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THE IMPACT OF FAMILY BACKGROUND ON THE RETURNS TO AND LENGTH OF SCHOOLING IN SWEDEN

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1. Introduction

It is a common observation in most societies that children to parents with high income and schooling and with high-status occupations tend to inherit the behaviour of their parents and in particular invest more in schooling than other children. This pattern is often considered a problem from both equity and efficiency points of views. It represents inequality of opportunity and possibly also inefficiency if the intellectual capacity of all children is not fully exploited. A variety of educational policies have been advocated to reduce the importance of family background for schooling decisions. No country seems, however, to have been very successful in this respect.

In order to change the existing pattern it is crucial to understand the basic mechanisms that create this persistent intergenerational pattern of schooling choices. The idea in this paper - borrowed from Chiswick(1988) - is that useful insight into the mechanisms can be obtained from the relationship between the length of schooling and the marginal returns to schooling.

We start in section 2 by describing the basic analytical idea. Then we describe the data in section 3 and the empirical results in section 4. The final section offers a concluding discussion of the study.

2. The analytical approach

The analytical point of departure is that the individual who is contemplating education faces a marginal rate of return schedule for additional amounts (i.e. in practice years) of schooling. This schedule basically reflects how much the individual can raise earnings by additional schooling. The individual also faces marginal costs of financing additional schooling. These costs include first of all the interest costs to borrow the money that is necessary to finance the life as a student. But it also includes the disutility of postponing income to the future. It is

reasonable to assume that the marginal rate of return is a decreasing function of years of schooling and that the marginal cost of financing schooling is an increasing function of years of schooling. By further assuming that the rational individual invests in schooling until the marginal return equals the marginal cost, the amount of schooling is determined as in part **a** of Figure 1.

Now, how can family background affect the amount of schooling in this framework? One potential explanation is that children from rich families can more easily finance the life as a student than children from poorer backgrounds. In this case - we call it **the financing hypothesis** - it is variation in the schedule for the marginal cost of financing education that generates the relationship between years of schooling and family background. This case is shown in part **b** of the figure. The interesting implication of this explanation is that there will be a negative correlation between the marginal rate of return and the length of schooling. If high financing costs represent market failures it is tempting to argue that this situation represent efficiency losses; those with a poor family background have high marginal returns on additional schooling investments but it does not take place because of high financing costs.

The other case is that those from rich families have more to get out of schooling, i.e. their marginal rate of returns is higher. We call this **the comparative advantage hypothesis.** The basic explanation of such variation in the returns to schooling can be that rich families when they raise their children emphasize skills that are useful at school more than other families do. They might also afford to invest more in activities that are useful at school.

The comparative advantage hypothesis implies the pattern shown in part **c** of the figure. The correlation between years of schooling and the marginal rate of return becomes positive.

A very straightforward way to implement these ideas is to estimate human-capital earnings functions which allow the schooling coefficient(s) to vary by family background. It is a well known fact that the marginal internal rate of return to schooling can be computed from regression equations with the logarithm of earnings (or wages) as a linear function of work experience and years of schooling where the latter variables might enter with quadratic or

higher powered terms. It is the derivative of the logarithm of earnings with respect to years of schooling that is the marginal internal rate of return.[1]

More specifically, we propose the following equation:

$$\ln W_i = \alpha_0 + \alpha_1 E_i + \alpha_2 E_i^2 + \alpha_3 S_i + \alpha_4 S_i^2 + \alpha_5 FB_i + \alpha_6 (S_i x FB_i) + \alpha_7 X_i + \varepsilon_i$$

where:

$\ln W_i$ = the natural logarithm of the hourly wage for individual i

E_i = years of work experience

S_i = years of schooling

FB_i = a set of family background variables

X_i = a set of control variables

ε_i = a stochastic error term

As family background variables it is reasonable to include both such that capture the income of the parents and the educational level. Income is useful for financing studies as well as for activities that can be used to invest in skills that are useful at school. That the educational level of parents **per se** can affect the ability of children to get more out of school is rather evident.

We also suggest to use the number of siblings as a family background variable. The reason is that having many siblings can affect both the possibility of parents to help finance the studies and the time and the resources that can be spent on the "quality" of each child. The quality/quantity trade off proposed by Gary Becker (see e.g. Becker (1991)) suggests that such mechanisms can be present.

The comparative advantage hypothesis implies that α_6 is positive (negative) for those

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[1]The technical conditions are that there are no interactions between schooling and experience and that schooling precedes work, (see Willis(1986)).

with strong (weak) family background. If there are no family background effects on the costs of financing and the cost schedule is rising we will obtain the pattern described by Figure 1c. The pure version of the financing hypothesis implies that α_6 is zero and α_4 negative. We will then observe a pattern like in Figure 1b.

3. The data

We will use the Swedish Level of Living Surveys (see Eriksson and Åberg (1987) for details) from 1968 and 1981. (In the near future we can also use the wave from 1991). The sample is representative for the population in both 1968 and 1981. The panel property of the data is not employed in this study.

The mechanisms that we are looking for are quite general in nature, so we should be able to detect them in a homogeneous sub sample of the population with only individuals who grew up in families with both parents present and with parents who were Swedish citizens at the birth of the individual. By restricting the sample in this way we need not control for "missing" fathers or mothers and we markedly reduce the problems of comparability between immigrants and native Swede's family backgrounds. We also restrict the sample to those who were 26 to 65 years old in 1968 and 1981 respectively; at the age of 26 most people have completed their education and entered the labour market.

A further restriction is that only employed persons are included in the analysis. The reason is that good data on hourly wage rates are available for employed persons but not for self-employed and entrepreneurs.

As family background variables we use the father's social group and educational level. We use social groups 1, 2, 3 and farmers[2] as dummy variables in our regressions with social

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[2]Farmers classified in social groups 2 and 3 are included as a separate category. Some very wealthy farmers who belong to social group 1 remain in this catagory.

group 3 as the base captured by the intercept. The father's educational level is divided into (i) senior high school ("gymnasium") or higher, (ii) secondary or vocational school ("real- or yrkesskola") and (iii) others. The latter group is the base.

The background of the mother is described by a dummy variable showing whether she was mainly working in the household during the childhood of the individual and another dummy variable for education above the compulsory level. We add age, age squared, marital status, living in a big city and working daytime (1981 only) as control variables. Table 1 contains the sample means of most of the variables used in the study.

Years of schooling vary a lot by these family background variables which can be seen in Table 2. The differences between those whose father belonged to social group 1 and those with a father from social group 3 is around five years. The importance of the educational level of the father is of the same magnitude. The mother's educational level is also quite important.

In Table 3 we present simple regression equations which explain years of schooling by means of these family background variables plus age and the number of siblings. The coefficients for "father social group 1" and "father high school or higher" are lower than the "raw" differences in Table 2, but still rather large. It is also interesting to note that the number of siblings has a strongly significant negative coefficient.

4. Results

The empirical results for both sexes together and for men and women separately for 1968 and 1981 are identically organized in Tables 4a-4f. The first column in each table shows the estimates of the simple Mincer-type equation. They reveal the typical concave experience pattern and strongly significant schooling coefficients. The latter coefficients were roughly halved from 1968 to 1981 which has been noted in several previous studies. The quadratic schooling variable shown in column 2 in the tables raises the explanatory value markedly for

both sexes and for men and the precision of the two coefficients is quite good. For women, however, the precision of the two schooling coefficients becomes very low.

In column 3 we keep both the linear and the quadratic schooling variables and add separate family background variables. Even though none of these variables is strongly significantly different from zero, they raise the adjusted coefficient of determination (with exception for women in 1981). The addition of these variables also reduces the impact of schooling on wages somewhat, but not very much.

Finally, we come to columns 4 to 6 in the six tables where the estimates which are central to our basic issue can be found. No coefficient of the interaction variables between years of schooling and the family background variables is significantly different from zero for both periods and for both sexes.

Even though the level of significance is low one can, however, see two patterns in the results which at least weakly support the comparative advantage hypothesis and the quality/quantity trade off. The comparative advantage hypothesis gets some support by the predominantly positive coefficients on the interaction variable for the father's education. Actually, either "father gymnasium or higher" or "father real- or yrkesskola" has a coefficient around 0.015 for all six samples analyzed. Despite the low precision, these estimates suggest that high returns to schooling might be the reason for more years of schooling for individuals with highly educated fathers.

Even though these estimates suggest that there is some comparative advantage involved in schooling decisions, they do not necessarily rule out that differences in financing costs are important too. By using the equations in column 4 in the tables 4a och 4b and evaluating the marginal return to schooling for those with different family backgrounds we get the picture in Figure 2. We have evaluated the marginal returns for the average years of schooling for the groups. The main impression from the figure is that there is neither a marked positive nor a negative relationship. For 1968 the two groups with farmers as fathers do reveal low schooling and high marginal returns which suggest that they had faced high financing costs. Apart from

those with farmer background, however, the general impression is that the marginal returns are equal for the various groups. How can this result be interpreted within our analytical framework? One interpretation is that the marginal cost schedule is equal for all and completely flat. The existence of subsidized financial aid for students helps explain this interpretation. Another possibility is that family background affects both the costs and the returns so that the net effect on the marginal return is zero.

Turning next to the quantity/quality trade off hypothesis, it gets some (weak) support by the fact that the interaction variables for number of siblings predominantly get negative coefficients. For men in 1968 this coefficient is around -.0023 with t-values around 1.7. A negative coefficient suggests that those with few siblings get more skills that are useful at school than other other children with many siblings.

By comparing the results in columns 4, 5 and 6 one can see that there is some, but not very severe, multicollinearity between father's social group and educational level.

5. Conclusions

Family background has a very strong impact on the length of schooling in Sweden; in 1981 men with a father from social group 1 had 15.8 years of schooling in contrast to 10.0 years for men with a father from social group 3. This suggests that there is considerable inequality of opportunity in Sweden.

Our analysis has revealed that the returns to schooling is higher for those with a strong family background, at least the educational level of the father seems to raise the returns. This finding helps explain the persistent intergenerational pattern of schooling choice; those with a strong family background invest more in schooling because they get more out of it!

However, we can not rule out that a favourable family background also affects schooling choice via lower costs to finance schooling. We did find, though, that when we

evaluated the **marginal** returns to schooling at the average length of schooling for various social groups they were quite equal (except for those with a farmer background who had a combination of low schooling and high marginal returns). This result is inconsistent with the notion that the intergenerational pattern of schooling choice represents a source of inefficiency.

One final caveat about the analysis is in order. We have treated years of schooling as homogeneous. Of course, it might be that those with strong family background have managed to get schooling of higher quality. We can not tell whether the higher returns are due to better schools or more appropriate investments by the parents. Whatever the reasons, however, our study suggests that those with a strong family background invest more in schooling because they get more out of it!

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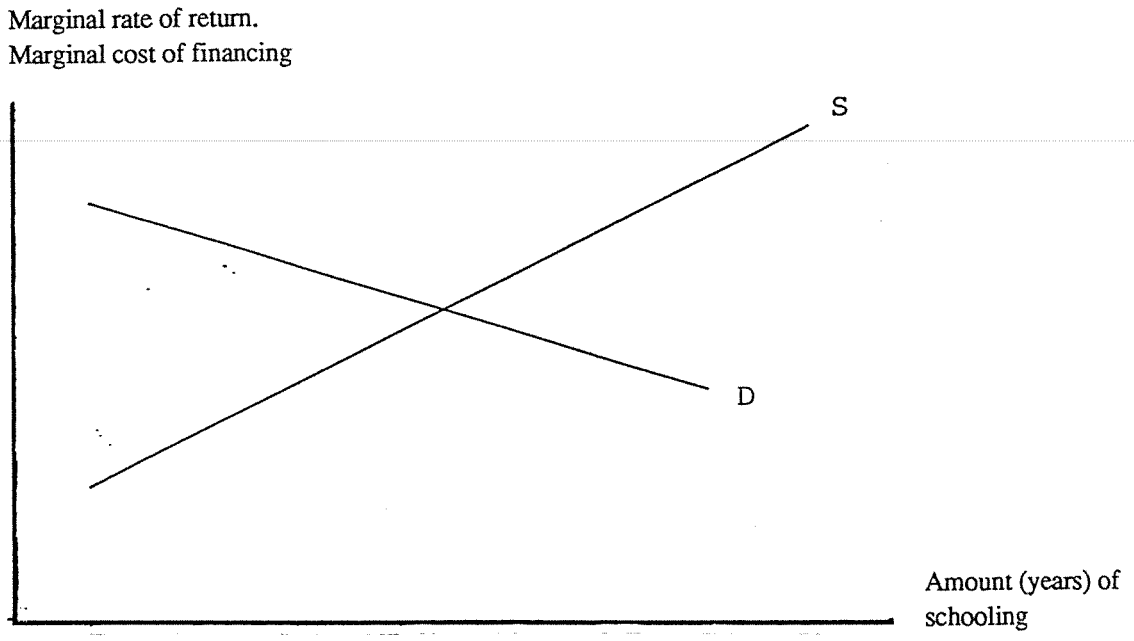
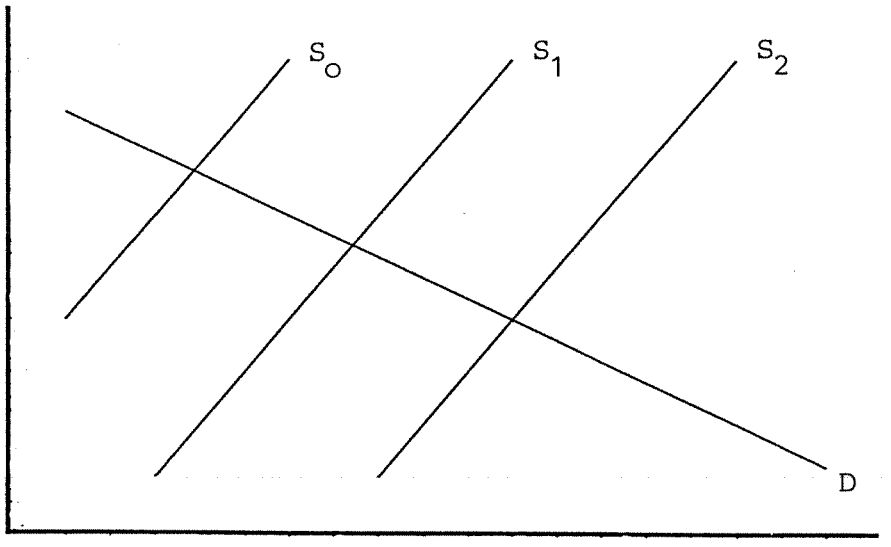
Figure 1. Determination of schooling choices.

a) General idea



b) Variation in cost of financing



c) Variation in the rate of return

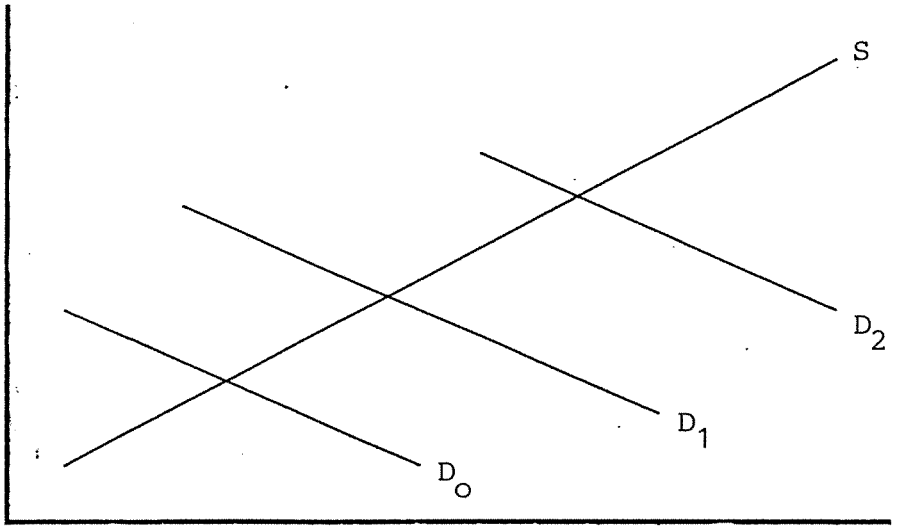
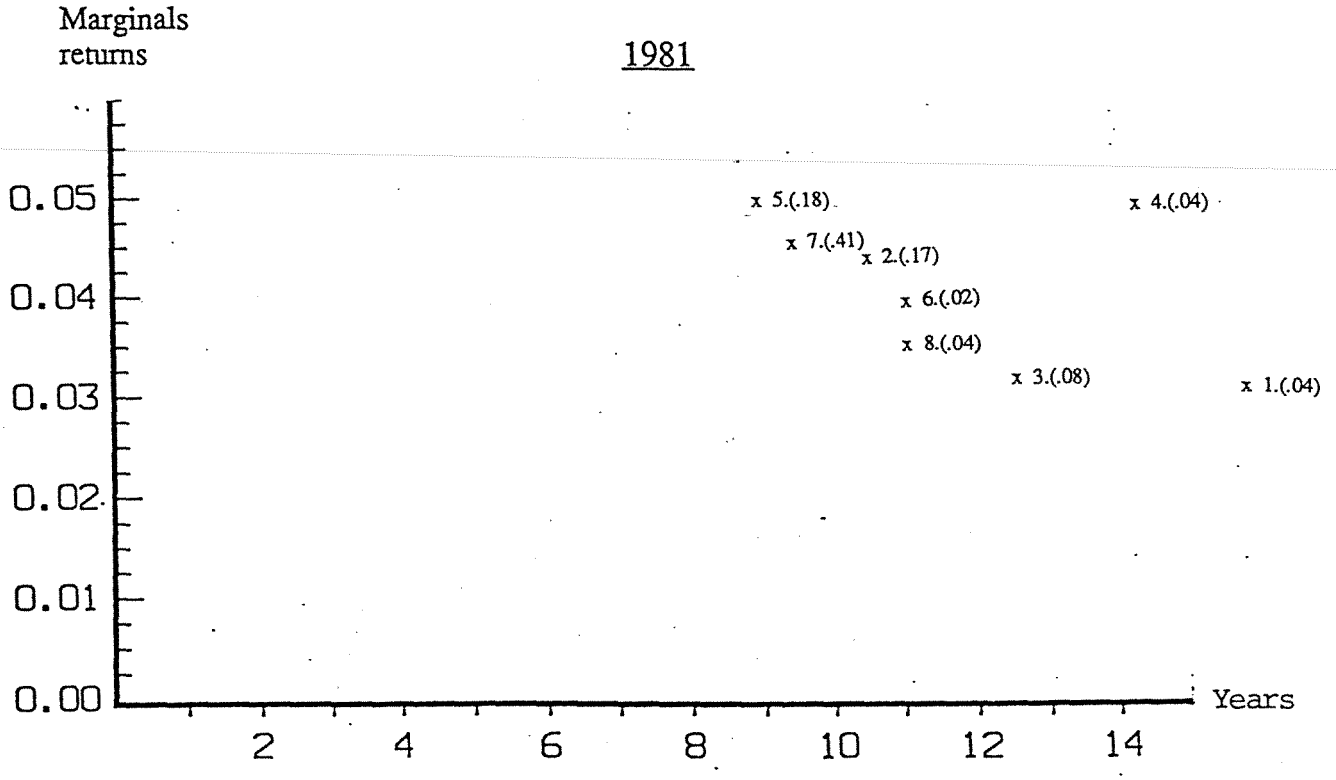
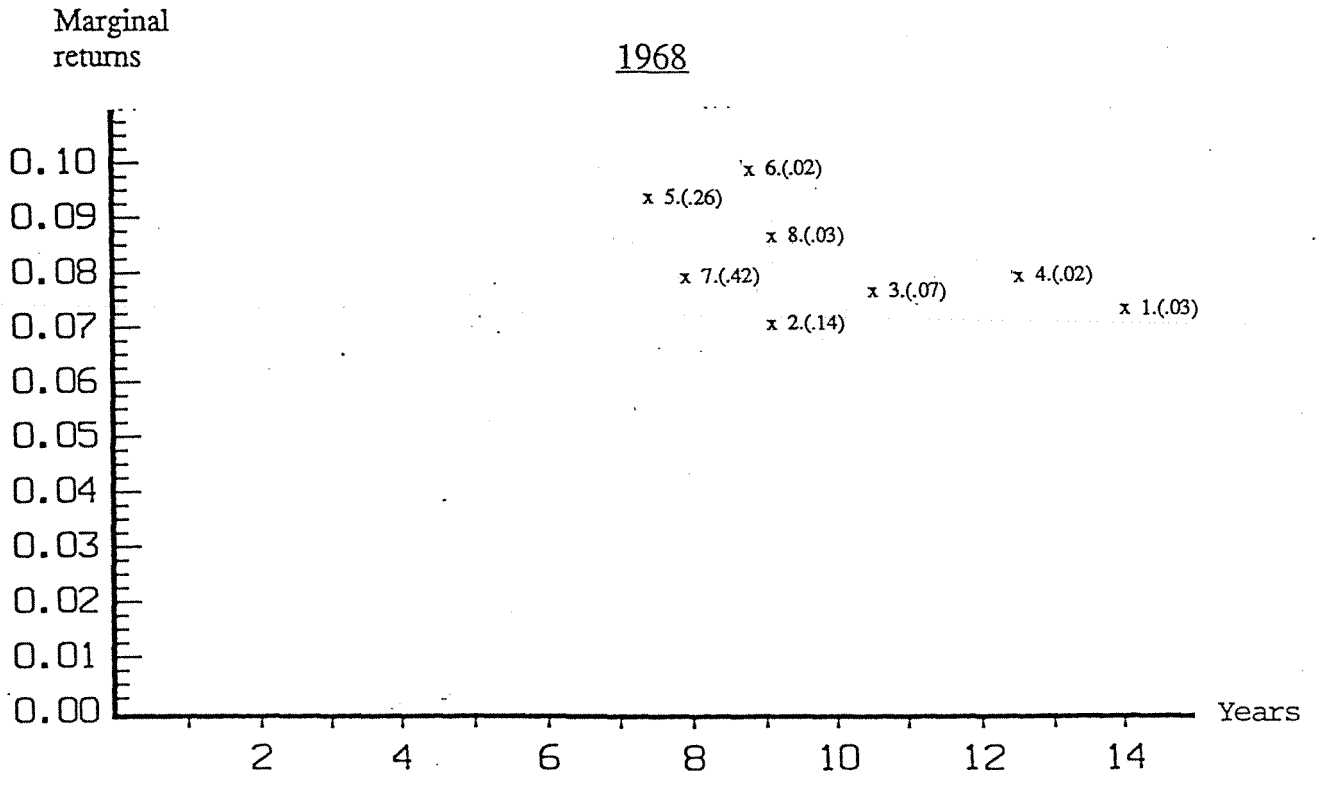


Figure 2. Marginal returns to schooling and the average length of schooling for various social groups. Sample fractions within parenthesis.





Notes: 1: Father social gr. 1 and high school or more. 2: Social group 2 and compulsory school.
3: Social group 2 and sec. or voc. school. 4: Social group 2 and high school or more.
5: Farmer and compulsory school. 6: Farmer and sec. or voc. school.
7: Social group 3 and compulsory school. 8: Social group 3 and sec. or voc. school.

Table 1. Sample means.

	1968		1981	
	Men	Women	Men	Women
Years of schooling	8.5	8.3	10.7	10.3
Work experience	27.2	18.4	23.8	18.0
Father social gr. 1	0.04	0.04	0.05	0.06
Father social gr. 2	0.20	0.26	0.29	0.30
Father farmer	0.28	0.27	0.20	0.19
Father high school or higher	0.05	0.06	0.07	0.09
Father secondary or voc. school	0.13	0.13	0.16	0.16
Mother home during child-hood	0.87	0.81	0.58	0.56
Mother education above compulsory level	0.10	0.10	0.16	0.17
Number of siblings	3.3	3.4	2.4	2.5
Married	0.83	0.74	0.80	0.78
Living in big city	0.35	0.38	0.35	0.35
Working daytime	-	-	0.84	0.83
n	1303	775	1294	1161

Table 2. Years of schooling by family background.

	1968		1981	
	Men	Women	Men	Women
Father social gr. 1	14.2	13.2	15.8	14.2
Father social gr. 2	10.0	9.4	12.1	11.4
Father social gr. 3	8.1	7.8	10.0	9.4
Father farmer	7.5	7.3	9.1	9.2
Father high school or higher	13.6	13.2	15.2	14.4
Father secondary or voc. school	10.1	9.6	12.7	11.6
Father compulsory school or less	8.0	7.8	9.9	9.5
Mother education above compulsory level	11.8	11.9	13.9	12.9
Mother compulsory school or less	8.2	7.9	10.1	9.7
n	1303	775	1294	1161

Table 3. Determinants of years of schooling.

	1968		1981	
	Men	Women	Men	Women
Constant	10.9 (31.0)	10.9 (29.4)	14.1 (38.3)	13.8 41.7)
Age	-.052 (-7.7)	-.071 (-9.4)	-.089 (-10.6)	-.101 (-12.6)
Father social gr. 1	3.51 (6.5)	2.12 (3.4)	2.56 (5.1)	2.02 (4.9)
Father social gr. 2	1.26 (6.1)	.94 (4.5)	1.02 (4.6)	1.09 (5.8)
Father farmer	-.43 (-2.4)	-.42 (-2.1)	-.59 (-2.5)	.18 (0.9)
Father high school or higher	1.96 (4.0)	2.29 (4.0)	2.27 (5.3)	2.38 (6.8)
Father secondary or voc. school	.98 (4.1)	1.09 (4.4)	1.58 (6.2)	1.11 (5.1)
Mother home during child-hood	-.34 (-1.5)	.28 (1.4)	-.26 (-1.4)	-.12 (-.8)
Mother education above compulsory level	1.25 (4.3)	1.81 (5.8)	1.43 (5.2)	1.19 (5.2)
Number of siblings	-.10 (-.3.4)	-.11 (-3.6)	-.18 (-4.4)	-.17 (-4.9)
n	1303	775	1293	1161
$\bar{R}^2$	.298	.370	.345	.388

Table 4a. Wage equations with family background variables, both sexes 1968. t-ratios within parenthesis.

	1	2	3	4	5	6
Constant	6.12 (43.0)	5.97 (36.3)	5.99 (36.2)	5.95 (34.0)	5.94 (34.0)	5.96 (34.0)
Work experience	.022 (7.4)	.022 (7.0)	.021 (6.9)	.022 (7.0)	.021 (6.9)	.022 (7.1)
Work experience squared/1000	-.38 (-6.2)	-.37 (-6.0)	-.35 (-5.8)	-.36 (-6.0)	-.36 (-5.8)	-.37 (-6.0)
Age	-.0045 (-.6)	-.0030 (-.4)	-.0030 (-.4)	-.0034 (-.5)	-.0032 (-.4)	-.0033 (-.4)
Age squared/1000	.051 (.6)	.039 (.5)	.031 (.4)	.038 (.4)	.034 (.4)	.037 (.4)
Women	-.271 (-14.8)	-.274 (-14.9)	-.272 (-14.7)	-.273 (-14.8)	-.272 (-14.7)	-.272 (-14.8)
Married	.137 (7.3)	.137 (7.4)	.136 (7.3)	.136 (7.3)	.135 (7.3)	.136 (7.3)
Living in big city	.096 (6.1)	.094 (6.0)	.094 (5.9)	.093 (5.9)	.093 (5.9)	.094 (5.9)
Years of schooling	.078 (29.4)	.102 (7.4)	.094 (6.7)	.102 (6.2)	.104 (6.4)	.099 (6.1)
Years of schooling squared	-	-.0011 (-1.8)	-.0010 (-1.6)	-.0013 (-2.0)	-.0014 (-2.1)	-.0011 (-1.7)
Father social gr. 1	-	-	0.143 (2.5)	.174 (.8)	.129 (2.2)	.050 (.3)
Father social gr. 2	-	-	.041 (2.0)	.086 (1.3)	.042 (2.0)	.049 (.8)
Father farmer	-	-	-.004 (-.2)	-.109 (-1.7)	-.004 (-.2)	-.114 (-1.8)
Father high school or higher	-	-	-.055 (-1.1)	-.252 (-1.4)	-.212 (-1.4)	-.056 (-1.1)

Table 4a continued

Father secondary or voc. school	-	-	.010 (.4)	-.080 (-1.1)	-.055 (-.8)	.012 (.5)
Mother home during child-hood	-	-	.040 (1.9)	.045 (.7)	.032 (.5)	.045 (.7)
Mother education above compulsory level	-	-	.029 (1.0)	-.008 (-.1)	.010 (.1)	-.037 (-.4)
Number of siblings	-	-	-.001 (-.3)	.012 (1.3)	.010 (1.0)	.012 (1.3)
Interactions with years of schooling						
Father social gr. 1	-	-	-	-.004 (-.3)	-	.007 (.5)
Father social gr. 2	-	-	-	-.004 (-.6)	-	-.000 (-.0)
Father farmer	-	-	-	.014 (1.8)	-	.015 (1.9)
Father high school or higher	-	-	-	.018 (1.2)	.013 (1.1)	-
Father secondary or voc. school	-	-	-	.010 (1.4)	.007 (1.0)	-
Mother home during child-hood	-	-	-	-.000 (-.0)	.001 (.2)	-.001 (-.0)
Mother education above compulsory level	-	-	-	.003 (.4)	.002 (.2)	.006 (.7)
Number of siblings	-	-	-	-.0016 (-1.5)	-.0013 (-1.2)	-.0016 (-1.5)
n	2078	2078	2078	2078	2078	2078
$\bar{R}^2$	.440	.441	.443	.444	.443	.443

Table 4b. Wage equations with family background variables, both sexes 1981. t-ratios within parenthesis.

	1	2	3	4	5	6
Constant	7.41 (72.3)	7.10 (59.9)	7.13 (59.7)	7.13 (29.0)	7.09 (57.3)	7.14 (56.5)
Work experience	.016 (6.8)	.014 (5.9)	.015 (5.9)	.014 (5.8)	.014 (5.8)	.015 (5.9)
Work experience squared/1000	-.25 (-5.3)	-.21 (-4.6)	-.22 (-4.6)	-.21 (-4.5)	-.21 (-4.5)	-.21 (-4.6)
Age	.0102 (1.9)	.015 (2.7)	.015 (2.7)	.015 (2.7)	.015 (2.7)	.015 (2.6)
Age squared/1000	-.088. (-1.4)	-.130 (-2.1)	-.129 (-2.1)	-.131 (-2.1)	-.134 (-2.2)	-.127 (-2.0)
Women	-.169 (-15.5)	-.175 (-16.0)	-.176 (-16.0)	-.177 (-16.1)	-.176 (-16.1)	-.175 (-16.0)
Married	.035 (3.0)	.035 (3.0)	.035 (2.9)	.035 (3.0)	.035 (2.9)	.035 (2.9)
Living in big city	.042 (4.1)	.040 (3.9)	.038 (3.6)	.038 (3.6)	.038 (3.6)	.038 (3.6)
Working daytime	-.041 -3.1)	-.041 (-3.1)	-.042 (-3.2)	-.041 (-3.2)	-.041 (-3.2)	-.043 (-3.3)
Years of schooling	.041 (25.2)	.078 (10.1)	.075 (9.6)	.076 (8.0)	.080 (8.8)	.076 (8.0)
Years of schooling squared	-	-.0016 (-5.0)	-.0015 (-4.8)	-.0016 (-4.2)	-.0017 (-4.7)	-.0016 (-4.3)
Father social gr. 1	-	-	.035 (1.3)	.155 (1.3)	.029 (1.0)	.048 (.4)
Father social gr. 2	-	-	.030 (2.4)	.008 (.2)	.031 (2.5)	.001 (.0)
Father farmer	-	-	.009 (.7)	-.016 (-.4)	.008 (.6)	-.016 (-.4)
Father high school or higher	-	-	.008 (.3)	-.252 (-2.4)	-.213 (-2.2)	.004 (.2)

Table 4b continued

Father secondary or voc. school	-	-	.000 (.0)	.051 (1.0)	.049 (1.0)	-.002 (-.1)
Mother home during child-hood	-	-	-.001 (-.1)	-.039 (-1.2)	-.035 (1.1)	-.040 (-1.4)
Mother educ. above compulsory level	-	-	.005 (.3)	.015 (.3)	.025 (.5)	-.009 (-.2)
Number of siblings	-	-	-.0015 (-.6)	.0080 (1.1)	.0084 (1.2)	.0069 (0.9)
Interactions with years of schooling						
Father social gr. 1	-	-	-	-008 (-1.0)	-	-.000 (-.1)
Father social gr. 2	-	-	-	.002 (.6)	-	.003 (.8)
Father farmer	-	-	-	.003 (.6)	-	.002 (.6)
Father high school or higher	-	-	-	.018 (2.4)	.015 (2.3)	-
Father secondary or voc. school	-	-	-	-.004 (-1.0)	-.004 (-1.0)	-
Mother home during child-hood	-	-	-	.004 (1.3)	.003 (1.2)	.004 (1.3)
Mother education above compulsory level	-	-	-	-.001 (-.2)	-.002 -.4)	.001 (.3)
Number of siblings	-	-	-	-.0010 (-1.4)	-.0011 (-1.4)	-.0009 (-1.2)
n	2455	2455	2455	2455	2455	2455
$\bar{R}^2$	.336	.343	.343	.344	.345	.342

Table 4c. Wage equations with family background variables, men 1968. t-ratios within parenthesis.

	1	2	3	4	5	6
Constant	6.33 (31.7)	5.96 (26.6)	5.91 (26.3)	5.95 (25.5)	5.91 25.4)	5.97 (25.6)
Work experience	.029 (5.0)	.027 (4.6)	.025 (4.2)	.028 (4.7)	.026 (4.4)	.028 (4.7)
Work experience squared/1000	-.53 (-5.3)	-.50 (-5.0)	-.47 (-4.7)	-.53 (-5.1)	-.49 (-4.7)	-.53 (-5.1)
Age	-.0219 (1.9)	-.0169 (-1.4)	-.0135 (-1.1)	-.0183 (-1.5)	-.0153 (-1.3)	-.0188 (-1.6)
Age squared/1000	.267 (2.0)	.227 (1.7)	.186 (1.4)	.244 (1.8)	.204 (1.5)	.251 (1.9)
Married	.211 (8.7)	.211 (8.7)	.209 (8.6)	.207 (8.5)	.207 (8.5)	.207 (8.5)
Living in big city	.106 (5.5)	.098 (5.1)	.098 (5.1)	.096 (5.0)	.098 (5.0)	.098 (5.1)
Years of schooling	.077 (21.4)	.133 (8.4)	.127 (7.8)	.130 (6.9)	.132 (7.0)	.127 (6.8)
Years of schooling squared	-	-.0025 (-3.6)	-.0023 (-3.4)	-.0024 (-3.3)	-.0025 (-3.4)	-.0022 (-3.1)
Father social gr. 1	-	-	0.117 (1.7)	.205 (.9)	.120 (1.7)	.124 (.6)
Father social gr. 2	-	-	.011 (.4)	.081 (1.0)	.011 (.4)	.025 (.3)
Father farmer	-	-	-.037 (-1.7)	-.200 (-2.7)	-.038 (-1.7)	-.210 (-2.9)
Father high school or higher	-	-	-.103 (-1.7)	-.226 (-1.1)	-.150 (-.9)	-.097 (-1.6)

Table 4c contined

Father secondary or voc. school	-	-	.001 (.0)	-.135 (-1.6)	-.090 (-1.1)	-.001 (-.0)
Mother home during child-	-	-	.053 (1.9)	.053 (.6)	.033 (.4)	.056 (.7)
Mother education above compulsory level	-	-	.044 (1.2)	.090 (.8)	.113 (1.0)	.068 (.6)
Number of siblings	-	-	-.001 (-.3)	.017 (1.5)	.014 (1.2)	.018 (1.6)
Interactions with years of schooling						
Father social gr. 1	-	-	-	-.008 (-.4)	-	.001 (.0)
Father social gr. 2	-	-	-	-.007) (-.8)	-	-.001 (-.0)
Father farmer	-	-	-	.021 (2.3)	-	.023 (2.5)
Father high school or higher	-	-	-	.013 (.8)	.005 (.4)	-
Father secondary or voc. school	-	-	-	.014 (1.7)	.009 (1.2)	-
Mother home during child-hood	-	-	-	-.000 (-.0)	.002 (.3)	-.000 (-.0)
Mother education above compulsory level	-	-	-	-.004 (-.4)	-.007 (-.7)	-.002 (-.2)
Number of siblings	-	-	-	-.0024 (-1.7)	-.0019 (-1.4)	-.0024 (-1.8)
n	1303	1303	1303	1303	1303	1303
$\bar{R}^2$	.404	.410	.412	.414	.411	.414

Table 4d. Wage equations with family background variables, women 1968. t-ratios within parenthesis

	1	2	3	4	5	6
Constant	5.71 (23.6)	6.16 21.64)	6.22 (21.2)	6.09 (18.7)	6.08 (29.0)	6.10 (18.9)
Work experience	.017 (3.9)	.020 (4.5)	.020 (4.5)	.020 (4.5)	.020 (4.5)	.020 (4.5)
Work experience squared/1000	-.29 (-3.0)	-.34 (-4.2)	-.34 (-3.4)	-.34 (-3.4)	-.34 (-3.4)	-.34 (-3.4)
Age	.0094 (.8)	.0069 (.6)	.0045 (.4)	.0048 (.4)	.0046 (.4)	.0052 (.4)
Age squared/1000	-.115 (-.9)	.096 (-.7)	-.078 (-.6)	-.079 (-.6)	-.077 (-.6)	-.083 (-.6)
Married	.028 (.9)	.022 (.7)	.027 (.9)	.026 (.9)	.027 (.9)	.027) (.9)
Living in big city	.083 (3.1)	.089 (3.3)	.090 (3.3)	.087 (3.2)	.087 (3.2)	.088 (3.2)
Years of schooling	.077 (15.9)	-.009 (-.3)	-.015 (0.5)	.009 (0.2)	.013 (.3)	.0004 (0.1)
Years of schooling squared	-	.0042 (3.0)	.0041 (2.7)	.0030 (1.5)	.0026 (1.4)	.0033 (1.8)
Father social gr. 1	-	-	0.152 (1.5)	.051 (.1)	.139 (1.4)	-.078 (-.2)
Father social gr. 2	-	-	.071 (2.1)	.139 (1.1)	.074 (2.1)	.131 (1.1)
Father farmer	-	-	.040 (1.2)	.028 (.2)	.040 (1.2)	.028 (.2)
Father high school or higher	-	-	.009 (.1)	-.181 (-.5)	-.262 (-.8)	.013 (.1)

Table 4d continued

Father secondary or voc. school	-	-	.034 (.8)	-.005 (-.0)	.020 (.2)	.037 (.9)
Mother home during child-	-	-	.032 (.9)	.073 (.7)	.071 (.7)	.073 (.7)
Mother education above compulsory level	-	-	.013 (.2)	-.073 (-.4)	-.067 (-.3)	-.104 (-.5)
Number of siblings	-	-	-.003 (-.6)	-.004 (-.2)	-.005 (-.3)	-.004 (-.2)
Interactions with years of schooling						
Father social gr. 1	-	-	-	.005 (.1)	-	.02 (.5)
Father social gr. 2	-	-	-	-.008) (-.5)	-	-.007 (-.5)
Father farmer	-	-	-	.002 (.1)	-	.002 (.1)
Father high school or higher	-	-	-	.017 (.5)	.022 (.9)	-
Father secondary or voc. school	-	-	-	.003 (.2)	.002 (.2)	-
Mother home during child-hood	-	-	-	-.005 (-.4)	-.005 (-.4)	-.005 (-.4)
Mother education above compulsory level	-	-	-	.008 (.4)	.007 (.4)	.011 (.6)
Number of siblings	-	-	-	.0001 (.0)	.0003 (.2)	.0001 (.1)
n	775	775	775	775	775	775
$\bar{R}^2$	.296	.304	.306	.301	.303	.302

Table 4e. Wage equations with family background variables, men 1981. t-ratios within parentheis.

	1	2	3	4	5	6
Constant	7.32 (42.4)	6.59 (32.7)	6.66 (32.8)	6.70 (32.3)	6.64 (32.3)	6.72 (32.5)
Work experience	.014 (3.0)	.005 (1.0)	.006 (1.2)	.004 (.8)	.004 (.8)	.005 (.9)
Work experience squared/1000	-.285 (-3.5)	-.127 (-1.5)	-.137 (-1.6)	-.101 (-1.2)	-.104 (-1.2)	-.111 (-1.3)
Age	.013 (-1.4)	.034 (3.2)	.032 (3.0)	.035 (3.2)	.035 (3.3)	.033 (3.1)
Age squared/1000	-.0675 (-.6)	-.276 (-2.4)	-.259 (-2.2)	-.294 (-2.5)	-.294 (-2.5)	-.281 (-2.4)
Married	.091 (5.3)	.093 (5.5)	.092 (5.4)	.091 (5.4)	.091 (5.3)	.091 (5.3)
Living in big city	.072 (4.9)	.067 (4.6)	.063 (4.2)	.062 4.2)	.063 (4.3)	.061 (4.2)
Working daytime	-.026 (-1.4)	-.029 (-1.6)	-.029 (-1.6)	-.029 (-1.5)	-.027 (-1.5)	-.031 (-1.6)
Years of schooling	.035 (12.5)	.100 (10.0)	.095 (9.3)	.087 (7.0)	.094 (7.9)	.087 (7.1)
Years of schooling squared	-	-.0026 (-6.7)	-.0025 (-6.4)	-.0024 (-5.1)	-.0026 (-5.7)	-.0025 (-5.4)
Father social gr. 1	-	-	0.072 (1.8)	.230 (1.4)	.060 (1.5)	.167 (1.1)
Father social gr. 2	-	-	.035 (2.0)	-.026 (-.5)	.036 (2.0)	-.028 (-1.1)
Father farmer	-	-	.001 (.1)	-.067 (-1.2)	-.004 (-.2)	-.066 (-1.1)
Father high school or higher	-	-	.011 (.3)	-.167 (-1.2)	-.128 (-1.0)	.004 (.1)

Table 4e continued

Father secondary or voc. school	-	-	.008 (.4)	.058 (.9)	.048 (.7)	.003 (.2)
Mother home during child-hood	-	-	.015 (1.0)	-.077 (-1.7)	-.068 (-1.6)	-.077 (-1.8)
Mother education above compulsory level	-	-	-.009 (-.4)	-.030 (-.4)	-.011 (-.1)	-.051 (-.7)
Number of siblings	-	-	-.005 (-1.5)	-.000 (-.0)	-.001 (-.1)	-.002 (-.2)
Interactions with years of schooling						
Father social gr. 1	-	-	-	-.010 (-.9)	-	-.005 (-.5)
Father social gr. 2	-	-	-	.006 (1.2)	-	.006 (1.2)
Father farmer	-	-	-	.006 (1.1)	-	.006 (1.1)
Father high school or higher	-	-	-	.011 (1.2)	.009 (1.0)	-
Father secondary or voc. school	-	-	-	-.004 (-.8)	-.003 (-.7)	-
Mother home during child-hood	-	-	-	.008 (2.2)	.008 (2.0)	.008 (2.2)
Mother education above compulsory level	-	-	-	.002 (.3)	.000 (.1)	.003 (.6)
Number of siblings	-	-	-	-.0005 (-.5)	-.0005 (-.5)	-.0004 (-.4)
n	1294	1294	1294	1294	1294	1294
$\bar{R}^2$	.256	.281	.283	.285	.284	.284

Table 4f. Wage equations with family background variables, women 1981. t-ratios within parenthesis.

	1	2	3	4	5	6
Constant	7.34 (55.3)	7.53 (47.1)	7.52 (46.4)	7.37 (41.3)	7.40 (42.3)	7.40 (41.7)
Work experience	.016 (5.3)	.017 (5.5)	.017 (5.5)	.017 (6.5)	.017 (5.4)	.017 (5.5)
Work experience squared/1000	-.253 (-3.9)	-.265 (-4.1)	-.265 (-4.1)	-.263 (-4.0)	-.264 (-4.1)	-.265 (-4.1)
Age	.0083 (1.2)	.0069 (1.0)	.0075 (1.1)	.0086 (1.3)	.0081 (1.2)	.0088 (1.3)
Age squared/1000	-.0718 (-1.0)	-.0631 (-.8)	-.070 (-.9)	-.081 (-1.1)	-.0753 (-1.0)	.0843 (-1.1)
Married	-.026 (-1.6)	-.025 (-1.5)	-.025 (-1.5)	-.025 (-1.5)	-.025 (-1.6)	-.026 (-1.6)
Living in big city	.008 (.6)	.009 (.6)	.008 (.6)	.006 (.5)	.007 (.5)	.007 (.5)
Working daytime	-.052 (-2.9)	-.052 (-2.9)	-.052 (-2.9)	-.052 (-2.9)	-.051 (-2.9)	-.053 (-2.9)
Years of schooling	.042 (18.4)	.012 (.9)	.011 (0.8)	.029 (1.6)	.029 (1.7)	.022 (1.3)
Years of schooling squared	-	.0013 (2.1)	.0013 (2.1)	.0008 (1.2)	.0007 (1.0)	.0011 (1.6)
Father social gr. 1	-	-	0.003 (.1)	.122 (.7)	.002 (.1)	.001 (.0)
Father social gr. 2	-	-	.028 (1.7)	.102 (1.7)	.030 (1.8)	.100 (1.7)
Father farmer	-	-	.012 (.7)	.058 (.9)	.013 (.7)	.058 (.9)
Father high school or higher	-	-	-.026 (-.8)	-.284 (-1.8)	-.244 (-1.6)	-.024 (-.7)

Table 4f continued

Father secondary or yrkesskola"	-	-	-.005 (-.3)	.043 (.6)	.060 (.8)	-.003 (-.2)
Mother home during child-hood	-	-	-.016 (-1.2)	.005 (.1)	.004 (.1)	.004 (.1)
Mother education above compulsory level	-	-	.019 (.9)	.012 (.1)	.017 (.2)	-.005 (-.1)
Number of siblings	-	-	.002 (.7)	.014 (1.3)	.014 (1.4)	.015 (1.4)
Interactions with years of schooling						
Father social gr. 1	-	-	-	-.010 (-.8)	-	-.001 (-.1)
Father social gr. 2	-	-	-	-.007 (-1.2)	-	-.007 (-1.3)
Father farmer	-	-	-	-.005 (-.8)	-	-.005 (-.8)
Father high school or higher	-	-	-	.019 (1.6)	.015 (1.4)	-
Father secondary or voc. school	-	-	-	-.004 (-.6)	-.006 (-.9)	-
Mother home during child-hood	-	-	-	-.002 (-.5)	-.002 (-.5)	-.002 (-.4)
Mother education above compulsory level	-	-	-	.001 (.1)	-.000 (-.0)	.002 (.3)
Number of siblings	-	-	-	-.0013 (-1.2)	-.0013 (-1.2)	-.0013 (-1.2)
n	1116	1116	1116	1116	1116	1116
$\bar{R}^2$	.240	.243	.242	.241	.242	.240