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Following in your Father's Footsteps?

- Intergenerational Mobility and Ethnic Capital Among Second Generation Immigrants in Sweden

By

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Abstract

In Sweden, more than twelve percent of the population are foreign-born. Their contribution to the Swedish society is important. However, since many immigrants are having problems finding suitable work, relative to their education, Swedish society is not efficient in utilising immigrants' skills and knowledge. In this context it is interesting to see if the attained educational level, income and employment status are "inherited" to the immigrants' children. In other word, to measure intergenerational mobility and ethnic capital among first and second generation immigrants.

This study uses the theoretical framework developed by Gary Becker and George Borjas to measure the relation between second generation immigrants, their parents and ethnic belonging.

The findings of the study are that second generation immigrants are influenced to a large extent by their parents and ethnicity. This is especially true among the poorest. The results of this study have some important policy implications.

Keywords: second generation immigrants, intergenerational mobility, ethnic capital, economic theory, econometrics.

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1 Introduction

In 2005, more than twelve percent of the Swedish population were foreign-born (Statistics Sweden). Their contribution to the Swedish society is important. However, Sweden has not always been efficient in utilising immigrants' skills and knowledge. For instance, at the present a debate about highly-educated immigrants having to take unskilled work, or worse, being unemployed. Statistics from the Swedish Integration Board (2005) showed that, in 2005, about 80 percent of the native-born population between 20 and 64 years old were either employed or engaged in employment measures. The corresponding share for immigrants was 64 percent. The difference could be explained with non-transferable education and lack of country-specific human capital. An example of the latter is poor knowledge of the Swedish language.

However, one would expect that the differences between immigrants and natives will fade away, as their children and grand-children grow up. If the convergence will take few or many generations depends on the intergenerational mobility. To give an example, if children attain the same length of education or income as their parents, intergenerational mobility is low. Conversely, if there is a great divergence between children and their parents, intergenerational mobility is high.

One way to illuminate this is to measure the correlation between the income of the fathers and the sons. A high (low) correlation is the same as low (high) intergenerational mobility. If, for instance, the correlation is 0.4 and the father earns one quarter of the national average, it would take three generations before the initial difference disappeared. However, if the correlation is 0.6, it could take up to six generations before all would be expected to have equal income.[1]

In regards to immigrants, if foreign-born work experience gives disadvantages relative to natives and intergenerational mobility is low, it will take many generations before the gap disappears. A high intergenerational mobility is therefore desirable to quickly remove any initial inequalities. Inequalities that are persistent between generations are not only devastating for particular individuals, it could also be damaging for the entire society. By not giving equal chances to all individuals, their competence could be lost, which could be valuable for the society.

[1] Example taken from Mazumder, 2005, p. 235

Furthermore, persistence of inequality could also be affected by ethnic belonging. It is for instance possible that other relatives than parents influence the childhood and choices in life. This will be further explained in section 3.4.

1.1 Aim and purpose

The aim of this study is to analyse what influences the socio-economic outcome for second generation immigrants (individuals with one or two foreign-born parents) in Sweden, using an economic framework. In other words, to measure the importance of intergenerational transmission and ethnic capital with different econometric techniques, described in sections 6.1 and 6.2.

1.2 Material and Method

The material used in this study consists of three parts: literature covering the relevant economic theory; articles measuring intergenerational mobility and ethnic capital; a dataset used in the econometric estimations. This aims to give the theoretical background for this study and to compare the results from the estimations of this study with previous research.

The econometric method used in the study is straightforward and in line with other studies analysing intergenerational mobility and ethnic capital. This will be further explained in chapter six.

1.3 Definitions

To avoid confusion, some definitions are appropriate. To begin with, all children in this study are Swedish born. However, they differ in regards to the origin of their parents; *Swedish native* refers to someone whose both parents are Swedish-born and *second generation immigrant* refers to someone who has one or two parents that are foreign-born.

Furthermore, intergenerational mobility refers to the link between a parent and his/hers child, also known as parental capital. For instance, correlation in annual income between the fathers and the sons. Ethnic capital depicts the relation between the average of an ethnic group (parent generation) and a child originating from that particular group. In other words, to measure ethnic capital is to first calculate the average of the parent generation, in each ethnic

group, and then calculate the correlation between these averages and the children's outcome. These concepts will be more technically described in chapter six.

The outcome variables, income, education and employed versus not employed, are referred to as outcome variables.

Finally, the relation between generations is also referred to as intergenerational transmission. Thus, high intergenerational transmission implies low intergenerational mobility and vice versa.

1.4 Limitations

Due to the construction of the data, only fathers and sons will be considered in this study. The reason for excluding women is that women's labour-supply generally is less and more variable than men's labour-supply. Hence, by only looking at men, who are more established in the labour-market, the comparison between generations in regards to labour-market outcomes, becomes more valid.

1.5 Plan of the Study

Chapter two will present a short overview of migration to Sweden. The third chapter will describe the theoretical framework used in the essay. Chapter four surveys previous studies on the subject. This will later enable a comparison between my results and those of others. Chapter five describes the dataset used in this study. The sixth chapter describes the econometric models and the results are presented in chapter seven. Finally, chapter eight concludes the study with summary and conclusions.

2 Migration in Sweden

The objective of this section is to give a short description of migration to Sweden with emphasis on the period relevant for this study[2]. That is, the mid-1960s to the mid-1980s (the period during which the immigrants studied in this thesis moved to Sweden) in which more than 800,000 moved to Sweden (Statistics Sweden).

From the mid 19th century up to the mid 1930s, emigration was larger than immigration. However, from the 1930s to present, with the exception of a few years in the 1970s, immigration has been larger than emigration. The motives for immigrating to Sweden have changed over the years; after the Second World War, immigrant labour dominated. The main reason for this was the Swedish industry, which had not been damaged by the war and was in great need of labour. The need for labour, together with a liberal view of immigration, lead to increased immigration. For instance, people moved to Sweden from Italy and Yugoslavia. In addition, the newly formed Nordic Common Labour Market had a positive effect on immigration. Implemented in the 1950s, it entitled Nordic citizens to freely settle and work within the Nordic countries. The most significant inflow was the 80,000 individuals who moved from Finland to Sweden during the years 1969 and 1970 (Heikkilä et al p. 5). In total, during these two years some 140,000 individuals moved to Sweden. That is, more than half of all immigrants came from Finland.

The worldwide economic depression after the oil crisis in the 1970s, reduced the need of labour and hence immigration to Sweden. In addition, immigration policy for non-Nordic citizens became more restrictive, further decreasing immigration.

Instead of work related immigration, refugee immigration became more frequent. During the 1980s and 1990s, a number of international incidents influenced immigration to Sweden. To give a few examples, the fall of the Soviet Union made it possible for people to move more freely and the civil war in Yugoslavia lead to a stream of immigrants. During the civil war in Yugoslavia, immigration peaked in 1994 at some 84,000 individuals, leading to a net inflow of 51,000 individuals (Statistic Sweden).

Furthermore, also notable is that residence permits, on the grounds of family ties, are very common. Unfortunately statistics are only available from 1980; however, it showed that between 1980 and 1985, more than 50 percent received residence permit on the grounds of family ties (Swedish migration board).

[2] The content of this section is based on “History of the Swedish Migration”, found on the webpage of the Swedish migration board.

3 Theory

The purpose of this chapter is to present the theoretical framework concerning intergenerational mobility and ethnic capital. Later in this study, empirical applications of these theories will be presented.

The economic theory of intergenerational mobility is used to model the relationship and transfers between two generations. In short, one outcome variable (e.g. annual income) is observed for the two generations and then compared. More formally, equation (3.1) is estimated.

$$Y_t = \alpha + \beta Y_{t-1} \tag{3.1}$$

To continue the example of annual income, Y_t is the annual income of the second generation (a son or a daughter) and Y_{t-1} is the annual income of the first generation (a parent). α is a constant reflecting the average increase or decrease between the generations and β measures the relationship between the generations. If the relationship is strong, β will be statistically significant and relatively large. In the contrary case; β will be small and perhaps even not statistically significant if there is a small or no relationship between the generations.

To better understand the background this relationship, other, more fundamental economic theories can be used; namely, Gary Becker's and Jacob Mincer's contribution to human capital theory and Gary Becker's unitary family approach. Furthermore, there are the theories concerning ethnic capital, which could be viewed as an indirect and additional channel of influence.

In this section, the basic theories will be presented briefly. This will be followed by a description of the more specific theories regarding intergenerational mobility and ethnic capital. Other, non-economic factors will also be presented.

3.1 Human Capital

The notion of a positive relationship between human capital investments (for instance in schooling or on-the-job training) and labour market outcomes (for instance earnings or type of job) is straightforward. It is for instance intuitive to believe that an individual with a master

degree faces more lucrative job opportunities than a person who starts working after high school.

In order to formalise this relation, Jacob Mincer introduced an earnings equation (3.2)[3]. The equation makes it possible to measure the relationship between earnings and human capital investments.

$$\log Y_t = \log Y_{t-1} + rI_{t-1} \tag{3.2}$$

In this simple form $\log Y_{t-1}$ and $\log Y_t$ represent the natural logarithm of earnings in time t and $t-1$, respectively. I_{t-1} is the investment in human capital at time $t-1$ and r is the rate of return on human capital investments. Usually, the rate of return is assumed to be diminishing (Polachek et al. 1993, p. 50). That is, human capital investments will after a certain point no longer be profitable as costs then outweigh benefits.

It should be stressed that t could correspond to a number of time-periods. It could be years or months as long as it considers one specific person. In order to use this equation for more than one generation we need theories combining children with their parents.

3.2 The Unitary Family

"On the topic of Economics of the family" by Gary Becker (1993, p 278) is an often cited work in regards to economy of the family. By introducing a unitary model of family decision-making it became possible to use only one utility function instead of one for every family member. It is assumed, in the model, that there is one family leader who distributes wealth and thereby utility within the family. Gary Becker (1993, p. 278) modelled a utility function comprising one parent and one child.

$$\text{Max } U_p = U[Z_1, Z_2, ..., Z_n, \psi(U_c)] \tag{3.3}$$

U_p and U_c are the parent's and child's utility, respectively. Z represent commodities[4] and ψ is a weight (positive) the parent puts on its child's utility. This model could also include

[3] All the equations in this section originate from the human capital literature; see for instance Polachek et al 1993. However, the notation is somewhat changed to become more coherent.

[4] In the unitary model developed by Gary Becker, utility does not come from market goods directly. Instead, market goods combined with work effort, by the family members, produces commodities that yield utility.

more children and more than one parent. However, given that a member, usually a parent, makes all the important decisions or that there is consensus about the family utility function between the parents, the family can still be analysed using this unitary model.

In this altruistic model there is a number of ways a parent can alter the child's utility. It could be through transfer of money or clothes and food. Another possibility is long-term transfer such as paying expenses for school. The size of the actual transfer is affected by the size of ψ. That is, a higher value of ψ, leads, ceteris paribus, to increased transfers.

However, the transfers are constrained by the household's total income, usually consisting of the parents' income. In other words, when solving (3.3) for the transfers to the child, subject to the family budget constraint, transfers will be dependent on a number of factors presented in equation (3.4)

$$Ts_n = Ts(I_h, Siblings, Cost_{school}, ...,) \tag{3.4}$$

Ts_n represents[5] transfers devoted to schooling for child n. Firstly, the overall household budget (I_h) will probably influence the amount transferred. That is, a household with higher income, ceteris paribus, could transfer more compared to a household with low income. Secondly, the number of siblings, $Siblings$ in equation (2.4), will probably have a negative effect on transfers to each child since more children, ceteris paribus, further constrain the household's budget. Thirdly, the cost of schooling $(Cost_{school})$, such as tuition fees and books, will probably affect the amount transferred. For instance, if the tuition fees are very high transfers originally devoted for schooling could be rerouted to other, non-school related transfers, such as clothing.

3.3 Intergenerational Mobility

To measure the relationship between a child and its parents, that is, intergenerational mobility in various dimensions such as earnings, education etc, a third equation can be constructed. By combining the two equations above, Becker and Tomes (1986, p. S2) constructed a direct relationship between the earnings of the child and those of the parent(s).

[5] Transfers are assumed to be a non-inferior good.

$$Y_t = \alpha + \beta Y_{t-1} + \varepsilon_{t-1} \quad (3.5)$$

The equation (3.5) is similar to equation (3.2). Instead of I_{t-1} the investment in human capital is dependent on the parents' income. This relationship was presented in equation (3.3) where the transfer from parent to child was influenced by the parent's income. α is a constant reflecting the average difference between two generations and ε_{t+1} is the error term. The error term could include market luck or endowment, which randomly affects the child's income (Solon, 1999 p. 1764).

Intergenerational income mobility is measured by β. If β is equal to one economic inequality will persist over generations. For instance, if the parent's earnings are in the top ten percentile the child's earnings will also be in the top ten percentile. A β greater than one would correspond to a widening of earnings inequality, often referred to as regression away from the mean. That is, economic inequalities will not only persist, they will grow over time. Conversely, if β is smaller than one (regression towards the mean) economic inequalities will decrease and eventually disappear.

The size of β is primarily an empirical question. It is, however, possible to theorise about its magnitude. As stated by Polachek and Siebert (1993, p. 51) a classless society would be accompanied by a high intergenerational earnings mobility, that is, a small β.

Furthermore, even in a society with persistent class differences some regression towards the mean is expected. Firstly, even if it is the parent solely who funds the child's education there is only so much human capital investment one can get. That is, given that the rate of return to investments in human capital is decreasing there will be no economic rationale for further investments after a certain point. Instead, transfers shift to other types of transfers and capital, and thus, regression towards the mean in market earnings are expected.

Secondly, even if ability is inherited it is not likely that inequality can persist. Nicholas (1993) used a similar approach when he analysed Entrepreneurial performance in Britain. He discovered a clear tendency for regression towards the mean in respect to ability across generations. Even though his study concerned nineteenth and twentieth century Britain the same is probably the case today.

3.4 Ethnic capital

As stated above, parents have substantial influence over their childrens' human capital investments and earnings outcomes, but other factors are also important. The importance of your surroundings is a well-established fact amongst sociologists (Coleman 1998, p. S95). For instance, siblings and friends could be of importance when a child makes a decision.

Coleman (1988) introduced the notion of social capital and its importance in respect to human capital. By social capital he emphasised the importance of social structure and norms. For instance, there could be norms or role models in a particular group which encourage higher education. This is why ethnic capital is similar to externalities. There is also a component of a public good. Ethnic group could for instance make it easier to spread information about job vacancies. That is, it could be costly for one individual to gather the information, but almost costless to spread it to your friends and family.

Borjas (1992) used the approach of ethnic capital when analysing children to immigrants. The rationale behind was that earnings differences between ethnic groups tended to persist over generations. They where not fully assimilated (Borjas 1992, p. 123). To account for ethnic influences he used an extended model of intergenerational earnings mobility which controlled for ethnic background.

$$Y_t = \alpha + \beta_1 Y_{t-1} + \beta_2 \overline{Y}_{t-1} + \varepsilon_{t-1} \tag{3.5}$$

Here, $\overline{Y}_{t-1}$ has been added to equation (3.4). $\overline{Y}_{t-1}$ is the average human capital of the ethnic group and β_2 is the coefficient measuring the effect of this ethnic capital. Clearly, if ethnic capital influences the child to a large extent β_2 will be statistically significant and relative large. To distinguish between correlation with parent and with ethnicity, parental influence is referred to as parental capital and ethnic capital is used for the influence of ethnicity.

3.5 Non-economic factors

The theory presented above is purely economic in the sense of only considering parents paying for their child's education. Even though this approach is straightforward, other explanations for intergenerational mobility and ethnic capital may be relevant. In relation to education other issues than economic ones probably influence the child's education. In a

Swedish context with free universities and access to favourable study loans, earnings of the parents might not seem that important. Instead, as stated by Oreopoulos (2004, p. 35) “more educated parents may have more favourable attitudes towards school”. This argument is convincing in the Swedish case where study loans are available. In addition, more knowledge by a parent could be relevant for the child’s education. To give a simple example; parents with more education, ceteris paribus, should be able to help their child with the homework.

Furthermore, as noted by Borjas (1992, p.145), it is possible that ethnic capital measures discrimination such as lack of access to school or other institutions.

4 Empirical Background

A number of studies have been conducted to measure intergenerational mobility and ethnic capital. It is out of the scope of this essay to cover them all. However, the most influential and relevant for this study will be mentioned. Furthermore, as this study concerns a Swedish dataset emphasis will also be put on studies conducted on Swedish data. A more extensive survey could be found in Corak (2006). It should also be noted that there is no consensus on how intergenerational mobility and ethnic capital should be measured. By looking at the theory, measuring income mobility seems to be appropriate. However, other variables such as education can also be used.

When measuring intergenerational mobility of income it is often expressed in terms of elasticity. That is, the income of the first and the second generation is measured in logarithms. If, for instance, the elasticity is 0.5, a twenty percent increase of the parent's income will raise the child's income by ten percent. In other words, half the increase is transferred.

Since intergenerational mobility has been studied for quite some time, methodology has developed. This has lead to a revision of the results from previous studies. This is further explored in the next section. Other than that, different studies do usually come to similar conclusions. However, in relation to quantile regression there is a divergence.

Furthermore, since the dataset used in this essay (see section 4) only includes men, the results in this chapter emphasize on studies using male participants.

4.1 Methodological Issues

Some methodological concerns have been raised towards early studies. Firstly, there is the matter of obtaining an estimate of long run earnings. By only using a single year, there is a risk of bias due to fluctuations (see for instance Solon, 2002 p.60). There is no problem if these fluctuations influence all subjects equally. However, this is usually not the case. For instance, one individual might be temporarily unemployed whereas another receives a large bonus. Apparently, if this single year is used, the estimate could be a poor estimate of long-run earnings.

Secondly, earnings should preferably be measured at the same age. It should not be measured in the beginning of an individual's career. For instance, future high-income earners might not have finished their education and hence not started their careers (Solon 2002, p.

60). Finally, early studies used homogenous samples. For instance, only certain ethnic groups or regions were studied. While it is possible that intergenerational mobility is high within this particular group, it could still be low relative to that of the entire population (Solon, 1989, pp. 173-174).

4.2 Intergenerational Mobility

A survey of empirical studies made by Becker and Tomes (1986) showed a low intergenerational elasticity of only 0.2. This indicates that advantages and disadvantages in earnings would quickly be wiped out. They concluded that regression towards the mean would be achieved in just three generations (Becker and Tomes (1982, p. S30). As mentioned above, these results were later contested. It should also be noted that the studies surveyed showed great variation with results ranging from zero to unity (Becker and Tomes, pp. S26 and S30).

Solon and Mazumder found a much higher intergenerational elasticity. Solon (1992) used a national sample in which he used a five year average for the father's income and found an elasticity of 0.4 between father and son. Mazumder (2005) used another approach. Instead of only using one parent (usually the father), he pooled the parents' income and found an elasticity of 0.6. As a consequence, the previous idea of high mobility between generations did no longer seem to be valid.

4.3 Ethnic Capital

The research on ethnic capital is an extension of that on intergenerational mobility. In a way intergenerational mobility studies controlled for ethnicity, as they usually only contained one ethnic group, natives. To control for ethnicity, the average skill of the ethnic group, is simply added. Further, ethnic group is often defined as country of origin.

Borjas (1992, pp. 137-138) found that ethnic capital did influence the outcome of the child, namely its income and education. The magnitude differed depending on specification, ranging from 0.1 for educational attainment to 0.3 for intergenerational income elasticity.

Borjas re-estimated the model in 1994 (p.569). Again, ethnic capital was important for educational attainment (around 0.3) and did even outrank parental capital in magnitude; however, the difference was not statistically significant.

4.4 Studies on Sweden

Most of the studies mentioned above were performed on US data. This raises the question of whether or not the results can be generalised, in this case, to Sweden. A priori, due to differences in the financing of higher education, it is likely that intergenerational mobility is higher in Sweden. That is, children from low-income families should have better opportunities to attain higher education in Sweden compared to the US.

In a survey of empirical studies made by Corak (2006, p.43), intergenerational earnings elasticities in different countries are compared. The survey showed that Sweden compared to the US had a relatively high mobility. Sweden did also have a lower earnings elasticity compared to France and the UK. In regards to the three Nordic countries: Denmark, Norway and Finland, Sweden had higher intergenerational earnings elasticity implying less mobility (Corak 2006, p. 43).

Table 3.1

Results from studies conducted on Swedish datasets.

Earnings Elasticity	Year published	Page(s)	Author(s)
Swedish natives			
0.07, 0.13	2000	53, 127	Österberg
0.14	2006	24	Hammarstedt and Palme
0.22-0.36	1997	1015	Björklund and Jäntti
Second generation immigrants			
0.08	2000	127	Österberg
0.14	2004	175	Hammarstedt and Palme
0.21	2006	24	Hammarstedt and Palme

Notes. All of the studies presented above concern elasticity between fathers and sons.

Results from previous research on Swedish datasets are summarised in table 3.1. By comparing these results with studies conducted on US data, intergenerational transmission appears to be less important in Sweden. Another conclusion from table 3.1 is that results differ. Looking at Swedish natives, the difference between the highest (0.36) and lowest (0.07) estimate is rather large.

As can be seen in the table above, some studies reported more than one result. The reason for this was that Österberg (2000) used two datasets with different settings and Björklund and

Jäntti (1997) used different measurements of earnings. Thus, it seems like results are highly dependent on dataset and specifications.

Since results diverge it is not clear whether Swedish natives or second generation immigrants face the highest intergenerational transmission. However, a comparison is possible using Österberg (2000, p. 127) and Hammarstedt and Palme (2006, p. 24) as they performed separate estimations for Swedish natives and second generation immigrants. In regards to Österberg the difference was small and negligible (0.07 and 0.08). However, Hammarstedt and Palme found a larger difference (0.14 and 0.21). Hence, intergenerational transmission appears to be more important for second generation immigrants.

In regards to studies on women, in general, intergenerational transmission was smaller (see Hammarstedt and Palme 2004, p. 176 or Österberg 2000, p. 53, 127f).

4.5 Quantile Regression

The use of Quantile Regression is rather new in economics, especially in labour economics. In short (more described in section 6.2), it offers a possibility to analyse different parts of the income distribution (quantiles) separately. That is, for instance, to compare intergenerational mobility between high-income sons and low-income sons.

Studies of mobility employing quantile regression do not always yield the same qualitative result. Some indicate that intergenerational elasticity increases by income and other indicate the opposite.

A study performed by Eide and Showalter (1999) analysed intergenerational mobility in the US. They used both earnings and years of schooling as the independent variable and found higher elasticities in the bottom quantiles than in the top quantiles. These results were later supported by a study carried out by Grawe (2004, p. 71-72). His study also used data from the US.

Other studies have reached the opposite conclusion. Österbacka (2001) analysed intergenerational mobility in Finland. She separated sons from daughters and used the father's and mother's earnings separately. When looking at sons, quantile regression revealed higher elasticity for the high-income sons than for the low-income sons. The opposite was true for daughters.

Aydemir et al. (2006) also found higher elasticity for high-income sons. They looked at second generation immigrants in Canada. However, the results were not conclusive. When

controlling for education, low-income sons had higher elasticity. To further illustrate the divergence in results, Hertz (2003) found opposite results for black and white families in the US. For white families, elasticity increased with income, whereas elasticity decreased with income for black families.

In regards to studies on Swedish data, Österberg (2000, p.127) found a negative trend between elasticity and earnings. That is, elasticity was the highest for low-income sons, and this was the case for both second generation immigrants and natives. This result was also found by Björklund and Jäntti (1997, p. 1017) who stratified their sample by income and found a similar pattern. They did not make any distinction between immigrants and natives.

In a recent study by Jäntti et al. (2006, p. 28), they found the opposite relation. That is, intergenerational mobility was higher for the lower tail compared to the upper tail of the income distribution. Jäntti et al. (2006) did not make separate estimates for immigrants and foreigners. In regards to Swedish women, Österberg (2000, p. 128) could not find any pattern when using quantile regression.

To sum up, there is a large divergence in the results of the different articles presented. Some of this divergence could probably be explained by the use of different datasets. Another possible explanation is the use of different specifications. For instance, for how many years income was measured or how old the individuals were when income was measured.

5 The Data

The sample in this study was drawn from the Register of the Total Population (RTB) at Statistics Sweden. The RTB contains information about permanent address, income and other socioeconomic variables. In addition, to obtain information about the father's income, data from the Swedish Censuses (Folk- och bostadsräkning) conducted in 1970, 1975 and 1980 was included.

Some of the variables were recoded in order to make them comparable. Firstly, fathers' and sons' annual income were inflated to 2005 Swedish crowns, using the consumer price index provided by Statistics Sweden. Secondly, education was recoded. Originally education was coded according to attained degree. This was recoded to the average number of years of schooling, corresponding to each education level. For further information, see Meghir and Palme (1999 p. 14).

5.1 Coding

The sample used in this study consists of observations of fathers and their sons. The sample covers all those immigrating from the mid 1960s up to the mid 1980s. However, as the father's annual earnings were measured in 1970, 1975 and 1980, individuals immigrating after 1980 were, per definition, excluded in the econometric analysis.

As mentioned in section 3.1 the use of one observation could potentially lead to bias, due to fluctuations. That is, one observation is not a good estimate for long-run earnings. In this study the average of the three years was used. If only two or one year were available the average of the two years or the single year was used instead.

Data on the son's annual earnings was retrieved from the RTB and there were two observations, one for 1999 and one for 2003. It would be possible to use the same procedure as with the father's earnings and use an average. However, as stated in section 3.1, the use of observations near the start of someone's career could also lead to bias. Hence, the annual earnings from 2003 are used. In addition, since all fathers had positive annual income, sons with zero income were excluded. If they were included, they would influence the result substantially. Alternative formulations will be presented in the sensitivity analysis.

Finally, to minimise the influence of outliers, the top one percent of annual income are censored to the 99th percentile for each distribution. Furthermore, fathers older than 60 in 1980 were not included as some of them could have retired.

5.2 Descriptive Statistics

Descriptive statistics are presented in Table 5.1 and 5.2 (below). Education is measured in years of schooling and income is logged. By using logarithms, interpretations of the results are simplified. Furthermore, observations of earnings are usually not normally distributed, they are often negatively skewed. The observations therefore tend to cluster in the upper end (high income) of the range. By taking the log, the range is narrowed and the distribution approaches the standard normal.

A number of findings are immediately apparent. Firstly, by looking at table 5.1, there are great divergences between continents in all dimensions. For instance, educational attainment by fathers from North America is well above the other countries. Furthermore, it appears that the geographical and cultural distance to Sweden has a negative effect for income and level of employment. This could perhaps be explained by difficulties to adapt to the Swedish society. Another explanation could be discrimination towards individuals originating from certain continents.

Table 5.1
Summary Characteristics By Continent

		Education		Annual Income		Employed if income exceeds (thn) [1] 75		100		
	Fathers' Origin	Father	Son	Father	Son	Father	Son	Father	Son	Sample size
1	Nordic countries	10.05	11.49	11.98	10.54	0.96	0.77	0.91	0.74	36,267
2	Western Europe	11.88	12.13	12.01	10.52	0.94	0.75	0.89	0.72	10,026
3	Eastern Europe	12.32	12.33	12.05	10.31	0.94	0.73	0.89	0.71	6,706
4	Southern Europe	10.07	11.73	11.89	9.75	0.95	0.68	0.89	0.65	12,952
5	North America	13.28	12.35	11.89	10.04	0.86	0.69	0.78	0.65	892
6	Latin America	12.98	11.92	11.52	9.63	0.74	0.61	0.57	0.55	942
7	Africa	11.82	11.84	11.63	9.17	0.82	0.60	0.70	0.55	1,652
8	Asia	12.68	12.42	11.86	10.06	0.89	0.67	0.80	0.63	929
9	Middle East	10.40	11.50	11.67	8.97	0.86	0.56	0.74	0.51	2,748
	All immigrants	10.73	11.75	12.05	12.23	0.94	0.73	0.88	0.70	73,114
	All natives	10.95	11.97	12.13	12.34	0.97	0.81	0.93	0.78	701,497

Notes. [1] Share of the sample with annual earnings equal or above the threshold. Sample size refers to income and employment. Occupational data were available for 58,908 observations. The corresponding sample size for Sweden was 625,268 observations. Education in years. Logarithmic incomes were used.

Secondly, when comparing Swedish citizens to all immigrants, Swedes do better. This is the case in all categories. Perhaps what is most striking is the employment ratio. If employment[6] is defined as income above one hundred thousand crowns, 93 percent of the Swedish fathers are employed compared to 88 percent of the immigrants. To include explanations for this gap would be out of the scope of this study. Interested readers could for instance read Rooth and Ekberg (2006).

Instead of looking at continents, table 5.2 presents descriptive statistics for each country. A first observation is that a few countries contribute a large share of the immigrants. For instance, more than a third of the immigrants have a Finnish origin. By looking at all of the Nordic countries it appears as the easiness to move freely encourages movement.

Secondly, there is the difference between countries. By looking at education attained by the fathers, the range between the highest and the lowest mean is almost four and a half years (India and Greece). A large part of the difference could probably be explained by difference in migration motives, though this is speculative. In the case of countries like Finland and Greece, many of the immigrants were probably related to the labour immigration in the 1960s. As the recruiting was mainly done directly by the industry, high education was not prioritised. Looking at the other extreme, with countries like India and Iran, there were probably other reasons for leaving the home country. For instance, it is likely that the Iranian Revolution in 1979 lead to emigration from Iran by intellectuals.

Thirdly, fathers, in general, have higher income but less education than their children. A reason for fathers having higher income than their children could be that the second generation is not yet fully established in the labour market. A possible explanation of the increase in education across generations could be the Swedish educational system, which compared too that in many other countries is more accessible.

The dataset used in this study is also used by Lenhoff (2006) in which he aggregate each origin country and estimates “ethnic intergenerational coefficients”. In other words, the influence of parental capital and ethnic capital is pooled. This will be further discussed in section 7.2.

[6] The reason for including the variable “employed” is to separate full-time employed from part-time employed. These boundaries are chosen since they are relatively well defined. A further definition would be zero income. This was however not possible as all fathers had positive earnings.

Table 5.2
Summary Characteristics By Country

		Education		Annual income		Employed if income exceeds (thn)[1] 75		100		
Fathers' Origin		Father	Son	Father	Son	Father	Son	Father	Son	Sample size
1	Denmark	10.45	11.42	12.11	12.25	0.95	0.77	0.90	0.74	5,315
2	Finland	9.82	11.46	12.03	12.24	0.96	0.77	0.92	0.74	27,141
3	Norway	11.17	11.79	12.20	12.30	0.96	0.77	0.91	0.74	3,709
4	Iceland	13.64	12.31	12.29	12.22	0.94	0.71	0.88	0.68	102
5	France	13.02	12.46	12.13	12.19	0.85	0.65	0.75	0.62	450
6	Holland	12.75	12.21	12.18	12.29	0.93	0.74	0.88	0.71	616
7	Great Britain	12.70	12.29	12.10	12.21	0.89	0.69	0.81	0.65	1,124
8	Germany	12.02	12.21	12.20	12.37	0.96	0.78	0.92	0.75	5,954
9	Austria	12.14	12.16	12.19	12.36	0.97	0.77	0.92	0.75	1,492
10	Other Western Europe	12.50	12.23	12.23	12.34	0.95	0.76	0.89	0.74	390
11	Bulgaria	11.80	11.95	11.98	12.11	0.91	0.62	0.84	0.59	172
12	Estonia	12.36	12.66	12.35	12.50	0.99	0.82	0.97	0.80	1,499
13	Poland	12.73	12.22	12.04	12.13	0.89	0.64	0.80	0.60	1,168
14	Romania	12.34	12.12	12.11	12.15	0.93	0.67	0.85	0.65	184
15	Soviet Union	11.38	12.08	12.10	12.30	0.97	0.75	0.90	0.72	440
16	Czechoslovakia	12.88	12.55	12.16	12.30	0.93	0.72	0.88	0.69	800
17	Hungary	11.91	12.09	12.11	12.28	0.95	0.73	0.90	0.71	2,189
18	Other Eastern Europe	12.47	12.58	12.39	12.44	0.96	0.81	0.94	0.81	254
19	Greece	9.58	11.80	11.91	12.00	0.91	0.62	0.84	0.57	2,348
20	Italy	10.44	11.72	11.99	12.25	0.94	0.72	0.87	0.69	1,663
21	Yugoslavia	10.19	11.70	11.97	12.15	0.97	0.70	0.90	0.67	7,112
22	Portugal	10.34	11.71	11.92	12.15	0.90	0.72	0.81	0.69	297
23	Spain	10.65	11.89	11.91	12.18	0.92	0.69	0.82	0.65	1,038
24	Other Southern Europe	10.17	11.87	11.94	12.13	0.97	0.70	0.91	0.67	494
25	USA	13.38	12.36	12.15	12.18	0.86	0.68	0.77	0.65	785
26	Canada	12.47	12.29	12.16	12.27	0.91	0.71	0.79	0.65	107
27	Chile	13.13	11.84	11.54	11.73	0.65	0.57	0.48	0.49	280
28	Other Latin America	12.91	11.96	11.82	12.02	0.77	0.62	0.61	0.57	662
29	Morocco	10.17	11.59	11.81	11.96	0.87	0.60	0.76	0.57	409
30	Other Africa	12.38	11.93	11.80	11.99	0.81	0.60	0.68	0.55	1,243
31	India	14.09	12.80	12.12	12.15	0.88	0.64	0.79	0.60	303
32	Pakistan	12.28	12.34	11.88	11.87	0.88	0.52	0.76	0.45	130
33	Other Asia	12.88	12.50	11.91	12.15	0.84	0.66	0.74	0.61	496
34	Iran	14.07	12.40	11.78	12.05	0.63	0.56	0.48	0.52	187
35	Palestine	12.14	11.89	11.84	12.01	0.90	0.64	0.83	0.60	169
36	Turkey	9.61	11.27	11.80	11.81	0.88	0.54	0.75	0.49	1,818
37	Other Middle East	11.09	11.84	11.85	11.97	0.86	0.59	0.77	0.54	574
	All immigrants	10.73	11.75	12.05	12.23	0.94	0.73	0.88	0.70	73,114
	All natives	10.95	11.97	12.13	12.34	0.97	0.81	0.93	0.78	701,497

Notes. [1] Share of the sample with annual earnings equal or above the threshold. Sample size refers to income and employment. Occupational data were available for 58,908 observations. The corresponding sample size for Sweden was 625,268 observations. Education in years. Logarithmic incomes were used.

6 Econometric Models

The estimation of intergenerational mobility and the role of ethnic capital is pretty straightforward. Basically, it is built on the equation (3.5) in section 3.3.

$$Y_t = \alpha_i + \beta_i Y_{t-1} + \varepsilon_i \tag{6.1}$$

To recapitulate Y usually refers to income or education. α is the constant and ε_{t-1} is the error term. t is the notation for the son, and $t-1$ refers to the father. β is the correlation or the elasticity, depending on whether the variables are in level or logged.

Before the variables were used, they were controlled for age and, if available, place of residence. Practically two equations were constructed, one for the son and one for the father.

$$Y_t = \alpha_i + \beta_i age + \beta_i age^2 + \beta_i residence + \varepsilon_S \tag{6.2}$$

$$Y_{t-1} = \alpha_i + \beta_i age + \beta_i age^2 + \varepsilon_F \tag{6.3}$$

In equation (6.2) and (6.3), *age* is normalised to the lowest age for the two groups respectively. *residence* is a vector of dummies for each county (county of Stockholm being baseline). Unfortunately, the fathers' places of residence were not reported, hence it could not be controlled for. Nor were years since migration available. As Nielsen et al. (2004, p. 872) showed that years living in the new country had a positive effect on earnings, annual income could have a downward bias for fathers only living in Sweden for a short while prior to their income being measured.

From equation (6.2) and (6.3) the error terms, ε_S and ε_F, are inserted into equation (6.4). They now serve as the new (annual income, education employed) variables which are controlled for age and, if available, place of residence.

$$\varepsilon_S = \alpha_i + \beta_i \varepsilon_F + \varepsilon_i \tag{6.4}$$

In equation (6.4), β_i is the coefficient of interest, which is the intergenerational correlation or elasticity. This procedure is then repeated for each country and each variable (annual income, education and employment status). Later, when ethnic capital is measured, ε_S and ε_F are

estimated using all immigrants together. That is, calculating equation (6.2) and (6.3), when all immigrants are pooled.

To measure the role of ethnic capital, equation (6.4) is extended by including the average of the outcome variable for each ethnic group ($\overline{Y}$).

$$\varepsilon_S = \alpha_i + \beta_i \varepsilon_F + \beta_i \overline{Y} + \varepsilon_i \tag{6.5}$$

Obviously, ethnic capital could be defined differently than based on the country of origin. An alternative could be to use religion, language or continent. However, since country of origin was the only available variable in the dataset this is used in this study.

6.1 Extension

To analyse which factors may influence ethnic capital, a number of interaction dummies are tested. By including the dummies it is possible to disentangle ethnic capital.

$$\varepsilon_S = \alpha_i + \beta_i \varepsilon_F + \beta_i \overline{Y} + \beta_i \overline{Y} * X + \varepsilon_i \tag{6.6}$$

X is a vector containing dummies and each specification is tested separately. The first specification concerns the size of the immigrant population; more than 1,500 individuals between 1,000 and 1,500 individuals; and the baseline is less than 1,000 individuals. The second specification tests the composition of the family in regards to if both parents are foreign born, or if the mother is Swedish born. Again, this is done on a country basis with a homogenous population defined as more than 70 percent of both parents being foreign. A heterogeneous population defined as between 50 and 70 percent of both parents being foreign; the baseline is defined as less than 50 percent.

The third specification considers the influence of living in one of the three major cities (Stockholm, Gothenburg and Malmo) or more precisely, the three county councils containing the three major cities. This is particular interesting since immigrants tend to concentrate in those cities and this seems to influence the individual's opportunity in the new country (Edin et al. 2003). Finally, a dummy is constructed for origins that might be considered to be discriminated in Sweden. These origin countries are defined as all countries except the Nordic countries, Western Europe and North America.[7] In other words, it is tested if individuals

[7] The definition of countries are presented in appendix A.

originated from countries that could be considered discriminated experience a larger or smaller impact of ethnic capital.

6.2 Quantile Regression

Calculations for quantile regression (QR) differ from those for ordinary least square (OLS). Firstly, OLS minimises the squared sum of residuals, QR minimises the absolute sum of residuals. One obvious advantage with minimising the absolute sum of residuals is the smaller sensitivity to outliers, compared to OLS. Secondly, OLS gives equal weight to each observation whereas QR gives different weights to each observation. By giving different weights, it is possible to estimate more than one set of coefficients and compare coefficients along a distribution. To give an example, one can analyse if low-income sons experience higher or lower intergenerational mobility relative to high-income sons.

A more in depth discussion of QR would be out of the scope for this thesis. Instead, interested readers can either turn to Koeneker and Hallock (2001) for an introduction to QR or to Koeneker and Basset (1978) for a more technical explanation.

7. Empirical Results

In this chapter the empirical results will be presented. Firstly, the results on intergenerational mobility, divided by continent and country of origin, are presented. Secondly, ethnic capital is included. Thirdly the results from the interaction dummies will be presented and lastly, the results from quantile regression are presented.

7.1 Intergenerational Mobility

Table 7.1 presents the coefficients when estimating intergenerational mobility between fathers and sons without taking ethnic capital into consideration. In the upper part of the table, a sample of Swedish natives is compared to all foreigners.

Table 7.1
Intergenerationell Transmission Coefficients by Continent

								Full- time employed if income exceeds (thn. crowns)				
		Sample Size	Father's education		Sample Size	Father's income		75		100		
Father's Origin			(1)			(2)		(3)		(4)		
	Sweden	570,002	0.22	***	632,102	0.18	***	0.06	***	0.05	***	
			(0.00)			(0.00)		(0.00)		(0.00)		
	R^2		0.11			0.01		0.00		0.00		
	All Foreigners	50,710	0.19	***	61,933	0.21	***	0.08	***	0.08	***	
			(0.00)			(0.01)		(0.01)		(0.00)		
	R^2		0.08			0.01		0.00		0.01		
1	Nordic countries	25,428	0.21	***	31,320	0.18	***	0.08	***	0.07	***	
			(0.01)			(0.00)		(0.01)		(0.01)		
2	Western Europe	7,229	0.22	***	8,714	0.20	***	0.08	***	0.08	***	
			(0.02)			(0.01)		(0.01)		(0.01)		
3	Eastern Europe	4,540	0.15	***	5,615	0.22	***	0.03		0.07	***	
			(0.03)			(0.01)		(0.02)		(0.02)		
4	Southern Europe	8,917	0.16	***	10,602	0.10	***	0.05	**	0.07	***	
			(0.03)			(0.01)		(0.02)		(0.01)		
5	North America	540	0.13	**	742	0.19	***	0.08	**	0.04		
			(0.06)			(0.02)		(0.04)		(0.04)		
6	Latin America	600	0.17	***	776	0.12	***	0.04		0.03		
			(0.06)			(0.02)		(0.04)		(0.03)		
7	Africa	1,006	0.08		1,285	0.14	***	0.07	*	0.08	***	
			(0.05)			(0.02)		(0.03)		(0.03)		
8	Asia	643	0.03		771	0.14		-0.01		-0.01		
			(0.06)			(0.02)		(0.04)		(0.03)		
9	Middle East	1,808	0.03		2,108	0.16	***	0.04		0.02		
			(0.05)			(0.01)		(0.03)		(0.02)		

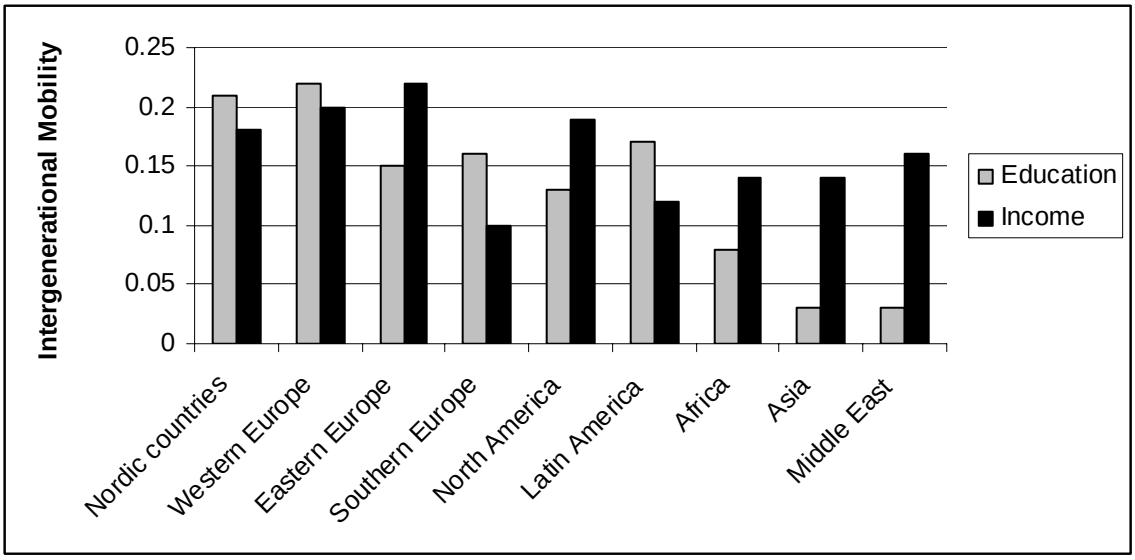
Notes. Different dimensions of the sons' labour-market outcomes were regressed on the corresponding labour-market outcome for the father. Results are adjusted for age and residence in Sweden. Standard errors are reported in parentheses; * indicates significance at 10 percent level, ** at 5 percent level and *** at 1 percent (all in one-tailed test). Calculated using SPSS version 13.

As shown by table 7.1, foreigners experience higher intergenerational education mobility (0.22 for natives and 0.19 for foreigners), but lower mobility for the other outcome variables (see table 7.1).

The results of this study are in line with previous studies conducted on Swedish data (reported in table 3.1). This goes for both Swedish natives and second generation immigrants

When looking at each continent separately it is apparent that there are some differences in all the labour-market outcomes. For instance, intergenerational educational mobility is much lower for the Nordic countries than for to Asia. This is also shown in graph 7.1, where the results from column (1) and (2) in table 7.1 are graphically illustrated.

Graph 7.1
Intergenerational Educational Elasticity by Continents



Notes. Data are taken from column (1) and (2) in table 7.1 where different dimensions of the sons' labour-market outcomes were regressed on the corresponding labour-market outcome for the father. Results are adjusted for age and fathers' residence in Sweden. The results for intergenerational income mobility for Africa, Asia and Middle East were not statistically significant

Graph 7.1 illustrates that the sons whose fathers for instance originate from the Nordic Countries experience less intergenerational educational mobility than sons whose fathers originate from Africa. The same goes for intergenerational income mobility. However, in regards to income the differences are not that apparent.

Table 7.2 presents the results for all countries calculated separately. Compared to table 7.1 and graph 7.1 it appears that there are some differences within continents. For instance, Southern Europe shows some discrepancy.

It should also be noted that some of the estimates are based on rather small samples. Hence, some of the results should be interpreted with caution.

Table 7.2

Intergenerationell Transmission Coefficients by Country

								Full- time employed if income exceeds (thn. crowns)			
		Sample Size	Father's education		Sample Size	Father's income		75		100	
Father's Origin			(1)			(2)		(3)		(4)	
	Sweden	570,002	0.22 (0.00)	***	632,102	0.18 (0.00)	***	0.06 (0.00)	***	0.05 (0.00)	***
	R^2		0.11			0.01		0.00		0.00	
	All Foreigners	50,710	0.19 (0.00)	***	61,933	0.21 (0.01)	***	0.08 (0.01)	***	0.08 (0.00)	***
	R^2		0.08			0.01		0.00		0.01	
1	Denmark	3,567	0.19 (0.01)	***	4,539	0.07 (0.03)	*	0.03 (0.02)		0.04 (0.02)	**
2	Finland	19,320	0.17 (0.01)	***	23,494	0.26 (0.02)	***	0.08 (0.01)	***	0.07 (0.01)	***
3	Norway	2,477	0.20 (0.01)	***	3,203	0.23 (0.04)	***	0.08 (0.03)	***	0.11 (0.02)	***
4	Iceland	64	0.09 (0.06)		84	0.02 (0.16)		0.21 (0.14)		0.16 (0.12)	
5	France	274	0.14 (0.04)	***	366	0.23 (0.1)	**	0.13 (0.06)	**	0.13 (0.05)	**
6	Holland	399	0.16 (0.04)	***	522	0.11 (0.1)		0.14 (0.06)	**	0.19 (0.05)	***
7	Great Britain	761	0.17 (0.02)	***	951	0.08 (0.06)		0.01 (0.04)		0.03 (0.03)	
8	Germany	4,425	0.23 (0.01)	***	5,213	0.27 (0.03)	***	0.10 (0.02)	***	0.11 (0.02)	***
9	Austria	1,097	0.14 (0.02)	***	1,324	0.08 (0.07)		0.03 (0.05)		0.01 (0.04)	
10	Other Western Europe	273	0.23 (0.05)	***	338	0.12 (0.11)		-0.01 (0.09)		0.01 (0.07)	
11	Bulgaria	101	0.15 (0.05)	***	131	0.04 (0.16)		0.03 (0.11)		0.03 (0.09)	
12	Estonia	1,066	0.23 (0.02)	***	1,318	0.29 (0.07)	***	0.08 (0.08)		0.12 (0.05)	**
13	Poland	728	0.17 (0.02)	***	919	0.08 (0.07)	***	0.05 (0.05)		0.06 (0.04)	*
14	Romania	119	0.23 (0.06)	***	151	0.23 (0.20)		0.08 (0.12)		0.09 (0.09)	
15	Soviet Union	270	0.22 (0.04)	***	367	0.22 (0.14)		0.40 (0.11)	***	0.08 (0.06)	
16	Czechoslovakia	561	0.20 (0.03)	***	663	0.10 (0.08)		0.05 (0.05)		0.04 (0.04)	
17	Hungary	1,537	0.20 (0.02)	***	1,856	0.08 (0.06)		-0.03 (0.04)		0.05 (0.03)	*
18	Other Eastern Europe	158	0.26 (0.05)	***	210	0.31 (0.14)	**	0.08 (0.12)		0.15 (0.09)	
19	Greece	1,413	0.11 (0.02)	***	1,800	0.12 (0.06)	*	0.05 (0.03)		0.10 (0.03)	***

20	Italy	1,057	0.13	***	1,410	0.11		0.05		0.01	
			(0.02)			(0.07)		(0.04)		(0.03)	
21	Yugoslavia	5,553	0.10	***	6,201	0.14	***	0.05		0.04	**
			(0.01)			(0.04)		(0.03)		(0.02)	
22	Portugal	199	0.02		249	0.43	**	0.02		0.07	
			(0.04)			(0.19)		(0.08)		(0.06)	
23	Spain	633	0.15	***	860	0.34	***	0.07		0.07	*
			(0.03)			(0.08)		(0.05)		(0.04)	
24	Other Southern Europe	62	0.21	***	82	0.08		-0.14		-0.08	
			(0.08)			(0.34)		(0.17)		(0.13)	
25	USA	480	0.20	***	653	0.15	**	0.09	**	0.06	
			(0.03)			(0.06)		(0.04)		(0.04)	
26	Canada	60	0.08		89	0.01		0.01		-0.09	
			(0.07)			(0.13)		(0.12)		(0.11)	
27	Chile	182	0.10	***	227	0.12		0.1		0.01	
			(0.03)			(0.11)		(0.06)		(0.06)	
28	Other Latin America	418	0.12	***	549	0.21	***	0.02		0.07	
			(0.03)			(0.07)		(0.04)		(0.04)	
29	Morocco	248	0.14	***	313	-0.11		0.02		0.01	
			(0.04)			(0.14)		(0.07)		(0.06)	
30	Other Africa	758	0.14	***	972	0.11	**	0.08	**	0.08	***
			(0.02)			(0.06)		(0.03)		(0.03)	
31	India	219	0.08	**	251	0.14		-0.03		-0.02	
			(0.04)			(0.11)		(0.08)		(0.07)	
32	Pakistan	87	0.03		104	0.04		-0.1		0.02	
			(0.05)			(0.21)		(0.13)		(0.09)	
33	Other Asia	337	0.09	***	416	-0.08		-0.02		-0.02	
			(0.03)			(0.08)		(0.05)		(0.05)	
34	Iran	135	0.19	***	152	0.02		0.02		-0.12	
			(0.05)			(0.14)		(0.07)		(0.08)	
35	Palestine	126	0.19	***	134	-0.26		-0.05		-0.11	
			(0.05)			(0.20)		(0.10)		(0.09)	
36	Turkey	1,152	0.13	***	1,371	0.09		0.07	*	0.04	
			(0.02)			(0.06)		(0.04)		(0.03)	
37	Other Middle East	395	0.12	***	451	-0.13		-0.02		0.03	
			(0.03)			(0.10)		(0.06)		(0.05)	

Notes. Different dimensions of the sons' labour-market outcomes are regressed on the corresponding labour-market outcome for the father. Results are adjusted for age and fathers' residence in Sweden. Standard errors are reported in parentheses; * indicates significance at 10 percent level, ** at 5 percent level and *** at 1 percent (all in one-tailed test). Calculated using SPSS version 13.

In regards to education, the correlation is rather low for India (0.08) and Pakistan (0.03). This is perhaps not surprising given table 5.2 which showed that fathers from these two countries were highly educated, whereas their children had education close to the average. Looking on the other extreme, fathers with education below average, like Finland and Greece, there correlation is also relatively low. Therefore, in regards to education, regression towards the mean is observed.

The presence of regression towards the mean can be measured by comparing, in absolute terms, the deviation of fathers' education in table 5.2 with intergenerational educational mobility in table 7.2. As expected was the rank-correlation negative, indicating that countries with large deviation from the aggregated mean in table 5.2 (10.95), experience more intergenerational educational mobility than countries close to the aggregated mean. Hence regression towards the mean is apparent. However, the correlation was not statistically significant.

There are more fluctuations when measuring intergenerational earnings elasticity. On the one extreme, Italy's high elasticity of 0.34 implies low mobility, relative to other countries of origin. However, an elasticity of 0.34 is in line with results from datasets on the US (see section 4.2).

On the other extreme, some countries have low elasticity, or even negative. A negative elasticity would imply a negative relationship between the earnings of the father and those of the son. However, that seems unlikely. A possible explanation is the lack of control for how many years the fathers have been in Sweden. As mentioned in section 6, years since migration did have a positive effect on earnings. When examining the scatter plots[8] (earnings for fathers and sons) for countries with negative elasticity, it is apparent that they are driven by fathers with low income and sons with high income. This is further discussed in the sensitivity analysis below.

In columns (3) and (4) the results on intergenerational employment mobility are presented. It should be mentioned that defining employment as annual income above 75,000 crowns as employment could prove problematic, due to the high share of fathers exceeding this threshold. Table 5.1 shows some 94 percent to have an annual income above 75,000. Thus, the use of this variable seriously violates one of the basic assumptions of OLS; x must vary (for instance: Kennedy 2004, p.206-208). As to the results of the estimations, again there is much variation indicating a varying degree of intergenerational employment mobility.

Before moving on to ethnic capital it is interesting to analyse if countries with a high intergenerational educational transmission also have a high intergenerational income transmission[9]. As follows from the discussion concerning investments in human capital and its positive influence on income, a positive correlation is expected. Calculating the rank-correlation between column (1) and (2) shows it to be positive and statistically significant,

[8] A scatter plot for Palestine is available in Appendix C.
[9] The reason for not including "employment" in this analysis is because those variables are created making use of income. Hence, they are correlated by construction.

indicating that countries with high (low) intergenerational income transmission also experience high (low) intergenerational educational transmission.

7.2 Ethnic Capital

Table 7.3 presents the results when ethnic capital is included. Compared to table 7.1 and 7.2, full-time employed is here only defined as annual income above 100,000 crowns. This is mainly due to the problem of low variation.

The specification for this estimation is presented in section 6. To recapitulate, all the countries are pooled and different definitions of intergenerational mobility are estimated, just like when all foreigners were pooled in the bottom part of table 7.1 However, in addition ethnicity is controlled for.

Table 7.3
Intergenerational Mobility and Ethnic Capital
for Second Generation Immigrants

	Education		Income		Employment	
Variables	(1)		(2)		(3)	
Father's outcome	0.17	***	0.19	***	0.07	***
	(0.01)		(0.03)		(0.01)	
Ethnic capital	0.08	***	0.35	***	0.35	***
	(0.02)		(0.10)		(0.05)	
R^2	0.08		0.01		0.01	
Sample Size	50,710		61,993		61,993	

Notes. Different dimensions of the sons' labour-market outcomes are regressed on the corresponding labour-market outcome for the father and the average corresponding labour-market outcome for the fathers' ethnic group. Results are adjusted for age and fathers' residence in Sweden. Robust standard errors which takes into account that ethnic capital does not vary within group are reported in parentheses; * indicates significance at 10 percent level, ** at 5 percent level and *** at 1 percent (all in one-tailed test). Employment defined as annual income exceeding 100,000 crowns. Only individuals with positive earning are included, see note under table 7.1. Calculated using Stata version 8.

A number of findings are worth noting. Firstly, ethnic capital has a significant impact on the child's outcome, and this is the case for all three outcome variables. Overall the impact of ethnic belonging influences the sons to a larger extent than parental capital. Secondly, the importance of ethnic capital varies between the labour-market outcomes. Education, compared to the other labour-market outcomes, does not appear to be that much influenced by ethnicity.

It could also be noted that fathers' outcome has a slightly lower effect on the sons' outcome compared to table 7.1. This is probably due to correlation between the fathers'

outcome and the ethnic groups' outcome. However, since the difference is not that large, multicollinearity does not appear to be a problem.

The results in table 7.3 can be compared to the results by Lenhoff (2006). He used the same dataset as in this study but the coefficients were estimated using aggregated data. Table 7.4 summarises the results found by Lenhoff.

Table 7.4
Pooled Effect of Fathers Outcome and Ethnic Capital

Outcome variable	Ethnic Intergenerational coefficients*	Combined effect from table 7.3
Education	0.27	0.25
Income	0.56	0.54
Employment	0.39	0.39

Notes. * Source: Lenhoff (2006). To calculate the combined effect, the sums of the coefficients are taken from table 7.3.

As can be seen from table 7.4 the results from this study are similar to the ones found by Lenhoff (2006). The similarity indicates robustness of the results from this study. The small divergence is probably due to rounding errors and different specifications. For instance individuals with zero income were excluded in this study since they influenced the results to a large extent (see section 5.1). However, this is not a problem when using aggregated data as the average, instead of individual annual income, is used.

In regards to comparing the effects between outcomes, it should be noted that a direct comparison cannot be made as the scaling is not the same. Looking at education, if the ethnic group on average has one more year of education, ceteris paribus, the second generation has 0.08 years more education. That is a rather small impact. In regards to income, if an ethnic group has, on average, 10 percent higher income, ceteris paribus, the second generation will have a higher income by 3.5 percent. Finally, if the entire ethnic group has a full-time employment, compared to not being employed there is a 35 percent greater chance that the second generation will be employed, ceteris paribus.

Compared to Borjas (1992 and 1994), who used datasets on the United States the influence of ethnic capital on intergenerational income mobility appears to be slightly more important in this study (Borjas found coefficients of 0.1 and 0.3). In regards to educational attainment, the importance of ethnic capital was greater in Borjas' studies (0.3), than in this study. The

difference in results could be explained by differences in countries, namely education system and labour market.

7.3 Extension

The results with the interaction dummies included are presented in table 7.3. In this specification only income is used as outcome variable. The reason for not using education is the rather low importance of ethnic capital for this outcome (see table 7.2). Furthermore, income is preferred over employment, as employment was a generated variable whereas income is measured directly.

Table 7.5
Intergenerational Income Mobility and Ethnic Capital
for Second Generation Immigrants, interaction dummies included

	Size of Ethnic Group		Composition of family		Live in big city		Discriminated origin	
Variables	(1)		(2)		(3)		(4)	
Father's income	0.18	***	0.18	***	0.19	***	0.19	***
	(0.03)		(0.02)		(0.03)		(0.02)	
Ethnic Capital (EC)	0.35	***	0.45	***	0.35	***	0.27	***
	(0.11)		(0.07)		(0.10)		(0.09)	
EC*Large	0.00	**						
	(0.00)							
EC*Medium	-0.00							
	(0.00)							
EC*Homogenous			0.00					
			(0.00)					
EC*Heterogeneous			0.01	***				
			(0.00)					
EC*City					0.00	**		
					(0.00)			
EC*Discriminated							-0.00	**
							(0.00)	
R^2	0.01		0.08		0.01		0.01	
Sample size	61,993		61,993		61,993		61,993	

Notes. Sons' income is regressed on fathers' income and the average corresponding labour-market outcome for fathers' ethnic group. In addition, interaction dummies are included to test the robustness of ethnic capital. "Size of the ethnic group" reefers to the size of the group in Sweden. "Composition of the family" reefers to if the parents in the ethnic group mainly consist of foreigners or if many sons have a Swedish mother. "Big city" refers to living in the three county councils containing the three biggest cities in Sweden. "Discriminated" is defined as all countries except the Nordic Countries, Western Europe and North America. Results are adjusted for age and fathers' residence in Sweden. Robust standard errors which take into account that ethnic capital does not vary within group are reported in parentheses; * indicates significance at 10 percent level, ** at 5 percent level and *** at 1 percent (all in one-tailed test). See section 6.1 for definition of the interaction dummies. Calculated using Stata version 8.

As seen in table 7.5, the interaction dummies had small or no influence. Even though they were statistically significant, the impact was negligible. In other words, the impact of ethnic capital seems robust; it does not vary by ethnic group, the size of the group or any of the other dimensions tested in table 7.5.

However, the coefficients for ethnic capital differ in the different models. The difference between the models (2) and (4) is rather big. This should, however, not be interpreted as the role of ethnic capital being more important when the composition of the family is controlled for. A more possible explanation is that ethnic capital and the interaction dummies are correlated. Hence, at least in these dimensions it seems like ethnic capital is robust in regards to differences among immigrants[10]. Obviously other definitions of interaction dummies could also be tested. However, as the ones tested did not influence the importance of ethnic capital, it appears that ethnic capital is robust.

7.4 Quantile Regression

A further possibility to disentangle the role of ethnic capital is by comparing different earnings quantiles (see section 6.2 for further information). The results are presented in table 7.6.

Table 7.6
Quantile Regression of Income Intergenerational Mobility and Ethnic Capital

	q10		q25		q50		q75		q90		OLS	
Variables	(1)		(2)		(3)		(4)		(5)		(6)	
Father's income	0.39	***	0.26	***	0.16	***	0.11	***	0.10	***	0,19	***
	(0.04)		(0.01)		(0.01)		(0.00)		(0.00)		(0,03)	
Ethnic capital	0.70	***	0.38	***	0.25	***	0.22	***	0.19	***	0,35	***
	(0.10)		(0.04)		(0.02)		(0.01)		(0.01)		(0,10)	
R^2	0.02		0.02		0.02		0.06		0.06		0.01	
Sample size	61,993		61,993		61,993		61,993		61,993		61,993	

Notes. Sons' income is regressed on fathers' income and the average corresponding labour-market outcome for fathers' ethnic group. Results are adjusted for age and fathers' residence in Sweden. Standard errors are reported in parentheses; * indicates significance at 10 percent level, ** at 5 percent level and *** at 1 percent (all in one-tailed test). The coefficients for OLS are taken from table 7.1. Calculated using Stata version 8.

Several findings reported in table 7.6 are worth noting. First, median regression (3) yields lower coefficients compared to OLS for intergenerational mobility and ethnic capital,

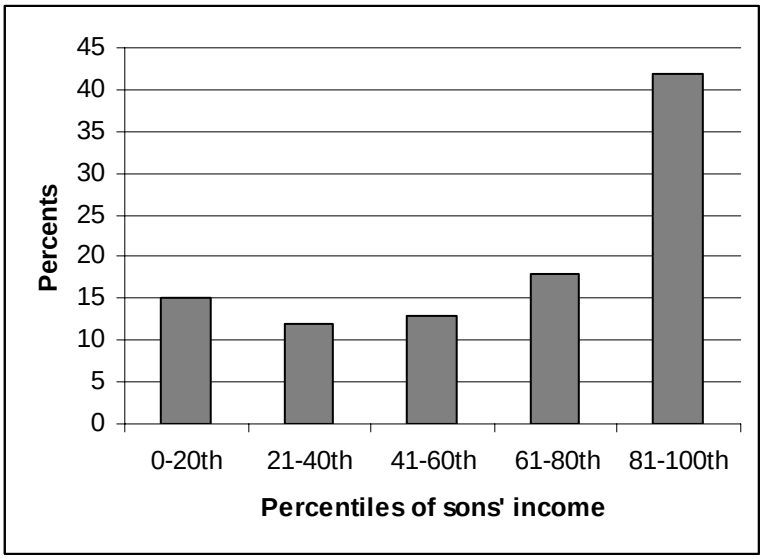
[10] An obvious risk of using interaction dummies is multicollinearity with ethnic capital. The changing coefficient for ethnic capital could be proof of this. However, as the base group is not included, there is no perfect multicollinearity between the interaction dummies and ethnic capital.

respectively. Hence, the OLS estimate is driven by individuals with low intergenerational mobility and high influence of their ethnicity.

Second, mobility is greater for high-income sons. Looking at the 90th quantile, the effect of ethnic capital and intergenerational income elasticity is close to 0.3. That is smaller than in the OLS estimation. However, elasticity then steadily increases and at the 10th quantile, the effect of intergenerational income mobility and ethnic capital is large. For ethnic capital, the coefficient is 0.70. That indicates that ethnicity influences the second generation immigrants to a large extent. Overall, the results from quantile regression indicate a larger (downward) mobility movement from the richest than (upward) mobility for the poorest since the coefficients are higher for the poorest. In other words, "riches-to-rags" appears to be more common than "rags-to-riches".

An alternative approach to illustrate the movement between generations is to analyse in which percentile sons end up. In graph 7.2, all second generation immigrants whose fathers have an annual income at the 91st percentile or above, are divided into groups in regards to their own annual income. As can be seen from the graph, sons are not equally distributed. Instead, a disproportionately large share has an annual income at the 91st percentile or above.

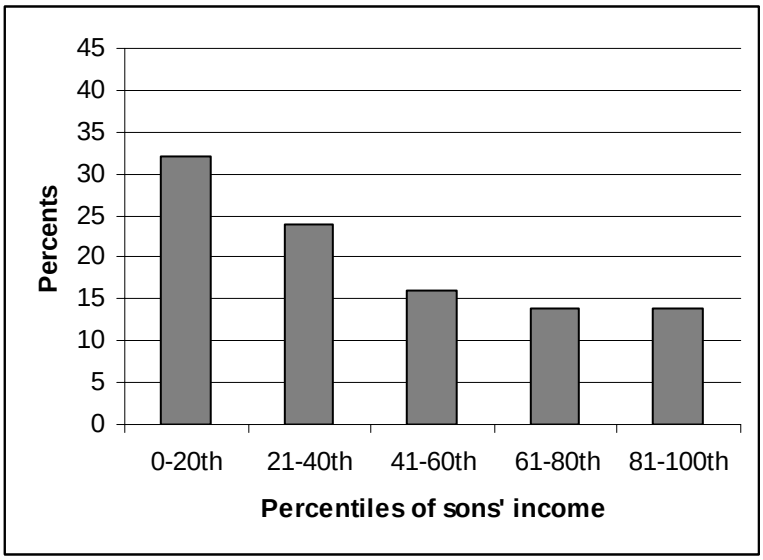
Graph 7.2
The Sons' Annual Income
whose fathers earn at the 91st percentile or above



Notes. Sons whose fathers have an annual income at the 81st percentile or above. Sons are categorised depending on there own annual income. Calculated using all immigrants.

In Graph 7.3, all second generation immigrants whose fathers earn at the 10th percentile or below, are divided into groups in regard to their own annual income. As can be seen from the graph, sons whose fathers earn at the 10th percentile or below, tend to earn a low income compared to all second generation immigrants.

Graph 7.3
The Sons' Annual Income
whose fathers earn at the 10th percentile or below



Notes. Sons whose fathers have an annual income at the 81st percentile or above. Sons are categorised depending on there own annual income. Calculated using all immigrants.

When comparing graph 7.2 and 7.3, they are almost the opposite of each other, in regards to the sons' annual income. Hence the graphical illustration in graphs 7.2 and 7.3 appears to support the findings in this section.

7.5 Sensitivity Analysis

To test the robustness of the models presented above, different specifications were tested. Firstly, the number of observations used was altered. If two, instead of one observation of the sons' earnings were used, the elasticity was slightly higher. The opposite was true if only one observation of the fathers' earnings was used; elasticity was lower compared to those in table 7.1. The conclusion drawn from this is that the result is sensitive to specifications. In regards to using one or two observations of the sons' income, it is possible that the use of two years is

better as it uses more information. However, based on the discussion in section 3.1 about the risk of using observations of income in the beginning of someone's career, one observation is used.

Secondly, the censoring of the 99th percentile was removed, as was the exclusion of fathers older than 60. This, both separately and together, had some but small influence on the overall results. However, some countries were affected more.

Thirdly, in order to correct for the negative intergenerational elasticities in table 7.1, both upper and lower bounds were used on earnings. This removed some of the negative elasticities, although not all. Furthermore, this also affected countries that did not have negative elasticities.

Lastly, different definitions were used for the dummies used in table 7.3. For instance the definition of "large" ethnic group was altered to encompass fewer or more countries. This and other alterations showed that the model was sensitive, as the statistical significance of the coefficients for the dummies decreased or disappeared completely. Furthermore, since the interaction dummies did not yield anything of economic interest, the effect of ethnic capital appears to be robust in regards to the dimensions tested in table 7.3.

The conclusion of the sensitivity analysis is that the model is sensitive in regards to which variable that is used. However, in line with the methodological discussion in section 4.1 the econometric models presented in this study are preferred.

8. Summary and Conclusions

This study aimed to measure the importance of intergenerational transmission and ethnic capital for second generation immigrants in Sweden. That is, someone having one or two foreign-born parents. Since the data set covered all (male) immigrating moving to Sweden between the mid 1960s and the 1980s, problems such as sample bias could be avoided. Furthermore, as income was measured in more than one period, average income could be used which should make the results less sensitive to fluctuations.

In addition to income, education and full-time employment were used to measure socio-economic outcomes. The results pointed at an intergenerational elasticity around 0.2 for income, which is in line with previous research. In regards to full-time employment, the correlation was 0.08 and in regards to education 0.2. Even though it could appear that intergenerational mobility varies depending on which measure is used, a direct comparison is not possible as the scaling is different. Overall, intergenerational mobility seems to be relatively high in Sweden and hence inequalities should disappear relatively quickly.

Furthermore, the results revealed that intergenerational mobility differed between countries of origin. This could be explained by differences in characteristics between immigrants. For instance, immigrants from Finland and Iran deviated to a large extent from the total immigrant population average when it comes to income and years of education. It was then perhaps not surprising that these countries had high intergenerational mobility as their children were closer to the overall mean for the next generation. In other words, regression towards the mean appears to be at its strongest for countries with large initial deviations.

When ethnic capital was included, the labour market appears to be less flexible. In regards to income, elasticity was 0.35. Full-time employment yielded a correlation of 0.35 and education a correlation of 0.08 (table 7.2). Again a direct comparison is not possible as scaling is different. Nevertheless, the results showed that group-belonging to a large extent influences the socio-economic outcome of the child. As stated by Borjas (1992, p.145) a possible explanation for the importance of ethnic capital is discrimination, towards both first and second generation immigrants.

But the seemingly large importance of ethnic capital could also be explained in other ways. To give an example, as residence permits due to family ties are very common grandparents living in the same household are likely to affect the upbringing of children living in that household. Furthermore, relatives could function as intermediaries in regards to finding jobs.

That is, for those who are able to take advantage of the available connections, ethnic capital might be positive.

The disaggregation of ethnic capital also yielded some interesting results. Firstly, differences between ethnic groups in size and composition did not influence the importance of ethnic capital. Nor did place of residence or origin. Secondly, in regards to the results from quantile regression, intergenerational transmission and ethnic capital appeared to be more important among low-income sons than among high-income sons. These results are in line with previous results from Swedish data (Österberg 2000, p. 127).

Looking at the economic theory presented in this study, it is apparent that it has relevance in the Swedish society, especially "ethnic capital". In other words, the contribution of Coleman and Borjas has been important.

A possible caveat of this study is that data included only immigrants between the mid-1960s and mid-1980s. During this time most of the immigration was work-related and only in the latter part of the period did immigration by refugees increase. As it is possible that the mechanisms affecting work-related immigrants differ from those affecting refugees, it is possible that the results from this study cannot be generalised to children who presently attend school.

To conclude, the main results from this study were that ethnic capital to a larger extent than parental capital influenced the socio-economic outcome of the child. Furthermore, the effects were larger for low-income sons than for high-income sons.

8.1 Policy implications and further research

The policy implications of this study are rather clear. Firstly, considering the impact of ethnic capital, it would not be wise if interventions were only directed towards individuals. Instead, entire groups should be in focus. Furthermore, interventions do not only take effect in the short run. In contrast, interventions helping generations today, also affect the generations of tomorrow. This has implications when evaluating and deciding whether or not an intervention should be undertaken; if long run benefits are not accounted for, the total benefits could be underestimated. Thus, an intervention could be considered inefficient, when in fact, it is efficient.

Secondly, as the importance of intergenerational transmission appeared to be larger for low-income sons, interventions should primarily be focused on these groups. If this is not

done they run the risk of being locked in, which in the long run leads to the persistence of inequalities.

As intergenerational mobility among second generation immigrants to some extent is unexplored territory, much research can still be done in this area. One possibility would be to examine if immigrants with different motives for immigration later differ in regards to intergenerational mobility. It would also be interesting to include women and see if their intergenerational mobility differs from that of men.

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Appendix A

A country is estimated separately if 50 or more children's both parents have a foreign origin and 50 or more children have a Swedish mother. The exception is Iceland and Canada, as they were the only countries left in their respective continent.

As immigration took place in the 1960s to the 1980s, some of the countries do not longer exist. However, the exception is the Baltic States (Estonia, Latvia, Lithuania), which are reported separately, due to their sheer size. The reason for countries like Italy and Spain being categorised as Southern Europe is due to the relatively low economic development during that time. Germany is defined as both former West-Germany and former *Deutsche Demokratische Republik* (DDR). However, as only five individuals came from DDR during the period of interest, their influence should be minimal.

The Nordic Countries: Denmark, Finland, Iceland and Norway.

Western Europe: Austria, Belgium, France, Germany, Great Britain and Northern Ireland, Holland, Ireland, Luxembourg, Monaco and Switzerland.

Southern Europe: Albania, Cypress, Greece, Italy, Malta, Portugal, Spain and Yugoslavia.

Eastern Europe: Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Soviet Union and Czechoslovakia.

North America: the United States and Canada.

Latin America: Argentina, Brazil, Bolivia, Barbados, Chile, Colombia, Costa Rica, Danzig, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Jamaica, Cuba, Mexico, Nicaragua, Panama, Paraguay, Peru, Surinam, Trinidad and Tobago, Uruguay and Venezuela.

Africa: Algeria, Angola, Burundi, the Comoros, the Central African Republic, the Democratic Republic of Congo, Djibouti, Egypt, Ethiopia, the Ivory Coast, Eritrea, French Morocco, Gambia, Ghana, Guinea, Cameroon, Congo, Kenya, Lesotho, Liberia, Libya, Malawi, Mali, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, Sudan South Africa, Tanzania, Tunis, Uganda, Zambia, Zanzibar.

Asia: Bangladesh, China, Hong Kong, India, Indonesia, Japan, Malaysia, Mongolia, Myanmar, Oman, Pakistan, the Philippines, Singapore, Sri Lanka, Taiwan, Thailand, South Korea South Yemen and Vietnam.

Middle East: the Gaza Strip, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Palestine, Syria, Turkey and Yemen

Appendix B

Test for Heteroskedasticity

The Bickel's variety of White's test for heteroskedasticity was used in this essay. More information on the test itself can be found in Wooldridge (2003, p. 269). Heteroskedasticity could be a problem as the standard error is often underestimated. However, this is not a major problem, in this essay, as the entire population is included. Thus, the true values should be estimated.

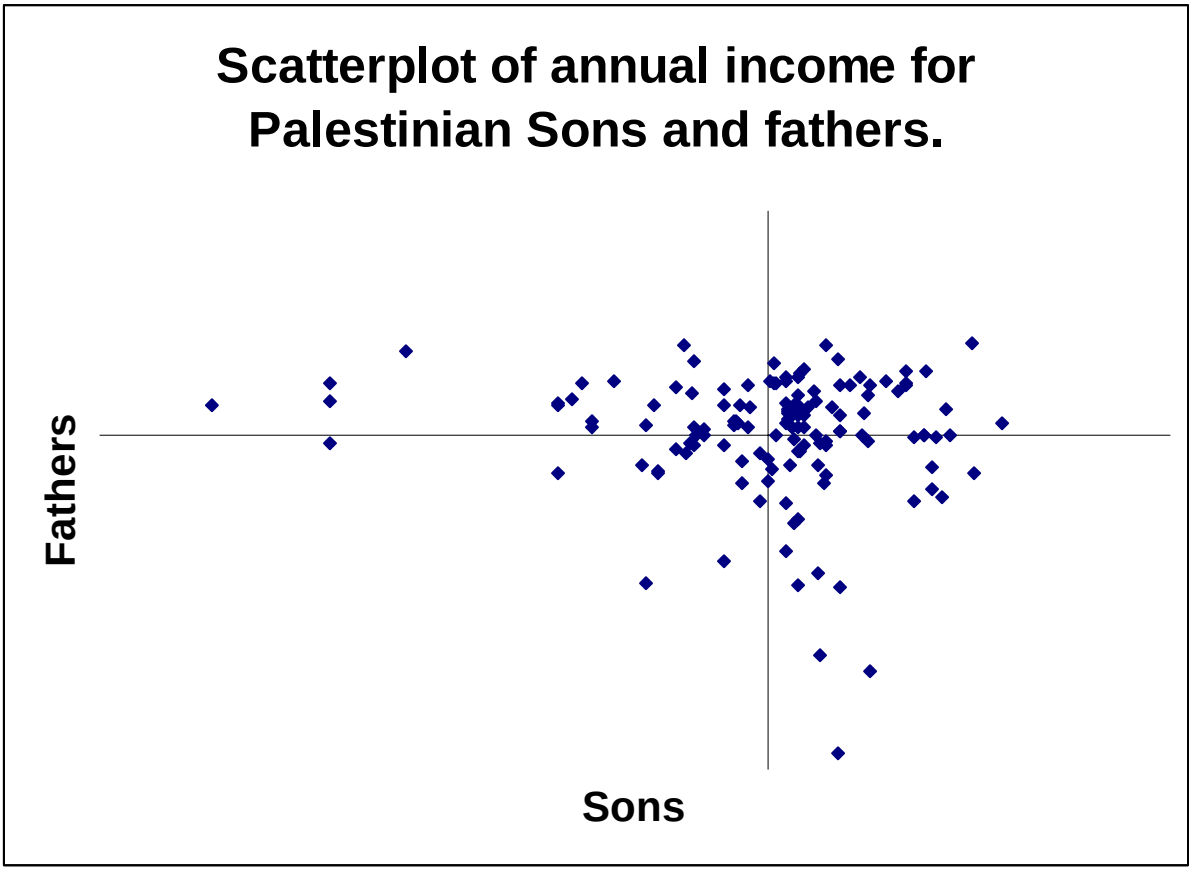
The test revealed that all models suffered from heteroskedasticity. The usual way of correcting for this is by using robust standard errors. However, this was not done when intergenerational transmission was calculated for each country as the statistical package, SPSS version 13, could not calculate robust standard errors. Still, as the true value should be estimated, it should not be a problem. The other calculation used robust standard errors which accounted for that some of the observations had the same independent variable (ethnic capital was constant within ethnicity).

Test for Misspecification

The Ramsey's Regression Specification Error Test (RESET) was used to test for form specification. Interested readers can turn to Wooldridge (2003, 292-293) for further information. Briefly, the test is designed to detect nonlinearities. Obviously, as ordinary least square is linear, nonlinearities can lead to wrong estimations. However, as stated by Verbeek (2004, p. 63); since omitted variables could capture nonlinearities, it is possible that the RESET picks up omitted variable. Hence, if the RESET discovers nonlinearities, including more variables could solve the problem.

Firstly, the models only measuring intergenerational mobility were tested. The tests all indicated some misspecification. This improved when "ethnic capital" was added to the model. Hence, on the basis of the RESET, the models including "ethnic capital" are preferred.

Appendix C



Notes. The values presented above are the residuals from the regressions where the sons' income were adjusted for age and the fathers' income were adjusted for age and residence.

The scatter plot above is from table 7.2 where the intergenerational income elasticities were measured. As can be seen there are some observations on the upper-left hand corner and lower-right hand corner, leading to a negative correlation for Palestinian intergenerational income elasticity.

Scatter plots for the other countries and labour-market outcomes can be retrieved from the author by request. A discussion concerning the negative coefficients in table 7.2 can be found in the sensitivity analysis.