Age at Immigration and Educational Attainment of Young Immigrants

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Abstract

For immigrants who arrive in a country at a young age it is easier to assimilate than for teenagers. This paper investigates up to what immigration age the educational attainment of young immigrants in the Netherlands is similar to the educational attainment of second-generation immigrants, who were born in the country having at least one immigrant parent. It appears that this borderline immigration age depends on gender and country of origin.

Keywords: young immigrants, educational attainment, age at immigration.

JEL classification: J15, J61

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1 Introduction

Recent studies stress the relevance of the relationship between age at immigration and assimilation. On the basis of an analysis of Canadian Census data Schaafsma and Sweetman (1999) conclude for example that educational attainment varies systematically with age at immigration. They also find a non-monotonic age-at-immigration earnings profile. Immigrants who arrived before their teen years do not have an earnings deficit relative to observationally equivalent Canadian born. Similar results for the US concerning the relationship between age at immigration and educational attainment are found by Gonzalez (2003), Bleakley and Chin (2004), and Chiswick and DebBurman (2004). Immigrants who arrive at younger ages in the US assimilate more quickly than immigrants that arrive in their teen years. Childhood immigrants tend to converge more rapidly to native educational attainment than adolescent or adult immigrants. The studies also find heterogeneity in the age-at-arrival effect across immigrant groups.

The current study deals with the educational attainment of young immigrants in the Netherlands. The main question is up to what immigration age the educational attainment of young immigrants will be comparable to the educational attainment of second-generation immigrants, who were born in the Netherlands from at least one parent who came as an immigrant. Analyzing the relationship between age at immigration and educational attainment is important from a policy point of view because it may help to formulate appropriate interventions to facilitate immigrant assimilation. Also, to the extent that these interventions are costly, it may lead to better targeting of the interventions.

2 Data

Our data are from a 1998 nationwide survey among the four main immigrant groups, Turks, Moroccans, Surinamese, Antilleans and among a native Dutch reference group in 13 of the largest cities in the Netherlands (see Van Ours and Veenman (2003) for details). Given the over-representation of immigrants in the largest cities, the survey may be considered to be representative for the four immigrant groups. The same does not hold for the native Dutch

population, since they are spread more evenly over the whole country. This is not a disadvantage, since the native Dutch sample is explicitly used as a reference group for the immigrant groups in the largest cities.

Our analysis concerns individuals aged 15 to 29 years. Table 1 gives information about the young immigrants in our sample. As shown the share of young immigrants born in the Netherlands varies from a low 22.8% for Moroccans males to a high 38.8% for Surinamese males. Table 1 also shows that the mean age for young immigrants not born in the Netherlands is very low for Surinamese and quite high for Turks and Antilleans. Finally, Table 1 gives an indication of the educational attainment of the various groups in our sample. On average the educational attainment of Turks and Moroccans is lower than the educational attainment of Surinamese, Antilleans and natives.

Since the Dutch educational system allows individuals to reach the same educational level through various tracks of different length, we focus on educational level attained. We distinguish four levels of education: 1 = Primary education, 2 = Lower secondary education (lower vocational or lower general), 3 = Intermediate education (intermediate vocational, GCSE and A-levels), 4 = Higher education (higher vocational and academic).

3   Statistical model

We distinguish between the desired level of schooling and the observed level of schooling, which is completed for schoolleavers and incomplete for individuals that are still at school. We assume that the desired level of education s^* of individual i depends on his or her observed characteristics x:

$$s_i^* = \beta' x_i + \varepsilon_i \tag{1}$$

where β is a vector of parameters and ε_i is an error term. The desired level of education is unobserved. Furthermore, since the actual level of (completed or incomplete) schooling s is a discrete variable we apply an estimation procedure that combines an ordered probit model for completed schooling and a probit model for individuals that are still at school. We assume that ε_i is normally distributed across observations. Then, we know for individuals that left school that their desired level of education is equal to the level of complete education: $s_i = 1$

if $s_i^* \leq 0$, $s_i = 2$ if $0 < s_i^* \leq \mu_1$, $s_i = 3$ if $\mu_1 < s_i^* \leq \mu_2$, $s_i = 4$ if $\mu_2 < s_i^*$. For individuals that are still at school we only know that the desired level of education is at least equal to the current level: $s_i = 1$ if $s_i^* > -\infty$, $s_i = 2$ if $s_i^* > 0$, $s_i = 3$ if $s_i^* > \mu_1$, $s_i = 4$ if $s_i^* > \mu_2$. Therefore,

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\begin{aligned}
\Pr(s_i = 1) &= d.\Phi(-\beta'x_i) + (1-d) \\
\Pr(s_i = 2) &= d.(\Phi(\mu_1 - \beta'x_i) - \Phi(-\beta'x_i)) + (1-d).(1 - \Phi(-\beta'x_i)) \\
\Pr(s_i = 3) &= d.(\Phi(\mu_2 - \beta'x_i) - \Phi(\mu_1 - \beta'x_i)) + (1-d).(1 - \Phi(\mu_1 - \beta'x_i)) \qquad (2) \\
\Pr(s_i = 4) &= 1 - \Phi(\mu_2 - \beta'x_i)
\end{aligned}
$$

where d is an indicator with a value of 1 if the educational level concerns completed education and a value of 0 if the educational level concerns incomplete education of people still in school. Furthermore, the μ's are unknown parameters, which are estimated jointly with the elements of vector β.

We do the analyses separately for males and females since within the immigrant groups there may be cultural differences in the way boys and girls are going through the educational system. We also do the analysis separately for Mediterranean (Turks and Moroccans) and Caribbean immigrants (Surinamese and Antilleans). The Caribbean immigrants basically face the same structure of primary and secondary immigration as the native Dutch do. This could mean that the age at immigration is less relevant than for the Mediterranean immigrants that face a different educational system in their country of origin.

Our explanatory variables are the following:

- Education of the father, for which we use a series of dummy variables representing primary education, lower secondary education, intermediate education and higher education. No education is the reference category.

- Education of the mother, specified in the same way as the education of the father.

- Immigrant group; we use four dummy variables, one for each immigrant group. Natives is the reference category.

- Age at immigration, for which we use a series of 8 dummy variables up to the age of 15, and a dummy variable for the age 15+ category. Born in the Netherlands is the reference category.

- Age: to account for the effect of age we use 14 dummy variables to cover each age between

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16 and 29. Age 15 is the reference group. To save space we do not report the values of the coefficients that relate to the age dummies.

4   Parameter estimates

The parameters are estimated using maximum likelihood, where the likelihood consists of the various probabilities of (2). The results are presented in Table 2. As shown in the first two columns the education levels of both the mother and the father affect the educational attainment of Mediterranean children. In these estimates it appears that the effect of fathers' education is often but not always stronger than the effect of mothers' education. The effect of ethnicity is never significantly different from zero. Conditional on the educational level of the parents Turkish and Moroccan youngsters born in the Netherlands do as well as natives. The coefficients of the dummies for age at immigration represent the effect of coming to the Netherlands at a particular age. In the estimates for the Mediterranean females already at lower ages of immigration the effect is significantly negative. From age 4 onwards the relevant coefficients are significantly negative. For Mediterranean males the effect of immigration is only negative at higher ages of immigration.

The third and fourth column of Table 2 show the estimation results for Caribbean immigrants. Here too, there is a significant effect of the education of the parents on the educational attainment of their children. Again, the effect of education of the father is somewhat stronger than the effect of the education of the mother. Also, conditional on the education of their parents and their age there is no effect of ethnicity for Caribbeans born in the Netherlands. The effect of age at immigration is smaller than for the Mediterraneans. In fact for male Caribbeans there does not seem to be any effect.

Table 3 shows the parameter estimates if we group age at immigration dummies. We distinguish three age intervals: 0-3, 4-11 and 11+ years. The first age interval 0-3 years reflects the age at which children do not attend formal education. The second age interval 4-11 years reflects the age at which children usually attend primary school. The third age interval is for children beyond primary school age. As shown in the upper part of Table 3 for Mediterranean females the coefficient of the first age group does not differ significantly from zero, while the

coefficients are significantly negative for the other age groups. Apparently, only for very young Mediterranean females there is no difference in educational attainment with native Dutch.[1] For Mediterranean males the first two age groups are insignificantly different from native born. This implies that only if they arrive in the Netherlands at a post primary school age they are worse off than native born. A similar conclusion holds for Caribbean females, while for Caribbean males age at immigration is indeed irrelevant.[2]

As an additional sensitivity analysis we investigated whether there are indeed significant differences in the effect of age at immigration on the educational attainment of the two groups. We pooled the samples and did the estimates separately for males and females. We compared estimates in which we impose the age at immigration effects to be the same with estimates in which the age at immigration effects are allowed to be different for Mediterraneans and Caribbeans. From these comparisons it appears that we cannot reject the hypotheses that the effects are different for the two groups.[3]

To investigate to what extent our results are sensitive to the inclusion of parental controls we estimated the models without parental control variables. The parameter estimates for the effects of age at immigration are shown in the lower part of Table 3. For the Mediterranean groups the parameter estimates hardly change. For the Caribbean groups the parameter estimates change somewhat but the bottom line of our conclusions does not change. Furthermore, we investigated whether age at arrival effects are different for more educated parents. We estimated separate age at arrival effects for individuals with at least one parent with an educational level of 3 or 4. It turns out that we cannot reject the hypothesis that the age at arrival effects are independent of parental education.[4]

A potential problem with having adult immigrants in the sample is that there might be

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[1]Note that for all estimates presented in the upper part of Table 3 the restricting 9 age intervals to 3 does not lead to a significantly different value of the loglikelihood.

[2]If we impose the insignificant age at immigration coefficients to be equal to zero the loglikelihood value hardly changes. From LR-tests it appears that we cannot reject the hypotheses that these coefficients are indeed equal to zero.

[3]The LR-test statistic for females is 29.6, for males it is 26.2, while the critical $\chi^2_{0.05}$-value with 3 degrees of freedom is 7.8.

[4]The LR-test statistics are 3.0 and 0.2 for Mediterranean females and males, and 2.0 and 7.6 for Caribbean females and males.

endogeneity in the decision to immigrate. While it is plausible that age at arrival is exogenous for childhood immigrants since they merely follow their parents, this argument may not hold for adults. For adults it could be that educational investment and migration decisions are jointly determined. Therefore, as a final sensitivity analysis we investigate to what extent our results change if we omit individuals that immigrated at age 16 or higher age. We find that the relevant parameters hardly change. Apparently, potential endogeneity through adult immigrants is not important for our parameter estimates.

5   Conclusions

This paper investigates from up to what immigration age it is easy for young immigrants to catch up with second-generation immigrants and natives in terms of educational attainment. Our main finding is that migration at a young age appears to be more of a disadvantage for the educational achievements of Turks and Moroccans than for Surinamese and Antilleans, while at the same time men are in general less disadvantaged by such migration than women. Since there are no indications that these differences are related to the receiving country (e.g. the characteristics of the educational system), the explanation must be searched for in the sending countries or in the groups' culture. In this respect it seems important that the educational system in Surinam and the Antilles, being (former) Dutch colonies, has a lot in common with the Dutch educational system. Since this is not the case with the Turkish and Moroccan educational system, this might explain the greater difficulties for the Turks and Moroccans. Migration to the Netherlands is for them a larger step than for the Surinamese and the Antilleans. The differences between men and women can be explained in terms of the more traditional culture of the immigrant groups, in which women are more 'protected' than men by the family. This implies that they in general have less contact with the host society. This protection might make women more vulnerable in the new environment, especially in a competitive schooling system.

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Table 1 Young immigrants; age 15 to 29 years

	% born in the Netherlands		Mean age at immigration[a]		Level of completed education[b]	
	Females	Males	Females	Males	Females	Males
Turks	28.8	28.3	14.4	14.5	1.65	1.99
Moroccans	27.3	22.8	13.2	13.1	1.67	1.74
Surinamese	32.3	38.8	11.8	11.6	2.40	2.38
Antilleans	24.1	28.4	16.1	14.6	2.43	2.85
Natives	100	100	-	-	2.97	2.79

[a] Of those not born in the Netherlands.

[b] Average of educational level of schoolleavers on a scale from 1 to 4.

Table 2 Parameter estimates[a)]

		Mediterranean		Caribbean	
		Females	Males	Females	Males
Education	Level 1	0.07 (0.7)	0.27 (2.6)*	-0.27 (1.7)	-0.43 (1.9)
Mother	Level 2	0.17 (0.9)	0.46 (2.0)*	0.31 (1.9)	-0.23 (1.1)
	Level 3	0.52 (2.1)*	0.32 (1.3)	0.53 (2.5)*	-0.26 (1.1)
	Level 4	0.57 (2.6)*	0.97 (2.9)*	0.47 (3.1)*	0.47 (2.2)*
Education	Level 1	0.31 (3.3)*	-0.04 (0.4)	0.20 (1.1)	0.27 (1.1)
Father	Level 2	0.77 (4.5)*	0.18 (1.1)	0.44 (2.2)*	0.65 (2.6)*
	Level 3	0.72 (3.6)*	0.67 (3.3)*	0.67 (3.0)*	1.18 (4.1)*
	Level 4	1.42 (5.5)*	0.57 (2.0)*	1.20 (5.1)*	0.98 (3.4)*
Immigrant	Turks	-0.01 (0.1)	-0.04 (0.2)	-	-
group	Moroccans	0.19 (1.1)	-0.04 (0.2)	-	-
	Surinamese	-	-	0.07 (0.5)	0.04 (0.2)
	Antilleans	-	-	0.13 (0.8)	0.35 (1.9)
Immigration age	0-1	-0.07 (0.4)	0.41 (2.1)*	0.05 (0.2)	-0.23 (0.9)
	2-3	-0.26 (1.4)	0.10 (0.6)	0.01 (0.1)	-0.11 (0.3)
	4-5	-0.45 (2.3)*	0.01 (0.1)	-0.07 (0.3)	0.14 (0.6)
	6-7	-0.39 (1.7)	0.03 (0.1)	-0.25 (1.0)	-0.47 (1.7)
	8-9	-0.63 (3.0)*	0.06 (0.2)	-0.19 (0.4)	-0.48 (1.5)
	10-11	-0.82 (4.3)*	-0.15 (0.7)	-0.55 (2.0)*	-0.20 (0.5)
	12-13	-0.88 (4.4)*	-0.29 (1.2)	-0.91 (3.4)*	0.32 (0.3)
	14-15	-1.03 (5.3)*	-0.94 (5.0)*	-0.29 (0.7)	-0.26 (0.5)
	15+	-1.09 (9.0)*	-0.56 (4.2)*	-0.32 (2.1)*	-0.06 (0.3)
	μ_1	0.46 (12.9)*	0.66 (15.7)*	0.70 (10.5)*	0.78 (9.6)*
	μ_2	1.50 (21.5)*	1.41 (22.1)*	1.77 (19.1)*	1.53 (15.5)*
-Loglikelihood		1137.4	1154.9	733.8	522.8
Observations		1308	1168	797	585

[a)] The estimates include dummy-variables for every age-year from 16-29; native Dutch are the reference group; absolute t-values in parentheses, * = significant at a 95% level.

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Table 3 Parameter estimates - sensitivity analysis[a)]

		Mediterranean		Caribbean	
a. Restricting coefficients		Females	Males	Females	Males
Immigration age	0-3	-0.16 (1.1)	0.21 (1.4)	0.02 (0.1)	-0.18 (0.8)
	4-11	-0.57 (4.3)*	-0.01 (0.1)	-0.25 (1.4)	-0.25 (1.3)
	11+	-1.06 (9.2)*	-0.58 (4.7)*	-0.39 (2.7)*	-0.04 (0.2)
$-Loglikelihood$		1140.2	1160.3	737.2	525.6
$LR\ test\ I$ [b)]		5.6	10.8	6.8	5.6
b. No parental controls					
Immigration age	0-3	-0.23 (1.6)	0.13 (0.9)	-0.31 (1.6)	-0.30 (1.3)
	4-11	-0.61 (4.6)*	-0.13 (0.9)	-0.71 (4.5)*	-0.49 (2.7)*
	11+	-1.02 (9.0)*	-0.66 (5.4)*	-0.76 (5.8)*	-0.23 (1.4)
-Loglikelihood		1198.1	1191.8	828.9	568.7
Observations		1308	1168	797	585

[a)] The other coefficients are very similar to those reported in Table 2 and are therefore omitted; native Dutch are the reference group; absolute t-values in parentheses, * = significant at a 95% level.

[b)] Comparing loglikelihoods with those of Table 2; note that the critical $\chi^2_{0.05}$-value with 6 degrees of freedom is 12.6.