an immigrant's performance for a Swedish employer (Piracha et al., 2012). Therefore, overeducated immigrants have smaller chances of getting jobs which require their level of education and are therefore forced to accept occupations with lower prestige.

The study has possible limitations with regard to the sample size and the data collection method. The sample size of 1,279 individuals is rather small for an econometric analysis, especially when considering that many specifications only focus on educational subgroups. On the one hand, studies using longitudinal data to investigate the occupational mobility of immigrants generally suffer from relatively low sample sizes. For instance, Rooth and Ekberg (2006) draw conclusions from regressions with only 147 individuals. On the other hand, this general limitation does not resolve the potential problems of small sample sizes, for example with respect to generalizations. The results should be viewed under this aspect.

With respect to the data collection method, this study faces the limitation that the very first job in Sweden is not observed. Apart from Bauer and Zimmermann (1999) and Helgertz (2013), all the other studies contain information about the first permanent job in the destination country, either by asking questions about the first job retrospectively in surveys and interviews (Rooth & Ekberg, 2006; Akresh, 2008; Simon et al., 2014) or by collecting information shortly after arrival (Chiswick et al., 2005). Due to this limitation, observing the direct transition from home to host country occupation is not possible. This is disadvantageous as the initial decline immediately after immigration may contain more information than the occupation observed in the first census after arrival.

The main limitation of this study is that the final sample is not representative of the total immigrant population. This is to a large degree caused by selection into employment. The study focusses only on those immigrants who experienced a successful employment transition between their home country and Sweden. However, this is problematic since immigrants who reported a job in at least two consecutive 5-year censuses after their arrival in Sweden are certainly better economically integrated than those who did not meet the criteria. Moreover, immigrants who left Sweden before their second observed census are excluded by definition. As a result, the final sample is positively selected which makes the overall positive conclusions about immigrant integration not representative of the whole immigrant population who arrived in the 1970s and early 80s.

6 Conclusion

This study examines the occupational mobility of immigrants from their countries of origin to Sweden. The general picture reveals that all immigrant groups face an initial decline in occupational status after their migration. With years since migration, however, they improve their occupational status considerably. After having spent more than fourteen years in Sweden, most groups come close to their pre-migration status. This U-shaped pattern is deeper the lower the international transferability of skills and the higher the level of schooling. Moreover, labor migrants experience a less steep trajectory than family unification migrants and refugees. All in all, the results suggest that the immigrants in the sample integrate very well in the Swedish labor market.

After controlling for level of education, having been overeducated in the home country is associated with lower occupational prestige while having been undereducated is related to higher status when compared to correctly matched individuals. Moreover, immigrants with jobs in the highest sector are more likely to experience downgrading when they have been undereducated in their country of origin. Therefore, the results suggest that the occupational mismatch in the home country should be taken into consideration when examining the labor market status of immigrants.

In order to improve the transferability of human capital, the study reinforces the recommendation for providing more opportunities for acquiring destination language skills and educational training. In particular, these opportunities should be directed to those immigrant groups that tend to experience a higher drop in occupational prestige after migration, such as refugees, non-Europeans, and highly skilled individuals. Moreover, it is recommended to invest resources in the labor market integration of immigrants with jobs that require skills that are not easily transferable. The analysis showed that especially teachers and engineers/technicians find it hard to transfer their human capital successfully.

If it is true that overeducated individuals have lower ability, policies directed to this group would not be effective. However, if the driving factor for their weaker performance are the expectations of the Swedish employers, improving the certification process of occupational licenses may contribute to overcoming the lower labor market performance of overeducated individuals. In general, more knowledge about the link between overeducation and ability has to be gained. For instance, this can be done by analyzing the relationship between IQ or other test scores and occupational mismatching in later life.

Finally, further research is required to establish the link between occupational mismatch and labor market outcomes. Future studies on that topic will benefit from larger longitudinal surveys of immigrants. Additionally, including data about vocational education in the home country would contribute to gaining more knowledge about the impact of occupational mismatch. Data on vocational education in the home country is actually available in the SLI database, so this could be exploited in another paper.

References

Books and Articles:

Akresh, I. R. (2008). Occupational Trajectories of Legal US Immigrants: Downgrading and recovery, *Population and Development Review*, vol. 34, no. 3, pp. 435-456

Barrett, A. & Duffy, D. (2008). Are Ireland's Immigrants Integrating into Its Labor Market?, *International Migration Review*, vol. 42, no. 3, pp. 597-619

Bauer, T. (2002). Educational Mismatch and Wages: A Panel Analysis, *Economics of Education Review*, vol. 21, pp. 221-229

Bauer, T. & Zimmermann, K. (1999). Occupational Mobility of Ethnic Migrants, *IZA Discussion Paper Series*, no. 58

Bengtsson, T., Lundh, C. & Scott, K. (2005). From Boom to Bust: The Economic Integration of Immigrants in Postwar Sweden, in K Zimmermann (eds.), *European Migration: What do we know?* New York: Oxford University Press

Bevelander, P. (1999). The Employment Integration of Immigrants in Sweden, *Journal of Ethnic and Migration Studies*, vol. 25, no. 3, pp. 445-468

Bevelander, P. (2005). The Employment Status of Immigrant Women: The case of Sweden, *International Migration Review*, vol. 39, no. 1, pp. 173-202

Bevelander, P. & Nielsen, H. (2001). Declining Employment Success of Immigrant Males in Sweden: Observed or unobserved characteristics?, *Journal of Population Economics*, vol. 14, pp. 455-471

Borjas, G. (1985). Assimilation, Changes in Cohort Quality, and the Earnings of Immigrants, *Journal of Labor Economics*, vol. 3, no. 4, pp. 463-489

Borjas, G. (1987). Self-Selection and the Earnings of Immigrants, *The American Economic Review*, vol. 77, no.4, pp. 531-553

Borjas, G. (1994). The Economics of Immigration, *Journal of Economic Literature*, vol. 32, no. 4, pp. 1667-1717

Carlsson, M. & Rooth, D. (2007). Evidence of Ethnic Discrimination in the Swedish Labor Market using Experimental Data, *Labour Economics*, vol. 14, pp. 716-729

Chiswick, B. (1978). The Effect of Americanization on the Earnings of Foreign-born Men, *Journal of Political Economy*, vol. 86, no. 5, pp. 897-921

Chiswick, B. (1986). Is the New Immigration Less Skilled than the Old?, *Journal of Labor Economics*, vol. 4, no. 2, pp. 168-192

Chiswick, B., Lee, Y. & Miller, P. (2005). A Longitudinal Analysis of Immigrant Occupational Mobility: A Test of the Immigrant Assimilation Hypothesis, *The International Migration Review*, vol. 39, no. 2, pp. 332-353

Chiswick, B. & Miller, P. (2008). Why is the Payoff to Schooling smaller for Immigrants?, *Labour Economics*, vol. 15, no. 6, pp. 1317-1340

Chiswick, B. & Miller, P. (2009). The International Transferability of Immigrants' Human Capital, *Economics of Education Review*, vol. 28, pp. 162-169

Chiswick, B. & Miller, P. (2010). The Effects of Educational-Occupational Mismatch on Immigrant Earnings in Australia, with International Comparisons, *The International Migration Review*, vol. 44, No. 4, pp. 869-898

Dahlstedt, I. (2011). Occupational Match: Over-and Undereducation among Immigrants in the Swedish Labor Market, *International Migration & Integration*, vol. 12, pp. 349-367

Duleep, H. & Regets, M. (1996a). Earnings Convergence: Does it matter where immigrants come from or why?, *The Canadian Journal of Economics*, vol. 29, no. 1, pp. 130-134

Duleep, H. & Regets, M. (1996b). Admission Criteria and Immigrant Earnings Profiles, *The International Migration Review*, vol. 30, no. 2, pp. 571-590

Duncan, G. & Hoffman, S. (1981). The Incidence and Wage Effects of Overeducation, *Economics of Education Review*, vol. 1, no. 1, pp. 75-86

Ganzeboom, H. & Treiman, D. (1996). Internationally comparable Measures of Occupational Status for the 1988 Standard Classification of Occupations, *Social Science Research*, vol. 25, no. 3, pp. 201-239

Green, F., McIntosh, S. & Vignoles, A. (1999). Overeducation' and Skills – Clarifying the Concepts, *Technical Report*.

Gustafsson, B. & Zheng, J. (2006). Earnings of Immigrants in Sweden, 1978 to 1999, *International Migration*, vol. 44, no. 2, pp. 79-117

Hammarstedt, M. (2000). The Receipt of Transfer Payments by Immigrants in Sweden, *International Migration*, vol. 38, no. 2, pp. 239-268

Hammarstedt, M. & Shukur, G. (2006). Immigrants' Relative Earnings in Sweden – A Cohort Analysis, *Labour*, vol. 20, no. 2, pp. 285-323

Hartog, J. (2000). Over-education and Earnings: Where are we, where should we go?, *Economics of Education Review*, vol. 19, pp. 131-147

Helgertz, J. (2010). Immigrant Careers: Why country of origin matters, Lund: Lund University Press

Helgertz, J. (2013). Pre- to Post-Migration Occupational Mobility of First Generation Immigrants to Sweden from 1970-1990: Examining the Influence of Linguistic Distance, *Population Research and Policy Review*, vol. 32, pp. 437-467

Joona, P., Gupta, N. & Wadensjö, E. (2014). Overeducation among Immigrants in Sweden: Incidence, Wage Effects and State Dependence, *IZA Journal of Migration*, vol.3:9

Kiker, B., Santos, M. & de Oliveira, M. (1997). Overeducation and Undereducation: Evidence from Portugal, *Economics of Education Review*, vol. 16, no. 2, pp. 111-125

Leuven, E. & Oosterbeek H. (2011). Overeducation and Mismatch in the Labor Market, *IZA Discussion Paper Series*, no. 5523

Lindstrom, D. & Massey, D. (1994). Selective Emigration, Cohort Quality, and Models of Immigrant Assimilation, *Social Science Research*, vol. 23, pp. 315-349

Massey, D., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A. & Taylor J. E. (1998). Worlds in Motion: Understanding International Migration at the End of the Millennium, Oxford: Oxford University Press

Persson, M. (2015). In Good Times and in Bad: Immigrants, Self-Employment and Social Insurances. Lund: Lund University Press

Piore, M. (1979). Birds of Passage: Migrant Labor and Industrial Societies, Cambridge: Cambridge University Press

Piracha, M. & Vadean, F. (2012). Migrant Educational Mismatch and the Labour Market, *IZA Discussion Paper Serie*s, no. 6414

Piracha, M., Tani, M. & Vadean, F. (2012). Immigrant Over- and Under-Education: The role of home country labour market experience, *IZA Journal of Migration*, vol.1:3

Rooth, D. & Ekberg, J. (2006). Occupational Mobility for Immigrants in Sweden, *International Migration*, vol. 44, no. 2, pp. 57-77

Rosholm M., Scott, K. & Husted, L. (2006). The Times they are A-Changin': Declining Immigrant Employment Opportunities in Scandinavia, *International Migration Review*, vol. 40, no. 2, pp. 318-347

Scott, K. (1999). The Immigrant Experience, Lund: Lund University Press

Scott, K. & Bengtsson, T. (2006). Immigrants Consumption of Sickness Benefits in Sweden, 1982-1991, *The Journal of Socio-Economics*, vol. 35, pp. 440-457

Sicherman, N. (1991). "Overeducation" in the Labor Market, *Journal of Labor Economics*, vol. 9, no. 2, pp. 101-122

Simon, H., Ramos, R. & Sanroma, E. (2014). Immigrant Occupational Mobility: Longitudinal Evidence from Spain, *European Journal of Population*, vol. 30, pp. 223-255

Tsai, Y. (2010). Returns to Overeducation: A Longitudinal Analysis of the U.S. Labor Market, *Economics of Education Review*, vol. 29, pp. 606-617

Verdugo, R. & Verdugo, N. (1989). The Impact of Surplus Schooling on Earnings: Some Additional Findings, *Economics of Education Review*, vol. 22, pp. 690-695

Åslund, O. & Rooth, D. (2007). Do when and where matter? Initial labour market conditions and immigrant earnings, *The Economic Journal*, vol. 117, pp. 422-448

Data Sources:

Swedish Longitudinal Immigrant Database (SLI), available at the Centre for Economic Demography, Lund University

Swedish Censuses (Folk- och bostadsräkningar, FoB) 1975, 1980, 1985, 1990

Appendix

A Occupational Classifications

Table A.1 Occupational classification SSYK 2012 (ISCO-08)

Occupations	Number Unit Groups	Required Education	Occupational Status ISEI
1 Managers	57	Tertiary	55
2 Professionals	113	Tertiary	70
3 Technicians and associate professionals	68	Tertiary	54
4 Clerical support workers	22	Secondary	45
5 Service and sales workers	44	Secondary	40
6 Skilled agricultural, forestry and fishery workers	10	Secondary	23
7 Craft and related trade workers	50	Secondary	34
8 Plant and machine operators, and assemblers	46	Secondary	31
9 Elementary occupations	16	Primary	20
0 Armed forces occupations	3	-	-

Source: Simon et al. (2014) and http://www.scb.se/sv_/Dokumentation/Klassifikationer-och-standarder/Standard-for-svensk-yrkesklassificering-SSYK/

Table A.2 Swedish socio-economic classification (SEI)

Socioeconomic groups	Required Education
Manual workers	
11 Unskilled employees in goods production	Primary
12 Unskilled employees in service producation	Primary
21 Skilled employees in goods production	Secondary
22 Skilled employees in service production	Secondary
Non-manual employees	
33 Assistant non-manual employees, lower level	Primary
36 Assistant non-manual employees, higher level	Secondary
46 Intermediate non-manual employees	Secondary
56 Professionals and other higher non-manual employees	Tertiary
57 Upper level executives	Tertiary
Employers	
60 Self-employed professionals	Tertiary
79 Self-employed other than professionals	-
89 Farmers	-

Source: http://www.scb.se/sv_/Dokumentation/Klassifikationer-och-standarder/Socioekonomisk-indelning-SEI/

B Status Change by Primary Education

Table B.1 Changes in job status over time, by primary education

VARIABLES	(1) Home to 1st	(2) Home to 1st	(3) 1st to 2nd	(4) 2nd to 3rd	(5) 3rd to 4th
Constant	-1.588	19.81**	2.097	8.505**	4.462
	(1.817)	(2.650)	(2.020)	(3.058)	(2.803)
Female	0.234	0.675	-1.442	-0.775	0.863
	(0.991)	(0.871)	(0.965)	(1.092)	(1.384)
Age	-0.0743	-0.0896*	0.0126	-0.127*	-5.32e-05
	(0.0406)	(0.0360)	(0.0353)	(0.0500)	(0.0583)
Years since Migration	0.640*	0.612*	-0.512	-0.0527	-0.625
	(0.323)	(0.292)	(0.307)	(0.367)	(0.480)
Married	0.821	0.167	-0.652	-0.642	-0.624
	(0.834)	(0.760)	(0.703)	(0.896)	(0.979)
Migration Cohort					
71-75	ref	ref	ref	ref	na
76-80	0.116	0.123	0.512	-0.386	na
	(1.078)	(0.958)	(0.979)	(1.106)	
81-85	-0.800	-1.219	1.097	na	na
	(1.407)	(1.284)	(1.018)		
Region of Birth					
European	ref	ref	ref	ref	ref
NonEuropean	-0.890	-0.598	0.748	0.0216	0.497
	(1.112)	(0.978)	(0.999)	(1.192)	(1.352)
USA/Germany	-1.221	-0.477	1.079	-1.034	14.17**
	(1.806)	(1.657)	(1.482)	(1.396)	(3.017)
Visa Category	-0.496	1.305	-2.911	3.309*	1.968
Labor migrant	(1.937)	(1.678)	(1.798)	(1.577)	(1.606)
Family unification migrant	ref	ref	ref	ref	ref
Refugee migrant	1.029	0.672	-0.313	1.736	0.887
	(1.176)	(1.053)	(1.161)	(1.288)	(1.716)
Unknown status	6.265**	10.19**	0.257	1.817	0.0883
	(1.145)	(1.153)	(1.135)	(1.240)	(1.760)
Occupational Match					
Correctly matched in home country	ref	ref	ref	ref	ref
Undereducated in home country	-13.30**	-0.983	-1.423	3.895*	3.428
	(1.521)	(1.530)	(1.198)	(1.839)	(2.411)
Occupational Status in home country	-	-0.651** (0.0633)	0.0191 (0.0438)	-0.111* (0.0524)	-0.0865 (0.0615)
Observations	652	652	652	344	138
R-squared	0.193	0.366	0.027	0.058	0.111

Robust standard errors in parentheses, ** p<0.01, * p<0.05

C Robustness Checks

Table C.1 Determinants for ISEI occupation status by tertiary education, by country method

VARIABLES	(1) ISEI census 1	(2) ISEI census 1	(3) ISEI census 2	(4) ISEI census 2
Constant	50.85**	49.40**	61.66**	61.28**
	(5.696)	(5.685)	(6.983)	(7.008)
Female	0.514	0.448	0.487	0.452
	(1.943)	(1.922)	(1.743)	(1.744)
Age	0.0739	0.0681	-0.225*	-0.226*
	(0.122)	(0.123)	(0.114)	(0.114)
Years since Migration	1.048	0.966	0.841	0.794
	(0.667)	(0.665)	(0.621)	(0.627)
Married	2.765	2.936	-0.188	-0.301
	(2.179)	(2.178)	(1.858)	(1.873)
Migration Cohort				
71-75	ref	ref	ref	ref
76-80	-1.706	-1.998	-1.458	-1.603
	(2.178)	(2.221)	(2.070)	(2.103)
81-85	-0.125	-0.536	-0.0599	-0.242
	(2.208)	(2.231)	(2.059)	(2.085)
Visa Category				
Labor migrant	ref	ref	ref	ref
Family migrant	-7.403**	-7.736**	-5.205*	-5.344*
	(2.288)	(2.317)	(2.058)	(2.075)
Refugee migrant	-9.402*	-7.431	-4.321	-3.351
	(4.064)	(4.124)	(3.550)	(3.649)
Unknown	-1.817	-2.108	-0.0626	-0.205
	(3.113)	(3.126)	(2.822)	(2.856)
Region of Birth				
European	ref	ref	ref	ref
NonEuropean	1.636	5.387	4.435	6.240*
	(2.872)	(3.215)	(2.455)	(2.770)
USA/Germany	8.987**	11.46**	8.812**	9.993**
	(2.102)	(2.486)	(1.954)	(2.252)
Occupational Match				
Correctly Matched in Home Country	ref	ref	ref	ref
Overeducated	-14.35**	-8.055**	-11.19**	-8.174**
in Home Country	(2.034)	(3.101)	(1.960)	(3.061)
Overeducation*Region of Birth				
Overeducated*European	-	ref	-	ref
Overeducated*NonEuropean		-14.69**		-7.084
	-	(4.766)	-	(4.821)
Overeducated*USA/Germany		-7.598		-3.569
	-	(4.533)	-	(4.645)
Observations	345	345	345	345
R-squared	0.263	0.284	0.205	0.211

Robust standard errors in parentheses, ** p<0.01, * p<0.05

Table C.2 Probability of maintaining home country job prestige, by country method, marginal effects

	Tertiary		Primary	
	(1)	(2)	(3)	(4)
VARIABLES	Census 1	Census 2	Census 1	Census 2
Female	-0.155**	-0.135**	0.177**	0.219**
	(0.0414)	(0.0447)	(0.0353)	(0.0342)
Age	0.00209	0.00174	0.00381*	0.00521**
	(0.00253)	(0.00261)	(0.00170)	(0.00166)
Years since Migration	-0.0177	-0.0194	-0.0304*	-0.0347**
	(0.0148)	(0.0159)	(0.0125)	(0.0123)
Married	0.0254	0.00328	0.0209	-0.0204
	(0.0467)	(0.0477)	(0.0344)	(0.0358)
Migration Cohort				
71-75	ref	ref	ref	ref
76-80	0.0490	0.00605	0.0587	-0.00946
	(0.0457)	(0.0503)	(0.0409)	(0.0407)
81-85	0.154**	0.0950	0.0362	-0.00541
	(0.0495)	(0.0551)	(0.0463)	(0.0455)
Region of Birth				
European	ref	ref	ref	ref
NonEuropean	0.0619	0.151**	0.0383	0.0150
	(0.0510)	(0.0570)	(0.0437)	(0.0440)
USA/Germany	0.109*	0.152**	-0.323**	-0.378**
	(0.0468)	(0.0491)	(0.0470)	(0.0433)
Visa Category				
Labor migrant	ref	ref	ref	ref
Family migrant	-0.144*	-0.142*	0.0535	0.0338
	(0.0599)	(0.0633)	(0.0440)	(0.0431)
Refugee migrant	-0.214**	-0.291**	0.0217	-0.0368
	(0.0819)	(0.0845)	(0.0710)	(0.0678)
Unknown	-0.131	-0.186*	0.00500	-0.0730
	(0.0713)	(0.0752)	(0.0689)	(0.0670)
Home Country Occupation				
Engineers/Technicians	ref	ref	na	na
Health Services	0.480**	0.393**	na	na
	(0.0795)	(0.0862)		
Teachers	-0.0379	-0.0332	na	na
	(0.0665)	(0.0749)		
Scientists	0.298**	0.436**	na	na
	(0.0981)	(0.101)		
Others	-0.0424	-0.0350	na	na
	(0.0604)	(0.0691)		
Occupational Match				
Correctly Matched in Home Country	ref	ref	ref	ref
Undereducated in Home Country	-0.158**	-0.157**	-	-
	(0.0493)	(0.0509)		
Overeducated in Home Country	-	-	-0.129**	-0.203**
			(0.0382)	(0.0360)
Observations	350	350	749	749

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

Table C.3 Determinants for ISEI occupation status by tertiary education, by country, high income

VARIABLES	(1) ISEI census 1	(2) ISEI census 1	(3) ISEI census 2	(4) ISEI census 2
Constant	55.94**	55.66**	72.36**	72.60**
	(6.205)	(6.345)	(7.442)	(7.569)
Female	1.552	1.675	0.309	0.484
	(2.246)	(2.260)	(1.993)	(1.987)
Age	-0.00235	-0.0160	-0.302*	-0.324*
	(0.139)	(0.143)	(0.126)	(0.128)
Years since Migration	0.418	0.415	0.0252	0.0439
	(0.773)	(0.774)	(0.692)	(0.695)
Married	2.872	2.799	2.036	2.046
	(2.538)	(2.558)	(2.128)	(2.165)
Migration Cohort				
71-75	ref	ref	ref	ref
76-80	-0.869	-0.734	-2.066	-1.897
	(2.412)	(2.411)	(2.292)	(2.302)
81-85	1.392	1.386	-0.0143	0.00831
	(2.529)	(2.549)	(2.228)	(2.218)
Visa Category				
Labor migrant	ref	ref	ref	ref
Family migrant	-7.859**	-8.402**	-6.337**	-6.849**
	(2.268)	(2.316)	(2.129)	(2.206)
Refugee migrant	-9.626*	-9.208*	-4.439	-4.611
	(4.078)	(4.287)	(3.530)	(3.694)
Unknown	-3.308	-3.627	-1.209	-1.577
	(3.358)	(3.383)	(3.097)	(3.163)
Region of Birth				
European	ref	ref	ref	ref
NonEuropean	3.501	5.127	5.948*	6.730*
	(3.004)	(3.424)	(2.518)	(2.810)
USA/Germany	6.823**	8.507**	5.497*	6.928**
	(2.302)	(2.614)	(2.173)	(2.366)
Occupational Match				
Correctly Matched in Home Country	ref	ref	ref	ref
Overeducated in Home Country	-14.54**	-10.46**	-13.06**	-10.15**
	(2.370)	(3.361)	(2.313)	(3.657)
Overeducation*Region of Birth				
Overeducated*European	-	ref	-	ref
Overeducated*NonEuropean	-	-6.064	-	-3.100
		(5.640)		(5.383)
Overeducated*USA/Germany	-	-7.927	-	-7.607
		(5.537)		(6.114)
Observations	279	279	279	279
R-squared	0.237	0.244	0.199	0.205

Robust standard errors in parentheses, ** p<0.01, * p<0.05

Table C.4 Probability of maintaining home country job prestige, high income, marginal effects

	Tertiary		Primary	
	(1)	(2)	(3)	(4)
VARIABLES	Census 1	Census 2	Census 1	Census 2
Female	-0.155**	-0.167**	0.182**	0.271**
	(0.0517)	(0.0548)	(0.0458)	(0.0422)
Age	0.00289	0.00196	0.00440*	0.00365
	(0.00305)	(0.00314)	(0.00213)	(0.00204)
Years since Migration	-0.0328*	-0.0361*	-0.0252	-0.0358*
	(0.0167)	(0.0179)	(0.0155)	(0.0146)
Married	0.0904	0.0147	0.0398	-0.00865
	(0.0570)	(0.0556)	(0.0409)	(0.0417)
Migration Cohort				
71-75	ref	ref	ref	ref
76-80	0.0532	-0.0260	0.0762	-0.0293
	(0.0536)	(0.0576)	(0.0519)	(0.0506)
81-85	0.190**	0.130*	0.0252	0.0318
	(0.0580)	(0.0639)	(0.0605)	(0.0556)
Region of Birth				
European	ref	ref	ref	ref
NonEuropean	0.106	0.193**	0.0422	0.0557
	(0.0618)	(0.0692)	(0.0564)	(0.0529)
USA/Germany	0.156**	0.124*	-0.295**	-0.364**
	(0.0517)	(0.0560)	(0.0574)	(0.0527)
Visa Category				
Labor migrant	ref	ref	ref	ref
Family migrant	-0.127*	-0.131*	0.0314	0.0363
	(0.0631)	(0.0661)	(0.0525)	(0.0497)
Refugee migrant	-0.226*	-0.189	0.0108	-0.0693
	(0.0930)	(0.101)	(0.0877)	(0.0804)
Unknown	-0.0669	-0.165	0.0370	-0.0311
	(0.0831)	(0.0858)	(0.0831)	(0.0779)
Home Country Occupation				
Engineers/Technicians	ref	ref	na	na
Health Services	0.573**	0.542**	na	na
	(0.0759)	(0.0807)		
Teachers	0.0277	-0.0353	na	na
	(0.0748)	(0.0778)		
Scientists	0.345**	0.466**	na	na
	(0.0984)	(0.0978)		
Others	-0.0349	0.0348	na	na
	(0.0626)	(0.0718)		
Occupational Match				
Correctly Matched in Home Country	ref	ref	ref	ref
Undereducated in Home Country	-0.174**	-0.152**	-	-
	(0.0574)	(0.0576)		
Overeducated in Home Country	-	-	-0.0845	-0.197**
			(0.0511)	(0.0458)
Observations	271	271	511	511

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