Return Migration, Investment in Children, and Intergenerational Mobility

Comparing Sons of Foreign- and Native-Born Fathers

Christian Dustmann

ABSTRACT

This paper studies parental investment in education and intergenerational earnings mobility for father-son pairs with native- and foreign-born fathers. We illustrate within a simple model that for immigrants, investment in their children is related to their return migration probability. In our empirical analysis, we include a measure for return probabilities, based on repeated information about migrants' return intentions. Our results suggest that educational investments in the son are positively associated with a higher probability of a permanent migration of the father. We also find that the son's permanent wages are positively associated with the probability of the father's permanent migration.

I. Introduction

Immigrants contribute significantly to the overall economic performance of their host economies. It is therefore not surprising that a large literature is concerned with the earnings mobility of the foreign-born population, both in isolation, as well as in comparison with those who are native-born.[1] But immigrants not only have an immediate effect on wealth accumulation and earnings and skill composition. They transmit their earnings status, as well as socioeconomic and cultural characteristics to the next generation. The economic adjustment process within the

1. See the early papers by Chiswick (1978) and Borjas (1985), and Borjas (1994b) for a survey.

Christian Dustmann is a professor in the department of economics at University College, London. *He is grateful to David Card for many helpful discussions, and to Jerome Adda, Teresa Casey, Steve Machin, Gary Solon, and two anonymous referees for comments. This research was funded by the Economic and Social Research Council (grant RES-000-23-0332). The data on which this analysis is based are available from the DIW in Berlin. Users must register and sign an agreement with the data provider. The author will help other researchers in pursuing these data.* *He may be contacted through Department of Economics, University College, London, Gower Street, London WC1E. Email: c.dustmann@ucl.ac.uk*
[Submitted July 2006; accepted April 2007]
ISSN 022-166X E-ISSN 1548-8004

immigrant's own generation has long been recognized as an important step in understanding the economic effects of immigration. In understanding the long-term consequences of immigration, assessment of intergenerational mobility in immigrant communities is perhaps equally important.

Although the process of intergenerational economic mobility has been intensively studied for majority populations (see among others Solon 1992; Zimmermann 1992; Bjørklund and Jaentti 1997; Plug 2004; Bjørklund, Lindahl, and Plug 2006; see Solon 1999, 2002 for reviews), less is known about intergenerational transmission in immigrant communities. For the United States, early studies by Chiswick (1977) and Carliner (1980) compare earnings of immigrants with their descendants and their children. More recently, Borjas (1992, 1994) emphasizes that intergenerational economic mobility among immigrants may be more complex. He argues that estimating the usual models of intergenerational income mobility may miss out an important aspect of this process: The skills of the next generation may not only depend on parental inputs, but also on the quality of the ethnic environment of the parent generation. Borjas terms this "ethnic capital." In later work Borjas (1995) shows that one reason for the external effects of ethnicity is segregation into particular neighborhoods—a point that has been reemphasized in work by Nielsen, Rosholm, Smith, and Husted (2001).

This paper focuses on another important characteristic of immigrant communities that may affect the process of intergenerational mobility: The probability the immigrant attaches to a permanent migration as opposed to a future return to the home country. A number of papers show that return migration may affect different aspects of immigrants' behavior. Work by Galor and Stark (1990) suggest that positive return probabilities may affect savings behavior. Dustmann (1997) provides evidence that married immigrant women whose husbands plan to return to their home countries have a higher labor force participation rate. Dustmann (1999) develops a model that suggests that immigrants who have higher probabilities of returning are less likely to acquire human capital specific to the host country economy if this human capital has a lower return back home. He finds evidence for this by investigating their investment in language skills. In a recent paper, Cortes (2004), arguing along the same lines, explains the higher rate of human capital accumulation by refugee immigrants in the United States with lower probabilities of their return migration.

Similar considerations may hold in an intergenerational context. In this paper, we investigate how parental probabilities of a permanent, as opposed to a temporary, migration affect investment in their children's education and intergenerational earnings mobility. We develop a model of intergenerational mobility with parental investments in the child's earnings potential, based on previous work by Becker and Tomes (1979) and Solon (2004), which we extend by allowing the probability of a permanent migration to affect parental human capital investments. The model suggests that, if returns to educational investment undertaken in the host country, are higher in the host than in the home country, and if the parent believes that the child's return probability increases in his own, educational investments should increase with the permanent migration probability, as should the child's permanent earnings.

Our empirical analysis is for Germany, and based on detailed data from a long panel that oversamples immigrants. We concentrate on father-son pairs. The data include unique information on parental return intentions, which we use to construct our measure for a permanent migration probability.

To understand the precise nature of how parental background may affect earnings in the next generation, we commence by estimating investment equations, relating educational investments to parental earnings, as well as return probabilities. We find strong and consistent evidence that, for immigrants, parental investment in education increases with the permanent migration probability. Estimation of investment equations that relate educational achievements to permanent parental earnings show estimates of similar magnitude for immigrants and natives. For earnings mobility, we again find that the son's permanent earnings increase in the father's permanent migration probability, conditional on father's permanent earnings and education.

We also find that educational achievements of immigrant parents are not correlated with educational achievements of their children. This is in contrast with previous work by Card, DiNardo, and Estes (1998) for the United States, who show that much of the intergenerational link between the economic status of immigrant fathers and their sons and daughters works through education.[2] Our findings are in line with similar results reported by Gang and Zimmermann (2000). One explanation for this weak link in educational outcomes for immigrants is that it is the permanent earnings position of the father that matters for the son's educational attainment; the father's education is then only correlated with the son's education if education is a good predictor for earnings. We show that this is not the case for immigrants in our sample.

We also estimate intergenerational mobility coefficients. Our analysis extends some previous work on Germany by Couch and Dunn (1997) and Wiegand (1997) for the native-born, but provides more robust estimates based on a longer panel, allowing us to address the problem of measurement error in permanent parental earnings, which bedevils studies of intergenerational transmission (see Solon 1989). In addition, we distinguish between immigrant and native father-son pairs. Our results reveal that intergenerational mobility between native-born fathers and their sons is larger than between foreign-born fathers and their sons, conditional on return probabilities of foreign-born fathers, although the difference is not statistically significant.

The paper is structured as follows. In the next section we develop a theoretical model, and discuss its empirical implications. In Section III we describe the data and the sample. Section IV presents the results, and Section V concludes.

II. Theory

Our model is a permanent income model of intergenerational mobility with parental investments in the child's earnings potential, following early work by Becker and Tomes (1979) and Solon (2004). It extends Solon (2004) by taking account of the way the probability of a permanent migration as opposed to a future return, may affect the decision of the parent to invest in their offspring's human capital.

We consider a one-person household with one child. There are two periods. In the first period (Period 0) both parent and child live in the host country. In the second period (Period 1), the parent returns to the home country with probability 1 - p, and remains in the host country with probability p. The parent retires in Period 1,

2. Similar results are reported by Riphahn (2001), Bauer and Riphahn (2004), and van Ours and Veenman (2003).

and has earnings in Period 0 equal to Y_0. The child is in full-time education in Period 0, and participates in the labor market in Period 1, either in the parent's home country, or in the host country.

The parent is altruistic and maximizes an intertemporal utility function, by choosing first period savings s_0, and investment in the child's human capital in the first period, I_0. When making these choices, the parent attaches the same probability p to his child's location choice in the second period as to his own. This assumption simplifies the algebra, but can be relaxed without affecting the key implications of our model, as long as the parent perceives the child's probability to remain in the host country to increase in his own probability of remaining.

The parent's intertemporal utility function is given by

$$(1) \quad V = u(c_0) + p[u(c_1^I) + \gamma v(y_1^I)] + (1-p)[u(c_1^E, b) + \gamma v(y_1^E)]$$

where $u(.)$ and $v(.)$ are the parent's and the child's utility functions, defined over parental consumption in Period 0 c_0, and parental consumption and the child's earnings in Period 1, and c_1^J and y_1^J. Here $J = E; I$ stands for Emigration or Immigration country. The parameter γ is an altruistic weight. If $\gamma = 0$, the parent does not consider the child's welfare in Period 1. The parameter b is a preference parameter, reflecting a preference for consumption at home over consumption abroad. If $b > 1$, more utility is obtained from consuming in the home country as compared to the host country.

We assume that parental investments translate into human capital of the child (h_1) according to the following production technology:

$$(2) \quad h_1 = \theta \log I_0 + e_0.$$

The parameter θ is a technology parameter measuring the productivity of investments. The term e_0 is the human capital the child receives without any direct parental investments (see Becker and Tomes 1979; Solon 2004 for a similar formulation). This term represents the attributes endowed upon the child, depending on characteristics of the parent, the child's upbringing, genetic factors, environment, and luck. It also may depend on existing networks, as well as the lack of opportunity to move out of social and economic structures from one generation to the next. This latter factor may be particularly important for immigrants, and we will discuss its implications later. It includes what Borjas (1992) calls ''ethnic capital''—the quality of the environment in which parental investments are made.

Human capital translates into earnings according to the following relationship:

$$(3) \quad \log y_1^j = \mu^j + r^j h_1,$$

where $j = I; E$. Our formulation allows for different base wages μ^j, as well as different returns to the child's human capital r^j in the two countries. It follows from Equations 2 and 3 that the child's earnings in the second period are related to parental investments as:

$$(4) \quad \log y_1^j = \mu^j + r^j \theta \log I_0 + r^j e_0$$

The parent's consumption in Period 0 equals $c_0 = Y_0 - I_0 - s_0$, where Y_0 is first period earnings. As the parent retires in Period 1, Period 1 consumption is equal to Period 0 savings. Choosing a simple logarithmic utility function, and substituting Equation 4

for the child's earnings into Equation 1, the optimization problem of the parent can be expressed as

$$\max_{s,I} V = \log(Y_0 - I_0 - s_0) + p[\log s_0 + \gamma(\mu^I + r^I \theta \log I_0 + r^I e_0)] + (1-p)[b \log s_0 + \gamma(\mu^E + r^E \theta \log I_0 + r^E e_0)]. \quad (5)$$

Maximizing Equation 5 with respect to savings and investment, and solving the first order conditions for the optimal investment I_0 yields:

$$I_0 = \frac{\gamma\theta(pr^I + (1-p)}{\gamma\theta(pr^I + (1-p)r^E) + (1 + p + b(1-p))} Y_0 = \Gamma(p; r^E, r^I, b, \gamma, \theta) Y_0. \quad (6)$$

The term in the numerator, which is equ the first term in the denominator, is the expected utility gain to one unit of parental investment in the child's human capital. The second term in the denominator is the expected lifetime utility from one log unit of additional consumption.

Simple comparative statics show that investment in the child's human capital increases in p, the probability of a permanent migration, as long as the return to human capital investments is higher in the host country ($r^I > r^E$). Furthermore, a lower probability of a permanent migration increases the expected gain in utility by consuming in the home country, as long as $b > 1$: The parent prefers to save more resources for their own future consumption, thus reducing investment in the child. The combined effect leads to an increase in investment with the probability of a permanent migration. Finally, investment increases with altruism γ and productivity of investment θ.

An estimable version of Equation 6 is obtained by taking logs, and adding an error term:

$$\log Ed_i = a_1 + a_2 P_{i0} + X_i' a + b \log y_{i0} + e_i, \quad (7)$$

where Ed_i is a measure of child's educational attainment, P is a variable measuring the probability of a permanent migration, X are additional control variables, and y_0 are permanent earnings of the father. Below we test whether investment into children's education increases with the probability of a permanent migration. If $r^I > r^E$, we should expect a_2 to be positive.

Now consider the relationship between the child's earnings and the parent's earnings for children who are observed in the host country in Period 2. Substituting Equation 6 into Equation 4 and rearranging terms yields:

$$\log y_1^I = \mu^I + r^I \theta \log \Gamma + r^I \theta \log Y_0 + r^I e_1. \quad (8)$$

Equation 8 is similar to the relationship between son's earnings and father's earnings, as derived in Solon (1999, 2004), except for the term Γ which, as we show above, increases in the probability of a permanent migration. An estimable version of Equation 8 is given by:

$$\log y_{i1} = \alpha_1 + \alpha_2 P_{i0} + \sum_{k=1}^{K} \alpha_{3k} D_{ik0} + \beta \log y_{i0} + e_{i0}, \quad (9)$$

where as before P is a variable measuring the probability of a permanent migration of the parent, and y_1 and y_0 are permanent earnings of the child and parent. The

variables D_{ik0} are dummy variables for the origin country k of individual i's father. They capture, among other factors, differences in ethnic capital (see Borjas 1992).[3] Again, if $r^I > r^E$, α_2 should be positive. We will test for this below.

III. Background, Data, and Descriptives

A. Background

Between the mid 1950s and 1973, the strong economic development in Northern Europe and the resulting demand for labor, led to a large inflow of immigrants mainly from the periphery countries of Europe, but also from Turkey, North Africa, South America, and Asia. The main receiving countries were Belgium, France, Germany, the Netherlands, Switzerland, and the Scandinavian countries.

The West-German economy experienced a strong upward swing after 1955, accompanied by a sharp fall in the unemployment rate (between 1955 and 1960, the unemployment rate fell from 5.6 percent to 1.3 percent) and an increase in labor demand. This generated a large immigration of workers from Southern European countries and Turkey into Germany. The percentage of foreign-born workers employed in West Germany increased from 0.6 percent in 1957 to 5.5 percent in 1965, to 11.2 percent in 1973, and declined thereafter. Bilateral recruitment agreements were set up between Germany and Italy, Spain, Greece, Turkey, Portugal, and Yugoslavia in the 1950s and 1960s.

Labor migration over this period was initially considered as temporary by both the immigration countries and the emigration countries. Individuals were not expected to settle permanently. The German recruitment policy was based on the assumption that foreign workers would after some years return to their home countries. Still, although return migration has been quite considerable (see Bohning 1987), a large fraction of foreign-born workers settled permanently.

1. The Data and Sample

The data we use for this analysis stem from 19 waves of the German Socio-Economic panel (GSOEP 1984-2002), which is a household-based panel survey, similar to the U.S. Panel Study of Income Dynamics (PSID) or the British Household Panel Study (BHPS). Initiated in 1984, the GSOEP oversamples the then resident immigrant population in Germany, which stems from the migration movement we have described above. In the first wave, about 4,500 households with a German born household head were interviewed, and about 1,500 households with a foreign-born household head. The data are unique in providing repeated information on a boost sample of immigrants over a long period of time. For our analysis, we use observations of the foreign-born from the over-sample, as well as from the standard sample.

Each individual in a household and over the age of 16 is interviewed. The household head provides information about all other individuals in the household and below the interviewing age. Individuals who leave households and form their own households are included in the panel. When individuals are 16 years old, they receive

3. Borjas (1992) parameterizes origin dummies as functions of the average log earnings of the ethnic group in the parent's generation.

their own personal identifier, and pointers connect them to their mother and their father. We construct a sample of father-son pairs for foreign-born and native-born fathers. We define a second generation immigrant as an individual who is born in Germany, and whose father is born abroad. The definition of our sample is in the tradition of previous studies on intergenerational mobility based on the PSID (see, for example, Solon 1992).[4] Our reference group includes individuals who are likewise born in Germany, and whose father is German born. In our analysis we use only father-son pairs.[5]

We analyze below the relationship between permanent migration probabilities, permanent parental earnings, and investment into sons' education. We also analyze intergenerational earnings mobility, and how the son's permanent wages relate to the father's permanent migration probability. Our analysis of educational achievements considers secondary track choice. Track choices in Germany are made at the age of 10, and determine whether individuals will be entitled to study at university, or will receive secondary education that entitles them only for vocational or apprenticeship based post-secondary education. Secondary track choice is strongly correlated with later earnings (see Dustmann 2004). For this analysis, we include all sons above the age of 16, as their track choice has already been made, even if they are still in secondary education. We also analyze completed education, and discuss results briefly in the text. Here we use only individuals above the age of 20, and who have completed education. For the analysis on earnings mobility, we exclude sons who are younger than 20 years; our age range is between 20 and 34.

2. Sample Characteristics and Variables

Our resulting samples contain a total of 795 sons born to native-born fathers, and 334 sons of foreign-born fathers. Because some fathers have more than one son, we have 640 corresponding native-born fathers, and 251 foreign-born fathers. In Table 1, we provide a breakdown of fathers and sons in the two samples.

In Table 2, we display information on the fathers' observable characteristics. Foreign-born fathers have about two years less education than native-born fathers do. The age of fathers when the son was born is similar, at about 30 years. Foreign-born fathers were on average in Germany for 5.5 years when their son was born.

As a measure for earnings, we use real hourly log wages for both fathers and sons. The GSOEP provides information on average monthly gross earnings in the month preceding the interview, and on actual weekly hours worked for pay during that month. From that information, and using a consumer price index, we compute an hourly real log wage rate in 2002 prices.

A common problem in the literature on intergenerational mobility is the lack of sufficient information for the estimation of a permanent wage for fathers as well as their sons, which is particularly severe in short panels. Zimmerman (1992), Solon (1989, 1992), and Dearden et al. (1997) among others, emphasize the problems of

4. Our sample is different from that used by Gang and Zimmermann (2000), who investigate the relationship between educational attainment and ethnic origin using the same data. They define children of immigrants as individuals who immigrated younger than the age of 16 (or who are born in Germany), and who are sampled in the core data. Their data on parental characteristics stems from retrospective information.
5. We concentrate here on males, as many females do not work, in particular in the immigrant sample. Therefore, the sample size becomes quite small, and selection becomes an issue.

Table 1
Foreign-Born and Native-Born Fathers

	Foreign-Born Fathers		Native-Born Fathers	
Number of Sons to Father	Number	Percent	Number	Percent
1	182	72.51	500	78.13
2	55	21.91	126	19.69
3	14	5.58	13	2.03
4	—	—	1	0.16
Total number of fathers	251	100.00	640	100.00
Total number of sons	334		795	

Source: GSOEP, various years

measurement error in parental earnings for the estimation of intergenerational mobility parameters. The length of our panel allows us to address this problem. Appendix Table A1 displays valid wage spells of fathers in our sample, where the first set of columns report numbers for foreign-born fathers and the second set of columns for native-born fathers.

An individual can report earnings a total of 19 possible years, corresponding to a total of 2,577 earnings spells for foreign-born fathers, and a total of 7,262 earnings spells for native-born fathers. About 75 percent of fathers in the two samples have more than six wage observations, constituting, for each group, more than 90 percent of all wage spells in the data.

For sons, we disregard earnings spells while being on apprenticeship schemes. Apprenticeship schemes are vocational training schemes that pay low and regulated wages, and these wages are not appropriate measures for permanent earnings status. As stated above, we also exclude wage spells when individuals were younger than 20, for similar reasons. Appendix Table A2 displays the wage information for sons.

Table 2
Individual Characteristics, Fathers

	Foreign-Born Fathers		Native-Born Fathers	
	Mean	Standard Deviation	Mean	Standard Deviation
Years of education, father	9.2	1.9	11.7	2.6
Age father when child born	30.6	6.3	30.0	6.2
Years since migration when child born	5.6	5.5	—	—

Source: GSOEP, various years.

Among those with foreign-born fathers, there are 161 individuals with 606 valid wage spells; among those with native-born fathers, there are 373 individuals with 1,824 valid wage spells.

In Table 3 we display percentiles as well as the mean and variance of average log real wages in our data. The entries in the table show that mean wages of native-born fathers are about 13 percent higher than mean wages of foreign-born fathers. For sons, this difference has reduced to 4 percent. Wages of both sons and fathers in the native sample are considerably more dispersed than wages of sons and fathers in the sample of foreign-born fathers. For natives, earnings of sons are slightly more dispersed than earnings of fathers—similar to the findings of U.S. studies using similar data (see Solon 1992). For the foreign-born, however, fathers' earnings seem to be more dispersed than sons' earnings. Differences between sons of native- and foreign-born fathers seem to be similar throughout the distribution, while differences for native- and foreign-born fathers are slightly more substantial in the upper percentiles of the distribution.

a. Permanent Earnings

To eliminate measurement error, we essentially follow the literature, which averages wages over a number of years, thus increasing the signal-noise ratio in earnings information (see for example Solon 1992 and Zimmerman 1992). Our method is slightly more general, and allows the inclusion of individuals with a minimum number of wage spells, but observed in different years, and without requiring subsequent valid spells. We do this by estimating fixed effects wage regressions, conditioning on a quadratic in age. Our regressions have the following form:

$$(10) \quad \ln w_{it} = a_1^k + a_2^k age_i + a_3^k age_i^2 + v_i + u_{it},$$

where $\ln w_{it}$ are log real wages of individual i in period t, v_i are individual fixed effects and u_{it} are iid error terms, which include measurement error. The index k

Table 3
Percentile Average Log Real Wages, Foreign and Native Born Fathers

Percentile	10th	25th	50th	75th	90th	Mean	Variance
Foreign-Born							
Son's average log real wage	1.97	2.14	2.31	2.51	2.62	2.31	0.087
Father's average log real wage	2.13	2.41	2.54	2.66	2.79	2.51	0.098
Father's predicted log real wage age 40	2.06	2.34	2.50	2.61	2.78	2.45	0.099
Native-Born							
Son's average log real wage	2.00	2.17	2.36	2.54	2.73	2.35	0.179
Father's average log real wage	2.26	2.42	2.60	2.83	3.08	2.64	0.145
Father's predicted log real wage age 40	2.17	2.33	2.53	2.75	2.97	2.55	0.143

Source: GSOEP, various years.

is an index for the two groups of foreign- and native-born individuals. We estimate Equation 10 separately for foreign-born and native-born fathers. Unconditional on age, the sum of estimates $\hat{a}_1^k + \hat{v}_i$ is the mean wage for individual i in group k. Conditioning on age fixes individuals at the same point in their life cycle. As for our measure of permanent earnings, we predict $\hat{a}_1^k + \hat{v}_i + \hat{a}_2^k age + \hat{a}_3^k age^2$ at age 40 for both native- and foreign-born fathers.[6] While estimates for $\hat{a}_2^k$ and $\hat{a}_3^k$ are unbiased and consistent, the estimates for v_i are unbiased but inconsistent for small t, and estimates of permanent earnings will suffer from measurement error if the sample contains individuals with small t (that is individuals that have reported earnings for a small number of years only). For our estimation, we will successively increase the minimum number of periods we require individuals to have valid earnings information to be included in the sample. The last rows of Table 3 report predicted earnings, and the distribution of predicted earnings for native- and foreign-born fathers.

b. Probability of Permanent Migrations

To compute the probability of a permanent migration, we use survey information on the father's assessment of whether or not he wishes to return to the home country in the future. Our data is unique in providing information about these evaluations. In each year between 1984 and 1995, immigrants have been interviewed regarding their intention either to stay permanently in Germany or to return home at some point in the future.[7]

These intentions are likely to be subject to measurement error; furthermore, permanent migration intentions also may change over the immigrant's life cycle.[8] To obtain a measure for the probability that immigrants may have assigned to a possible permanent migration when making investment decisions about their child, we have first coded this information into a binary variable (assuming the Value 1 when the response was 3: "I want to remain permanently"). Similar to obtaining permanent earnings measures, we then estimate fixed effects regressions, where we condition on years since migration and years since migration squared:

$$(11) \quad P_{it} = b_1 + b_2 ysm_i + b_3 ysm_i^2 + \xi_i + e_{it},$$

where P_{it} is equal to 1 if individual i reports in period t the intention of a permanent migration, and ysm is a measure of the years since migration of i. The ξ_i are individual fixed effects, and the e_{it} are iid error terms, which include measurement error. As our measure of a permanent migration probability, we compute $\hat{b_1} + \hat{b_2} ysm\tilde{} + \hat{b_3} ysm\tilde{}^2 + \hat{\xi}_i$, where $ysm\tilde{}$ and $ysm\tilde{}^2$ are the father's years of residence and years of residence squared when the child was 10 years old.[9] In Germany, this is the age when

6. The age at which we predict earnings does not matter for estimation of intergenerational coefficients.

7. The exact phrasing of the question is "How long do you want to live in Germany?" Respondents could answer (1) "I want to return within the next 12 months," (2) "I want to stay several more years in Germany," or (3) "I want to remain in Germany permanently."

8. Return intentions do not always transform into realizations, at least over the course of our panel. Of those who replied in 1984 that they consider their migration temporary, 25 percent have returned by 1997, compared with 12 percent among those who replied in 1984 that they wish to stay permanently.

9. As for wages, fixing this for other years of residence does not affect the estimation results we report below, as it does not change the variation in this variable across individuals.

Table 4
Distribution of Permanent Migration Probabilities

Percentile	10th	25th	50th	75th	90th	Mean	Variance
Permanent migration probability when child is ten years old	0.07	0.16	0.37	0.65	0.81	0.40	0.07

Source: GSOEP, various years.

secondary track schools are decided, see Dustmann (2004) for details. We then normalize this variable between 0 and 1. We present the distribution of the resulting variable in Table 4. On average, the probability of remaining permanently in Germany for a father whose son is 10 years old is about 40 percent.

c. Selection issues

The sample of the foreign-born father-son pairs we use for analysis is one that is selected—we observe more father-son pairs where fathers have a higher propensity to stay permanently. This induces a selection, which is correlated with our measure for a permanent migration probability: Those with a higher probability of a permanent migration (measured by past intentions) will be more likely to be in the sample. If sons of those immigrants who remain in the sample perform differently than sons of those who return (conditional on father's permanent earnings and permanent migration probability), then this will bias the coefficient of the return probability. The bias will be downward if residuals in the selection equation and the intergenerational mobility equation are positively correlated (indicating that sons of father-son pairs who remain in the sample do better than sons of father-son pairs who drop out of the sample, conditional on father's earnings and permanent migration probability). The intuition is that those who have a low probability to remain permanently, but are nevertheless in the sample, must have unobserved characteristics that are positively related to the son's performance, which leads to a reduction of the coefficient estimate on the permanent migration probability in absolute size.[10] We can therefore interpret the coefficients on the permanent migration measure as a lower bound.

10. More formally, suppose that the latent index for being selected into the sample, s^* is linear in p, the probability of a permanent migration, with $s_i^* = \alpha_0 + \alpha p_i + u_i$, and that a father-son pair is in the sample if $s_i^* > 0$. Suppose that the outcome equation is given by $y_i = \gamma_0 + \gamma p_i + v_i$, and assume that u_i and v_i are jointly normally distributed, with variances 1 and σ_v^2 and correlation coefficient ρ. Then selection could be accounted for adding the generalized residual $E(v_i \mid s_i^* > 0) = \lambda(c_i)$ to the estimation equation, where $\lambda c_i = \phi(c_i)/\Phi(c_i)$, with ϕ and Φ being the density and distribution function of the standard normal, and $c_i = \alpha_0 + \alpha p_i$. We obtain the estimation equation $y_i = \gamma_0 + \gamma p_i + \sigma_v p \lambda(c_i) + e_i$. Omission of $\lambda(c_i)$ results in a biased estimate for γ. The expectation of the error term when omitting λ, conditional on p_i, is $p\sigma_v E(\lambda(c_i) \mid p_i)$. Since λ decreases in c_i, the bias is downward for $\rho > 0$ and $\alpha > 0$.

IV. Results

B. Investment in Education

We commence by estimating investment equations. Our theoretical model relates investment in children to fathers' permanent earnings, as well as to the probability of a permanent migration. As a measure for investment, we use the son's educational outcomes. We concentrate here on secondary school track choice. Results on completed education are very similar, and we briefly discuss them.

In Germany, age 10 marks an important decision in the school career of children. At this age, the child transfers from primary to secondary school, and, at the same time, has to decide between three secondary school tracks: lower secondary (with graduation typically at age 16), intermediate secondary (with graduation typically at age 16–17), and upper secondary (with graduation typically at age 18–19). Although switching tracks is possible, it rarely occurs (see Pischke 1999 for evidence). Only high school allows for continuation to University; lower and intermediate secondary schools qualify for blue collar and white-collar apprenticeship degrees.[11] Initial track choice is therefore very important for future career prospects. Dustmann (2004) illustrates the strong correlation between secondary school track, post-secondary educational achievements, and earnings.[12]

The main objective of our analysis is to understand the relationship between the probability the father assigns to a permanent migration and the educational qualifications of the son. We also investigate the relationship between the father's permanent earnings and school track enrollment of the son. And finally, we investigate the possible correlation between the child's educational achievements and education of the father, and compare this for immigrants and natives.

In Table 5, we display secondary school degrees for sons of native- and foreign-born fathers. The numbers show that sons of native-born fathers have a higher probability of attending higher track schools than the sons of foreign-born fathers. While about 64 percent of sons of native-born fathers attend at least an intermediate secondary school, this number is only 46 percent for sons of foreign-born fathers. On the other hand, about 8 percent of sons of foreign-born fathers do not complete secondary school training, while this is the case for only 3 percent of sons of native-born fathers.

The numbers in the lower panel give the total number of years of education for the two groups. There is a difference in the number of years of full-time education between sons of native- and foreign-born fathers of about 1.3 years, which is a significant reduction compared to the fathers' generation, where this difference was 2.4 years (see Table 2).

Our sample includes all sons above the age of 15, even if they are still in secondary education, because the secondary school choice has been made before that age. We

11. Note that in Germany, only about 19 percent of a cohort attends university. About 65 percent enrolls on an apprenticeship training scheme, a combined school-workplace training scheme that lasts between two and three years. Many qualifications that can only be acquired through college or university attendance in the United States or the United Kingdom are obtained through apprenticeship training in Germany.

12. Early tracking is not unusual in continental European countries. Hanushek and Woessmann (2006) report that tracking at age ten also takes place in countries like Austria, Hungary, and Slovakia. In countries like Italy, France, Greece, and the Netherlands tracking takes place younger than the age of 16.

Table 5
Educational Attainments, Sons of Foreign- and Native-Born Fathers

	Foreign-Born	Native-Born
No completed secondary school	7.89	3.16
Lower secondary	46.37	32.50
Intermediate secondary	29.02	35.26
Higher secondary (high school)	16.72	29.08
Number of observations	317	760
Total number of years in fulltime education	10.49	11.77
Number observations	180	440

Source: GSOEP, various years.
Note: sample for track choice includes all sons above the age of 15, even if they are still in secondary education, as the secondary school choice has been made before that age. Fulltime education is measured as the total number of years in fulltime education for those who have finished fulltime education.

also report results for completed education, measured as the total number of years in full-time education for those who have finished full-time education.

In Table 6, we present results from an ordered probit model of secondary school choice. We report results for sons of foreign-born fathers (upper panel), and of native-born fathers (lower panel). As in Table 5, we distinguish between four levels: no completed secondary school, lower secondary school, intermediate secondary school, and high school.[13] In all regressions we condition on the son's birth cohort, the age of the father when the son was 10-years-old, and (for foreign-born fathers) on the country of father's birth (coefficients are not reported).

In the left panel, we present estimation results of coefficients on the father's permanent migration probability only (Column 1), and when we condition in addition on the father's permanent log wage (where we use estimates based on a minimum of five wage spells), and his years of education (Columns 2). In Appendix Table A3, we report the marginal effects of these variables on the probability that the son does not obtain a secondary school degree (first column), and achieves a high school degree (second column). These probabilities are calculated at sample means for each sample.

The coefficient on the measure of a permanent migration probability is significantly different from zero (Table 6, Column 1). Unconditional on the father's permanent earnings and education, an increase in the probability of remaining permanently of one standard deviation is associated with an increase in the probability of high school attendance of about four percentage points. Given that only about 17 percent of sons

13. The underlying latent model for school track choice is given by $Ed_i^* = x_i'\beta + \alpha Edf_i + \gamma P_i + u_i$, where Ed_i^* is an index for track choice of individual i, Edf_i is the level of education of i's father (measured in years), P_i the father's return probability, and x_i a vector of characteristics, including son's cohort and father's country of origin and age, and where $u_i \sim N(0, \sigma^2)$. The observed variable Ed_i is related to the latent index as follows: $Ed_i = k$ iff $Ed_{si}^* \in (\theta_{k-1}, \theta_k]$, where $k = 1,2,3,4$. Here $\theta_0 = -\infty$ and $\theta_4 = \infty$. The realizations $Ed_i = k$ correspond to no ($k = 1$), lower ($k = 2$), intermediate ($k = 3$) and higher ($k = 4$) secondary school.

Table 6
Educational Investment

Secondary school track choice	1		2		3		4	
	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
Foreign-born fathers								
Probability of permanent migration	0.612	0.262	0.571	0.315				
Father's permanent log wage			0.804	0.410			0. 879	0.349
Father's years of education			0.040	0.037	0.057	0.034		
Number of observations	314		309		307		551	
Native-born fathers								
Father's permanent log wage							1.106	0.127
Father's years of education					0.219	0.023		
Number of observations	-		-		620		757	

Source: GSOEP, various years.
Note: Ordered probit estimates, dependant variable: secondary school track. All estimation equations include son's birth cohort, the age of the father when the son is 10 years old, and (for the foreign-born) father's country of origin dummies.

of foreign-born parents attend high school, this impact is quite large. In Column 2, we condition in addition on the father's permanent wages and on the father's years of education. This specification corresponds to the investment equation in Equation 4. Conditioning on the father's schooling should further eliminate influences that affect both the son's educational attainment, and remigration probabilities. The size of the coefficient of the permanent migration probability reduces only slightly if we condition on these variables. Thus, conditional on the father's level of education, age, and permanent wages, a sizable difference remains in enrollment in higher track schools between those whose fathers tend to remain permanently in the host country, and those whose fathers do not. The coefficient estimate on the father's permanent wage is positive and significant. An increase in father's permanent log wage by one standard deviation (0.21) increases the probability that the son will enroll in a higher secondary school by about four percentage points (see Appendix Table A3).

In Columns 3 and 4, we report results for estimation equations conditioning only on permanent log wages, and on fathers' education, for both foreign (upper panel) and native-born (lower panel) father-son pairs. The latter equation is frequently estimated in the literature on the intergenerational mobility of education. Within our investment model, it can be interpreted as a reduced-form equation, where the effect of fathers' education on sons' educational attainments works through fathers' permanent wages. For foreign-born fathers, the father's years of education is insignificant, but it is highly significant (and much larger) for native-born fathers. For the latter group, each year of additional education increases the probability that the son attends high school by 7.3 percentage points. These results support estimates by Gang and Zimmermann (2000), who do not find any association in education between foreign-born parents and their children. This may be, in their case, because their sample includes immigrants who arrived before the age of 16, and have therefore obtained or started education in their home countries. In our case, all sons of foreign-born parents are born in Germany; despite that, we find only small and insignificant associations between fathers and sons' educational attainments.

We have also estimated the same specifications for the completed number of years of education for those sons who completed full-time education on father's permanent migration probabilities (results not reported). Estimation results are very similar. As for the track choice, sons of fathers who have a higher probability of remaining permanently have significantly higher completed levels of education. Conditioning on the father's permanent log wage and level of education in addition, reduced the coefficient estimate only slightly, and is largely in line with track choice results reported above. When we estimate investment equations conditioning only on the father's permanent wage or the father's years of education in addition, the coefficient on the father's permanent earnings is remarkably similar for natives and immigrants, suggesting that an increase in permanent wages of 10 percent increases years of education by about 0.18. As before, while for native fathers, education is strongly and significantly associated with sons' education, it is smaller and insignificant for immigrants.

What explains the small coefficient we estimate for the intergenerational correlation in education for immigrants? One reason might be measurement error. As education of the foreign-born is obtained abroad, it is more likely to be miscoded than education obtained in the host country. This may lead to a downward bias in

Table 7
Intergenerational Correlation Coefficients, Foreign and Native Born Fathers

	All		More than 4 valid wage spells		More than 7 valid wage spells	
	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
Foreign-born fathers	0.145	0.070	0.365	0.108	0.408	0.144
Number of observations	583		503		404	
Number of groups	155		129		107	
Native-born fathers	0.177	0.055	0.251	0.061	0.290	0.066
Number of observations	1,737		1,474		1,329	
Number of groups	360		320		284	

Source: GSOEP, various years.
Note: dependant variable: Son's log hourly wage. Regression includes son's age and age^2, a linear time trend, and father's country of origin dummies for individuals with a foreign-born father.

estimates; however, it is unlikely to explain fully the large difference in point estimates for foreign- and native-born father-son pairs.[14]

A further explanation is that it is permanent earnings rather than educational achievements of the father that drives educational outcomes of the son. This interpretation is compatible with an intergenerational permanent income model, as the one we develop above. The association between fathers' permanent earnings and sons' education that we estimate is similar for school track choice of foreign- and native-born (Table 6), and near identical for completed full-time education. If education of the father affects the son's education mainly through the father's earnings, a low correlation between permanent earnings and education—as often found in immigrant communities—explains why some studies (like Gang and Zimmermann 2000) find only a modest association of educational achievements between parent and offspring in immigrant samples.[15]

1. Intergenerational earnings correlation

a. Comparing Foreign- and Native-born Father-Son Pairs

We now turn to analysis of intergenerational mobility in permanent earnings, and on the impact of a permanent migration probability on permanent wages. In Table 7, we first report intergenerational correlation coefficients for both immigrants and natives, using the measure for fathers' permanent log wage as described above. We ignore here the permanent migration variable for immigrants, but we use measures for fathers' permanent income that gradually remove measurement error. We use all wage information for sons, and report standard errors that allow for an equi-correlated covariance matrix. Estimates are based on Equation 9, but include in addition a quadratic in son's age and a linear time trend. The upper panel of Table 7 reports results for foreign-born fathers, and the lower panel reports results for native-born fathers.

The results in the first column are based on all available observations for constructing fathers' log wages. Intergenerational correlation coefficients for natives as well as immigrants are small, and similar in magnitude to those reported by Crouch and Dunn (1997). In the second column, we use as a measure for parental permanent earnings predictions based on at least five wages spells. This should reduce any downward bias through measurement error. The effect on estimates is quite dramatic, with coefficients increasing to 0.25 for natives, and 0.36 for immigrants. The last column reports estimates where only father-son pairs with fathers reporting at least eight wage spells are included. Coefficients rise further, to 0.29 for natives, and 0.40 for immigrants. Restricting the samples even further (we experimented with at least 11 wage observations for fathers) does not lead to any significant further change in the coefficients.

14. Assuming that measurement error is well-behaved, and taking the point estimates in the completed education regressions at face value, the variance of the measurement error will need to be four times as large as the variance in fathers' education to explain the difference in estimates between regression results for sons of foreign and native born fathers.

15. Regressing fathers' permanent earnings on his years of education results in a coefficient of 0.022 for foreign fathers, but 0.078 for native fathers.

Table 8
Son's Log Wages and Permanent Migration Probabilities, Foreign-Born Fathers

	All				More than 4 valid wage spells		More than 7 valid wage spells	
	1		2		3		4	
	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
Father's log wage	—	—	0.140	0.070	0.344	0.111	0.387	0.152
Father's permanent migration propensity	0.186	0.081	0.197	0.083	0.130	0.090	0.110	0.103
Number of observations	591		568		488		389	
Number of groups	159		153		127		105	
Permanent migration probability based on information before son was 16 years old								
Father's log wage	—	—	0.289	0.104	0.322	0.149	0.364	0.181
Father's permanent migration propensity	0.235	0.087	0.244	0.085	0.238	0.090	0.242	0.104
Number of observations	375		363		300		264	
Number of groups	109		105		89		78	

Source: GSOEP, various years.
Note: dependant variable: son's log hourly wage. Regression includes son's age and age^2, a linear time trend, and father's country of origin dummies.

The increase in estimated coefficients is in line with other studies, suggesting substantial underestimation in the degree of intergenerational immobility through measurement error in parental earnings. The numbers further suggest a larger intergenerational immobility for immigrant father-son pairs than for native father-son pairs. The difference in point estimates, based on estimates in Column 3, is about 0.12; however, the difference is not significantly different from zero, which is perhaps not surprising given the small sample size. The magnitude of estimates for immigrants is similar to that reported for the United States by Solon (1992) and Zimmermann (1992), who obtain coefficients of about 0.4. They also use multiyear averages to reduce measurement error in parental earnings. Our point estimates for natives are smaller than those in the U.S. studies. Bjørklund and Jantti (1997), using a method for estimating intergenerational income correlation on independent samples for Sweden, also conclude that Swedish estimates are smaller than those obtained for the United States.

b. Permanent Migration Probabilities

In Table 8, we report estimates for immigrants where we condition additionally on the father's probability of a permanent migration, as suggested by Equation 9. Other regressors include, as before, a quadratic in the son's age, the father's origin dummies, and a time trend. The estimated coefficient of the measure for a permanent migration suggests a higher log wage for sons whose fathers tend to consider the migration as permanent rather than temporary. The effect is sizable: An increase in the probability of a permanent migration by one standard deviation (0.26) increases the son's permanent real wages by about 5 percent.

In the next columns, we condition in addition on the father's permanent wages. Column 2 consider all father-son pairs with at least one observation on fathers' earnings, and Columns 3 and 4 restrict the sample to father-son pairs with more than four or seven earnings observations for the father. In Column 2, the coefficient on the father's probability of a permanent migration remains roughly the same as in Column 1, with about the same standard error. Conditional on fathers' permanent earnings, an increase in the probability of the father staying permanently continues to increase the son's permanent wage.

When using measures for fathers' earnings that are based on more than four or seven wage observations (Columns 3 and 4), the coefficient on the measure for a permanent migration propensity decreases in size, and is less precisely estimated. One reason for this is the reduction in sample size when we move to fathers with more than four, or seven valid wage spells. The decrease in the coefficient on the permanent migration probability could be due to the father's permanent earnings being positively correlated with the father's probability to migrate permanently. Therefore, a downward bias in the effect of fathers' permanent earnings on the son's wage translates into an upward bias in the coefficient estimate of the permanent migration probability. Overall, return probabilities seem to be related to sons' permanent earnings in a way that is compatible with the model, although the last estimates are not significant.

Finally, note that in this specification the size of the coefficient on the father's permanent wage measure is slightly decreased, as compared to results reported in Table 7, but still larger in magnitude to results for native-born fathers.

c. Robustness checks

1. Simultaneity

One concern with our estimates is that fathers condition their own migration plans on the son's labor market performance, which may lead to simultaneity bias if we use information on the father's remigration plans after the son has entered the labor market. To check this, we have reestimated regressions in Table 8 using permanent migration probabilities that are constructed from the father's responses before the son was 16 years old (which is the minimum age for labor market entry).

We present results in the lower panel of Table 8. The estimates for the permanent migration probability increase slightly in size, and remain stable and significant throughout the four specifications. Estimates for the three measures of the father's permanent earnings are more similar in size across specifications than before. The reason is that the sample, which is based on permanent migration intentions before sons were 16 years old, excludes many of those fathers who have only a small number of wage observations, thus reducing the measurement error bias from the start. Results confirm that there is a positive relationship between the father's permanent migration propensity and the child's earnings along the lines we have hypothesized above.

Parents may have knowledge about their child's future earnings performance before their child's entry into the labor market, and condition their return intentions on this, which may then still lead to biased estimates. When using father-son pairs where migration probabilities are computed when the child was even younger leads to small samples. We have experimented with that, and used father-son pairs for which we can compute return probabilities for fathers based on survey information when the son was 13 years of age or younger. The sample size drops to 164 observations when estimating specifications as in Column 3 of Table 8. The coefficient on the permanent migration probability is similar to that reported in Table 8: 0.266, with a standard error of 0.114.

2. Siblings

We include in our sample siblings who have the same father (see Table 1 for frequencies). To check if our results are robust to using only the oldest son for father-son pairs with more than one son, we reestimate the models restricting our sample to father-oldest son pairs if a father has more than one son. The results for the intergenerational correlation coefficients are similar, with point estimates and associated standard errors of 0.261 (0.058) and 0.278 (0.061) for natives, using wage information based on more than 5 or 7 years of the father's wage data, and corresponding coefficients of 0.355 (0.165) and 0.360 (0.197) for immigrants. Point estimates remain higher for immigrant father-son pairs.

When conditioning on the permanent migration probability in addition, coefficients on the father's permanent earnings decrease slightly, as before. The estimated coefficient on the father's permanent migration probability is similar: point estimates for regressions in Columns 1-4 of Table 8 are 0.20, 0.16, 0.15, and 0.17.

V. Discussion and Conclusions

Earlier research by Borjas (1992) suggests that the way wealth and earnings potential is transmitted from one generation to the next may differ between immigrant and native-born communities. Borjas argues that for immigrants the quality of the ethnic environment may provide an externality in the production of human capital of the next generation, which affects parental investments. In this paper we investigate a further reason why parental investment may be different across immigrant groups: differences in parents' assessment about a permanent or a temporary migration. We also estimate and compare intergenerational correlation coefficients for education and permanent earnings, distinguishing between immigrant and native-born father-son pairs. Our empirical analysis is based on a long panel that oversamples immigrants. The data provide unique and repeated information on permanent migration intentions of foreign-born individuals.

To analyze parental investment in the son's education, we investigate secondary school track choice. We find a strong association between the probability of fathers' permanent migration, and sons' educational attainments, conditional on the father's age and origin country, and the son's cohort. These estimates remain similar if we condition in addition on fathers' education, and on fathers' permanent earnings.

For both native- and foreign-born fathers, the father's permanent earnings positively affect educational achievements of the son. For father-son pairs with native-born fathers, we also find a strong correlation between educational attainment of father and son, while this correlation is small and insignificant for immigrants. We explain this with the low association between education and earnings for foreign-born fathers: If parental earnings affect investment in the child's education, as suggested by the permanent income model of intergenerational mobility, then the father's education is a weaker proxy for permanent earnings for immigrants than for natives.

Estimating intergenerational correlation coefficients in permanent earnings for father-son pairs of foreign- and native-born fathers, and taking account of measurement error using a flexible averaging method, we find intergenerational correlation coefficients of about 0.3 for father-son pairs with native-born fathers, and about 0.4 for father-son pairs with foreign-born fathers. Consistent with our hypothesis, we find for foreign-born fathers that the son's permanent wages are positively associated with the probability of the father's permanent migration.

Our results therefore suggest that the effects of permanent as opposed to temporary migration expectations on immigrants' performance, as established for instance by Dustmann (1997) and Cortes (2004), are not restricted to the immigrant generation but are likely to carry over to the next generation.

Appendix 1 Table A1

Frequencies of Earning Spells, Fathers

Years	Foreign-Born Fathers				Native-Born Fathers			
Observed earnings	Individuals	Sum Percent	Sum Valid Spells	Sum Percent Spells	Individuals	Sum Percent	Sum Valid Spells	Sum Percent Spells
0	7	2.79	—	—	23	3.59	—	—
1	8	5.98	8	0.31	23	7.19	23	0.31
2	7	8.76	22	0.85	17	9.84	57	0.78
3	13	13.94	61	2.36	23	13.44	126	1.73
4	6	16.33	85	3.29	32	18.44	254	3.49
5	13	21.51	150	5.82	28	22.81	394	5.42
6	11	25.90	216	8.38	23	26.41	532	7.32
7	20	33.86	356	13.81	18	29.22	658	9.06
8	6	36.25	404	15.67	29	33.75	890	12.25
9	15	42.23	539	20.91	31	38.59	1,169	16.09
10	23	51.39	769	29.84	24	42.34	1,409	19.40
11	19	58.96	978	37.95	25	46.25	1,684	23.18
12	18	66.14	1,194	46.33	29	50.78	2,032	27.98
13	12	70.92	1,350	52.38	25	54.69	2,357	32.45
14	13	76.10	1,532	59.44	43	61.41	2,959	40.74
15	8	79.28	1,652	64.10	33	66.56	3,454	47.56
16	9	82.87	1,796	69.69	39	72.66	4,078	56.15
17	10	86.85	1,966	76.29	35	78.13	4,673	64.34
18	16	93.23	2,254	87.46	71	89.22	5,951	81.94
19	17	100.00	2,577	100	69	100.00	7,262	100.00
Total	251	—	2,577	—	640	—	7,262	—

Source: GSOEP, various years.

Table A2
Frequencies of Earning Spells, Sons

Years	Sons of Foreign Born Fathers				Sons of Native Born Fathers			
Observed earnings	Individuals	Sum Percent	Sum Valid Spells	Sum Percent Spells	Individuals	Sum Percent	Sum Valid Spells	Sum Percent Spells
0	173	51.80	–	–	423	53.14	–	–
1	48	66.17	48	7.92	68	61.68	68	3.73
2	31	75.45	62	18.15	63	69.60	126	10.64
3	12	79.04	36	24.09	47	75.50	141	18.37
4	21	85.33	84	37.95	25	78.64	100	23.85
5	10	88.32	50	46.20	24	81.66	120	30.43
6	9	91.02	54	55.12	31	85.55	186	40.63
7	7	93.11	49	63.20	22	88.32	154	49.07
8	9	95.81	72	75.08	21	90.95	168	58.28
9	5	97.31	45	82.51	22	93.72	198	69.13
10	4	98.50	40	89.11	20	96.23	200	80.10
11	1	98.80	11	90.92	9	97.36	99	85.53
12	—	—	—	—	11	98.74	132	92.76
13	2	99.40	26	95.21	8	99.75	104	98.46
14	1	99.70	14	97.52	2	100.00	28	100.00
15	1	100.00	15	100.00	—	—	—	—
Total	334	—	606	—	796	—	1,824	—

Source: GSOEP, various years.

Table A3
Secondary School Track Choice, Marginal Effects

	1		2		3		4	
	No secondary school	Highest secondary school	No secondary school	Highest secondary school	No secondary school	Highest secondary school	No secondary school	Highest secondary school
Foreign Born Fathers								
Probability of permanent migration	−0.085	0.153	−0.070	0.140				
Father's permanent log wage			−0.098	0.197			−0.133	0.240
Father's years of education			−0.005	0.010	−0.008	0.013		
Native Born Fathers								
Father's permanent log wage							−0.066	0.399
Father's years of education					−0.011	0.073		

Source: GSOEP, various years.
Note: marginal effects, ordered probits. Specifications as in Table 6. Probabilities are calculated at sample means for each of the two samples.

References

Bauer, Philip, and Regina T. Riphan. 2004. "Heterogeneity in the Intergenerational Transmission of Educational Attainment: Evidence from Switzerland on Natives and Second Generation Immigrants." Basel: University of Basel. Unpublished.

Becker, Gary, and Nigel Tomes. 1979. "An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility." *Journal of Political Economy* 87(6):1153–89.

_____. 1986. "Human Capital and the Rise and Fall of Families." *Journal of Labor Economics* 4(3): S1–S39.

Bjørklund, Anders, and Markus Jantti. 1997. "Intergenerational Income Mobility in Sweden Compared to the United States." *American Economic Review* 87(5):1009–18.

Bjørklund, Anders, Mikael Lindahl, and Erik Plug. 2006. "The Origins of Intergenerational Associations: Lessons from Swedish Adoption Data." *Quarterly Journal of Economics* 121(3): 999–1028.

Bohning, W. Roger. 1987. *Studies in International Migration.* New York: St. Martin's Press.

Borjas, George J. 1985. "Assimilation, Changes in Cohort Quality, and the Earnings of Immigrants." *Journal of Labor Economics* 3(4):463–89.

_____. 1992. "Ethnic Capital and Intergenerational Mobility." *Quarterly Journal of Economics* 107(1):123–50.

_____. 1993. "The Intergenerational Mobility of Immigrants." *Journal of Labor Economics* 11(1):113–35.

_____. 1994. "Long-Run Convergence of Ethnic Skill Differentials: The Children and Grandchildren of the Great Migration." *Industrial and Labor Relations Review* 47(4): 553–73.

_____. 1994b. "The Economics of Migration." *Journal of Economic Literature* 32(4):1667–1717.

_____. 1995. "Ethnicity, Neighborhood, and Human Capital Externalities." *American Economic Review* 85(3):365–90.

Card, David, John DiNardo and Eugena Estes. 1998. "The More Things Change: Immigrants and the Children of Immigrants in the 1940s, the 1970s, and the 1990s." NBER Working Paper 6519.

Carliner, Geoffrey. 1980. "Wages, Earnings and Hours of First, Second and Third Generation American Males." *Economic Inquiry* 18(1):87–102.

Chiswick, Barry. 1977. "Sons of Immigrants: Are they at an Earnings Disadvantage?" *American Economic Review* 67(1):376–80.

_____. 1978. "The Effect of Americanization on the Earnings of Foreign-born Men." *Journal of Political Economy* 86(5): 897–921.

Couch, Kenneth A., and Thomas A. Dunn. 1997. "Intergenerational Correlation in Labor Market Status: a Comparison of the United States and Germany." *Journal of Human Resources* 32(1):210–32.

Cortes, Kalena E. 2004. "Are Refugees Different from Economic Immigrants? Some Empirical Evidence on the Heterogeneity of Immigrant Groups in the United States." *Review of Economic and Statistics* 86(2):465–80.

Dearden, Lorraine, Steve Machin, and Howard Reed. 1997. "Intergenerational Mobility in Britain." The Economic Journal 107(440):47–66.

Dustmann, Christian. 1997. "Differences in the Labour Market Behaviour between Temporary and Permanent Migrant Women." *Labour Economics* 4(1):29–46.

_____. 1999. "Temporary Migration, Human Capital, and Language Fluency of Migrants." *Scandinavian Journal of Economics* 101(2):297–314.

_____. 2004. "Parental Background, Secondary School Track Choice, and Wages." *Oxford Economic Papers* 56(2):209–30.

Galor, Oded, and Oded Stark. 1990. ''Migrants Savings, the Probability of Return Migration, and Migrants Performance.'' *International Economic Review* 31(2):463–67.

Gang, Ira N., and Klaus F. Zimmermann. 2000. ''Is Child Like Parent? Educational Attainment and Ethnic Origin.'' *Journal of Human Resources* 35(3):550–69.

Nielsen, Helena S., Michael Rosholm, Nina Smith, and Leif Husted. 2001. ''Intergenerational Transmissions and the School-to-Work Transition of 2nd Generation Immigrants.'' Working Paper 01-04, Aarhus: Centre for Labour Market and Social Research.

Pischke, Jörn-Steffen. 1999. ''Does Shorter Schooling Hurt Student Performance? Evidence from the German Short School Years.'' Cambridge, Mass.: MIT. Unpublished.

Plug, Erik. 2004. ''Estimating the Effect of Mother's Schooling on Children's Schooling Using a Sample of Adoptees.'' *American Economic Review* 94(1):358–68.

Riphahn, Regina T. 2001. ''Dissimilation? The Educational Attainment of Second Generation Immigrants.'' CEPR Discussion Paper No. 2903.

Solon, Gary. 1989. ''Biases in the Estimation of Intergenerational Earnings Correlations.'' *Review of Economics and Statistics* 71(1):172–74.

_____. 1992. ''Intergenerational Income Mobility in the United States.'' *American Economic Review* 82(3):393–408.

_____. 1999. ''Intergenerational Mobility in the Labor Market.'' In *Handbook of Labor Economics*, Vol. 3A, ed. Orley C. Ashenfelter and David Card, 1761–1800. Amsterdam: North-Holland.

_____. 2002. ''Cross-Country Differences in Intergenerational Earnings Mobility.'' *Journal of Economic Perspectives* 16(3):59–66.

_____. 2004. ''A Model of Intergenerational Mobility Variation over Time and Place.'' In *Generational Income Mobility in North America and Europe*, ed. Miles Corak, 38-47. Cambridge, England: Cambridge University Press.

Van Ours, Jan C., and Justus Veenman. 2003. ''The Educational Attainment of Second Generation Immigrants in The Netherlands.'' *Journal of Population Economics* 16(4):739–53.

Wiegand, Johannes. 1997. *Four Essays on Applied Welfare Measurement and Income Distribution Dynamics in Germany 1985–1995.* PhD Dissertation. London: University College London.

Woessmann, Ludger, and Eric A. Hanushek. 2006. ''Does Educational Tracking Affect Performance and Inequality? Differences-in-Differences Evidence across Countries.'' *Economic Journal* 116 (510): C63–C76.

Zimmerman, David. 1992. ''Regression Toward Mediocrity in Economic Stature.'' *American Economic Review* 82(3):409–29.