OVER-EDUCATION AMONGST THE CHILDREN OF IMMIGRANTS IN SWEDEN

Abstract
The main focus of the article is whether immigrants' descendants have the same occupational mismatch as immigrants, or whether their experiences reflect those of the population with Swedish-born parents. Register data for the entire population of Sweden for the year 2007 is used for a multivariate analysis. All employed individuals aged between 25 and 64 have been selected. The main results show that the descendant generation has lower levels of mismatch compared to the immigrant generation: the male descendant population shows higher odds of being over-educated, whereas the female descendant population does not significantly differ in this from Swedish-born individuals with two Swedish-born parents.

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1 Introduction

Since World War II, Swedish society has undergone profound changes in the areas of migration and integration. In this same time period, Sweden experienced positive net immigration to the extent that in 2007, Sweden's foreign-born population and their children constituted around 17% of the total population (Statistics Sweden Database). However, during this time, the labour market integration of immigrants dropped from being higher or at par with the native population to a native-immigrant employment gap of about 20%. A number of explanations for this employment gap have been suggested (e.g. Bevelander 2000; Bevelander 2011; Bevelander & Pendakur 2009; Bethoui 2006; Carlsson & Rooth 2007; Dahlstedt & Bevelander 2010; Nekby *et al*. 2008; Rooth 1999; Åslund & Rooth 2007; Scott 1999).

The question of how the children of immigrants fare in the labour market is becoming an increasingly urgent one in all immigration countries. Classical studies of the area include Chiswick (1978) and Borjas (1992, 1993). Studies of the labour market position of the descendants of immigrants are also emerging in the Swedish context (e.g. Schröder & Wilhelmsson 1998; Rooth & Ekberg 2003; Hammarstedt & Ekberg 2004; Bethoui 2006; Behrenz *et al*. 2007; Hammarstedt 2002, 2009; Andersson & Hammarstedt 2010; Hammarstedt & Palme 2012; Crul *et al*. 2012).

However, the occupational match, that is, the match between the educational level of the individual and the skill requirements of the job position, both of which are important for the individual and for society as a whole, have rarely been scrutinised in the context of the immigrant population. There are studies of the occupational match of the immigrant population but they are few (these studies will be shown in section 2). What is even more striking is that no studies have been conducted on the occupational match and mismatch of the descendant generation. This article tries to fill this gap in the research by investigating the occupational mismatch of the descendants in the labour market in Sweden. To be more precise, the objective is to investigate the probability of descendants of immigrants being employed at a lower skills level than their education stipulates (over-education). In doing this, it is relevant to compare the parental generation with those who are Swedish-born with two Swedish-born parents (referred to as the reference population). Moreover, most of the research on the descendant generations' labour market position is made by categorising descendants after the birth region of their parents (i.e. descendants of parents born in the Middle East, Asia and so forth, with Hammarstedt & Palme (2012) as an exception) instead of the specific country of birth of the parents (e.g. Iran or Poland). This article will therefore conduct an analysis on 12 specific country groups, that is, categorise the descendant generation after the parents' specific country of birth.

The article sets out to answer the following questions:
- Do descendants of immigrants have a lower occupational mismatch than their immigrant parents?

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- Are there differences in occupational mismatch between the reference population and descendants?
- Is there a difference in the occupational mismatch between those descendants who have one parent born outside of Sweden and those who have two parents born outside of Sweden?
- Does the country of origin of the parent affect the occupational match of his or her descendants?

The article makes use of register data for the year 2007 provided by Statistics Sweden in order to analyse the employed population between 25 and 64 years of age. A descriptive analysis is followed by a set of logistic regressions that control for a number of human capital-related variables. The advantages of using the register data include the highly reliable information about the core variables used (i.e. education, employment and skills level of the job) and the fact that the entire population of the studied groups can be analysed (both foreign-born and descendants born in Sweden).

This introduction is followed by a section on previous research, starting with a presentation of international research and concluding with research focusing on the Swedish labour market. The data and method are then presented and are followed by a presentation of the empirical results. The article ends with a concluding discussion of the results and a summary.

2 Theory and earlier research

In line with human capital theory (Becker 1964; Schultz 1961) stressing the importance of education for economic integration, this study analyses the over-education among the children of immigrants in Sweden. The basic idea behind the theory is that a higher skill and/or education level of the individual should in turn lead to better economic integration. However, skills and education are not perfectly transferable between countries, which could delay both labour market entrance and occupational match of immigrants relative to natives (Chiswick & Miller 2009). Since children of immigrants do obtain skills and education of the 'destination' country, they should have similar occupational matching levels as natives.

On the one hand, mismatch could be due to the individual choices of labour market entrants starting to climb the career ladder, or could also be a way of getting a foothold in the labour market in order to start a career (Groot & Maassen van den Brink 2000). From these perspectives, mismatch could be regarded as something temporary and something related to age. However, mismatch as a result of personal choice does not have to be temporary. There may be situations where an individual opts for a job for which he or she is over-educated, for monetary or other reasons (Sicherman 1991).

On the other hand, mismatch could be more or less forced upon the individual due to discriminatory practices and/or a devaluation of the individual's human capital, such as education. (Upon arrival in the new country an individual can still use the education but the education is valued less than in the country of origin. This means the individual need to upgrade the education in order to benefit fully from the education.) As discussed in Dahlstedt (2011), the migrant generation can be mismatched as a result of discriminatory practices or signalling problems (Chiswick & Miller 2009). Signalling theory (Spence 1973) stipulates that employers use the educational level of the workers as an indicator or a signal of the workers' productivity. In the context of labour market participation of immigrants this means that employers may find it difficult to interpret the signals

(educations) of migrant workers and thereby also find it difficult to decide the productive capability. This is something that should affect the immigrated generation but not the descendant generation since the descendant generation is more likely to have Swedish education.

Extensive research has been carried out on the labour market outcomes of immigrants' descendants in international migration research (for an early example see Child 1943; for more recent research see e.g. Borjas 1993; Portes & Rumbaut 1996, 2001; Crul et al. 2012). The picture painted in this research includes lower labour market participation, lower employment rates and lower wages compared to 'natives'. Van Ours & Veenman (2002) found that descendants in the Netherlands showed a lower level of labour market participation, and also that those who participated were less likely to have a job. Algan et al. (2009) found that in France, Germany and the UK, 'there is a clear indication that – in each country – labour market performance of most immigrant groups as well as their descendants is – on average worse than that of the native population, after controlling for education, potential experience and regional allocation' [Algan et al. 2009: 24. For Denmark see Skyt Nielsen et al. (2001); for France, Belzil & Poinas (2008); for the US, Chiswick & DebBurman (2003); and for Canada, Tu (2010)].

The labour market position of the descendant generation is weaker than that of the population with native-born parents, which Borjas (1993) suggests is in some respects due to inheritance: 'the wage of second-generation ethnic groups crucially depends on the wage of the first-generation national origin group' (Borjas 1993: 133).

Although a considerable amount of international research is available on occupational match and mismatch (see e.g. Bauer 2002; Brynin & Longhi 2009; Groeneveld & Hartog 2004; Groot & Maassen van den Brink 2000; Hung 2008; Kiker et al. 1997; Rubb 2003; Sicherman 1991), very few studies of mismatch are related to immigrants in the labour market, as stated in the introduction. Notable exceptions include Berggren & Omarsson (2001), Oscarsson & Grannas (2001, 2002), Bevelander & Lundh (2007), Green et al. (2007), Chiswick & Miller (2009), Dahlstedt (2011), Kalfa & Piracha (2013), Nielsen (2007) and Nordin et al. (2008). To my knowledge, no research has been conducted on the descendant generation in Sweden or elsewhere.

However, there is research focusing on other aspects of the labour market position of descendants to immigrants, such as unemployment, employment and wage levels. This points in a similar direction to that of international research. For example, Schröder & Wilhelmsson (1998) showed that the risk of Swedish-born youth being unemployed increased by a third if one of the parents was foreign-born. Hammarstedt (2002) showed that the descendants' wages were dependent on the parents' country of birth, and that the wage level was to some degree inherited from the parental generation. Hammarstedt (2009) also showed that differences in income were likely to occur after several generations.

A similar result can be found in Rooth & Ekberg (2003), who indicate that the labour market outcome depends on the parents' country of birth, where individuals with parents born in European countries (excluding Southern Europe) have a similar position in the labour market to those with Swedish-born parents. Individuals with parents from Southern European and non-European countries are more likely to be unemployed and have lower earnings. An additional finding is that for individuals with one Swedish-born parent, there is less likelihood of being unemployed compared to those with two foreign-born parents. According to Behrenz et al. (2007), most of

the differences in income can be explained by lower probabilities of having a job (Behrenz *et al*. 2007: 171).

There seems to be a certain amount of inter-generational transmittance between the parental and the descendant generation. Andersson & Hammarstedt (2011) found this to be the case with regard to self-employment, Hammarstedt & Ekberg (2004) found the same for participation in social assistance and unemployment benefits and Hammarstedt & Palme (2012) found it in earnings mobility. This means that when the parental generation experiences difficulties in the labour market, for example groups from Africa and the Middle East, the descendant experiences similar difficulties.

The findings from the studies that focus on the occupational match and mismatch of immigrants in the Swedish labour market points in a similar direction as the international research. These studies suggest that immigrants who are not working at a matching level are more likely to work at a level that is below their skills level (educational level), while natives are more likely to work at a level above their skills level (see Bevelander & Lundh 2007; Oscarsson & Grannas 2001, 2002; Andersson Joona *et al*. 2014). Dahlstedt (2011) has found that immigrants work at a lower skills level than their education stipulates to a greater extent than natives. At the same time, there are considerable differences between immigrant groups. Dahlstedt also found that the type of education is important: general education (education that does not lead to a vocational certificate) increases the probability of being mismatched compared to vocational education (education that leads to a vocational certificate).

Regardless of the cause of the mismatch, there is evidence of an income penalty for those working at a mismatched level (Kalfa & Piracha 2013; Nordin *et al*. 2008, Andersson Joona *et al*. 2014). This means that the individual does not get the right payback for the educational effort expended (the right payback for investments in the human capital). In this way, they do not have the same opportunities to make use of their educational level as those who are working on a level that is in accordance with their education.

To summarise the discussion, the descendant generation seems to have a weaker position in the labour market, with lower employment rates and wages. To a certain extent this depends on the descendant's parents' position in the labour market. What could be expected in terms of mismatch in the descendant generation is a rather difficult question, mainly due to the lack of research on mismatch among descendants. However, the research that has been done on the mismatch of the immigrant generation could give us some clues as to what to expect. For instance, it could be expected that descendants would have higher levels of mismatch compared to the reference population, but lower levels than the parental generation, due to education received in Sweden. Variations between different groups of descendants could also be expected, as well as differences relating to parental composition. The picture painted in the previous research also supports these expectations. In general, the descendant generation has a weaker labour market position than the Swedish-born population with two Swedish-born parents in terms of employment rates, unemployment rates and wages. On the other hand, the labour market position depends, to a certain degree, on the parent's position in the labour market (Hammarstedt 2002; Andersson & Hammarstedt 2011) and also where the parents come from (Rooth & Ekberg 2003).

3 Data & method

3.1 Population and variables

The statistical information used comes from the STATIV database provided by Statistics Sweden (SCB) for the year 2007. The studied population is the employed population between the ages of 25 and 64. At the age of 25, the majority of the population is likely to have graduated from university, and the official retirement age in Sweden is 65. The sample amounts to 3,595,292 individuals (1,833,423 men and 1,761,869 women).

3.2 Selection of groups

As already indicated, Sweden has had a positive net migration since the Second World War. During the period immediately following the war, and up to the beginning of the 1970s, labour migrants who were needed in Swedish industries dominated the migration. These migrants largely came from the Nordic and European countries. After the oil crisis in the 1970s, the labour unions put pressure on the government to discontinue its labour migration policy. As a consequence, labour migration came to a halt and was replaced by refugees and family reunion migrants [for an extensive discussion on the Swedish migration history see Lundh & Ohlsson (1999) and Svanberg & Tydén (2005)]. After the 1970s, people from Southern Europe and non-European countries dominated the migration.

The selection of groups has been governed by the size of the descendant generation, that is, the number of descendants between 25 and 64 who are employed and where information about the educational and occupational level is available. This means that the selection depends on the age distribution and the employment rate of the specific group.

This also means that most of the studied groups are those that first came to the country during the labour migration period or before, and that the majority of the chosen groups are European, since they have been in Sweden the longest and therefore have a larger descendant generation. More recently arrived groups would have been interesting to include, but due to the age distribution and the employment rate in these groups, this was not possible. Iraqi and Somali descendants can serve as an example. In these groups, only 1–2% are aged between 25 and 64 and employed (see Bevelander & Dahlstedt, 2012 for a discussion on the age distribution and employment rate among descendants). This means that there is a forced selection bias in the choice of groups, meaning that the studied groups have an age distribution and employment rate that is suitable for analysis in this article.

Groups such as the Finns, Germans, Danes and Estonians either pre-date the labour migration period or arrived during the labour migration period. Italians, Greeks and Turks also arrived during the labour migration period, as did the first wave of Yugoslavians. A second wave of Yugoslavians came during the Balkan War in the 1990s. The Polish group came during 1970s and 1980s. The Chilean migration to Sweden reached its first peak in the early 1970s and a second peak in the 1980s. These groups, together with UK migrants, all have a descendant generation that is large enough to facilitate an analysis of the occupational mismatch. The Indian group is also included in the study. Apart from being the most recent group, it is also the smallest (a total of 839 individuals).

In this study, the descendant generation is defined as individuals born in Sweden and having one or two foreign-born parents. There are two reasons for this. The first is to determine whether there is an effect from having one parent born in Sweden, and if there is, whether this is different if the father or mother is born in Sweden. The second is to ensure that there are enough individuals in each of the 12 studied descendant groups.

3.3 Variables

The dependent variable in the analysis is occupational match. This variable is calculated by using the Job Analysis method. The Job Analysis method relies on a systematic evaluation of the educational requirements for each job, undertaken by professional job analysts (Hartog 2000). An example is The International Labour Organization's International Standard of Classification of Occupations 1988 (ISCO 88). In this article, the Job Analysis is employed by using The Swedish Standard Classification of Occupations 1996 (SSYK 96). SSYK 96 classifies occupations in a hierarchical framework according to the type of work performed and the skill levels necessary for completing the work. SSYK 96 is connected to the national educational index (SUN2000) that classifies education according to level and type. These two indexes are divided into four levels, each of which is connected, as can be seen in Table 1. In this way, the proportion of the population working at a level that matches their education, the proportion working at a higher level (under-educated) and the proportion working at a lower level (over-educated) can be calculated.

The educational index SUN2000 is also used to distinguish between different types of education. At the secondary and university levels, it is possible to distinguish between general and vocational education (see Dahlstedt & Bevelander 2010; Dahlstedt 2011 for a discussion).

3.4 Regression models

In order to calculate the effect of belonging to a certain group and generation on the probability of being over-educated, a number of logistic regressions are made separately for the male and female population controlling for standard human capital variables. In the base regression (A), only the control variables age, age squared,[1] marital status, type of education, years since migration and years since migration squared are included. Age and age squared are continuous variables, as are years since migration and years since migration squared. Type of education and marital status are both categorical variables. A dummy variable has been created for both these variables.

The second regression (B) controls for belonging to a certain generation. The reference group is Swedish-born with two Swedish-born parents, with the immigrant generation set to one and the descendant generation set to two. In regression (C), the analysis is more detailed, in that the immigrant and descendant generations are divided into 12 specific country groups, with the same reference group as before.

Regressions (D) and (E) are created in order to see the effects of the parental composition. These regressions only include the descendent population with Swedish-born parents and the reference population. In regression (D), a variable is created that divides the studied country groups into two categories: two parents born in the specific country and one parent born in the specific country. Regression (E) measures the effect of having a mother and/or father born outside Sweden. In all the regressions, the dependent variable is over-educated (1) or not (0).

Table 1. Occupational match definition

Education (SUN2000)	Occupational level (SSYK 96)			
	Elementary occupations	**Low level workers**	**Technicians, associate professionals and lower managerial positions**	**Professionals and managerial positions**
Compulsory (1)	Match	Under-educated	Under-educated	Under-educated
Secondary (2)	**Over-educated**	Match	Under-educated	Under-educated
Post-secondary education <3 years (3)	**Over-educated**	**Over-educated**	Match	Under-educated
Post-secondary education ≥3 years (4)	**Over-educated**	**Over-educated**	**Over-educated**	Match

Note: The three digit level is used in both.
Source: Statistics Sweden

4 Empirical results

4.1 Descriptive statistics

In Tables 2 and 3, the over-education rate for the studied groups is shown divided by generation, gender and parental composition. The pattern visible for the immigrant generation is the same pattern as Dahlstedt (2011) showed, in that almost all immigrant groups have a higher over-education rate than the reference population. Only Finnish men and women and Turkish women have a lower over-education rate than the reference group. Another pattern that is recognisable is that women have higher over-education rates than men (Dahlstedt 2011).

As expected, there are considerable differences between the descendant groups. In the male population, the over-education rate spans from 13% (Denmark) to 25.6% (Chile), whereas in the female population, the span is from 18.2% (Denmark) to 32% (Chile).

Compared to the reference group, almost all descendant groups in the male population have higher over-education rates (except Danish and Finnish males). The same can be seen in the female population (with the exception of Danish, Estonian and Italian females) All other male and female groups have a higher over-education rate, which suggests that the descendent generation has a weaker position in terms of over-education rates compared to the reference group. This weaker position could be due to discrimination, but could also have other causes, such as differences in types of

Table 2. Proportion of over-educated in the employed population (age group: 25–64) by groups, gender and generation

	% Over-educated			
	Men	*Men*	*Women*	*Women*
Reference group	**14.6**		**19.0**	
	Immigrants	Descendants	Immigrants	Descendants
Chile	25.2	25.6	25.9	32.0
Denmark	16.3	13.1	20.7	18.2
Estonia	26.7	17.1	49.0	18.5
Finland	12.0	14.7	18.2	21.0
Greece	21.3	22.5	21.5	28.1
India	28.7	23.8	32.6	30.0
Italy	19.9	16.7	22.6	19.4
Poland	26.9	21.3	33.9	24.5
Turkey	18.1	18.4	14.4	20.7
Germany	21.1	16.5	25.8	20.0
UK	28.1	22.2	24.4	26.7
Yugoslavia	24.1	18.1	23.5	23.3
Other	30.1	17.0	32.1	20.6
Total	**15.9**		**20.2**	

Source: Statistics Sweden, own calculations

education and differences in the age composition of the groups (a younger population means more labour market entrants, which could mean a higher over-education rate).

In comparison to the parental generation the picture is somewhat different. Chilean, Finnish, Greek and Turkish descendants all have higher over-education rates than their respective parental generation, both among the male and female population, which is contrary to expectations. Among the female population, the UK descendants also have higher over-education rates than the parental generation. The remaining descendant groups all have lower rates compared to their parental generation.

Table 3. Employed Swedish-born generation by parental composition (age group: 25–64 years)

	% Over-educated			
	Men		*Women*	
	Two parents	**One parent**	**Two parents**	**One parent**
Sweden	**14.6**	–	**19.0**	–
Chile	26.1	25.0	32.1	32.0
Denmark	12.4	13.2	16.4	18.5
Estonia	18.7	16.7	17.6	18.7
Finland	13.9	15.1	20.5	21.2
Greece	23.5	21.3	27.3	28.7
India	23.3	23.9	42.3	27.0
Italy	15.0	17.0	13.0	20.2
Poland	26.2	19.7	28.5	23.3
Turkey	18.7	17.2	20.2	22.3
Germany	13.5	16.8	15.9	20.5
UK	18.8	22.3	36.9	26.4
Yugoslavia	19.0	16.6	22.0	25.1
Other countries	19.3	16.6	21.9	20.1
Father Swedish-born, mother foreign-born	15.8		20.2	
Mother Swedish-born, father foreign-born	16.3		21.5	
Both foreign-born	16.3		20.9	
Total	**14.8**		**19.2**	

Note: One parent born in the specific group means that the other is Swedish-born.
Source: Statistics Sweden, own calculations

In Table 3, the descendant generation is divided into gender, group and parental composition. As is the case with Table 2, there is no clear-cut pattern among the male population. Six of the studied groups (Chile, Estonia, Greece, Poland, Turkey and Yugoslavia) show the expected pattern of lower levels of over-education for those with one Swedish-born parent compared to those with two foreign-born parents. Among the female population, fewer groups (India, Poland, UK) show the expected pattern.

In the last rows of Table 3, the descendant generation as a whole is divided according to whether the mother or father is foreign-born. What is interesting here is that there is either only a small difference or none at all between those with two foreign-born parents and those with a foreign-born mother or father. The differences in the female population are even smaller.

4.2 Regressions

A set of logistic regressions have been made in order to control the findings from the descriptive analysis. The first set (A–C) is made in order to see whether there is any difference between the descendant groups and the reference group on the one hand and the immigrant generation on the other whilst controlling for a number of variables. The second set of regressions (D and E) is made in order to see whether there are any differences in the mismatch due to parental composition. These regressions are made separately for the male and the female population.

4.2.1 Belonging to a descendant group

In Table 4, regressions (A–C) are displayed for the male population. Regression (A) is a base regression with only control variables. In this regression, we can see that age reduces the risk of being over-educated, which means that the older a person is, the lower the risk. Having a general education also increases the odds of being over-educated.

In regression (B), a dummy variable is included in the regression to control for belonging to either the immigrant generation or the descendant generation. The descendant generation has statistically significant higher odds of being over-educated compared to the reference population, and on the other hand, has lower odds compared to the immigrant generation.

In regression (C), the immigrant and descendant variables have been split into the studied groups. In comparison to the reference population, two descendant groups show lower odds of being over-educated than the reference population, namely the Danish and Finnish groups. This was also visible in the descriptive statistics, where the Danish and Finnish groups had about the same or lower over-education rates than the reference population. In addition, we can also see that two groups do not differ significantly from the reference population, the Italian and Yugoslavian descendants.

Compared to the respective immigrant generation, all descendant groups display lower odds of being over-educated than the immigrant generation; this is according to the expectations.

In Table 5, the regressions (A–C) are displayed for the female population. In regression (A), we can see that age decreases the odds, and having a general education increases the odds. In regression (B), it is interesting to note that the descendant generation as a whole does not statistically differ from the reference population.

Table 4. Odds of being over-educated for male population (age group: 25–64 years)

	(A)	(B)	(C)	
	Exp(B)	Exp(B)	Exp(B)	
Age (1)	0.941***	0.934***	0.936***	
Age (2)	1.000***	1.000***	1.000***	
Married	1.083***	1.025***	1.022***	
General education	1.532***	1.439***	1.437***	
Years since migration (1)		1.018***	1.013***	
Years since migration (2)		0.999***	0.999***	
Reference Group		1.000***		
Immigrants		1.980***		
Descendants		1.046***		
			Immigrants	Descendants
Reference group			1.000***	
Chile			1.890***	1.297*
Denmark			1.444***	0.885***
Estonia			2.025***	1.299***
Finland			1.200***	0.941***
Greece			1.806***	1.275***
India			2.033***	1.480***
Italy			1.555***	1.040
Poland			2.033***	1.374***
Turkey			1.113**	0.868*
Germany			1.745***	1.128***
UK			2.119***	1.413***
Yugoslavia			1.769***	1.006
Other			2.241***	1.130***
Constant	0.929***	0.988***	0.957***	
(N)	1,833,423	1,833,423	1,833,423	

Source: Statistics Sweden, own calculations

When we split the generation variable into the different groups in regression (C), we can see that all descendant groups have lower odds than their respective parental generation, as could be expected from the results in regression (B).

Among the female descendant groups, the Danish, Finnish and Italian groups show statistically significant lower odds of being over-

educated compared to the reference population. In addition to this, four more groups - Chilean, Greek, Polish and German descendants – show no statistically significant difference compared to the reference group. In the descriptive analysis, the Danish and Italian descendants had lower over-education rates than the reference population. So, in the regressions controlling for other variables, it is interesting to see that the differences between the reference population and the descendant groups become less pronounced.

So far, the expectations discussed in the previous research seem to hold in general. In general, descendants have lower odds of being under-employed than the immigrant generation. As expected, there are also large differences between the studied groups. For the male population it also seems as though the expected results hold. Most of the descendant groups in the male population have odds of over-education that are higher than the reference group. In the female population, this does not seem to be the case. Here only four of the descendant groups show significantly higher odds of being under-employed compared to the reference group.

4.2.2 Parental composition

In this step of the analysis, the aim is to determine whether parental composition has any influence on the odds of being over-educated. By analysing the Swedish-born population, and dividing them according to their parents' country of birth, it should be possible to see how parental composition affects over-education while controlling for the standard control variables. In regression (D), the focus is on having one or two foreign-born parents from the studied groups, and in regression (E), the focus is on which of the parents is foreign-born.

In Table 6, the results for the male population are presented. The expected result would be that those with one parent born in another country would have lower odds compared to those with two foreign-born parents, but higher odds than the reference population. The first thing that needs to be noted is that there are a lot of insignificant results, which makes the analysis difficult. Among the descendant groups with significant results for both one and two parents (Denmark, Estonia, Finland and Poland), only Estonian and Polish descendants with two parents born in the respective country have higher odds compared to those with one parent born in the respective country. In the light of these results, and based on these numbers, we are unable to draw any (safe) conclusions from the analysis.

Turning to the last regression (E), the expectations in this regression are the same as in the previous, namely that those with two foreign-born parents would have the highest odds of being over-educated. This is not the case in regression (E), however. Here, those with a foreign-born mother and a Swedish father have the highest odds of being over-educated, closely followed by those with a foreign-born father and a Swedish mother. Those with two foreign born parents have the lowest odds of being over-educated; even lower than the reference population. In this sense, the results are contrary to what was expected.

In Table 7, the results for the female population are presented. Much of what we saw in the analysis of the male population is repeated in the female population. In regression (D), four descendant groups show significant results for both one and two foreign-born parents (Denmark, Estonia, Italy and Turkey), which means that also here, it is difficult to draw any conclusions. Out of these four groups, only Estonians show the expected results with higher odds for those with two foreign-born parents than with one foreign-born parent. Also,

Table 5. Odds of being over-educated for female population (age group: 25–64 years)

	(A)	(B)	(C)	
	Exp(B)	Exp(B)	Exp(B)	
Age (1)	0.896***	0.891***	0.890***	
Age (2)	1.001***	1.001***	1.001***	
Married	0.972***	0.942***	0.946***	
General education	1.320***	1.439***	1.254***	
Years since migration (1)		1.006***	1.006***	
Years since migration (2)		1.000***	1.000***	
Reference group		**1.000***		
Immigrants		1.775***		
Descendants		0.987		
			Immigrants	Descendants
Reference group			**1.000***	
Chile			1.447***	0.982
Denmark			1.578***	0.943**
Estonia			3.362***	1.117**
Finland			1.586***	0.974*
Greece			1.374***	1.062
India			1.583***	1.310*
Italy			1.382***	0.847**
Poland			2.517***	1.079
Turkey			0.634***	0.586***
Germany			1.688***	1.036
UK			1.555***	1.200***
Yugoslavia			1.297***	0.849***
Other			1.845***	1.013
Constant	5.337***	5.763***	5.825***	
(N)	1,761,869	1,761,869	1,761,869	

Source: Statistics Sweden, own calculations

in regression (E), the results are similar to those seen in the male population, with the lowest odds among those having two foreign-born parents, closely followed by those with a foreign-born father and a Swedish-born mother. Both of these groups have lower odds than the reference population. Again, the results are inconclusive for the female population and further studies are required.

Table 6. Regression of (D) on (E) and the odds of being over-educated for male population (age group: 25–64 years)

		(D)	(E)
		Exp(B)	Exp(B)
Age (1)		0.920***	0.919***
Age (2)		1.001***	1.001***
Married		1.035***	1.035***
General education		1.432***	1.435***
Both parents Swedish			1.000***
Father Swedish			1.066***
Mother Swedish			1.022***
No Swedish parent			0.995***
	Two parents	One parent	
Sweden	1.000***	–	
Chile	1.179	1.267	
Denmark	0.862*	0.883***	
Estonia	1.641***	1.241***	
Finland	0.841***	0.968*	
Greece	1.295***	1.153	
India	1.054	1.535***	
Italy	0.983	1.026	
Poland	1.748***	1.221***	
Turkey	0.796***	0.904	
Germany	1.006	1.142***	
UK	0.995	1.385***	
Yugoslavia	1.021	0.899*	
Other	1.200***	1.108***	
Constant		1.463***	1.473***
N		1,627,030	1,627,030

Source: Statistics Sweden, own calculations

Table 7. Regression of (D) on (E) and the odds of being over-educated for female population (age group: 25–64 years)

		(D)	(E)
		Exp(B)	Exp(B)
Age (1)		0.874***	0.875***
Age (2)		1.001***	1.001***
Married		0.954***	0.953***
General education		1.253***	1.255***
Both parents Swedish			1.000***
Father Swedish			1.027**
Mother Swedish			0.976*
No Swedish parent			0.893***
	Two parents	One parent	
Sweden		1.000***	
Chile	0.856	0.998	
Denmark	0.869*	0.946*	
Estonia	1.301***	1.099*	
Finland	0.877***	1.000	
Greece	0.967	1.049	
India	1.460	1.212	
Italy	0.607*	0.856*	
Poland	1.270**	0.989	
Turkey	0.505***	0.736**	
Germany	0.942	1.046*	
UK	1.284	1.156**	
Yugoslavia	0.741***	0.934	
Other	0.955	1.008	
Constant		9.073***	8.913***
		1,548,301	1,548,301

Source: Statistics Sweden, own calculations

5 Discussion and conclusions

The aim of the article is to study the occupational mismatch of the descendants of immigrants. This is done by analysing the mismatch for descendants in 12 different groups among the Swedish employed population between the ages of 25 and 64 years using register-based data from Statistics Sweden's database STATIV for 2007. The first question asked in this article is, do descendants have a lower occupational mismatch than their immigrant parents? The answer is a strong yes. When looking at the immigrant and descendant generations as a whole, there are significant differences among men and women. This result is also visible when the generations

are split into the 12 studied groups. This means that there is substantial evidence to suggest that, in terms of occupational mismatch, the descendant generation does much better than the parental immigrant generation. One possible explanation for this is that the descendants have obtained most of their education in Sweden and are thereby not affected by the devaluation of human capital (Chiswick & Miller 2009; Dahlstedt 2011) that their parents experienced when migrating. The descendant generation is also less likely to be affected by signalling problems since the education is obtained in Sweden. Descendants are also probably more fluent in the language and have a better knowledge of the labour market in Sweden; two factors that positively influence the mismatch, but this is something that have not been possible to control for in this analysis.

The second question posed in the article is if there are differences in occupational mismatch between the reference population and descendants. The answer is interesting. For the male population, the answer to the question is yes, because although there is only a small difference between the descendants and the reference group, it is nevertheless significant. For the female population, the answer is no. Looking at the descendant generation as a whole, there is no statistically significant difference in the odds of being under-employed between the reference group and the descendants. When controlling for the specific descendant group, the results show that only three of the twelve studied groups have odds that are higher than the reference group. The other groups have lower or non-significant odds. This means that there is no or very little difference between the female descendants and the reference group when it comes to the occupational mismatch. This result is both unexpected and positive, because it also means that female descendants do as well as the reference group. So, in terms of occupational mismatch, descendant females do better than descendant males as well as the reference group. Although this is a positive and unexpected result, it must be said that the female population as a whole has a higher level of mismatch than the male population as a whole, which opens up a less positive interpretation, namely that female descendants are 'integrated' into over-education.

The third question; does it matter whether one or two of the descendants' parents are born outside of Sweden, was a difficult question to answer. The descriptive analysis was inconclusive, which was also the case for the regression analysis. The analysis of the parental composition could be interpreted as parental composition having little influence on the occupational mismatch.

The answer to the fourth question concerning the parental country of origin is yes, there are major differences between the studied descendant groups, just as there are major differences between the immigrant groups. In this sense, it seems that the parents' country of birth affects the mismatch. This is a result that points to the importance of group specific analysis, also for the descendant generation. As noted in the discussion of previous research, most of the research on the labour market position of the descendant generation in Sweden has focused on the analysis of regional groups. The differences found in this particular study would not have been identified if the regional group method had been applied.

As stated in the previous research, both national and international research on the labour market position for the descendant generation shows that, in terms of employment rates and wages, descendants are worse off in the labour market than the native population (Algan *et al*. 2009; Belzil & Poinas 2008; Chiswick & DebBurman 2003; Hammarstedt 2002, 2009; Rooth & Ekberg 2003; Skyt Nielsen *et al*. 2001; Tu 2010). In this perspective, it is interesting to see that with regard to occupational mismatch, there is little (the male population) or no (the female population) difference between the descendant generation and the reference group (Swedish born with two Swedish-born parents). One possible explanation for this is that there is an initial penalty for descendants in terms of finding it more difficult to obtain employment. Such penalties could be due to discriminatory practices (Carlsson & Rooth 2007), a non-Swedish sounding name (Arai & Skogman Thoursie 2009) and signalling problems (Spence 1973). However, once inside the labour market, there is no or very little penalty (although there is a bigger penalty for male descendants than for female descendants). However, it must be remembered that the selection of groups in this study 'suffers' from a positive selection bias, which means that almost all the groups are European and have a long history in Sweden. Whether these results will hold in an analysis of more recent non-European groups has yet to be discovered.

From a policy perspective, it means that resources to improve the descendant generation's position in the labour market should be aimed at the recruitment process, since the results from previous research suggest that there is a penalty for the descendant generation in obtaining employment, that is, in the recruiting process. At the same time, this study suggests that once inside the labour market, fewer problems are encountered in obtaining employment at a level that is in accordance with the educational level of the individual. As seen in this study, and also in other studies of mismatch, the female population as a whole has a higher level of mismatch. This needs to be addressed both from a policy perspective and in research and questions asked as to why this is so and how it could be countered.

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Notes

1. Age squared and years since migration squared is added to the regression model in order to make the model more accurate. Adding the square of age and years since migration allows the model to predict the effect of age and years since migration even if it is a non-linear relationship.

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