AKF Working paper

Jacob Nielsen Arendt, Chantal Pohl Nielsen & Vibeke Jakobsen

The Relationship between Pre- and Post-migration Qualifications and their Impact on Employment Status

AKF's publication *The Relationship between Pre- and Post-migration Qualifications and their Impact on Employment Status* is available at www.akf.dk

AKF, Danish Institute of Governmental Research
Købmagergade 22, DK-1150 Copenhagen K
Phone: +45 43 33 34 00
Fax: +45 43 33 34 01
E-mail: akf@akf.dk
Internet http://www.akf.dk

Publisher: AKF
ISBN: 978-87-7509-212-3
i:\08 sekretariat\forlaget\kbj\2752\2752 pre- and post-migration.docx
February 2012

AKF, Danish Institute of Governmental Research
Carries out and reports social science research of interest to the public sector and in particular to regions and local governments.

Jacob Nielsen Arendt, Chantal Pohl Nielsen & Vibeke Jakobsen

The Relationship between Pre- and Post-migration Qualifications and their Impact on Employment Status

AKF, Danish Institute of Governmental Research
2012

Preface

This working paper is part of a larger project funded by the Strategic Programme for Welfare Research. The aim of the project is to examine the extent to which immigrants' qualifications are being utilised in the Danish labour market. For the purpose of this project we have combined data from a survey conducted in 2006 on the employment status and qualifications of immigrants from Turkey, Iran and Pakistan with register data.

The current part of the project examines the extent to which qualifications from the home country as well as qualifications acquired in Denmark affect the employment status of immigrants. It is also examined whether qualifications from the home-country affect educational attainment in Denmark. A second part of the project is planned in 2012, where the prevalence and determinants of over-education among employed immigrants will be examined.

Preliminary results from the current working paper have been presented at the conference I-days in Copenhagen and at an internal seminar. The project was planned as a joint collaboration between AKF (the Danish Institute of Governmental Research) and SFI (the Danish National Centre for Social Research). From AKF Director of Research Jacob Nielsen Arendt and Senior Researcher Chantal Pohl Nielsen participated. From SFI Researcher Vibeke Jakobsen participated. Jacob Nielsen Arendt conducted the empirical analyses, whilst both Jacob Nielsen Arendt and Chantal Pohl Nielsen participated in the research design phase as well as in the preparation and revision of the manuscript. Vibeke Jakobsen contributed to the research design phase and commented on the manuscript. The authors would like to thank Elvira Andersson, who has previously been employed as a research assistant at AKF, for assisting with the preparation of the data, and Kræn Blume Jensen, Gabriel Pons Rotger and Anna Piil Damm for valuable comments.

Jacob Nielsen Arendt
February 2012

Contents

Summary

This study provides new evidence on the extent to which home and destination-country specific qualifications for non-Western immigrants can explain their employment status in the destination country. A combination of survey and administrative data provides rich data for Turkish, Pakistani and Iranian immigrants entering Denmark as adults on the basis of refugee status or family reunification. We examine the process by which qualifications affect employment status in two steps: First we examine the importance of pre-migration levels of education and labour market experience on time till enrolment in further education and final completed level. We then examine whether certain combinations of pre- and post-migration qualifications matter for employment status. We find that home-country qualifications have no direct impact on employment status once destination-country qualifications are accounted for. Home-country education matters indirectly, though, by affecting destination-country educational attainment. In particular, immigrants with a high school degree or an advanced degree are much more likely to enrol and complete an advanced degree in the destination country. Destination-country language proficiency, labour market experience and an advanced degree all have a large positive and significant influence on the probability of being employed. We find no evidence that language is complementary to home-country education in the sense that it should improve the applicability of home-country education.

1 Introduction

The economic assimilation of immigrants in Western countries continues to be a topic of interest in both research and politics. The literature on immigrant labour market performance stresses the importance of distinguishing between different sources of human capital and the less-than-perfect transferability of foreign-acquired education and experience to destination-country labour markets (e.g. Chiswick 1978; Chiswick & Miller 2009; Duleep & Regets 1999; Friedberg 2000; Ferrer & Riddell 2008; Ferrer, Green & Riddel 2006; Hartog 2000).

Two key findings in this literature that seem to hold in most countries are (i) that foreign-acquired skills are not fully utilized in the labour markets of destination countries, but (ii) that immigrant-native gaps in labour market performance tend to diminish with time spent in the destination country. A plausible explanation for the narrowing gaps is that destination-country specific human capital is being accumulated. This is confirmed by findings of significant labour market returns to destination-country skills (e.g. Chiswick 1978; Borjas 2004; Aydemir & Sweetman 2006; Ferrer, Green & Riddel 2006).

The aim of this paper is to achieve a better understanding of the role that *post-migration* accumulation of language skills, formal education and labour market experience play in terms of enhancing the chances of immigrants with different *pre-migration* profiles to obtain employment in the destination country.

Immigrants arrive in a destination country with varying levels of education and labour market experience, depending on their age as well as their family's socio-economic status and traditions. For many of the younger immigrants, pursuing further education in Denmark would be a natural next step as a strategy for obtaining a job. For immigrants who arrive with higher levels of education and perhaps also labour market experience, there are more options to be considered, as they may choose to enter the labour market based on these pre-migration skills. However, many immigrants will find it necessary to attain a certain level of language proficiency in order to enter the labour market. These language investments may complement their pre-immigration qualifications, by increasing their returns (Chiswick & Miller 2003). Alternatively, embarking on and completing formal education in the destination country may be necessary in order to acquire the qualifications required in the labour market of the destination country. It is also expected to send a strong signal to potential employers about an immigrant's motivation and perseverance in terms of integrating into the destination-country labour market (Weiss 1983). Our empirical analyses seek to explore the importance of three main strategies (although not mutually exclusive) that immigrants can apply to enter the destination-country labour market: 1) Relying on pre-immigration qualifications, 2) Investing in language proficiency, 3) Investing in post-immigration education.

In the first part of our analysis, we investigate which factors are important in determining the duration from immigration year until enrolment in further education, as well as the probability of completing different levels of education in the destination country. How quickly after migration an immigrant enrols in formal education in the destination country has, to

our knowledge, not been studied before.[1] Differences in the duration till enrolment may indirect shed light on the strategy used upon arrival. The assumption is that immigrants with imperfectly transferable pre-migration skills, who are aware of the limited applicability of their foreign-acquired skills, will pursue post-migration education rather quickly, whereas less-informed immigrants will pursue education after some time in the destination country as a *consequence* of having experienced the imperfect transferability of their foreign education.

In the second part of the analysis, we examine how various combinations of home and destination-country qualifications matter for employment status. More specifically, we do this in three consecutive steps. First, we explore the impact of pre-migration skills and characteristics on the chances of getting a job. Second, we examine whether destination-country language proficiency acts as a mediating factor for home-country education in line with the study by Chiswick & Miller (2003). Third, we examine how post-migration educational attainment and labour market experience affect employment status.

The study is based on a combination of survey and administrative data on immigrants from Iran, Pakistan and Turkey. The immigrants included in the survey have come to Denmark as refugees or to join their families and so sample selection arising from deliberate (employment-related) migration is only a minor issue. This also implies that pre-migration characteristics can be taken as exogenous. The survey questions allow for measurement of a flexible range of qualifications, while the administrative data contain reliable information on labour market outcomes and educational attainment from the year of arrival.

[1] The link between pre- and post-migration educational attainment has been examined in a few studies and most have found a positive relationship (Chiswick & Miller 1994; Cobb-Clark, Connolly & Worswick 2005; Tubergen & Werfhorst 2007; Banerjee & Verma 2009). Two US studies found a negative relationship between pre- and post-migration education (Borjas 1982; Hashmi-Khan 1997). It has been claimed that these contradictory results arise because of measurement error in the education variable in these two US studies (Chiswick & Miller 1994). Using administrative data on destination country education, such a measurement error is practically ruled out in the present study.

2 Theory

The purpose of this section is to provide a background against which to interpret our empirical analyses. The theoretical literature on immigrant behaviour in destination-country labour markets is far from well established, so this section briefly summarises the application of two main theories with the aim of explaining immigrants' education and labour market performance in the destination country.

The most obvious theoretical starting point for our study is human capital theory, viewing education as an investment (e.g. Becker 1993) incurring costs in the short run (i.e. foregone earnings and education-related expenses) in return for higher expected benefits in the long run (i.e. higher probability of getting a job and higher wages). Compared to objectively similar natives, recently arrived immigrants lack destination-country specific human capital such as language skills and knowledge of the formal and informal functioning of the labour market. There are several strategies an immigrant could choose depending on e.g. his age-at-arrival and pre-migration education and labour market experience.

The younger and less experienced an immigrant is, the more likely it is that he is willing to spend time and resources accumulating destination-country specific skills by e.g. taking a formal education. In many cases, such investments will be a natural continuation of an already initiated but incomplete, educational trajectory from the home country.

An older immigrant, who has an education from his home country and perhaps also several years of labour market experience, might choose one of two strategies: (i) to rely on his foreign-acquired qualifications and to accumulate destination-country specific skills (including language skills) whilst in a job, or (ii) to take a destination-country education in order to compensate for lower quality or outdated foreign-acquired qualifications. In terms of the first strategy, developing good language skills may be a way of improving the applicability of these foreign-acquired qualifications in the new destination-country context. In the words of Chiswick & Miller (2003), there may be a complementarity between language proficiency and pre-immigration qualifications.

In terms of the second strategy, an immigrant may choose to take an education in the destination country at the same or at a different (higher or lower) level compared with his or her home-country education. Moreover, it may be that taking an education within a completely different field may be a sensible strategy if this is seen as an effective way of increasing the chances of getting a job.

Human capital theory rests on the notion that education enhances the productivity of an individual. Alternatively, it may be that formal education simply reveals – or signals – the inherent productivity of an individual (Spence 1973). This is the second strand of theoretical literature that is relevant for this study. Signalling in the labour market occurs because an employer can never be completely sure of an applicant's true productivity. An employer can, however, observe certain indicators that firms have experienced (or otherwise believe) to be correlated with productivity. Such indicators include age, gender, ethnicity, experience, education and other personal characteristics (Ehrenberg & Smith 1994). According to the job-

signalling model, the level of education can be used as a screening device, which employers use initially to sort job applicants. The source of education (country, university, etc.) can also be used as a screening mechanism. In countries where higher education is publicly financed or at least heavily subsidised by the state (like in Denmark), it may be rational for individuals to obtain a degree in order to be able to send a signal to potential employers (Chevalier 2003). In other words, if an immigrant expects that the signal value of taking a destination-country education is high, he might choose this as his deliberate strategy for entering the destination-country labour market even though he has a high level of education and labour market experience from his home country.

On the other hand, immigrants who initially aimed at entering the labour market based on their home-country qualifications may find it difficult to find jobs that match the level of their foreign-acquired qualifications (cf. Nielsen 2011) thus becoming motivated for taking a destination-country education after some years in the destination country. Thus, the timing of educational attainment in Denmark may differ because of differences in immigrants' knowledge (or perception) of the functioning of the destination-country labour market, including the transferability of their specific pre-migration education and labour market experience. Discrimination may also be a reason why immigrants with foreign-acquired qualifications experience difficulties in the destination-country labour market (Jacobsen 2004).

The process of learning about the destination-country job market and culture takes time, and so the number of years since immigration may have an impact on labour market outcomes independent of accumulation of specific destination-country qualifications (i.e. formal education and language skills). However, the better informed destination-country employers are about an immigrant's qualifications, the less should years since immigration matter. Instead, the *timing* of human capital accumulation may send important signals to potential employers. Enrolment of a destination-country education shortly after arrival, for example, is likely to send a strong signal to employers about an immigrant's knowledge about the destination country, motivation and willingness to adapt, learning ability, and also about a limited impact of suffering prior to and during migration.

Interpreting human capital and signalling theory in our context leads us to suggest that immigrants will generally follow one of two strategies, depending on e.g. their age at arrival, their home-country qualifications and their knowledge, or presumptions, about the destination-country labour market: (i) they may rely on their home-country qualifications and seek to complement them with developing good destination-country language skills in order to get a job, or (ii) they may pursue a destination-country education as soon as possible either because this is a natural next step up the educational ladder or because they expect that their foreign qualifications are insufficient or incompatible with requirements in the destination-country labour market. To the extent that the first strategy is unsuccessful, disappointed immigrants with foreign qualifications may choose the second strategy, but will do so after having tried to make use of their pre-migration qualifications.

3 Immigrants in Denmark

As mentioned in the introduction, the present study is about immigrants from Turkey, Pakistan and Iran living in Denmark. The migration histories of these three immigrant groups are quite different. Immigration from Turkey and Pakistan started in the late 1960s and the early 1970s, where men came to work as unskilled workers ('guest workers') in the Danish manufacturing industry. In 1973, Denmark tightened its foreign labour recruitment policy and introduced measures to reduce the influx of foreigners. This only left two major channels of legal entry to Denmark: family reunification and asylum (Bauer et al. 2004). Many of the male guest workers stayed in Denmark and brought their families to the country. Moreover, many of the children of Turkish and Pakistani guest workers have continued to find their spouses in their home countries (Schmidt & Jakobsen 2000). Since 2002 the immigration rules for family reunification have become even more restrictive and marriage migration from Turkey and Pakistan to Denmark has decreased (Schmidt et al. 2009).

Immigration from Iran began in the mid-1980s, when a large number of asylum seekers obtained residence permits in Denmark. Immigration flows from Iran were part of a more general increase in the number of refugees arriving in Denmark. In the latter half of the 1980s refugees generally came from Iran, Iraq, Lebanon and Sri Lanka, while the 1990s saw immigrants arriving from two new sources, namely from Bosnia-Herzegovina and Somalia (Pedersen & Smith 2001).

4 Data

For the present study, we use survey data collected by the Danish National Centre for Social Research in 2006 combined with administrative data. The 2006 survey includes 18-45-year-old immigrants from Turkey, Iran and Pakistan and native Danes. The distinction between immigrants and native Danes is based on Statistics Denmark's classification of the population into three groups: immigrants, descendants of immigrants and native Danes (Poulsen & Lange 1998). Statistics Denmark defines immigrants as foreign-born individuals whose parents are also foreign-born or have foreign citizenship. All the immigrants in this survey have arrived in Denmark before 2006. Roughly 4,050 individuals were selected for interviews – about 1,000 from each of the immigrant groups and about 1,100 native Danes. The sample was drawn as a simple random sample of individuals living in private households in Denmark from each of the four groups in the Danish Civil Registration System (CPR). The CPR has approximately 99.9% coverage of individuals living in Denmark and includes everyone who expects to stay in Denmark for at least three months. The data collection process consisted of telephone interviews supplemented by face-to-face interviews. The immigrants received two letters: one in Danish and one in either Turkish, Farsi or Urdu. Although the interview was to be carried out in Danish if possible, the questionnaire was translated into each of the three languages and interviewers speaking the relevant language were available to conduct the interview if necessary. This procedure has ensured that insufficient Danish language skills were not a barrier for participation. The survey period was from February to November 2006. The response rate for immigrants was approximately 52%. More specifically, the response rate was 40% for the Pakistanis, 55% for the Turks and highest for the Iranians (60%) cf. Deding, Fridberg & Jakobsen (2008). These response rates resulted in a collection of responses from 1,568 immigrants.

Education obtained abroad was measured in two ways in the survey: by years and by category. The latter was divided into five major groups: none, primary school, high school, vocational and advanced studies. The survey data are supplemented by data from administrative registers collected by Statistics Denmark. The registers are used to obtain information on two key outcomes of interest: educational attainment and labour market outcomes in Denmark. The levels of education in the survey were constructed to be comparable with the level and fields of Danish educations as recorded in the registers.

Educational attainment in the registers is recorded as the highest degree obtained in Denmark in 2005. If educational information is not available in 2005 (i.e. the year before the survey was conducted), e.g. because the immigrant was abroad at the time the register data were recorded, information from the previous year is used. Moreover, information on enrolment in formal education in a given year is also available, and if enrolled, the time of enrolment is recorded. Enrolment information is available in the present study from 1990 and onward. Years of Danish labour market experience are registered in the administrative data back to 1964 through compulsory payments to supplementary labour market pension funds. These data are therefore much more accurate than most data used for labour market experi-

ence which is typically calculated as approximations based on age and level of education. Labour market status is recorded as the longest held socio-economic position in 2006. Labour market status is used to measure employment status in a given year, where the employed consist of wage-earners and self-employed. The alternative consists of both unemployed and immigrants who are out of the labour force.

As the focus of this study is on attainment of Danish education, immigrants arriving after the year 2000 are excluded in order to allow some time for possible enrolment into an education in Denmark. Immigrants who arrive before the age of 18 are also excluded to allow for some time to obtain home-country education and to rule out young immigrants, who are required by law to enrol in the Danish education system. Observations with missing or invalid data for years since immigration and foreign education are deleted. Also, immigrants who have come to Denmark for other reasons than for family reunification or as refugees are deleted to rule out selection arising from economic migration. After these adjustments, the final sample consists of 761 immigrants among which 436 have arrived after 1990.

5 Econometric models

This section outlines the econometric models used to investigate the two outcomes of interest in our analysis, i.e. (1) immigrants' educational attainment in Denmark and (2) immigrants' labour market status in Denmark.

5.1 Part 1: Destination-country educational attainment models

Part of the migration literature considers the migration as an investment itself, and models pre- and post-migration education as joint decisions (e.g. Duleep & Regets 1999). Unlike this literature, which mainly focuses on economic migrants, we believe that when focusing on refugees and family reunifications, it makes sense to consider the post-migration educational choices as an independent choice, contingent on qualifications at the time of arrival.

Various options for the modelling of educational attainment are possible. We model the educational attainment process in two steps: First, we consider the choice of enrolment in further education. As outlined in the theory section, time since migration probably plays a crucial role for education decisions. Therefore, a duration model is used, which specifically accounts for time since migration. As described e.g. in Allison (1982), a discrete version of a duration model can be modelled using standard discrete outcome models such as the logit by creating person-period specific spell data.

Let y_{it} be a dummy for whether individual i has enrolled in further education in the t'th period after migration and let h_{it} be the hazard rate, i.e. the transition probability for enrolment in period t, provided that no enrolment has been observed prior to t. The likelihood for y_{it} can be written as:

$$(1) \qquad L_j = \prod_{i=1}^{n} \prod_{s=1}^{t_i} h_{is}^{y_{is}} (1-h_{is})^{(1-y_{js})} ,$$

where t_i is the observed time at which individual i experienced an event (in this case, enrolment in further education in Denmark), or the last period the individual is observed. This is a model that has been used in other studies of educational attainment (e.g. Ehrenberg & Mavros 1995; Ours & Ridder 2003). The hazard is modelled as a function of covariates using a logit specification:

$$(2) \qquad \log\left(\frac{h_{it}}{1-h_{it}}\right) = \alpha_t + W_i\pi$$

where α_t are year dummies for years since immigration. W is the set of variables used to explain destination-country educational attainment and include the following pre-migration characteristics: home-country education and home-country labour market experience, age at immigration, immigration status (refugee or family reunification to a spouse or parent),

gender, country of origin and whether the immigrant is from rural or urban areas in the country of origin to account for regional differences that are not captured by home-country education level and years of labour market experience. This could e.g. be differences in shares of qualified workers in local labour markets and in the quality of educational institutions.

In the second part of the analysis of the educational attainment process, we model completed level of education at the time of the survey by a multinomial logit. The outcome is divided into five levels of education: (1) primary school, (2) high school, (3) vocational training or (4) advanced levels of education, and (5) immigrants who have not taken any formal education in Denmark as a baseline category against which each of the remaining education categories is compared. The same set of variables that is used in the enrolment model is used in the completion model.

5.2 Part 2: Destination-country labour market attachment models

To investigate determinants of employment status in 2006, a logit model is used. A multinomial logit model has also been used to distinguish wage-earners from self-employed, and unemployed from immigrants who are not part of the labour force, but as they provided similar results with respect to the qualification variables (experience, education and language) we choose to present the simpler logit models. To investigate various hypotheses about the impact of the combination of destination and home-country skills, and the possible complementarity between language skills and education, we estimate a set of models, which adds different regressors of particular interest to a common base model.

I. The base model

The base model includes a set of regressors that is used in many studies of immigrant labour market attachment and which is included in all of our subsequent models. Importantly, the primary focus of the base model is to identify which qualifications the immigrant had with him/her upon arrival in Denmark, and what impact they have on employment status, when controlling only for other pre-migration characteristics and years since immigration. Therefore, we believe that the set of controls used in the base model with fair confidence can be taken as exogenous. More specifically, the regressors included in the base model are the same as the ones included in the analysis of completed education. The base set of regressors is denoted X, (which equals W in (2) plus years since immigrations) such that the model is specified as:

$$(3) \qquad \log\left(\frac{P_i}{1-P_i}\right) = X_i \pi^1,$$

The superscript "1" refers to the model number and P is the probability of being employed.

II. The destination-country language proficiency model

In the next model, we examine whether destination-country language proficiency works as a mediator for home-country education or as Chiswick & Miller (2003) put it: whether language is complementary to home-country education with respect to labour market status. Complementarity is defined as the case, where language proficiency increases the effect of home-country skills, independent of their separate effects, i.e. the presence of an interaction effect:

$$(4) \qquad \log(\frac{P_i}{1-P_i}) = X_i\pi^2 + \delta_1 L + \delta_2 Ed_{hc} + \delta_3 L * Ed_{hc},$$

where L is an indicator of good Danish language skills and Ed is a set of home-country education dummies (that are also included in the regressor set X). It is noted that interactions should be interpreted cautiously in non-linear models, see e.g. Ai and Norton (2003).

III. The destination-country qualifications model

The third model adds destination-country specific education and labour market experience to the base model:

$$(5) \qquad \log(\frac{P_i}{1-P_i}) = X_i\pi^3 + \tau_1 Ed_{dki} + \tau_2 Exp_{dki},$$

where Ed_{dk} and Exp_{dk} are destination-country education variables and labour market experience, respectively. When comparing this to the base set estimates, the base case can be interpreted as showing the total effect of home-country skills consisting of a partial effect running through destination-country skills (the effect measured by the τ_1's) and a direct effect in addition to destination-country skills (measured by the π^3's corresponding to home-country education). The three destination-country employment status models to be estimated are summarised in Box 1.

Box 1 Design of destination-country labour market attachment models

Models	Regressors
I. Baseline	Home-country education, home-country labour market experience, gender, country of origin, rural/urban area in country of origin, age at immigration, refugee or family reunification, years since immigration (YSM)
II. Destination-country language proficiency	Base + language proficiency dummy and interactions with home-country education
III. Destination-country qualifications	Base + destination-country labour market experience and destination-country education

A note of caution is in place. While we argued above that controls in the base model can be taken as exogenous, more caution should probably be taken when interpreting the partial

associations uncovered in model II and III as causal, as they are more likely to be subject to endogeneity biases. Nevertheless, for ease of exposition, the associations are discussed as effects, and potential biases are discussed and examined later.

6 Empirical results

6.1 Descriptive statistics

Table 6.1 contains the means for the main variables used in the analyses. The variables are divided into four groups: immigration characteristics, background characteristics, qualifications from the home and destination countries, respectively, and finally employment status in 2006.

Table 6.1 Descriptive statistics by country of origin. Means

Variable	All	Pakistan	Iran	Turkey
Immigration characteristics:				
Arrived before 1990	0.427	0.279	0.553	0.360
Arrived 1990-2000	0.572	0.721	0.447	0.639
Refugee	0.360	0.043	0.748	0.042
Family reunification, spouse	0.503	0.765	0.230	0.694
Family reunification, parent	0.132	0.191	0.020	0.250
Age at immigration	23.959	24.137	25.289	21.894
Years since immigration	14.766	13.322	16.003	14.093
Unemployment, year of arrival	8.477	8.366	8.501	8.527
Background characteristics:				
Woman	0.477	0.557	0.403	0.521
Iran	0.449	0.000	1.000	0.000
Pakistan	0.240	1.000	0.000	0.000
Turkey	0.311	0.000	0.000	1.000
From rural area	0.277	0.377	0.064	0.508
From a larger city	0.440	0.344	0.687	0.156
From a minor city	0.282	0.278	0.248	0.334
Speaks English well	0.173	0.191	0.248	0.050
Speaks Danish well	0.542	0.431	0.736	0.347
Home-country qualifications:				
No education	0.045	0.054	0.017	0.080
Primary education	0.389	0.426	0.175	0.669
High school	0.370	0.295	0.543	0.177
Vocational	0.061	0.049	0.091	0.029
Advanced	0.132	0.174	0.172	0.042
Experience (years)	1.833	1.393	2.442	1.292
Destination-country qualifications:				
No education	0.670	0.857	0.508	0.758
Primary education	0.052	0.060	0.008	0.110
High school	0.018	0.005	0.026	0.016
Vocational	0.095	0.032	0.157	0.055
Advanced	0.162	0.043	0.298	0.059
Experience (years)	4.306	3.373	4.095	5.330
Employed in 2006	0.615	0.541	0.650	0.621

Note: 761 observations.

The table shows that the general migration history described in section three is reflected in our sample: Turks have a longer history of migration to Denmark, while Iranians to a large degree have migrated following the Iran-Iraq conflict in the mid-1980s, and Pakistanis have migrated more recently. This is reflected both in the period of arrival and in the average years since immigration, being 14.50 years for immigrants from Pakistan, 15.85 for immigrants from Iran and 16.35 years for immigrants from Turkey. There are other notable differences between immigrants from Iran and from the two other nationalities. Turks and Pakistanis have typically migrated to Denmark to achieve family reunification, as opposed to Iranians, who are primarily refugees. This is also reflected by the larger share of Iranians being men, who generally have migrated at an older age and are from larger cities. The Iranians also have better English language skills and though they have stayed in Denmark for shorter time than e.g. many of the Turks, they are more affluent in the Danish language at the time of the survey.

The next set of variables describes human capital acquisition in the home and destination countries, respectively. It is observed that 43% of the immigrant groups considered here arrived in Denmark with at most primary schooling. 37% has a high school degree equivalent and 19% has further education, i.e. either a vocational or an advanced degree from their home country. The distribution of educational attainment obtained in Denmark is even more dispersed with two thirds who have not completed any schooling nor education and 25% who have completed further education. It is also observed that the immigrants generally have a very limited amount of labour market experience from their home country at the time of arrival.

Table 6.2 shows the joint distribution of foreign and Danish education. The table is to be read row-wise, showing the percentage of immigrants with a given level of foreign education, who have subsequently obtained a given level of education in Denmark.

Table 6.2 Combinations of pre- and post-migration levels of education (row percentage)

Education obtained prior to migration	Education obtained in Denmark					
	None	Primary	High school	Vocational	Advanced	N
None	0.571	0.200	0.057	0.086	0.086	35
Primary	0.791	0.091	0.010	0.078	0.030	296
High School	0.564	0.021	0.025	0.099	0.291	282
Vocational	0.745	0.000	0.021	0.128	0.106	47
Advanced	0.614	0.000	0.010	0.129	0.248	101
N	510	40	14	73	124	761

A number of interesting features can be observed from this table of educational combinations. The share of immigrants who does not obtain an education in Denmark is a bit higher for those with a vocational background or primary schooling. Among the immigrants with at least a high school degree, who have completed a Danish education, most complete an education at the tertiary level (i.e. either vocational or advanced). Immigrants with a post-

migration advanced level of education are typically those who had either a high school degree or an advanced degree from their home country at the time of arrival.

Those with a vocational or advanced degree were also asked about their field of education. Only two individuals (not shown in the table) completed a Danish education within both the same level and field of education as the education obtained prior to migrating to Denmark: One with a vocational degree (within trade) and one with an advanced degree (within the humanities). This is a stunning result and it indicates that the immigrants are not merely obtaining a Danish education in order to supplement already acquired skills, but rather that they reconsider their options and start anew. However, because of the limited number of observations in general and only very few observations within the same field, field of study is not included further in the analyses.

In table 6.3 the employment rates for groups of immigrants with different qualifications are reported. More specifically, table 6.3 shows employment rates for immigrants with a given level of home- and destination-country specific education and experience levels, as well as employment rates for immigrants who have a good level of Danish language.

Table 6.3 Employment rates for given level of pre- and post-migration qualifications

Home-country education		Destination-country education		Destination-country language	
None (reference)	0.457	None (reference)	0.524	Not good Danish (reference)	0.448
Primary	0.554**	Primary	0.641	Good Danish	0.757**
High school	0.689	High School	0.571		
Vocational	0.617*	Vocational	0.754**		
Advanced	0.640**	Advanced	0.910**		
Home-country experience		**Destination-country experience**			
0-2 (reference)	0.603	0-2 (reference)	0.378		
3-5	0.658	3-5	0.667**		
6+	0.632	6+	0.910**		

Note: 756 observations. Tests for significant difference to the reference group: ** p < 0.05, * p < 0.1.

Table 6.3 shows that 46% of the immigrants who arrive in Denmark without any education are employed in 2006. The corresponding figure is 55% for those with a primary education as the highest completed level in the home country. For all higher levels of education, the employment rates are substantially and significantly higher. A similar picture is seen with respect to the level of education completed in the destination country, although the differences are even wider, as the employment rate is 75% for immigrants with a Danish vocational degree and 91% for immigrants with an advanced degree. Large and significant differences in employment rates are also present for immigrants who possess good Danish language skills and immigrants who have more Danish labour market experience. Those with foreign labour market experience have slightly higher employment rates, but the differences are not statisti-

cally significant. Note that these differences are descriptive and do not account for differences in other pre-migration characteristics, e.g. years since migration and age at migration nor do they account for the interdependent effects of different groups of characteristics.

6.2 Part 1: Determinants of Danish educational attainment of immigrants

This section examines the determinants of Danish educational attainment of immigrants by modelling two different outcomes: First, the time from immigration till enrolment in further education in Denmark is modelled using a discrete duration model and second, completed education is modelled using a multinomial logit model. As information on enrolment is only available from 1990, we constrain the data to immigrants arriving after 1989 for this specific analysis. This limits the sample to 436 immigrants. Among the 436 immigrants arriving after 1989, 120 enrol in further education. The mean time till enrolment is 5.45 years for those who enrol.

The results from the estimated discrete duration models are presented in table 6.4 and they show that labour market experience from the home country does not influence enrolment in further education in Denmark. It should be mentioned that almost two thirds of the immigrants in this sample have none and the rest have only rather limited labour market experience from their home country. Home-country education, however, plays a large role for whether immigrants enrol in further education. Thus, having a high school or an advanced degree lowers the time from immigration till enrolment, compared to having no home-country education. The impact is 4.3 percentage point higher probability per year for those with a high school degree, and 6.1 percentage point higher probability per year for immigrants with an advanced degree of enrolling in further education. The impact of having a vocational degree from the home country is almost as large as the impact of having a high school degree, but it is not significant.

Table 6.4 Enrolment: Discrete duration model for time from immigration till enrolment in Danish further education. Marginal effects

	Estimate	Standard error
Experience, destination country	-0.001	(0.001)
High school, destination country	0.043**	(0.011)
Vocational, destination country	0.034	(0.022)
Advanced, destination country	0.061**	(0.018)
Woman	0.005	(0.007)
Iran	0.027**	(0.010)
Pakistan	-0.020**	(0.006)
From rural area	0.008	(0.009)
From a larger city	0.013*	(0.007)
Age at immigration	-0.003**	(0.001)
Refugee	-0.013	(0.009)
Family reunification, spouse	-0.025**	(0.011)

Note: 3,879 observations. Robust standard errors in parenthesis. Constant and time dummies included. Marginal effects presented as average 0-1 changes for dummies and marginal derivatives for other variables. * $p<0.1$; ** $p<0.05$.

Table 6.4 also shows that even for immigrants arriving as adults and when controlling for home-country experience and education, age at immigration still matters, the younger being more likely to enrol in an education in Denmark at all levels. Immigrant status also matters, in the sense that those whose immigration status is family reunification to a spouse are less likely to enrol in further education than the control group, which consists of those whose migration status is family reunification to a parent (not surprisingly). The refugees do not differ significantly from the control group. There are also significant differences across home countries and home regions, but surprisingly none between men and women.

Table 6.5 Completion: Multinomial logit model for completed destination-country education level. Marginal effects

	Primary	High school	Vocational	Advanced
Experience, home country	-0.008*	0.001	0.003	-0.007
	(0.005)	(0.001)	(0.003)	(0.005)
High school, home country	-0.010	0.022	-0.067**	0.210**
	(0.016)	(0.017)	(0.025)	(0.033)
Vocational, home country	-0.053**	0.009	-0.034	0.178**
	(0.007)	(0.026)	(0.033)	(0.078
Advanced, home country	-0.055**	-0.011	-0.019	0.335**
	(0.007)	(0.010)	(0.026)	(0.051)
Woman	-0.030**	0.004	0.028	0.010
	(0.012)	(0.014)	(0.022)	(0.028)
Iran	-0.026	0.036	0.071*	0.072
	(0.020)	(0.028)	(0.037)	(0.053)
Pakistan	-0.008	-0.015	-0.037	-0.033
	(0.014)	(0.009)	(0.032)	(0.047)
From rural area	0.021	0.018	0.051	-0.105**
	(0.016)	(0.022)	(0.047)	(0.032)
From a larger city	-0.003	0.005	0.101**	-0.067**
	(0.022)	(0.013)	(0.030)	(0.024)
Age at immigration	-0.019	-0.009	-0.022	-0.075**
	(0.018)	(0.008)	(0.022)	(0.028)
Age at immigration, squared/100	0.022	0.011	0.041	0.143**
	(0.035)	(0.014)	(0.044)	(0.054)
Years since immigration	-0.003	-0.015**	0.035**	0.058**
	(0.008)	(0.005)	(0.015)	(0.019)
Years since immigration, squared/100	-0.002	0.040**	-0.102	-0.135*
	(0.025)	(0.017)	(0.047)	(0.058)
Refugee	-0.039**	-0.020	-0.012	-0.062
	(0.013)	(0.0175)	(0.038)	(0.056)
Family reunification, spouse	-0.098**	-0.0290**	-0.047	-0.162**
	(0.020)	(0.014)	(0.031)	(0.042)

Note: 761 observations. Robust standard error in parenthesis. Constant included. Marginal effects presented as average 0-1 changes for dummies and marginal derivatives for other variables. * $p<0.1$; ** $p<0.05$. No completed destination-country education is the baseline category.

Table 6.5 presents the results from estimated multinomial models for completed education level in 2006. The results in the enrolment analysis are largely confirmed, in that home-country labour market experience does not matter for completion of education levels beyond primary schooling, whereas home-country education does. Home-country education mainly affects whether immigrants complete an advanced degree. The impacts are large: home-country high school, vocational and advanced degree raise the probability of having completed an advanced degree by 21, 18 and 33 percentage points, respectively (corresponding to re-

lative effects of 31, 27 and 47%, respectively). Age at immigration and years since immigration also significantly affect completion of an advanced degree, but at a marginally decreasing rate. In fact, the impact of age at migration turns positive after the age of 30, whereas the impact of years since migration stays positive, and is close to being constant, in the observed range.

6.3 Part 2: The impact of home and destination-country qualifications on the employment status of immigrants

In this section we investigate whether the combination of home and destination-country human capital matters for immigrants' employment status. Employment status is measured in 2006 to be able to utilise information on immigrant characteristics, especially language proficiency, from the survey. The descriptive statistics in table 6.1 showed that 61% of the immigrants are categorised as employed (either wage-earner or self-employed).

Table 6.6 shows results from three logit models for employment status, following the step-wise model design described in Box 1: Model I is a model with the base set of pre-migration characteristics, model II adds to this language proficiency and language proficiency interacted with home-country education and model III adds to model I destination-country qualifications.

Table 6.6 Employment status in 2006. Logit models for being employed. Marginal effects

	Baseline model (I)		Destination-country language proficiency model (II)		Destination-country qualifications model (III)	
	Estimate	Std.err.	Estimate	Std.err.	Estimate	Std.err.
Experience, home country	0.002	(0.005)	0.002	(0.005)	0.005	(0.005)
High school (HS), home country	0.109**	(0.042)	0.045	(0.056)	0.029	(0.039)
Vocational (Voc), home country	0.057	(0.072)	0.014	(0.108)	-0.030	(0.069)
Advanced (Adv), home country	0.125**	(0.050)	-0.018	(0.091)	0.053	(0.050)
Woman	-0.212**	(0.038)	-0.190**	(0.037)	-0.074**	(0.036)
Iran	-0.096	(0.060)	-0.149**	(0.056)	-0.008	(0.056)
Pakistan	-0.091*	(0.048)	-0.010**	(0.047)	0.019	(0.041)
From rural area	0.086**	(0.042)	0.059	(0.042)	0.083**	(0.039)
From a larger city	-0.018	(0.046)	0.004	(0.044)	-0.013	(0.041)
Age at immigration	-0.012**	(0.004)	-0.005	(0.004)	-0.007*	(0.004)
Years since immigration	0.006	(0.003)	0.003	(0.003)	-0.012**	(0.003)
Refugee	-0.030	(0.071)	-0.010	(0.070)	0.0491	(0.065)
Family reunification, spouse	-0.074	(0.054)	-0.042	(0.053)	0.014	(0.047)
Speaks Danish well (SDW)			0.192**	(0.052)		
SDW * HS, home country			0.057	(0.078)		
SDW * Voc, home country			0.019	(0.141)		
SDW * Adv, home country			0.122	(0.112)		
High school, dest. country					0.043	(0.100)
Vocational, dest. country					0.054	(0.055)
Advanced, dest. country					0.225**	(0.048)
Experience, dest. country					0.077**	(0.009)
Experience squared					-0.002**	(0.001)

Note: 756 observations. Robust standard errors in parenthesis. Odds ratios. * p<0.1; ** p<0.05.

To start with the base model (I), the table shows that country of origin matters as Pakistanis are less likely to be employed than are the Turks and Iranians. Immigrants from rural areas are more likely to be employed in Denmark, given their level of home-country qualifications. Age at immigration and being a woman are also significant, and both have a negative impact on employment rates, whereas immigration status is not significant. Finally, the likelihood of being employed increases with years since immigration, which in previous studies has been interpreted as a sign of assimilation, but the effect is small and insignificant[2]. It is worth mentioning though that without controlling for age at immigration, the effect of years since immigration is large and positive.

[2] A quadratic specification for both home-country labour market experience, age at immigration and years since immigration has been estimated for all models, including the following sections, but the quadratic terms have been left out where insignificant.

With respect to home-country qualifications, we see a similar picture as for the education models: even though the impact of home-country labour market experience is of the expected sign, it plays a limited role for the employment status in the destination country. The effect is both of a limited magnitude and insignificant. However, both immigrants with a high school degree and immigrants with an advanced degree from the home country are more likely to be employed, raising the probability by 11 and 13 percentage points, respectively. These are very large employment effects, and when compared to a baseline probability of around 60% they constitute relative effects of 18 and 22%.

The presented model can be thought of as showing the sum of effects of home-country skills with a direct impact on employment status as well as with an indirect impact working through the accumulation of destination-country qualifications. In the following we add different measures of destination-country qualifications to separate the direct and indirect effects from home-country qualifications as well as to gauge the independent impact of destination-country qualifications.

Columns four and five in table 6.6 show the results from the model where Danish language proficiency is included both separately and interacted with home-country education (model II). It shows that most coefficients are of the expected sign, i.e. that destination-country language proficiency generally improves the chances of being employed *and* that good destination-country language proficiency increases the effect of home-country education. The latter are, however, not significant.[3] The independent effect of good Danish language proficiency on the probability of employment versus non-employment is large and significant as expected. It is worth mentioning that a similar exercise has been conducted with English language proficiency. As many Danes and immigrants (especially Pakistanis) speak English reasonably well, good English language proficiency may open doors to the labour market. However, both the independent effect of English language proficiency as well as the interactions with home-country education are insignificant in the employment model.

Therefore, our findings do not support those of e.g. Chiswick & Miller (2003). In their analysis of Canadian data, they too find that destination language skills are an important factor in determining immigrant's labour market performance (measured by earnings in their study). In contrast to our study, however, they find a significant complementarity between language skills and both schooling and pre-immigration experience.

The results from Model III (cf. Box 1) including destination-country experience and education are presented in column six and seven of table 6.6. It is seen that Danish labour market experience clearly increases the probability of employment, but at a marginally decreasing rate. Destination-country education beyond primary schooling is positively related to the probability of being employed in most cases, but it is only an advanced degree in the destination country that is significant when the baseline variables are also considered. A destination-country advanced degree raises the probability of being employed by 22.5 percentage points (a relative effect of 34%). It is worth mentioning that this is a large effect, also relative to

---

3 We have examined the effects on predicted probabilities following Ai & Norton (2003) and the conclusions are the same.

Danes. For Danes of a similar age, the difference in employment rates (controlling for labour market experience and gender) between those with an advanced degree and those with at most primary schooling is only 11 percentage points or 15% in relative terms.

It is surprising that immigrants who complete a Danish vocational degree do not have a higher employment rate than immigrants with lower levels of Danish education (including none). First of all, an explanation partly comes from the fact that few immigrants (only 73) in our sample completed a vocational degree. Second, by further scrutiny it turns out that the missing impact of a vocational degree is "explained" by the level of Danish labour market experience. Hence, without controlling for Danish labour market experience, the effect of a vocational degree is much higher and resembles the difference in raw employment rates presented in table 6.3.

Table 6.6 also shows the indirect effect of *home-country* skills in the model (II) and (III) where destination-country qualifications have been added. It is seen, when compared to column two, that in both models, the indirect impact of home-country education is insignificant. In particular, the positive impact of having either a high school diploma or an advanced degree that was observed in model (I) is markedly smaller in model (II) and (III). These results lead us to conclude that education obtained in Iran, Pakistan and Turkey does *not* improve employment outcomes for immigrants from these countries once we have taken account of any formal education these individuals may have taken in Denmark. However, home-country education obtained in these countries improves the labour market attachment *indirectly* by increasing the probability of obtaining an advanced degree in Denmark.

As a final observation, we compare the effect of years since immigration across different specifications. From table 6.6, model (III) it is observed that the more years since immigration, the lower the chances of being employed according to this model. This could be interpreted in the way that because we are now controlling for both actual labour market experience and accumulation of Danish education, time spent in the country without skill acquisition is not productive in terms of increasing the chances of getting a job. Note that in comparison, the impact of years since immigration is positive in the models that do not control for Danish labour market experience and education, as found in many previous studies, but it is insignificant.

6.4 Robustness analyses

In this section we address two sources of bias potentially present in the previous analyses: (1) Whether omitted variables bias the estimated relationship between destination-country education and employment status and related to this (2) whether the results are robust to the exclusion of individuals who have poor health. It is not possible a priori to rule out that health, motivation, perseverance and other hard to measure factors affect both the decisions to take a Danish education and the chances of employment. This would create an endogeneity problem that would bias the results. To account for potential endogeneity of destination-country education directly we have estimated a bivariate probit model for the two dummy outcomes: employment and further education.

Table 6.7 Joint model for further education and employment. Bivariate probit. Probit coefficients

	Probit		Bivariate probit			
	Employment		Further education		Employment	
	Estimate	Std.err.	Estimate	Std.err.	Estimate	Std.err.
Experience, destination country	0.007	(0.017)	-0.008	(0.020)	0.010	(0.016)
High school, destination country	0.217*	(0.129)	0.539**	(0.145)	-0.014	(0.117)
Vocational, destination country	0.107	(0.225)	0.307	(0.275)	0.020	(0.208)
Advanced, home country	0.194	(0.172)	1.047**	(0.179)	-0.174	(0.150)
Woman	-0.635**	(0.109)	0.339**	(0.122)	-0.578**	(0.010)
Iran	-0.373**	(0.186)	0.559**	(0.218)	-0.463**	(0.171)
Pakistan	-0.202	(0.137)	-0.321*	(0.182)	-0.051	(0.128)
From rural area	0.219*	(0.128)	-0.276	(0.168)	0.109	(0.114)
From a larger city	-0.018	(0.135)	0.072	(0.134)	0.048	(0.125)
Age at immigration	-0.028**	(0.014)	-0.030*	(0.016)	-0.015	(0.012)
Years since immigration	0.003	(0.011)	0.068**	(0.013)	-0.024**	(0.010)
Refugee	-0.166	(0.213)	-0.073	(0.231)	-0.270	(0.191)
Family reunification, spouse	-0.130	(0.157)	-0.619**	(0.178)	0.075	(0.141)
Further education	0.882**	(0.141)			2.168**	(0.095)
Unemployment, year of arrival			0.049**	(0.023)		

Note: 762 observations. * p<0.1; ** p<0.05.

The results from the bivariate probit model are presented in table 6.7. Results from a standard probit model that does not account for endogeneity of further education are presented for comparison. Note that the results from the probit model are not directly comparable to the results from the logit model in table 6.6. First of all because a different model is used (but this should not affect results much), second because years of Danish labour market experience has been excluded from the probit model and third because Danish education is measured by a single dummy for any further education, i.e. vocational or advanced degree. The last two choices are both made out of a concern that all education variables as well as experience are endogenous, and because of the difficulty of handling several endogenous variables at the same time. Nevertheless, column two and three in table 6.7 shows that further education has a large positive and significant effect.

In the bivariate probit model, the effects of endogenous variables are identified by the non-linearity of the model (Wilde 2000). However, identification will in practice be improved if valid instrumental variables are utilised. The national unemployment rate in the year of arrival is used as an instrumental variable for further education. This is valid under the assumptions that the unemployment rate in the year of arrival is related to completion of further education and that it has no effect on employment status. While the former is testable, the latter is not. Even though there is some evidence supporting the latter, the so-called scarring effect, at least for natives, several studies have found it to be non-existent for immigrants' employment outcomes (e.g. Chiswick, Cohen & Zach 1997; Clark & Lindley 2006). Moreover, we find that the assumption is likely since the immigrants included in this analysis

have been in the destination country for at least six years and some even for thirty years. If we include the unemployment rate as a determinant in the employment equation, as is done in the scarring-effect literature, it has a small and insignificant effect.

In table 6.7 it is seen from the last row that the instrument has a positive and significant effect on further education as expected and as necessary for identification. Moreover, it is also seen that further education has a positive and significant effect on the probability of being employed versus non-employed. This confirms the story told above. We do not want to emphasise the magnitude of the estimated effects too much, as the method in general is data-requiring and we have a relatively small sample size. Notice though that by comparison to the probit coefficients, there is indication of an even larger effect, when accounting for endogeneity of further education.

Another source of bias might arise from the fact that some immigrants may have severe health problems which would limit both potential destination-country educational attainment and worsen their labour market situation. As a robustness check, we have excluded individuals who have some kind of health problem. 183 immigrants with various indications of poor health are deleted[4]. In this model, there are obviously fewer significant differences in both the multinomial logit for completed education and the logit for employment status. But the main message goes through: Home-country education has a significant positive impact on Danish educational attainment, but not on employment status. A difference is obtained in that home-country education does not matter for employment status, even when no controls for destination-country qualifications are included. Those with good Danish language proficiency or a Danish vocational or advanced degree or more Danish labour market experience are still significantly more likely to be employed than non-employed. These results are available upon request from the authors.

[4] More specifically, we remove individuals who receive sickness benefits or disability pension as well as individuals with an unidentified socio-economic position, either as registered in the administrative data or self-reported in the survey (147 observations), those who report they are not employed because of sickness (34 additional observations) and those who report that they have not been able to use their qualifications due to sickness (3 additional observations).

7 Discussion

Our analyses show that immigrants from Pakistan, Iran and Turkey have a higher chance of being employed if they arrive in Denmark with some form of education from their home country. In particular, immigrants with a high school degree or an advanced level of education prior to arrival have the best chances of employment. Pre-migration labour market experience, however, does not seem to be an advantage. Moreover, contrary to previous studies, we find no evidence that labour market attachment improves with years spent in the destination country, which is partly explained by a negative effect of age at immigration.

One hypothesis that was examined in the paper was that good language skills could act as a mediator of home-country education (cf. the approach taken by Chiswick & Miller 2003). However, our results do not support this hypothesis. Good language skills do have a separate positive impact on the probability of employment, but good language skills do not enhance the impact of other pre-migration education levels on labour market attachment.

Apart from good language skills, we find clear evidence that labour market experience in the destination country increases the chances of being in employment. Taking an advanced level education in the destination-country also increases the chances of employment, whereas education below this level does not, when Danish labour market experience has been taken into account. Interestingly, having taken account of potential destination-country labour market experience and education, the impact of years since immigration becomes significantly negative. This result can be interpreted as meaning that it is only "productive" time spent in Denmark, i.e. accumulating labour market experience or taking an advanced level education that will increase an immigrant's chances of employment. Time spent without accumulating measurable qualifications will, at best, not improve an immigrant's chances of employment, and at worst, may send negative signals to potential employers about, e.g. underlying productivity or motivation.

Our labour market model results suggest that there are two distinct types of successful immigrants: those who arrive in Denmark with a high school diploma and those who arrive with an advanced level education. These two groups are not only more likely to be employed compared with those arriving with no education, our education model results show that they are also significantly more likely to pursue an advanced education in Denmark. For those with a high school diploma, this can be seen as a natural extension of an initiated education path. For the other group, who already has an advanced level education from their home country, they may be more willing and able to pursue further education in Denmark because they have higher skills and more resources compared to less educated migrants. One explanation for this could be that advanced education differs more across countries than do other levels of education, thus making international transferability more difficult. Alternatively, it may also be the case that either they are more aware of the need for a Danish education a priori or that they experience the need sooner.

We examined whether the results were subject to specific biases by taking a potential non-random selection into destination-country education directly into account and by excluding immigrants with health problems. None of these analyses suggested that the main results are invalid. There are of course other potential selection issues in immigration studies and it is beyond the scope of a single study to address them all. For one thing, there is the problem of selective migration and re-migration. Selective migration describes the situation that it is a non-random population that succeeds in migrating to a given country. Re-migration might not be random either, and it has been postulated that mainly the most successful immigrants will re-migrate to their home-country or another country (e.g. Edin, LaLonde & Åslund 2000). A related problem is that the immigrants arriving in different years might have different characteristics (Borjas 1985). As our sample is a cross-sectional sample, conditioning on immigrants being observed in Denmark in 2006, we cannot account for neither the selective migration nor the re-migration problem and we cannot distinguish cohort effects from the effect of years since immigration. We argue that selective migration is likely to be of limited concern when considering refugees and family reunifications, as opposed to economic migrants. In addition, recent Swedish evidence suggests that re-migration rates are very low for non-OECD immigrants and that it does not bias assimilation results for this group of immigrants. As the nationality of immigrant groups arriving in Sweden broadly resembles the Danish experience for a large part of the period in consideration, we do not consider this to be a major problem in our study. Finally, previous studies tend to find that the effect of years since immigration is upwardly biased in cross-sectional studies (Borjas 1985, 1991). As the effect of years since immigration is negative in our study when accounting for destination-country qualifications, it is a conservative estimate of the *lack* of assimilation occurring when not accumulating specific skills such as destination-country language proficiency and formal education.

Another potential source of bias may arise from non-random non-response. The response rate used in the survey is relatively high by international standards. Yet, a previous study has documented that the response rate is particularly high for the well-educated and the employed (Deding, Fridberg & Jakobsen 2008). This implies that the relationship between destination-country education and employment is biased upwards. Even though non-response has not been addressed directly, we believe such a bias should have been reflected in the estimates that accounted for endogeneity of destination-country education, under the condition that the instrument is unrelated to any propensity for a higher response rates. However, a direct analysis of non-response bias has not been conducted.

A third source of potential bias stems from potential measurement error in variables from the survey, most importantly home-country education. This gives rise to attenuation bias in a setup where the measurement error is pure noise. It seems likely, though, that measurement error in self-reported home-country education especially pertains to low educated

immigrants who overstate their education. By construction this creates a negative correlation between true education and the error which mitigates the attenuation bias[5].

[5] For the purpose of illustration, we show this in a linear model with one regressor, and the bias will often be similar in more complex models. Let x^* be a covariate that is measured with a non-classical error as x. The linear model is: $y = \alpha + \beta x^* + u,\ x = x^* + e, \mathrm{cov}(e, x^*) < 0$. Then the OLS estimator of β has a bias equal to:

$$y = \alpha + \beta x + u - \beta e,\ \hat{\beta} = \frac{y'x}{x'x} \underset{p}{\rightarrow} \beta + \frac{\mathrm{cov}(x, u - \beta e)}{Var(x)}.\ |\ bias(\hat{\beta})\ | = |\ \frac{\mathrm{cov}(x^* + e, u - \beta e)}{Var(x)}\ | = |\ \beta(\frac{Var(e)}{Var(x)} + \frac{Cov(x^*, e)}{Var(x)})\ | < |\ \beta(\frac{Var(e)}{Var(x)}\ |$$

The last term is the absolute bias in the classical measurement error model.

8 Conclusion

We have found that home-country qualifications have no direct effect on labour market outcomes, once destination-country qualifications, i.e. language skills, labour market experience and formal education, are accounted for. Home-country education matters indirectly, though, by affecting destination-country educational attainment. With respect to destination-country qualifications, we find that language proficiency, labour market experience and an advanced degree have large, positive and significant effects on the probability of being employed. We find no evidence that destination-country language enhances the impact of home-country education on the probability of success in the labour market in the sense of Chiswick & Miller (2003). Finally, once we account for destination-country education and experience, the former positive (albeit insignificant) coefficient on years since immigration turns negative (and significant), indicating that time spent in the destination country per se does not in itself lead to better chances of getting a job.

9 References

Ai, C. & E.C. Norton (2003): Interaction terms in logit and probit models. *Economics Letters,* 80(1): 123-129.

Allison, P. (1982): Discrete-Time Methods for the Analysis of Event Histories. *Sociological Methodology*, 13:61-98.

Aydemir, A. & A. Sweetman (2006): *First and Second Generation Immigrant Educational Attainment and Labor Market Outcomes: A Comparison of the United States and Canada*. IZA Discussion paper No. 2298.

Banerjee, R. & A. Verma (2009): *Determinants and effects of post-migration education among new immigrants in Canada*. Canadian Labour Market and Skills Research, Working Paper No. 11.

Bauer, T.; C. Larsen & P.C. Matthiessen (2004): Immigration Policy and Danish and German Immigration. In T. Tranæs & K.F. Zimmeran (Eds.): *Migrants, Work and the Welfare State*. Copenhagen: Rockwoolfondens Forskningsenhed.

Becker, G. (1993): *Human Capital. A Theoretical and Empirical Analysis with Special Reference to Education*. Chicago: The University of Chicago Press, 3rd Ed.

Borjas, G. (1982): The Earnings of Male Hispanic Immigrants in the United States. *Industrial and Labor Relations Review*, 35(3):343-353.

Borjas, G. (1985): Assimilation, changes in cohort quality, and the earnings of immigrants. *Journal of Labor Economics*, 3(4):463-489.

Borjas, G. (1991): Immigration and self-selection. In Abowd, J.M. & B.R. Freeman (Eds.): *Immigration, Trade and the Labor Market*. Chicago: The University of Chicago Press.

Borjas, G. (2004): The economic analysis of immigration. In O.C. Ashenfelter & D. Card (Eds.): *Handbook of Labor Economics*. Volume 3A. Amsterdam: North-Holland, Elsevier Science.

Chevalier, A. (2003): Measuring over-education. *Economica,* 70(279):509-531.

Chiswick, B.R. (1978): The effect of Americanization on the earnings of foreign-born men. *Journal of Political Economy*, 86:897-921.

Chiswick, B.R. & P.W. Miller (1994): The determinants of post-immigration investments in education. *Economics of Education Review*, 13(82):163-77.

Chiswick, B.R. & P.W. Miller (2003): The complementarity of language and other human capital: immigrant earnings in Canada. *Economics of Education Review*, 22:469-480.

Chiswick, B.R. & P.W. Miller (2009): The international transferability of immigrants' human capital. *Economics of Education Review*, 28:162-169.

Chiswick, B.R.; Y. Cohen & T. Zach (1997): The Labor Market Status of Immigrants: Effects of the Unemployment Rate at Arrival and Duration of Residence. *Industrial and Labor Relations Review*, 50(2):289-303.

Clark, K. & J. Lindley (2006): *Immigrant Labour Market Assimilation and Arrival Effects: Evidence from the UK Labour Force Survey*. IZA DP No. 2228.

Cobb-Clark, D.; M.D. Connolly & C. Worswick (2005): Post-migration investments in education and job search: A family perspective. *Journal of Population Economics*, 18(4):663-690.

Deding, M.; T. Fridberg & V. Jakobsen (2008): Non-response in a survey among immigrants in Denmark. *Survey Research Methods*, 2(3):107-121.

Duleep, H.O. & M.C. Regets (1999): Immigrants and human capital investments. *American Economic Review*, 89:186-190.

Edin, P.A.; R. LaLonde & O. Åslund (2000): Emigration of immigrants and measures of immigrant assimilation: Evidence from Sweden. *Swedish Economic Policy Review*, 7(2):163-204.

Ehrenberg, R. & P. Mavros (1995): Do doctoral students' financial support patterns affect their time-to-degree and completion probabilities? *Journal of Human Resources*, 30(3): 581-609.

Ehrenberg, R.G. & R.S. Smith (1994): *Modern labor economics: Theory and public policy*. New York: Harper Collins College Publishers.

Ferrer, A. & W.C. Riddell (2008): Education, credentials, and immigrant earnings. *Canadian Journal of Economics*, 41(1):186-216.

Ferrer, A.; D.A. Green & W.C. Riddel (2006): The Effect of Literacy on Immigrant Earnings. *The Journal of Human Resources*, 41(2):380-410.

Friedberg, R.M. (2000): You Can't Take It with You? Immigrant Assimilation and the Portability of Human Capital. *Journal of Labor Economics*, 18(2):221-25.

Hartog, J. (2000): Over-education and earnings: where are we, and where should we go? *Economics of Education Review*, 19(12):131-147.

Hashmi-Khan, A. (1997): Post-migration investments in education by immigrants in the United States. *The Quarterly Review of Economics and Finance,* 37:285-313.

Jakobsen, V. (2004): Overeducation or Undereducation and Wages of Young Immigrants in Denmark. Chapter in: *Young immigrants from the former Yugoslavia, Turkey and Pakistan: Educational attainment, wages and employment.* PhD thesis, Department of Economics, Aarhus School of Business.

Nielsen, C.P. (2011): Immigrant over-education: Evidence from Denmark. *Journal of Population Economics,* 24(2):499-520.

Ours, J. van & G. Ridder (2003): Fast track or failure: A study of the graduation and dropout rates of PhD students in Economics. *Economics of Education Review,* 22:157-166.

Pedersen, P.J. & N. Smith (2001): *International Migration and Migration Policy in Denmark*. Working Paper, Aarhus University.

Poulsen, M.E. & A. Lange (1998): *Indvandrere i Danmark*. Copenhagen: Statistics Denmark.

Schmidt, G.; B.K. Graversen, V. Jakobsen, T.G. Jensen & A. Liversage (2009): *Ændrede familiesammenføringsregler. Hvad har de nye regler betydet for pardannelsesmønstret blandt etniske minoriteter?* SFI-rapport 09:28.

Schmidt, G. & V. Jakobsen (2000): 20 år i Danmark – en undersøgelse af nydanskeres situation og erfaringer, København: Socialforskningsinstituttet.

Spence, A.M. (1973): Job market signalling. *The Quarterly Journal of Economics*, 87(3):355-74.

Tubergen, F. van & H. van de Werfhorst (2007): Postimmigration investments in education: A study of immigrants in the Netherlands. *Demography,* 44(4):883-898.

Weiss, A. (1983): A Sorting-cum-Learning Model of Education. *Journal of Political Economy*, 91(3):420-42.

Wilde, J. (2000): Identification of multiple equation probit model with endogeneous dummy regressors. *Economics Letters*, 69: 309-312.

Dansk sammenfatning

Jacob Nielsen Arendt, Chantal Pohl Nielsen & Vibeke Jakobsen

Sammenhængen mellem medbragte og danske kvalifikationer og deres effekt på beskæftigelsesstatus

Dette working paper præsenterer ny indsigt i den økonomiske integration af ikke-vestlige indvandrere ved at undersøge, hvilken betydning hhv. danske og medbragte kvalifikationer har for deres arbejdsmarkedstilknytning i Danmark. Datagrundlaget er spørgeskemadata koblet til individbaserede registerdata for indvandrere, som er kommet hertil som voksne enten som flygtninge eller familiesammenførte fra Tyrkiet, Pakistan og Iran. I undersøgelsen ser vi nærmere på, hvordan indvandreres kvalifikationer påvirker integrationsprocessen i følgende to trin. Først undersøger vi, hvordan uddannelse og erhvervserfaring opnået i hjemlandet påvirker sandsynligheden for at påbegynde en uddannelse i Danmark, og for dem, der gør, hvilket niveau af uddannelse de opnår. I det andet trin ser vi på, om der er bestemte kombinationer af medbragte og danske kvalifikationer, der har positiv betydning for arbejdsmarkedstilknytningen.

Resultaterne viser, at medbragte kvalifikationer ikke har direkte indflydelse på arbejdsmarkedstilknytningen, når man samtidig har taget højde for de kvalifikationer, der opnås efter ankomsten til Danmark. Medbragt uddannelse har dog en indirekte indflydelse, idet den påvirker sandsynligheden for at tage en uddannelse i Danmark. Indvandrere, som har en gymnasial eller en videregående uddannelse på ankomsttidspunktet, har en større tilbøjelighed til at påbegynde og færdiggøre en videregående uddannelse i Danmark. Blandt dem, som endnu ikke har påbegyndt en uddannelse i Danmark, vil indvandrere med henholdsvis en gymnasial og en videregående uddannelse fra hjemlandet have 4 og 6 procentpoint større sandsynlighed for at påbegynde en uddannelse sammenlignet med indvandrere uden en uddannelse fra hjemlandet. Derudover har de to grupper henholdsvis 21 og 33 procentpoint højere sandsynlighed for at have færdiggjort en videregående uddannelse i Danmark i 2006 end indvandrere uden nogen medbragt uddannelse. Gode danskkundskaber, dansk arbejdsmarkedserfaring og en videregående uddannelse taget i Danmark har alt sammen store positive og statistisk signifikante effekter på sandsynligheden for at være i beskæftigelse. De indvandrere, der har taget en videregående uddannelse i Danmark, har 23 procentpoint højere sandsynlighed for at være beskæftiget end de indvandrere, der ikke har nogen dansk uddannelse. Gode danskkundskaber øger beskæftigelseschancerne for alle indvandrere uanset uddannelsesniveau. Men samtidig finder vi imidlertid, at gode sprogfærdigheder ikke i sig selv er nok til at forøge anvendeligheden af en *medbragt* uddannelse på det danske arbejdsmarked.

The Relationship between Pre- and Post-migration Qualifications and their Impact on Employment Status

This study investigates the extent to which home and destination-country qualifications explain employment status among non-Western immigrants in Denmark. The dataset used is a combination of survey and administrative data providing detailed information on home-country education, labour market experience and Danish language proficiency for Turkish, Pakistani and Iranian immigrants. Using logistic models, we find that home-country qualifications have no direct impact on employment status once destination-country qualifications have been accounted for. Home-country education matters indirectly by affecting destination-country educational attainment: Immigrants with a high school degree or an advanced degree are much more likely to enrol and complete an advanced degree in Denmark. Having obtained the latter significantly improves the chances of being employed, as do good Danish language skills and experience obtained in the Danish labour market. Interestingly, we do not find that good Danish language skills improve the usefulness of home-country education in terms of getting a job in Denmark.

AKF
Anvendt KommunalForskning