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Intergenerational Mobility, Human Capital Transmission and the Economic Position of Second-Generation Immigrants in Sweden^{*}

by

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Abstract: We examine three different aspects of intergenerational earnings mobility among immigrants in Sweden: (a) average earnings mobility of the entire group of immigrants compared to native Swedes; (b) is intergenerational mobility between groups of immigrants with different national origin; (c) individual within immigrant group intergenerational mobility and how it relates to the performance of the different groups of second-generation immigrants. We use a unique data set, which contains information on earnings from 1975 and 1980 for the *all* male immigrants arriving before 1970 along with earnings information of their sons between 1997 and 1999. We find that the entire group of immigrants converges in earnings to the native comparison group, but that the average earnings of the different groups of immigrants diverge in the second generation. We also find that groups of immigrants with low intergenerational earnings mobility, high rate of intergenerational transmission of human capital, have on average higher earnings in the second generation. This finding supports a prediction from the well-known Becker-Tomes model for intergenerational transmission of human capital.

JEL: J15, J24, J61, J62.

KEYWORDS: Intergenerational income mobility, Intergenerational earnings correlation, Becker-Tomes model.

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1. Introduction

The number of immigrants has, like in most other OECD countries, increased rapidly in Sweden over the most recent decades. In 2004, the number of foreign born residing in Sweden amounted to 11 percent of the population, which is about the same as the US, and the number of individuals with at least one foreign born parent, second-generation immigrants, to about 25 percent. The performance on the labor market of such large share of the population is of course of great importance for Sweden's economy, as it would be for any country with a similar composition of the labor force.

In this study we examine the outcome of the second-generation immigrants on the Swedish labor market in relation to the first generation. We use a unique data set, which contains information on labor earnings from 1975 and 1980 for *all* male immigrants arriving before 1970 and for *all* their children between 1997 and 1999. To each first-generation immigrant, a native individual has been matched with respect occupation, region of residence and age to form a comparison sample of natives to the original data set.¹ This data also contains corresponding information on the next generation. Because of the large size of the data set, almost 70,000 male second-generation immigrants - which is a total survey rather than a sample - we are able to divide the data into 20 sub-groups with respect to geographical origin, which allows for separate analysis.

In the first part of the analysis, we study intergenerational mobility of the entire group of immigrants compared to the group of natives, and between immigrant-group intergenerational mobility. This enables us to analyze if earnings of the entire group of second-generation immigrants converge or diverge to the entire group of natives. It also enables us to investigate if earnings of different groups converge or diverge in the second generation, i.e., whether an advantage or a disadvantage of a particular group is reinforced or weakened in the second generation. To a large extent this part of the study parallels that of Borjas (1993) for the US.

Since our data enables us to link the first and second generations on an individual basis we are, however, able to extend the analysis to intergenerational mobility *within* the different groups of second-generation immigrants. This, in turn, enables us to analyze why certain groups of second-generation immigrants are more and some are less successful than their

¹ We will explain the sampling procedure in detail below.

parent generation on the labor market. We depart from the well-known Becker-Tomes model for intergenerational transmission of human capital (see e.g. Becker and Tomes, 1986). As we will show in Section 2, it follows from this model that a high degree of intergenerational transmission of human capital within a group of individuals will lead to higher income level in the second generation and lower inter-generational income mobility. To test this prediction empirically, we will proceed in two steps. In the first step, we estimate intergenerational earnings mobility within the different groups of immigrants. In the second step, we relate these estimates to the outcomes for the entire groups. This is done both by just comparing averages between different groups and by a regression analysis on grouped data.

Several interesting results emerged from the study. We find that starting from a 5.0 percent average earnings disadvantage in the first generation, the earnings of the entire group of second-generation immigrants converge, and in fact exceeds by 1.6 percent, average earnings of the comparison group of natives. However, the results from the between immigrant-group analysis shows that average earnings in the different groups of immigrants diverge, since the point estimate of the coefficient in a linear regression of average group earnings in the second generation on earnings in the first one exceeds one. We also find that individual intergenerational earnings mobility is lower in the group of immigrants compared to natives. We interpret this result as the family being more important for the labor market outcome among immigrants. Finally, we find that intergenerational mobility is heterogeneous within the different groups of immigrants and that groups with lower mobility, and higher level of transition of human capital within the families, have on average higher earnings from labor. This result is interpreted as supporting the prediction from the Becker-Tomes model of intergenerational transmission of human capital.

The present study relates to two different branches of the previous literature on intergenerational income mobility and intergenerational transmission of human capital. The first one is intergenerational mobility between different groups of immigrants (see e.g. Borjas, 1993, for a study on US data, and Österberg, 2000, or Rooth and Ekberg, 2003, for studies on Swedish data). The present study extends this branch of the literature since we are also able to study within-group intergenerational mobility, which in turn enables us to analyze why certain groups on average move up and some move down in the aggregate income distribution. The second branch is general empirical studies on intergenerational income mobility (see Solon, 1999, for an overview of this literature, or Björklund and Jäntti, 1997, for a study on Swedish

data). However, previous studies within this literature have not been concerned by differences in intergenerational mobility between different groups in a society and how it relates to the performance of these groups on the labor market.

The paper is organized as follows. Section 2 discusses the implications of the Becker-Tomes model for intergenerational income mobility among immigrants. In Section 3 we first describe the history of immigration to Sweden and immigration policy up to 1970. We then describe the data set used in the study. Section 4 presents the results and Section 5 concludes.

2. Intergenerational Transmission of Human Capital and Intergenerational Income Mobility

The study of intergenerational transmission of human capital among immigrants involves several additional aspects compared to conventional studies on intergenerational income mobility. Borjas (1993) stresses the importance of possibilities to transmit human capital between generations for the immigration decision and thereby the selection of immigrants. Societies may, indeed, differ in how, and to what extent, skills are transmitted between generations. In the introduction to the chapter on intergenerational income mobility in *Handbook of Labor Economics* (Solon, 1999), a society with no transmission of human capital within the family is (complete mobility) is contrasted with a society where the position at the labor market is completely inherited. In such “cast” society, there will be no intergenerational income mobility.

In the real world, all societies are of course between these two extremes. However, empirical evidences on intergenerational income mobility, reviewed by Solon (1999), suggest that they can vary substantially in this respect. It is likely that welfare state arrangements, such as public financing of education, as well as more or less rigid social structures affect this outcome. Following Borjas’ argument, an “open” society, with high degree of intergenerational mobility, is, everything else equal, likely to attract unskilled workers in the first generation, since their children have a higher chance of improving the position on the labor market compared to their parents. Conversely, a “closed” society, with low degree of intergenerational mobility is likely to attract skilled workers in the first generation, since their children are more likely to maintain their labor market position.

Another determinant of intergenerational mobility is preferences to transmit human capital, i.e., to invest in ones children. To clarify this point, we depart from the well-known Becker and Tomes model, as presented by Solon (1999), for intergenerational transmission of human capital. Suppose income in the parent generation is divided into consumption expenditures and investment in the next generation, i.e.,

$$y_{t-1} = C_{t-1} + I_{t-1}, \quad (8)$$

where y is income, C consumption and I investment in the next generation. The sub-index $t-1$ indicates that it refers to the parent generation. The income in the next generation is then determined as:

$$y_t = (1+r)I_{t-1} + E_t, \quad (9)$$

where r is the return on the investment and E is a composite component for “everything else” that influence earnings. This process is supposed to be known by the parent generation. To determine the optimal size of the investment in the next generation, suppose the parent generation has the following utility function for consumption in the current period and income for the next generation:

$$U = (1-\alpha)\log C_{t-1} + \alpha \log y_t, \quad (10)$$

where the parameter α can be interpreted as taste for the income level of their children. If this utility function is maximized subject to the budget constraint in (8) the following expression for the optimal level of investment in the next generation is obtained:

$$I_{t-1} = \alpha y_{t-1} - (1-\alpha)E_t / (1+r). \quad (11)$$

We are the able to derive an expression for the income level of the second generation, i.e.,

$$y_t = \beta y_{t-1} + \alpha E_t, \quad (12)$$

where $\beta = \alpha(1+r)$. If y_{t-1} and E_t are orthogonal, β gives the intergenerational correlation in earnings. This is, however, unlikely to be the case. To examine this, let us divide E_t in two components, i.e.,

$$E_t = e_t + u_t \quad (13)$$

where e_t measures “nature and nurture” inherited from the parent generation and u_t measures “pure market luck”. Let us further assume that e_t follows an AR(1) process, i.e.,

$e_t = \lambda e_{t-1} + v_t$. The income in the next generation can the written as

$$y_t = \beta y_{t-1} + \alpha \lambda e_{t-1} + \alpha v_t + \alpha u_t \quad (14)$$

and the intergenerational correlation in labor earnings can be written as

$$\text{Corr}(y_t, y_{t-1}) = \delta\beta + (1 - \delta)[(\beta + \lambda)/(1 + \beta\lambda)], \quad (15)$$

where $\delta = \alpha^2 \sigma_u^2 / [(1 - \beta^2) \sigma_e^2]$.

Equation (15) shows that intergenerational correlation is positively related to the taste for income in the next generation, α . It also shows that r , the returns on investment in human capital, and λ , the strength of transmission of endowments, affect both the intergenerational correlation and the income levels in the second generation. Finally, it can be seen that the intergenerational correlation in earnings is affected by the relative magnitude of σ_e^2 and σ_u^2 . If the variation in endowments is more important, intergenerational correlation in earnings will be higher.

The data used in this study allow us to estimate the intergenerational earnings correlation within groups of immigrants with different geographical origin. Following the Becker-Tomes model, to the extent that intergenerational earnings correlation varies between immigrants and natives, or between immigrant groups, it should be referred to between-group differences in these four parameters. Since all individuals in the data are active on the same labor market, it is unlikely that the returns to investments in human capital, r , is different between different groups. It is also unlikely that λ , the strength of transmission of endowments, or σ_u^2 / σ_e^2 , the relative magnitude the variation in inherited endowments and market luck, varies between different groups on the same labor market. However, preferences for investing in the next generation, measured by α , is a choice variable and can very well differ between different ethnic groups or groups with different level of skills.

It is, for example, conceivable that immigrants originating from countries where the family is more important for funding higher and secondary education, e.g. the US, are more willing to invest in their children. Also, there is extensive anecdotal evidence on political refugees who for political reasons were restricted on the labor in their country of origin, or had to leave prominent position, are more inclined to be engaged in the careers of their children. This would primarily apply to the immigrant groups originating from ex-communist countries in Eastern Europe and to some extent from Latin American countries. Conversely, it is likely that workers who were recruited to jobs in the new country that are better than what they

could have get in their country of origin, find it more profitable to go in for their own careers.² Finally, it should be stressed that preferences for investing in ones children can vary with the skill level of the parent generation. It is not evident that, as in the formulation of the Becker-Tomes model given above, equal shares of the parents' income are transferred to the children.

Another implication of the Becker-Tomes model is that, controlling for the level of human capital in the first generation, individuals with preferences to invest in their children, i.e., relatively high α , will, on average, improve the situation for their children. This is seen from equation (14) above. Following this reasoning above, that a differences in intergenerational correlation in labor earnings between groups active on the same labor market can also be referred to differences in preferences to invest in ones children, α , a testable implication of the Becker-Tomes model is thus that groups with low intergenerational earnings mobility should improve their average labor market outcome in the second generation. This implication of the model is examined empirically in Section 4 on groups of immigrants with different geographical origin.

3. Sweden's Immigration History 1910-1970 and Data

3.1. Swedish immigration policy and migration to Sweden until 1970

The first-generation immigrants included in our sample arrived to Sweden between 1916 and 1970. Table 1 gives a brief description of different eras in Sweden immigration policy and the composition of immigrants entering Sweden during this period. In the first period described in the table, 1910-1940, immigration to Sweden was very limited. The annual average number of immigrants amounted to about 7,000 annually, compared to an annual emigration, primarily to North America, on about 12,000 annually. One reason for the low emigration was the restrictive policies towards immigrants that were applied from 1917 and ahead. During the economic recession in the 1920's the policy regarding immigrants in Sweden and other European countries became even more restrictive. In the 1930's and Sweden became a net immigration country. This was, however, primarily due to a decreased rate of emigration to the US and the immigration to Sweden primary consisted of return migration from the US.

² As we will see in Section 3 on history of immigration to Sweden below, this could apply to immigrants

Table 1. Composition of immigrants to Sweden and Swedish immigration and refugee policy 1910-1970.

Point of time:	Immigration and refugee policy	Type of immigration	Major source countries
1910-1940	Restrictive policy against immigrants and refugees from 1917 and ahead	Return migration from North America and immigrants from the Nordic countries	Nordic countries. Return migrants from North America
1940's	Less restrictive refugee policy due to Second World War	Refugee immigration due to the second world war	Nordic countries and countries in Eastern Europe
1950's	The common Nordic labor market 1954	Low educated labor force migration	Finland, other Nordic countries, Italy, Greece
	Collective labor force conveyance with recruitment campaigns	High educated labor force migration	Western Europe
1960's	The 1953 Work regulation of the OEEC which gave non-Nordic immigrants right to enter Sweden individually and then apply for a work permit and the Alien Act of 1953 which gave foreigners resident in Sweden legal protection and security in the country.	Refugee migration	Hungary
	The Geneva convention of 1951 regarding different classifications of refugees.		
	Restriction that non-Nordic immigrants must arrange for visas, employment and residence before entering Sweden.	Low educated labor force migration	Finland, other Nordic countries, Yugoslavia
		Refugee migration	Czechoslovakia

It was not until the Second World War that immigrants without previous ties to Sweden began to arrive in significant numbers. From the 1940's and ahead Sweden have had a large yearly average immigrant surplus. For the period 1940-1970 the average annual immigration amounted to about 29,000 individuals and the average annual emigration amounted to about 14,000 individuals. Most of the emigrants during this period were former immigrants.

In the 1940's most of the immigrants were refugees due to the Second World War. During the war most refugees came from the neighboring Nordic countries and the Baltic States. Migration during the late 1940's consisted mainly of refugee immigrants from countries in Eastern Europe with Poland and the Baltic States as dominating countries.

originating from Southern Europe.

The character of immigration changed in the late 1940's. From the beginning of the 1950's until the early 1970's immigration to Sweden was predominately labor force migration. The labor force migration depended to a large extent on the economic cycle. Immigration increased in times of high demand for labor and decreased when the demand for labor decreased. The labor force migration during the 1950's and 1960's was made possible by three institutional changes: First, the agreement about a common Nordic labor market in 1954, removing the needs for residence and work permits for immigrants from the Nordic countries. Secondly, the collective labor force conveyance with recruitment campaigns across Europe instituted by the Swedish Labor Market Board in co-operation with local unions and companies. Thirdly, the approval of the 1953 Work Regulation of the OEEC and the Alien Act of 1954. The Alien Act of 1954 was designed to give foreigners resident in Sweden certain legal protection and security in the country and together with the Work Regulation of the OEEC it made it possible for non-Nordic immigrants to enter Sweden individually and then apply for a work permit there.

Labor force migration during the 1950's consisted mainly of immigrants from Finland, from Western European countries such as West Germany, Belgium and the Netherlands, and from Southern European countries such as Italy and Greece. The Western European immigrants were in general better educated than the immigrants from the Nordic countries and Southern Europe. At the beginning of the 1960's immigration from Yugoslavia started to increase. In the mid-1960's Finland, Yugoslavia and Greece were the dominating labor force migration countries. There was also labor force migration from Turkey during the mid-1960's.

The Alien Act of 1954 lasted until the mid-1960s when it was changed under pressure from Swedish labor unions. In the mid-1960s Swedish labor organizations saw immigrants holding down the wage level for low paid workers. In 1968 the Swedish government imposed the restriction that non-Nordic immigrants must arrange for their visas, employment and residence before they entered Sweden. However, these restrictions did not reduce the total labor force immigration. The non-Nordic immigration decreased but the Nordic immigration increased instead. The total labor force immigration reached its peak in the years around 1970, and it was not until the economic recession in the mid-1970s that labor immigration to Sweden decreased.

Refugee migration to Sweden was low during the 1950's and 1960's. There was refugee migration from Hungary in connection with the rising in the mid-1950's and from Czechoslovakia in connection with the Soviet Union's assumption of power in the late 1960's.

The character of the non-European immigration to Sweden has changed over the years. Prior to 1970 non-European immigration constituted only about 10 percent of the total immigration to Sweden. Migration from non-European countries prior to 1970 was to a large extent return migration of Swedish citizens, and many of the foreign born persons who immigrated to Sweden from non-European countries prior to 1970 were members of the same families as the Swedish return migrants. However, in the mid-1970's the number of refugees from non-European countries started to increase. During the 1970's non-European immigrants made up about 25 percent of the total immigration to Sweden. Most of the non-European immigrants during the 1970's were refugees from Latin America. During the 1980's and 1990's the share of non-European immigrants amounted to about 50 percent of the total immigration to Sweden and were mostly dominated by refugees from Asia and Africa.

3.2 Data

Our sample, obtained by Statistics Sweden, contains data on all foreign-born individuals who were resident and gainfully employed in Sweden in 1970 and their children. The foreign-born individuals were between 20 and 64 years of age in 1975 and 1980. The children born in Sweden by those individuals were between 20 and 64 years in 1997, 1998 and 1999. This means that our sample contains foreign-born individuals that immigrated to Sweden between 1916 and 1969.

Table 2 shows how the data for the study have been designed. For a comparison with natives a twin method was used. For each first-generation immigrant in the sample a native Swede was selected randomly from cell with the same age, gender, geographical residence (county) and occupational status (at the three-digit level from the SNI-code, which means 282 different occupations) as the immigrant.

Table 2. Description of how the data has been designed.

	Explanation
First generation immigrant	All first generation immigrants gainfully employed or self-employed in Sweden 1970
Native twins	Native born individuals with the same age, gender, county of residence and occupational status as their foreign born counterparts by the year 1970
Second generation immigrant	Children of foreign born fathers
Native comparison group	Children with both parents born in Sweden
Birth year for foreign born fathers and native twins	1916-1955
Birth year for second generation immigrants and native comparison groups	1935-1977
Fathers earnings observed	1975, 1980
Sons earnings and social assistance dependency observed	1997, 1998, 1999
Earnings definition	All fathers with positive earnings in 1975 and 1980 All sons with positive earnings in 1997, 1998 and 1999

We use data on first-generation immigrants and their native twins from the 1975 and 1980 Censuses. All sons who were 20 years of age or older in 1997 are linked to their parents. The second-generation immigrants and children of natives were observed in 1997, 1998 and 1999.

The second-generation immigrants have been divided by their fathers' region of origin into twenty groups with the emigration pattern to Sweden as a starting point. The groups selected for our analysis are immigrants from Finland, other Nordic countries, former Yugoslavia, Greece, Italy, Turkey, the Baltic States, former Soviet Union, former Czechoslovakia, Hungary, Poland, Germany, France, United Kingdom, the Netherlands, the Middle East, Africa, Asia (except the Middle East), Latin America and the United States and Canada. To each one of the sixteen immigrant groups a comparison group containing children to native-born twins has been selected. In the native comparison groups the father was born in Sweden. The groups and the number of individuals in each group are presented in Table 3.

Table 3. Number of individuals and share of individuals with a native born mother in different groups of second-generation immigrants.

Father's region of birth		Number of male second generation immigrants	Share of second generation immigrants with a native born mother (percent)	Number of children of native "twins"
1	Finland	25,674	35.8	19,477
2	Other Nordic countries	14,614	70.3	10,865
3	Former Yugoslavia	4,262	28.7	3,369
4	Greece	1,029	29.5	785
5	Italy	1,389	65.2	1,160
6	Turkey	408	32.3	310
7	Baltic States	4,327	51.6	3,213
8	Former Soviet Union	1,393	36.7	963
9	Czechoslovakia	1,058	40.8	930
10	Hungary	2,515	49.5	2,064
11	Poland	1,484	45.1	1,137
12	Germany	7,383	64.5	5,828
13	France	357	79.0	287
14	United Kingdom	592	81.3	501
15	The Netherlands	754	67.0	528
16	Middle East	255	56.1	160
17	Africa	470	66.8	291
18	Asia	456	74.3	326
19	Latin America	246	74.0	176
20	United States and Canada	1,832	89.7	1,360
Pooled groups of second-generation immigrants				
1	Nordic countries	40,288	48.3	30,342
2	Southern Europe and Turkey	7,088	36.2	5,624
3	Eastern Europe	10,777	47.2	8,307
4	Western Europe, US and Canada	10,918	70.3	8,504
5	Africa and Middle East	725	63.0	451
6	Latin America and Asia	702	74.2	502

Table 3 shows that the great majority of the second-generation immigrants are sons of fathers originating from the Nordic countries. It also shows that the share of second-generation immigrants born by native-born mothers varies between the groups. Sons of labor-force migrants, e.g. originating from Finland, Greece, Turkey or Yugoslavia, are to a larger extent than other second-generation immigrants born by a foreign-born mother. For these groups only about 30 percent have Swedish mothers. In the groups originating from Western Europe, Asia and Latin America the share of second-generation immigrants born by a native born mother in many cases exceeds 70 percent. Among second-generation immigrants with fathers born in the United States or Canada the share with a native born mother is almost 90 percent.

Table 4 also shows that the age of the second-generation immigrants varies between different groups. The average age among sons with fathers originating from the Baltic States and the former Soviet Union is about 40 years. The average age among sons to immigrants from countries in Western Europe, the Nordic countries (except Finland) and countries in Eastern Europe is about 35 years. As regards second-generation immigrants with fathers originating from Southern Europe or non-European countries the average age is considerably lower. For second-generation immigrants with fathers originating from former Yugoslavia, Greece, Turkey and the Middle East the average age is below 30 years.

Table 4. Average age and percentage share of individuals with earnings from labor > 0 in 1997, 1998 and 1999. Second-generation immigrants and native comparison groups.

No.	Father's region of birth	Average age (years)		Share of individuals who had earnings from labor > 0 in 1997, 1998 and 1999 (percent)	
		Second generation immigrants	Children of natives	Second generation immigrants	Children of natives
1	Finland	33.1	34.6	79.1	72.9
2	Other Nordic countries	38.8	39.8	79.7	72.7
3	Former Yugoslavia	29.0	32.6	70.8	71.5
4	Greece	28.5	33.1	56.9	75.2
5	Italy	33.6	36.6	75.0	72.5
6	Turkey	28.8	34.6	60.8	65.8
7	Baltic States	40.1	41.5	81.7	72.8
8	Former Soviet Union	42.3	43.4	78.3	73.1
9	Czechoslovakia	36.1	37.2	80.3	75.9
10	Hungary	34.2	36.0	76.3	73.3
11	Poland	39.6	41.8	76.6	70.9
12	Germany	35.8	36.9	82.0	73.0
13	France	36.4	36.8	78.2	65.5
14	United Kingdom	34.1	36.2	80.2	74.1
15	The Netherlands	36.5	37.4	81.2	73.5
16	The Middle East	28.6	31.7	66.3	70.6
17	Africa	30.8	34.4	70.4	73.2
18	Asia	34.8	38.3	77.4	76.1
19	Latin America	33.4	36.6	79.7	73.9
20	United States and Canada	43.3	43.7	81.0	72.2
Pooled groups of second generation immigrants					
1	Nordic countries	35.2	36.5	79.3	72.8
2	Southern Europe and Turkey	29.8	33.6	77.4	71.9
3	Eastern Europe	38.5	39.9	79.2	73.0
4	Western Europe, US and Canada	35.8	36.9	81.6	72.7
5	Africa and Middle East	30.0	33.4	69.0	72.3
6	Latin America and Asia	34.3	37.7	78.2	75.3

Finally, Table 4 shows that the share of second-generation immigrants with positive earnings from labor varies between the groups. Among second-generation immigrants with fathers

originating from the Nordic countries, Asia, Latin America, Western and Eastern Europe this share is between 85 and 90 percent. For some of the Southern European groups and the Middle East the share is considerably lower.

4. Results

4.1 Economic positions of first- and second-generation immigrants and between-group intergenerational mobility

Table 5 compares the economic position of first- and second-generation immigrants with that of the native comparison groups. Since these results are obtained on the entire population of immigrants we do not report standard errors. The first two columns show the results for the first-generation immigrants. In the first of these columns the average earnings of the immigrants are compared to the average of the twin native group. The interpretation of this comparison is the difference that remains when controlling for composition in occupation, sector of employment and local labor market. The second column shows the results of the comparison when all native twin groups have been pooled together, i.e., the difference compared to the natives with the average occupation, sector and local labor market composition of the entire immigrant group. To control for differences due to earnings variation over the life cycle, all individual earnings are measured as deviation from a cubic polynomial in age which is estimated on the entire data set.

Table 5. Differences in log earnings between male first generation immigrants and native comparison groups in 1975 and 1980 (pooled data) and difference in earnings and use of social assistance between male second generation immigrants and native comparison groups in 1997, 1998 and 1999 (pooled data).

No.	Father's region of birth	Differences in log earnings between male immigrants and native twins	Differences in log earnings between male immigrants and all natives	Differences in log earnings between male second generation immigrants and native their twins	Differences in log earnings between male second generation immigrants and all natives	Differences in use of social assistance between male second generation immigrants and their native twins	Differences in use of social assistance between male second generation immigrants and all natives
1	Finland	-0.032	-0.029	0.012	0.004	0.020	0.025
2	Nordic countries	-0.050	-0.082	0.038	0.026	0.017	0.016
3	Former Yugoslavia	-0.092	-0.105	-0.175	-0.184	0.041	0.032
4	Greece	-0.149	-0.223	-0.399	-0.377	0.048	0.037
5	Italy	-0.049	-0.067	-0.024	-0.063	0.021	0.017
6	Turkey	-0.262	-0.248	-0.232	-0.305	0.064	0.054
7	Baltic States	-0.014	0.021	0.138	0.153	-0.001	-0.013
8	Soviet Union	-0.015	-0.120	0.048	0.061	0.001	0.009
9	Czechoslovakia	-0.063	0.002	0.038	0.047	-0.010	-0.013
10	Hungary	-0.090	-0.062	-0.071	-0.065	0.032	0.019
11	Poland	-0.184	-0.188	0.087	0.031	0.002	0.009
12	Germany	-0.005	0.002	0.079	0.087	-0.005	-0.009
13	France	-0.205	-0.152	-0.103	-0.096	0.024	0.011
14	United Kingdom	-0.077	-0.006	-0.111	-0.103	0.025	0.021
15	The Netherlands	-0.063	-0.048	0.063	0.123	-0.002	-0.002
16	The Middle East	-0.276	-0.200	-0.251	-0.295	0.073	0.055
17	Africa	-0.284	-0.193	-0.225	-0.359	0.088	0.053
18	Asia	-0.090	0.002	-0.019	-0.024	0.005	-0.007
19	Latin America	-0.141	-0.094	0.238	0.086	-0.003	-0.009
20	United States and Canada	-0.041	-0.092	0.047	0.060	-0.012	-0.022
Average difference			-0.050		0.016		0.017
Pooled groups of second generation immigrants							
1	Nordic countries	-0.038	-0.047	0.022	0.014	0.021	0.022
2	Southern Europe and Turkey	-0.103	-0.123	-0.160	-0.182	0.037	0.033
3	Eastern Europe	-0.065	-0.047	0.060	0.060	0.008	0.002
4	Western Europe, US and Canada	-0.026	-0.001	0.059	0.069	-0.003	-0.007
5	Africa and Middle East	-0.280	-0.196	-0.236	-0.342	0.085	0.054
6	Latin America and Asia	-0.108	-0.020	0.078	0.015	0.002	-0.007
Average difference			-0.050		0.016		0.017

The result show that the first-generation immigrants earned on average about 5.0 percent less than the native group. The comparison to the entire native group shows that there are substantial differences between the immigrant groups in this respect. Immigrants from Turkey, the Middle East and Africa earned on average 20 to 25 percent less than natives in the first generation while immigrants from Germany and United Kingdom earned on average

about the same as natives in the first generation. The comparison with the twin group shows that varying part of the earnings differentials compared to natives can be referred to differences in composition with respect to occupation, sector and local labor market. For example, the immigrants from the Baltic States had 1.4 percent earnings disadvantage when compared to the native twin group, but an earning *advantage* compared to the entire native group. This result is probably due to that this group are predominantly employed in occupations that require high skills. However, for the African group the earnings disadvantage can be referred to that this group earns less within their occupations, sectors and local labor markets. The smallest earnings differentials compared to the native twin group are found among the geographically, and in some cases culturally, close immigrant groups from Finland, Other Nordic countries, Germany, the Soviet Union and the Baltic States.

The third and fourth columns show the corresponding results for the second-generation immigrants. However, since the twin group now consists of the sons of the first-generation native twin group, it does not maintain its characteristic of being matched on the characteristics of the immigrant group, i.e., the interpretation of the remaining earnings differential as the differential “controlling” for compositional differences cannot be maintained. On the other hand, it gives a measure on how successful the group of second-generation immigrants has been compared to a group of natives with similar socio-economic background.

The comparison of the average relative earnings of the entire group of second-generation immigrants shows that the 5.0 percent earnings *disadvantage* in the first generation is reversed to a 1.6 percent earnings *advantage* for the second-generation immigrants. However, Table 5 also shows that the average earnings disadvantage has increased for some groups. This is most apparent for the group originating from Turkey, Greece, the Middle East and Africa. Turning to the second-generation immigrants from the Nordic countries, Eastern Europe, Western Europe and from Latin America we find that second-generation immigrants from these groups have increased their relative earnings compared to natives in the second-generation. Second-generation immigrants from the Baltic States earn about 15 percent more than natives in the second-generation. For second-generation immigrants from Czechoslovakia or the Soviet Union the corresponding earnings advantage compared to natives amounts to about 6 and about 5 percent respectively while second-generation immigrants originating from Germany and the Netherlands earn about 9 and 12 percent more

than natives in the second-generation. Also second-generation immigrants Latin America earns more than natives in the second-generation. For this group the earnings advantage compared to natives amounts to almost 9 percent.

For the second-generation immigrant group we have an additional outcome measure: the share of the group that received social assistance in 1997, 1998 and 1999. The results of the comparison of this outcome measure are shown in column five and six. The results reveal differences between second-generation immigrants and their native comparison groups in the use of social assistance. The largest difference is found among male second-generation immigrants originating from Turkey, the Middle East and Africa. The share of social assistance recipients is more than 5 percentage points higher among second-generation immigrants with fathers originating from Turkey, the Middle East or Africa than among the native comparison group. Among male second-generation immigrants from Greece the difference with respect to the native comparison group amounts to almost 4 percent.

There are six second-generation immigrant groups - consisting of the Baltic States, Czechoslovakia, Germany, the Netherlands, the United States and Canada and Latin America - that are relatively successful as regards both earnings and social assistance. There is also a middle group consisting of Finland, Other Nordic countries, Italy, Hungary, Poland, former Soviet Union, France and United Kingdom; and a less successful group consisting of former Yugoslavia, Greece, Africa, the Middle East and Turkey. Finally, there is one outlier in the relation between average earnings differential and dependence on social assistance: Second-generation immigrants originating from Asia have relatively low earnings but also a small share that receives social assistance.

To assess the intergenerational mobility between groups of immigrants we estimate a relationship of the relative earnings of the two generations. This is given by:

$$y_s = 0.074 + 1.425 y_f, \quad R^2 = 52.6, \quad N = 20,$$

(0.040) (0.319)

where y_s is the relative earnings of the second-generation and y_f is the relative earnings of the first generation and the standard errors are reported in parentheses.

The constant in this regression model has the interpretation of mobility *vis-à-vis* the entire group of natives, i.e., an about 7 percent increase in relative earnings for the entire group.³ The slope coefficient measures mobility between the different immigrant groups. If it is zero, there is no correlation between the economic positions of the first- and second-generation immigrants and if it is one all groups maintain their position in average earnings relative to the group of natives. If it is between zero and one it, can be interpreted as “regression towards the mean”: It measures the share of a relative earnings advantage that is maintained in the second generation. The point estimate on 1.4 could be interpreted as an earnings *divergence* between groups in the second generation: The between-group average earnings differentials are reinforced in the second generation. Although, the coefficient is not significantly different from one the pattern of divergence is apparent when comparing the results pooled groups in the lower panel of Table 5. The comparatively small earnings disadvantages of the groups originating from the Nordic countries, Latin America, Eastern and Western Europe are reversed to earnings advantages in the second generation, while the large earnings disadvantages of the groups originating from Southern Europe, Middle East and Africa are reinforced in the second generation.

To sum up, although average labor market earnings of the second-generation immigrants exceeded those of the native comparison group the results show that there are great differences in the economic position between different groups of second-generation immigrants in Sweden. Especially among immigrants from non-European and from Southern European countries the yearly earnings are lower than among their native comparison groups. Furthermore, for immigrants from Africa and from especially Southern European countries the difference in yearly earnings compared to native seem to be larger in the second-generation than in the first generation. Second-generation immigrants from these regions also have a higher rate of social assistance recipients than natives. For other groups, such as the Nordic countries, and some countries in Eastern and Western Europe immigrants seem to do better in the second generation than in the first compared to natives. Finally, for some groups, such as immigrants from Hungary, France and the United Kingdom the difference in earnings seem to be smaller between second-generation immigrants and the native comparison group than among first generation immigrants and the native comparison group.

³ The average convergence in relative earnings between natives and the second-generation immigrants was estimated for the entire population. Note, however, that this estimate refers to different weighting of the groups than the 6.6 percent convergence presented above and imposes a restrictive functional form that also can also explain some of the discrepancy.

4.2 Within-group intergenerational mobility

There are several methodological problems related to the estimation of intergenerational correlation in labor market outcomes. As thoroughly explained by Solon (1992), these are primarily related to measurement problems of labor income for the parent generation. We follow Solon and denote earnings of the father as y_{fi} and of the son y_{si} . Solon (1992) shows that if observed labor earnings can be measured as the sum of a permanent and a transitory component, i.e., $y_{fit} = y_{fi} + v_{fit}$ and $y_{sit} = y_{si} + v_{sit}$, OLS regression of y_{sit} on y_{fit} yields inconsistent estimates of ρ . The asymptotic bias, which has a very similar interpretation as “attenuation bias” in the presence of measurement errors, is given by the following expression:

$$p \lim \hat{\rho} = \rho \sigma_{yf}^2 / (\sigma_{yf}^2 + \sigma_{vf}^2) < \rho, \quad (16)$$

where σ_{yf}^2 is the variance in the permanent component of parent generation labor earnings and σ_{vf}^2 the variance of the transitory one.

Another potential problem with the regression approach for measuring the intergenerational correlation in labor earnings is that it requires that the variance in labor earnings between individuals does not change over the generations, else it will measure $\rho \sigma_{yf}^2 / \sigma_{ys}^2$. An alternative approach, which does not suffer from this deficiency, is to estimate the correlation coefficient directly. The disadvantage of this estimator is, as again shown by Solon (1992), that it has a negative asymptotic bias also if there is only a non-zero variation in the transitory component of the second generation’s labor earnings, the dependent variable in the regression approach. This is shown by the following expression:

$$p \lim R = \rho \sigma_y^2 / \sqrt{(\sigma_y^2 + \sigma_{vf}^2)(\sigma_y^2 + \sigma_{vs}^2)} < \rho. \quad (17)$$

As a sensitivity analysis we use both estimators in the empirical analysis.

To control for individual earnings differentials over the life cycle, we use a quadratic polynomial in age for both the first and second generation, i.e.,

$$y_{fi} = \beta_{f0} + \beta_{f1}age_i + \beta_{f2}age_i^2 + u_{fi}, \quad (18)$$

and

$$y_{si} = \beta_{s0} + \beta_{s1}age_i + \beta_{s2}age_i^2 + u_{si}. \quad (19)$$

Substituting this into the AR(1) process assumed for the correlation over generations we get

$$y_{si} = (\beta_{s0} - \rho\beta_{f0}) + \rho y_{fi} + \beta_{s1}age_i + \beta_{s2}age_i^2 - \rho\beta_{f1}age_i - \rho\beta_{f2}age_i^2 + \varepsilon_i + u_{is} - \rho u_{if}, \quad (20)$$

For estimating ρ , we use both the regression model (20) estimate and, as a sensitivity analysis, the correlation coefficient of the residuals from the regressions in (18) and (19).

We use two different strategies for dealing with the asymptotic bias due to the difficulties in measuring lifetime earnings of the first generation. First, we use labor earnings averaged over annual earnings in 1975 and 1980, which can be observed in the data. Although this strategy will diminish the asymptotic bias, the estimator would still be inconsistent. However, since our primary interest in this study is to compare different immigrant groups, our analysis will only be affected to the extent that different groups have different variance in their transitory earnings component. Second, we use educational attainments of the parent generation as instrument for the average annual earnings. Although this approach gives consistent estimates of intergenerational correlation in earnings, the drawback is, which applies to all IV estimates, the efficiency loss compared to OLS.

The data on parental generation education is obtained from the 1990 census and contains information on highest education in 9 levels: the lowest level is basic compulsory level and the highest PhD. For a large share, 16.6 percent among immigrants and 15.4 percent of the native comparison group, information on education level is missing. To some extent, this high rate of missing values has to do with that this data is obtained 10 years later than the earnings data, i.e., a large share of the have passed away or emigrated during that time. In the 2SLS estimation we use dummy variables for each education level as instrumental variables. We use missing information on education as an additional category.

As described in Section 3, we have information on earnings for the second generation, the dependent variable in the regression models, from three years: between 1997 and 1999. To

use all these observations in the estimation we include year effects in the specification and in addition to that we allow general dependence over time for observations from the same individual and also between observations from siblings (see Moulton, 1986).

The results are shown in Table 6. The first two columns show the result from the OLS regression model for the second-generation immigrants with different geographical origin and the native comparison group respectively. Column 4 shows results for the different groups of second-generation immigrants when the correlation coefficient, instead of the regression model, has been used as estimator and, finally, column 6 shows the estimates from the IV model.

The estimates of the overall difference in intergenerational income mobility between natives and immigrants show that natives have higher inter-generational earnings mobility. The estimated levels are much higher for the IV estimator, which is expected since we know that the other two estimators have an asymptotic downward bias. It can also be seen that the efficiency of the IV model is inferior compared to the OLS one, since the standard errors are about three times larger. However, the difference between immigrants and natives is statistically different in all models and corresponds to more than 40 percent of native intergenerational correlation in labor earnings in all models, although it is largest in the estimates from the IV model. This result indicates that the family, and family resources, is more important for the labor market outcome among immigrants. A plausible background to these results is that native families are more integrated in e.g. the schools system and the society in general, while immigrant families have to rely on family resources to a larger extent.

Turning to the estimates of mobility within each group, it is, again, apparent that the level of the IV estimates is much higher than the OLS ones. However, this time the precision of the IV estimates is more problematic since we cannot use them for establishing significant differences between groups. For some groups, e.g. the group originating from Turkey, the bad precision of the IV estimates has to do with little variation and a high rate of missing values in the variable measuring father's education. However, the result in Table 6 shows that the point estimates of the three estimation procedures, with a few exceptions, give a very similar rank. The groups with the lowest mobility, highest intergenerational correlation, are those originating from Latin America, France, the US or Canada. The highest mobility is estimated

for those originating from Middle East or Turkey. Six groups, those originating from Finland, Other Nordic Countries, the Baltic States, Hungary, Germany, the US and Canada have significantly lower mobility for the OLS estimates than the entire group of natives. No group has significantly higher mobility than the group of natives.

As is evident from the results shown in Table 6, the precision of these estimates are very low for some groups of immigrants also in the OLS model. The results are, however, similar within groups of immigrants originating from areas from the same part of the world. Table 6 also shows the results from an additional analysis where we, in order to increase the precision of the estimates, have pooled the original 20 groups of immigrants to six larger groups. These results confirm that pattern from the previous analysis: The lowest mobility is within the groups originating from Western Europe, the United States and Canada, countries in Eastern Europe, Latin America and Asia. The second highest mobility is in the group originating from Southern Europe and the highest mobility is in the group originating from Middle East and Africa. A comparison of the results from the OLS model for the groups originating from Africa, Middle East or Southern Europe with those originating from Eastern Europe shows that mobility is significantly higher in the former two groups. Again, the results of intergenerational mobility within the comparison groups of natives are never significantly different from each other.

Table 6. Estimates of within immigrant group or native comparison group intergenerational earnings mobility. (Standard errors within parentheses).

Geographic origin	Regression estimates. Second generation immigrants	Regression estimates. Native comparison group	Rank. Second generation immigrants	Correlation coefficient. Second generation immigrants	Rank. Second generation immigrants	IV. Second generation immigrants	Rank. Second generation immigrants
1. Finland	0.183 (0.009)	0.124 (0.008)	12	0.104 (0.003)	13	0.343 (0.029)	11
2. Other Nordic Countries	0.209 (0.011)	0.131 (0.010)	7	0.138 (0.004)	6	0.371 (0.032)	9
3. Former Yugoslavia	0.180 (0.025)	0.124 (0.019)	13	0.091 (0.009)	15	0.199 (0.101)	16
4. Greece	0.170 (0.040)	0.182 (0.042)	14	0.106 (0.018)	12	0.006 (0.185)	20
5. Italy	0.123 (0.043)	0.097 (0.041)	16	0.069 (0.014)	18	0.202 (0.127)	15
6. Turkey	0.100 (0.074)	0.082 (0.044)	19	0.047 (0.032)	19	0.820 (0.321)	1
7. Baltic States	0.248 (0.023)	0.157 (0.018)	4	0.158 (0.009)	4	0.423 (0.057)	5
8. Former Soviet Union	0.163 (0.045)	0.016 (0.037)	15	0.089 (0.016)	16	0.190 (0.164)	17
9. Czechoslovakia	0.184 (0.043)	0.238 (0.032)	11	0.115 (0.017)	11	0.252 (0.087)	13
10. Hungary	0.247 (0.028)	0.170 (0.023)	5	0.150 (0.011)	5	0.529 (0.071)	2
11. Poland	0.189 (0.046)	0.149 (0.031)	10	0.120 (0.017)	10	0.356 (0.136)	10
12. Germany	0.201 (0.016)	0.149 (0.013)	8	0.135 (0.007)	8	0.413 (0.049)	6
13. France	0.272 (0.064)	0.116 (0.056)	1	0.201 (0.029)	1	0.496 (0.156)	3
14. United Kingdom	0.110 (0.051)	0.077 (0.039)	18	0.071 (0.023)	17	0.213 (0.125)	14
15. The Netherlands	0.223 (0.053)	0.158 (0.037)	6	0.135 (0.019)	7	0.486 (0.150)	4
16. The Middle East	0.064 (0.073)	0.217 (0.075)	20	0.038 (0.039)	20	0.184 (0.272)	18
17. Africa	0.121 (0.061)	0.192 (0.053)	17	0.092 (0.027)	14	0.167 (0.132)	19
18. Asia	0.201 (0.064)	0.174 (0.052)	8	0.130 (0.025)	9	0.342 (0.172)	12
19. Latin America	0.251 (0.086)	0.083 (0.082)	3	0.189 (0.039)	2	0.372 (0.146)	8
20. United States and Canada	0.254 (0.031)	0.183 (0.027)	2	0.188 (0.014)	3	0.391 (0.076)	7
All natives		0.140 (0.004)		0.090 (0.002)		0.222 (0.013)	
All immigrants	0.207 (0.005)			0.129 (0.002)		0.386 (0.016)	

Table 6 (continued). Estimates of within pooled immigrants group and native comparison group intergenerational earnings mobility. (Standard errors within parentheses).

Geographic origin	Regression estimates. Second generation immigrants	Regression estimates. Native comparison group	Rank. Second generation immigrants	Correlation coefficient. Second generation immigrants	Rank. Second generation immigrants	IV. Second generation immigrants	Rank. Second generation immigrants
1. Nordic countries	0.192 (0.007)	0.128 (0.006)	4	0.116 (0.003)	4	0.346 (0.021)	3
2. Southern Europe and Turkey	0.146 (0.028)	0.124 (0.026)	5	0.085 (0.012)	5	0.264 (0.103)	5
3. Eastern Europe	0.226 (0.012)	0.158 (0.010)	1	0.138 (0.005)	3	0.395 (0.034)	2
4. Western Europe, US and Canada	0.209 (0.013)	0.150 (0.010)	3	0.143 (0.006)	2	0.398 (0.037)	1
5. Africa and the Middle East	0.086 (0.046)	0.193 (0.044)	6	0.064 (0.024)	6	0.137 (0.127)	6
6. Latin America and Asia	0.222 (0.051)	0.144 (0.045)	2	0.154 (0.022)	1	0.274 (0.124)	4

An apparent feature of the results obtained above is that the groups where we observed the highest degree of intergenerational earnings mobility, Africa, Middle East and Southern Europe, also have the lowest level of earnings in the first generation. It is quite conceivable that the low level of intergenerational transmission of human capital within these groups can simply be that they have low level of skills in the first generation, rather than ethnic differences. To discriminate between these two hypotheses we estimate a model that allows for heterogeneous intergenerational earnings mobility in different earnings levels in the first generation. This model is specified as

$$y_{si} = \alpha + \rho_1 y_{fi} + \sum_{k=2}^6 \beta_k I_k + \sum_{k=2}^6 \rho_k I_k * y_{fi} + \sum_{j=2}^5 \gamma_j Q_j * y_{si} + f(Age_{fi}) + g(Age_{si}) + u_i, \quad (21)$$

where I_k is a set of dummy variables indicating the five different regions of origin and Q_j is set of dummy variables for quintile of the earnings distribution of first generation earnings. The specification also includes a quadratic specification in both first and second-generation age as well as, for specification (2) and (4), a full set of interaction between the age variables and the group of immigrant dummy variables.

Table 7. Intergenerational earnings mobility in different earnings levels in the first generation.

Variable	Immigrants		Natives	
	(1)	(2)	(3)	(4)
y_f	0.145 (0.013)	0.133 (0.014)	0.084 (0.011)	0.075 (0.012)
$Q_2 * y_f$	-0.001 (0.001)	-0.001 (0.001)	-0.000 (0.001)	-0.000 (0.001)
$Q_3 * y_f$	-0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
$Q_4 * y_f$	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
$Q_5 * y_f$	0.005 (0.001)	0.005 (0.001)	0.005 (0.001)	0.005 (0.001)
$I_2 * y_f$	-	-0.035 (0.029)	-	-0.003 (0.026)
$I_3 * y_f$	-	0.031 (0.014)	-	0.025 (0.011)
$I_4 * y_f$	-	0.013 (0.015)	-	0.020 (0.012)
$I_5 * y_f$	-	-0.095 (0.046)	-	0.055 (0.045)
$I_6 * y_f$	-	0.028 (0.052)	-	0.009 (0.044)
Test for joint significance parameters of $I_2 * y_f - I_6 * y_f$ (p-value)	-	0.028	-	0.196
R^2	0.094	0.099	0.030	0.038
N*t		267,562		215,996

The results from the estimation of the model are presented in Table 7. The first two columns show the result for immigrants and the last two columns the corresponding ones for the comparison group of natives. The results shown in column (1) and (3) corresponds to the model with homogenous intergenerational mobility within the ethnic groups, but heterogeneous mobility within income groups. These results show a very similar pattern. There is significantly lower mobility in the group with highest first generation income. However, the magnitude of the difference is very small, since they are on the third decimal.

Column (2) and (4) shows the results from the full models, i.e., when mobility is allowed to be heterogeneous within ethnic groups as well. The result from the F-test of joint significance of the interaction terms between first-generation and the ethnic group indicators shows that we can reject homogenous mobility within different groups. Again, homogeneity within the native comparison groups cannot be rejected. Taken together, we conclude from these results

that heterogeneous mobility between groups with different initial skills do not seem to be important enough to account for the observed differences in intergenerational mobility between the ethnic groups.

4.3 Determinants of between-group intergenerational mobility

In Section 2 we concluded that the initial level of human capital, i.e., the human capital level in the first generation, and the transmission of this to the next generation are of importance for the success of the second-generation immigrants on the labor market in the new country. In this section, we will empirically examine the importance of these factors on the average relative earnings of different groups of the second-generation immigrants.

We use two different measures of average human capital level in the first generation: the average relative earnings from labor of the first generation and the level of GDP per capita in the country of origin. To measure the transition of human capital between generations we use the results obtained on intergenerational correlation labor earnings. Table 8 shows the results from regressions where we use the relative income level of the second-generation immigrant group as a dependent variable and different permutations of the three variables explained above as independent variables.

Table 8. Determinants of average relative earnings of different groups of second-generation immigrants (t-values within parentheses).

Variable	(1)	(2)	(3)	(4)
Intercept	0.074 (1.88)	-0.110 (-1.37)	-0.245 (-3.63)	-0.137 (-1.67)
Per capita GDP			0.912 (2.80)	0.167 (0.68)
Intergenerational correlation		1.373 (2.56)		1.298 (2.61)
First generation income	1.425 (4.47)	1.190 (4.05)		1.296 (4.00)
R ²	52.6	65.7	39.6	82.3
N	20	20	14	14

Specification (3) and (4) omits former Yugoslavia, the Baltic States, the Soviet Union, Czechoslovakia, Hungary and Poland since per capita GDP was not available for these countries.

The per capita GDP in their father's home countries is used in specification (3) in Table 8. This time the level of the coefficient has no firm interpretation, however the fact that it is positive and significantly different from zero on the 5 percent level, shows that the level of economic development in the source country has a lasting effect in the second generation.

Specification (2) shows the result when the within-group intergenerational correlation is included as an explanatory variable. This result confirm the pattern observed in Section 4.2 that groups with low intergenerational income mobility, or a high degree of intergenerational transmission of human capital, tend to have an higher earnings in the second generation. In specification (4) we have also added GDP per capita in the country of origin and average relative income level of the first generation respectively to the specifications. As can be seen in Table 8, the significance of the within-group intergenerational correlation in earnings is maintained also in this specification.

5. Conclusions and Discussion

Several interesting results were obtained in this study. The first one is that the second-generation immigrants not only converge in average earnings with the comparison group of natives, but also did in fact reverse the 5.0 percent earnings disadvantage to a 1.6 percent earnings advantage. Given the compressed Swedish wage structure, this 6.6 percent average change in average earnings is quite substantial and exceeds for example observed earnings differentials due to one year additional schooling. However, the result on divergence in average earnings between immigrant groups shows that less successful groups, primarily originating from developing countries becomes even less successful in the second generation implies increased earnings differentials within the group of immigrants in the second generation.

It is easily seen from standard results of the random-walk stochastic process, that a coefficient of one on parental income in a regression of the second-generation income on parent generation income implies increasing variance in log earnings over time. This result has, however, limited practical importance, since the empirical estimates of this parameter always yields results far below one. However, the result of an exploding variance also applies for the study of average group income of immigrants and natives, and average income for different immigrant groups. In these cases the implication of diverging or converging incomes or "regression towards the mean" has a greater empirical relevance. Given that the cohorts of

immigrants arriving to Sweden after 1970 almost exclusively originate from developing countries and that the assimilation on the labor market has deteriorated radically in recent years our results suggests that the effects of the degenerated assimilation will have an effect also on the next generation second-generation immigrants.

Our data also allowed us to test to what extent groups of families with a high degree of intergenerational transmission of human capital tend to do better on the labor market in the second generation. In Section 2 we showed that this is a likely implication of the well-known Becker-Tomes model of intergenerational transmission of human capital. The empirical evidences in this study support this implication. There is a significantly lower degree of intergenerational mobility within the entire group of immigrants compared to natives. A plausible explanation to this difference is that the family is more important than other institutions in the society in families that are less integrated in a new country and, therefore, immigrants as a group have preferences to invest more in their children. They also improve their position on the labor market *vis-à-vis* natives, which support the implication from the Becker-Tomes model. This also comes through when we compare within-group intergenerational mobility and earnings in the second generation between immigrant groups.

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