

The Effect of Parental Background on Track Choices and Wages

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1. Introduction

The extent of intergenerational links with respect to economic outcomes has been a key topic in social and economic research. The intergenerational transmission of economic opportunities has been widely analyzed by studying intergenerational mobility with respect to education.¹ The rationale is that education data for both parents and children are more frequently available and usually more reliable than income variables. Moreover, income variables do not only reflect opportunities but also lifestyle choices that may differ across generations. The literature on intergenerational mobility of educational attainment has mainly focused on the ability to reach college bound education.² While one cannot dismiss the importance of access to higher education, we claim that it is too narrow a view of the educational system. In Switzerland, the main educational track is provided by dual apprenticeship training. The current literature

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1 See a review by HAVEMAN and WOLFE (1995).

2 Results for Switzerland can be found in BAUER and RIPHAHN (2006, 2007) and CATTANEO, HANSLIN and WINKELMANN (2007).

on intergenerational mobility tends to focus on educational attainment, whereas parents may influence their children choices at earlier stages as shown by DUSTMANN (2004) for Germany. This may also be true in Switzerland, which has a very similar educational system and where young people must choose between vocational or academic education at the age of 15 or even earlier depending on the canton of residence. This choice is partly driven by academic performance but also by individual preferences and, most probably, by social values. For instance, CONLON (2005) has shown that selection into vocational education is better explained by parental background variables than by schooling performance. CHECCHI and FLABBI (2007) also found strong parental background effects to explain school track choices in Italy.

The impact of parental background variables on educational attainment has already been documented in Switzerland. BAUER and RIPHANN (2006) show that the age of tracking is important in shaping schooling inequality in Switzerland. CATTANEO, HANSLIN and WINKELMANN (2007) investigate the impact of family background variables on educational attainment over time, providing evidence of greater educational opportunities for women with lowly educated parents. Our work builds upon this literature by focussing on the impact of parental background variables at the age of tracking, as previous results have shown the importance of tracking on educational inequalities. Clearly, comparisons through time may not always be relevant as educational systems may go through significant changes. Thus, we investigate the impact of parental background variables on wages through their effect on upper secondary educational attainment. One may observe that, over time, individuals with lowly educated parents have a lower (higher) probability to access academic (vocational) education at age 15. While early tracking may increase educational inequality, this does not imply that early tracking increases income inequality. Indeed, the complete effect will depend on the total returns to the various upper secondary tracks. As such, greater access to tertiary vocational education may raise the relative returns from upper secondary vocational studies and thus reduce the importance of early tracking on inequalities. This point is especially important since early tracking is often blamed for schooling inequalities (OECD, 2009). It may also shed some light on the relevance of promoting universities of applied sciences (i.e. tertiary vocational education) in Switzerland.

The importance of intergenerational links with respect to upper secondary school tracks in Switzerland is analyzed by means of microdata from the Swiss household panel (SHP). We first examine the trend in educational track choices over six decades by means of a standard multinomial logit model. In a second step, we measure the impact of intergenerational links at age 15 on wage

inequalities. The financial consequences of intergenerational links on wages are measured by simulating age earnings profiles with the help of estimated school track probabilities.

The remainder of the paper unfolds as follows: Section 2 briefly discusses the main features of the Swiss schooling system, Section 3 describes the data. Section 4 presents the results on intergenerational links while Section 5 illustrates the impact of the latter on wages. Finally, we conclude with some qualifications.

2. The Swiss Schooling System

A brief description of the Swiss schooling system is useful for understanding our approach. Education in Switzerland is not shaped at the federal level. Instead, each canton has its own schooling system, which leads to some important differences. This is notably the case for tracking, which can take place at ages between 11 and 15 depending on the canton of residence. Such differences may be quite important for our research topic. However, our main data source does not allow to delve into this feature of the Swiss schooling system.

Although the various cantonal schooling systems are quite disparate, they do share some important components. Compulsory schooling generally begins around age 5 and ends at age 15.³ Primary school usually covers the first 6 years. Then, depending on the cantons, some tracking takes place between the age of 11 and 15, either in the type of schooling (vocational vs. general), or the type of teaching (low ability vs. high ability classes). The transition towards upper secondary schools takes place at the age of 15. While there is a large array of schools to choose from, one can distinguish five tracks which will eventually be grouped into three main categories. One first option is to drop out of school and search for a job on the labour market. The second possibility is to choose a dual apprenticeship training which implies working part-time in a firm and spending between 1 and 2 days per week at school. Thirdly, youngsters may choose full-time vocational school. A fourth choice available is college bound education, the diploma of which gives access to university and other forms of tertiary education. Finally, there are some very general training schools which provide little return on the labour market and offer very few possibilities to go into any form of tertiary education. Therefore, we consider general training schools as a form

3 In some cantons, nursery school (which caters for children aged 4 to 6) is compulsory while in others it is not. It should also be noted that a harmonization programme (Harmos) across all cantons is currently being implemented.

of lower education. Upper secondary school choices are based partly on schooling performance, but may also reflect individual choices.

The transition to tertiary education is obviously dependent on the upper secondary school achievement. Vocational education may lead to tertiary education as one can pursue education in higher vocational school, the so-called university of applied sciences. This type of school has recently been expanded in Switzerland in order to offer some kind of higher education for those who chose vocational training. However, the effect of this reform cannot be analyzed with the data at our disposal as it concerns the cohort currently pursuing education. Indeed, the law instituting the university of applied sciences was promulgated at the end of 1995, and for reasons which are detailed below, our youngest cohort is born in 1979. As new educational institutions were not created overnight, this reform is unlikely to affect our results. It is also worth noting that the Swiss educational system has gone through little institutional changes. More specifically, the institutional settings of vocational education (the largest educational path in Switzerland) have remained practically unaltered between 1930 and 1995.

3. Data

We make use of the Swiss Household Panel (SHP) which is a representative household survey spanning from 1999 to 2008. Regarding intergenerational links, our variable of interest is the first degree completed after lower secondary education. This means that we observe the first successful track choice after the age of 15. We cannot take into account individuals who switched educational tracks after their initial choice or who dropped out of the schooling system since we do not have information on the actual first choice, whether it was successful or not. We broadly define three educational outcomes: lower educational track, vocational education, college bound secondary education. Lower education is defined as those who did not complete any education further than secondary school as well as other full time educational tracks that do not lead to tertiary education (a primary example is general knowledge school). These degrees are poorly rewarded on the labour market. Clearly, individuals choosing this kind of education at age 15 can grab the opportunity to pursue other types of education at a later time, thus mitigating the grim judgement one may have on these educational tracks. In order to have sufficiently large groups for each cohort, we do not distinguish between full-time vocational school and individuals engaged in an apprenticeship, which we group in a single category. To sum up, the dependent

variable has three categories which we label as follows: lower education, vocational education and college bound education.⁴

The choice of the independent variables is driven by data availability as well as by basic economic theory. Obviously, many factors are at play in shaping a person's educational attainment, as thoroughly described by HAVEMAN and WOLFE (1995), who themselves draw upon the work of Becker⁵. In this framework, family is a production unit which employ resources in order to generate utility among its members. Hence, educational attainments will primarily depend on total family income and how efficiently the latter is used. Variables such as the number of siblings, genetic endowment and social values will also be important determinants. In our empirical framework, parental education captures most of these dimensions as it is positively correlated with income, favourable genetic attributes and a positive attitude towards higher education. Since no fitting variable is available to control for innate ability, parental education will most certainly capture all these factors simultaneously, and we do not attempt to differentiate between them.

In the SHP, our key variable "parental education" is coded over a large set of qualifications. We intentionally group these qualifications in three main categories namely *low* education which is education (compulsory schooling), *mid-level* education (upper secondary educational attainment) and *higher* education (tertiary educational attainment). For each individual, the variable pertains to the highest educational attainment across both parents. This measure of parental education may seem rather crude, but grouping the various qualifications into three broad categories will actually reduce noise in the data. It should indeed be reminded that we work with *biographical* variables. While they are likely to provide a valid information on the level of education, one should remain cautious while dealing with precise information on qualifications as they may be misreported. Another problem arises when the educational attainment of one parent is missing. One could either drop the observation, code the parental educational variable with the remaining information or explicitly code the parental education variable with a missing information category. No single method is preferable to another since the pattern of missing information is likely to depend on the age of individuals when using biographical variables. In this paper, we choose the third option.⁶

4 Tertiary education can be reached through any educational tracks. Yet, only our college bound category allows one to reach university education directly.

5 See in particular BECKER and TOMES (1986).

6 We run several robustness checks by deleting missing observations or by imputing the information on one parent. The results are qualitatively similar as marginal effects are within the range of the standard deviation of the results presented in the paper.

We build five cohorts spanning from 1920 to 1979 in order to keep only individuals who have completed their schooling years. Although the SHP at our disposal covers the years up to 2008, our youngest cohort is born in 1979 because the biographical data for subsequent cohorts become much less reliable.⁷ For each individual, we only keep information available in the most recent sample. Moreover, the sample is restricted to individuals who have completed all their education in Switzerland. After deleting missing values, we end up with a sample of 12,042 observations (6,553 women, 5,489 men). The descriptive statistics are displayed in Table 1. As expected, the data reveal a shift towards the academic track for both genders, though the change is noticeably sharper for women. Across the various cohorts, the propensity to choose vocational education has remained fairly stable for men, while it has increased for women. For both genders, we observe a slight decrease in the proportion of individuals going into vocational tracks. Quite naturally, parental education has followed the same pattern as the one observed for track choices since parents have become more educated over time. This shows that the expansion of the academic track may be due to a *composition* effect as shown by CATTANEO, HANSLIN and WINKELMANN (2007). Finally, the acuteness and frequency of financial problems during youth have diminished over time. Of course, this variable is highly subjective and what is meant by financial difficulties may differ according to the nationality and the age of the individuals. Yet, the pattern of this variable is in line with the improvement of the economic situation of Swiss households.

In the second part of the article, we discuss wages, their evolution in relation to parental influences. Based on all available waves of the SHP, we keep full-time wage workers aged between 20 and 65 years. The wage variable is the standardized yearly wage rate, expressed in logarithms. In order to compare wages between different waves of the SHP, the wages are adjusted with the CPI at the time of the interview.

7 Current educational attainment for younger individuals in the SHP is not updated on a yearly basis.

Table 1: Descriptive Statistics SHP Sample Means

	1920–39		1940–49		1950–59		1960–69		1970–79	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
<i>School track</i>										
Low	46.21	17.75	30.12	9.05	22.96	7.51	17.62	5.32	11.49	5.57
Vocational	47.13	68.71	58.47	74.94	60.93	74.61	65.99	77.23	61.25	72.96
Academic	6.65	13.54	11.41	16.01	16.11	17.88	16.40	17.45	27.27	21.47
<i>Parental education</i>										
Low	29.02	31.74	24.51	25.41	20.40	22.37	17.56	14.96	9.63	11.05
Mid	46.86	46.53	51.54	46.29	50.00	51.59	51.92	55.82	49.84	46.36
High	9.80	10.24	13.19	16.82	16.46	17.31	17.91	19.50	25.00	29.20
Missing information*	14.33	11.49	10.76	11.48	13.14	8.73	12.62	9.72	15.53	13.39
<i>Age 15</i>										
Mother not in household.	8.60	8.65	5.43	4.99	5.60	5.14	4.36	3.90	3.64	3.68
Father not in household.	13.68	13.77	10.29	7.54	10.17	9.31	12.50	11.35	13.03	10.87
Mother is Swiss	89.28	91.24	93.08	93.97	89.21	89.31	83.37	82.70	82.04	81.85
Father is Swiss	91.96	94.20	93.92	94.66	91.22	91.92	83.49	83.83	80.26	81.58
Parents in employment	95.66	96.02	97.94	97.56	98.27	98.53	98.72	98.58	98.54	98.92
<i>Situation during youth</i>										
Some financial problems	18.95	20.02	14.22	13.46	11.20	10.94	10.29	8.87	7.04	6.74
Constant financial problems	23.11	22.87	20.95	18.21	14.45	11.67	11.63	8.09	6.23	4.04
Number of observations	1082	879	1069	862	1446	1225	1720	1410	1236	1113

Notes: Swiss household panel, authors' calculations. Parental education: low: below upper secondary; mid: upper secondary; high: tertiary.

* Missing information: at least one parent's information missing.

4. Determinants of Upper Secondary Education

We first estimate a multinomial logit model in order to capture changes between cohorts in the probability of choosing a given school track at age 15. The model contains relatively few variables. Our rationale is that parental background may affect many other control variables. Introducing few control variables enables us to measure the gross effect of parental background on educational choices. The independent variables are a set of dummy variables for the highest educational attainment achieved by one parent (or both), a dummy variable for the working status of the mother (and the father) at age 15, variables for a mother or a father not present in the household at age 15, variables for financial difficulties during youth⁸ and one another variable for foreign parents. The latter was preferred over current citizenship as individuals may have obtained the Swiss nationality after their studies. The model is estimated by cohort, yet we still control for time trend by introducing a linear time trend. Finally, the sample is limited to individuals who have pursued all their education in Switzerland. Notice that we do not attempt to establish whether the estimated correlations are due to ability or social inequalities, and we steer clear of the Nature vs. Nurture debate which is beyond the scope of this paper.

Overall, the marginal effects at sample means have the expected signs.⁹ For instance, parental tertiary education is positively correlated with choosing academic education, whereas it is negatively correlated with the low educational track and vocational education. We also observe that financial difficulties in youth age have a negative effect on the probability of choosing the academic track while the impact of this variable on choosing the vocational track is rather ambiguous. Yet, it seems that in the most recent cohorts, financial difficulties are positively linked to vocational education. Finally, disrupted families negatively affect the probability of going into higher education.

To get a better grasp on the changes in track choice probabilities, we plot the effect of parental education on the probabilities of choosing various educational tracks for both genders (Figures 1 to 3). In each plot, we draw the probability ratios between two types of parental education by year of birth.¹⁰ The probabilities have been estimated by holding constant all characteristics but our variables

8 This variable is highly subjective and what is meant by financial difficulties may differ depending on the nationality and the age of the individuals. As we estimate the model by cohorts and for individuals born in Switzerland, these consistency problems are somewhat reduced.

9 The marginal effects at sample means are reported in Tables A1 to A5.

10 The probability lines have been smoothed by a kernel estimator.

of interest, namely year of birth and parental education. More specifically, we assume that both parents were present in the household at age 15, that the household did not face any financial difficulties and that at least one parent was in the labour force. This parental background combination has been chosen because it corresponds to the modes of the binary independent variables. It should be noted that the pattern of the diagrams does not depend on how our baseline person is defined since we plot probability ratios.

We start our analysis with lower education. The observed patterns (Figure 1) are very similar across genders. For individuals with lowly educated parents, the probability to end up in the lower educational track is about twice that of individuals with high or intermediate education. This ratio remains broadly constant over time. We also observe that differences between individuals with highly educated parents and individuals whose parents have achieved only intermediate education have become somewhat smaller over time. In the earliest cohorts, there was a sharp difference between these two parental education variables. Individuals with highly educated parents had a much smaller probability to end up in the lowest educational track. In the most recent cohorts, we observe little differences between parents with high education and parents with intermediate education.

As for the vocational track, the differences between genders are much sharper. The intergenerational correlations have barely changed over time for men. The probabilities of ending up in the vocational track are fairly similar for individuals with lowly educated parents or parents with only secondary education. Highly educated parents exert a negative impact on the probability of choosing a vocational track. It should be noted that the probability to choose vocational education has increased over time for individuals with lowly educated parents, while it has decreased in the most recent cohort for individuals with more favourable family background. The pattern is somewhat different for women. Initially, the probability to choose vocational education was much lower for individuals with lowly educated parents, compared to the two other measures of parental education. Over the years, the relative importance of parental education has become similar to that of men. The probability to go into vocational education is relatively similar for individuals whose parents have achieved low or mid-level education, while highly educated parents also exert a negative impact on the probability of choosing this educational track.

Finally, the evolution of the academic track is also interesting. In fact, for men, the probability of choosing this track, conditional on parental education, has barely changed over the various cohorts. This suggests that the expansion of this kind of education primarily stems from the improvement of students' family background rather than better access to academic education. With respect to

Figure 1: Probability Ratios between Parental Educations, Low Educational Track

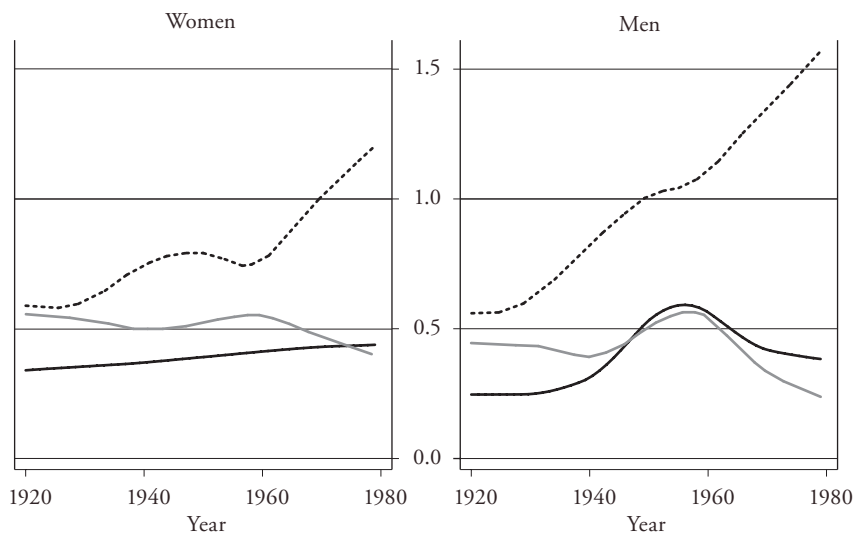


Figure 2: Probability Ratios between Parental Educations, Vocational Track

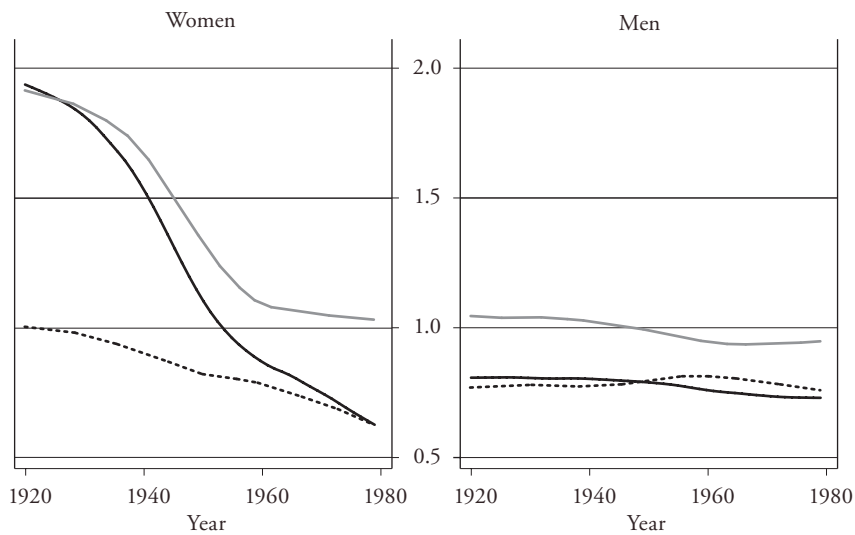
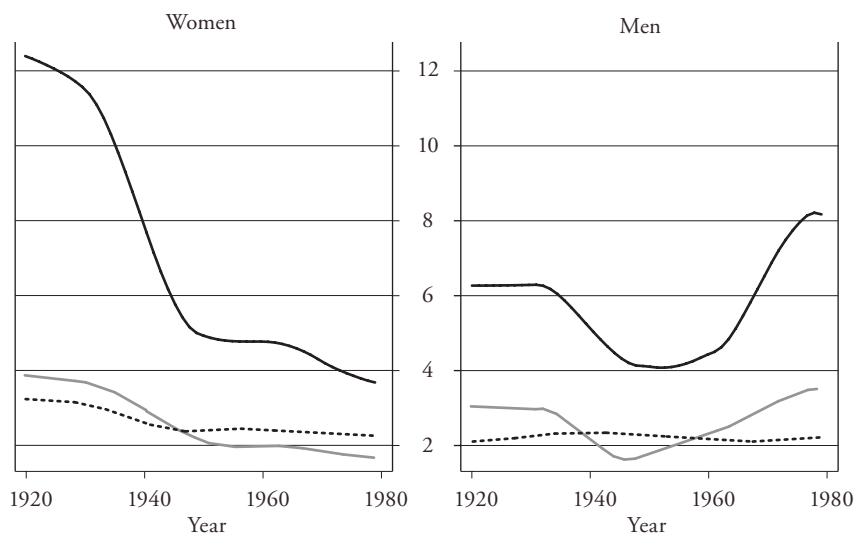


Figure 3: Probability Ratios between Parental Educations, Academic Track



Legend to Figures 1–3:

Parental education

Low: no secondary degree; Mid: secondary degree; High: tertiary education

---- High/Mid — Mid/Low — High/Low

probability ratios (Figure 3), the curves do not show any particular pattern. For instance, in the first cohort (1920–1939), individuals with highly educated parents had a probability to go into academic education about 6 times higher than that of people with lowly educated parents. This ratio falls to approximately four for individuals born between 1950 and 1960 and rises again in the last cohort. Not too surprisingly, the picture is somewhat different regarding women. The probability to go into academic education conditional on parental background has increased over time for each level of parental education. For instance, women with lowly educated parents have seen their probability to go into academic education rise from less than 2% for those born in the 1920's to approximately 15% for those born at the end of the 1970's. The impact of family background variables has somewhat decreased over time. Initially, women with highly educated parents had about 12 times more chances to go into academic education than women with lowly educated parents. This ratio has decreased to about four times, a figure slightly lower than the one found for men.

5. Intergenerational Links and Wages

We now turn to the impact of parental background variables on wages, which is channelled through upper secondary educational attainment. The change documented in the previous section may or may not translate into changes in the wage distribution as the latter will also depend on the returns attached to various qualifications. Our empirical strategy is therefore twofold and borrows from DUSTMANN (2004). We first estimate the impact of upper secondary education on wages. We next make use of the estimated coefficients from the wage equations as well as the computed probabilities from the previous section to measure how intergenerational links translate into wage profiles and how such changes in intergenerational correlations may have affected income inequality. As a starting point, the following (log) wage equation is estimated:

$$\ln(w_i) = \alpha_0 + \alpha_1 VOC_i + \alpha_2 ACA_i + \gamma EA_i + \delta_1 P_i(AGE) + \delta_2 COH_i + u_i \quad (1)$$

where $\ln(w)$ is the annual wage rate,¹¹ VOC and ACA are dummy variables for vocational education and academic track, EA is a vector for further educational achievements captured by dummy variables for respectively higher vocational education and university degrees, $P(AGE)$ is a polynomial in age of degree 3 and COH are cohort dummies. The subscript i stands for individuals and u_i is an error term. This equation estimates the effects of qualifications (vs. years of education for the standard Mincer type equation). By including all qualifications, not only the highest qualifications attained, we can compare the returns to adequate control groups. Indeed, in the highest qualifications studies, the treatment group is usually the least qualified. Comparing the gross returns to tertiary vocational education with those of university education is of little interest if we use the same reference group since individuals are likely to have chosen a different path towards tertiary education. Finally, thanks to the panel structure of our dataset, we can also identify both cohort and age effects.

We make use of the wage data available in the SHP to estimate equation (1) for men and women, by means of a standard ordinary least square regression. In order to make the results across genders more comparable, we restrain the sample

11 As our data cover the period between 1999 and 2008, we deflated the wage variable by using the monthly CPI.

Table 2: Wage Regressions, Swiss Household Panel 1999–2008

	Women		Men	
	I	II	III	IV
Constant	6.432 (0.462)	5.943 (0.456)	8.605 (0.270)	7.934 (0.280)
Vocational	0.120 (0.020)	0.127 (0.020)	0.096 (0.017)	0.128 (0.019)
High school	0.258 (0.027)	0.336 (0.024)	0.164 (0.021)	0.350 (0.020)
Higher vocational	0.161 (0.018)	– –	0.195 (0.007)	– –
University	0.176 (0.027)	– –	0.315 (0.015)	– –
Age	0.314 (0.033)	0.346 (0.033)	0.141 (0.019)	0.181 (0.019)
Age ² /10 ³	–0.682 (0.088)	–0.749 (0.085)	–0.241 (0.046)	–0.326 (0.048)
Age ³ /10 ⁵	0.483 (0.074)	0.531 (0.074)	0.133 (0.036)	0.193 (0.038)
R ²	0.2758	0.2527	0.3254	0.2572
Number of observations	3444		9808	

Notes: Ordinary least squares, robust standard errors in parentheses. Dependent variable: standardized yearly wage rate (logarithm). Not reported: cohort dummies, nationality.

to full-time workers. Column I and III of Table 2 display the coefficients of the full model, namely with variables of both upper secondary and tertiary educational achievement (the omitted category is individuals choosing the lower education at age 15 and no further education). According to these estimates, the return to secondary vocational degree is equal to 9.5% and 12% for men and women respectively, while a high school degree provides a premium of 16% for men and 26% for women. Both university and higher vocational training provide substantial wage increases. Among women, the pay-off from tertiary vocational education is about the same size as the one for university education. For men, university education provides a much greater premium than tertiary vocational. It should be noted that the paths to tertiary education mainly belong to

the same kind of education (i.e. either vocational or academic), thus the overall returns of the highest achieved degree is usually obtained by the sum of the coefficients attached to secondary and tertiary education in either vocational or academic education.¹² This means that women with university degrees usually earn more than women with tertiary vocational degrees, even though the coefficients attached to these qualifications are the same.

Columns II and IV show the results for wage regressions on secondary school achievements only. The coefficients can be interpreted as the gross effect of secondary school degrees. The latter underestimates the true return of those who achieved further education and overestimates the genuine returns of those who did not go further than upper secondary schooling. The reference group is made up of people who achieved lower education at the upper secondary level, regardless of their subsequent educational achievements. As expected, the coefficients of the upper secondary school degrees increase in the process. The premium attached to vocational education is now equal to 13% for men and women. It is worth noting that the increase in the high school coefficients is much sharper as it equals 35% for men and 34% for women. This is due to the highest transition rates towards tertiary education for academically trained individuals. These specifications will be used as a starting point to investigate the impact of parental background (via upper secondary school choice) on individual wages.

Following DUSTMANN (2004), we simulate how changing intergenerational links translates into wages through their effect on secondary school choice. We use the estimated coefficients from equation (1) to predict log wages conditional on parental background (PB):

$$\begin{aligned} E(\ln(w) | PB) &= \hat{\alpha}_0 + \hat{\alpha}_1 E(voc | PB) + \hat{\alpha}_2 E(aca | PB) \\ &= \hat{\alpha}_0 + \hat{\alpha}_1 \Pr(voc | PB) + \hat{\alpha}_2 \Pr(aca | PB) \end{aligned} \quad (2)$$

The probabilities $\Pr(voc | PB)$ and $\Pr(aca | PB)$ are obtained from our probabilistic model. Individuals from different age groups will have different wages due to their position on the wage-age profile and to their conditional probability to achieve different secondary school attainment. The wage-age profile is assumed

12 The return to mixed strategies (for instance combining upper secondary vocational education with university education) cannot be inferred from our estimates. Indeed, BACKES-GELLNER and TUOR (2010) have shown complementarities between the two main types of education in Switzerland.

to be independent of the parental background, thus convergence (or divergence) in the wage profiles will stem from changing intergenerational correlations.¹³

We consider three individuals, who differ only with respect to parental education (low, middle and high). Individuals live with both parents at age 15, and have not suffered from financial difficulties during their youth. Relaxing this assumption for the less favoured group substantially increases the wage gap. In Figures 4 and 5, we plot the predicted wage gaps between different parental education levels for women and men respectively. The log wage difference between an individual who has grown up with tertiary educated parents and an individual with lowly educated parents is quite substantial. It ranges between approximately 6.6% and approximately 10% for men, and between approximately 10% and 17% for women. However, the size of the gap is lower than the one found by Dustmann for Germany (about 30%). Combining our conditional probabilities with the wage estimates of DUSTMANN (2004), we obtain predicted wage gaps that are similar to those found in Germany. The reason is that the returns to secondary education are patently much higher in Germany than in Switzerland, especially for women.

The size of the gap is somewhat larger for women. As the gross returns to secondary education are similar, these differences mainly arise through the large differences in the predicted probabilities. As far as the trend is concerned, we observe no clear pattern with respect to men. With respect to women, our results indicate that the predicted wage gap has increased over time. This may seem at odds with our previous results showing that the impact of parental variables on school track choices has decreased over time for women. Yet, the probability to go into higher education was quite low for any kind of parental background in the early cohorts. While parental background variables had a sizeable impact in relative terms (i.e. the probability ratios), they had a small impact on actual probabilities. Differences between men and women can also be explained by the fact that the latter have a lower probability to go into the intermediate track, favouring “extreme” choices. One should bear in mind that our results do not imply any direct causality from parental background to wages. Parental background may affect wages through unobserved ability and network effects. Our estimates should be taken as a composite of all these effects.

13 All determinants except parental background and age are held constant. We therefore need to choose a year on which these predicted age-earnings profiles will be computed. There is no strong motive to prefer one year over another, and we selected 2004 simply because this year had the largest sample in the wage regressions. This implies that the oldest individuals in our predictions were born in 1939 and the youngest in 1979.

Figure 4: Impact of Parental Education on Wages (Women)

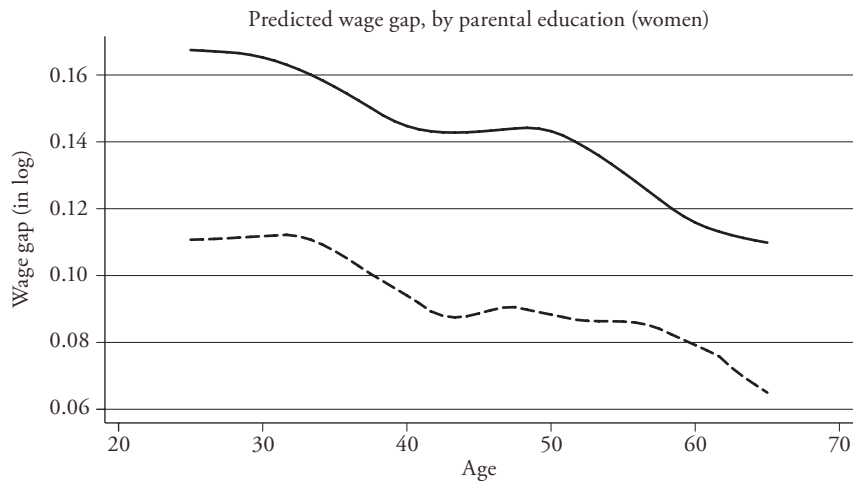
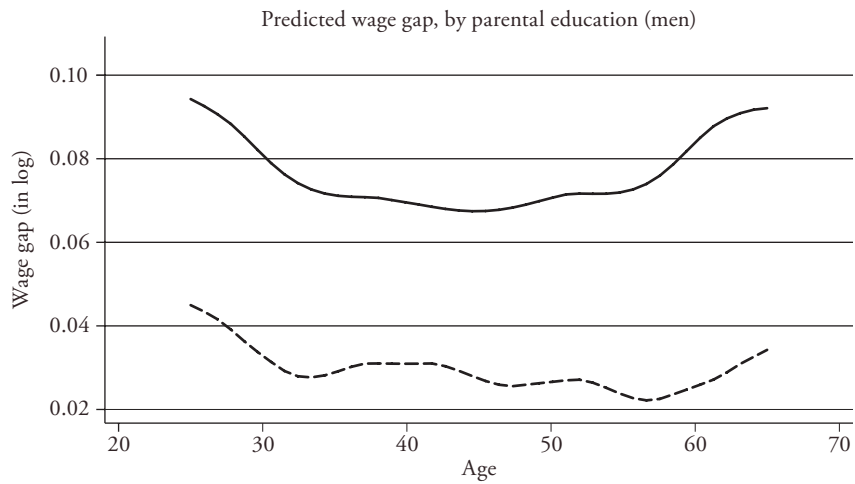


Figure 5: Impact of Parental Education on Wages (Men)



Legend to Figures 4 and 5:
Parental education
Low: no secondary degree; Mid: secondary degree; High: tertiary education
— High/Low - - Mid/Low
Smoothed values (kernel-weighted local polynomial regression)

6. Conclusion

There is no doubt that parental background plays an important role for upper secondary school choice in Switzerland, and our paper attempts at gauging this effect for both men and women and its evolution through time. The Swiss schooling system is characterized by widespread apprenticeship, which still ranks as the most popular educational track. Some authors have raised the concern that widespread apprenticeship training may eventually increase income inequality as it would not offer the adequate tools to pursue further education. According to our estimates, it does not appear to be the case for Switzerland. Our findings point to quite a limited impact of parental background (through upper secondary educational attainment) on wages in Switzerland as compared to Dustmann's study with German data. These differences mainly arise from lower returns from upper secondary educational attainment in Switzerland, which in turn can be explained by the low propensity to pursue tertiary education for individuals following the high upper secondary educational track in Switzerland.

Thus, a policy supporting tertiary education for those who achieved a vocational degree may be more effective in reducing inequalities than a policy aimed at mitigating the impact of parental background at age 15. Indeed, providing adequate tertiary vocational education may increase the gross returns from upper secondary vocational education and thus reduce the impact of tracking on overall inequality. Yet, such policy would only be effective in reducing inequalities if transitions to tertiary education are relatively immune to the impact of parental background variables.

Finally, one cannot preclude that the observed changes in school track probability conditional on parental background are not the reflection of changes occurring in the educational system. While the institutional framework has been remarkably stable in Switzerland over the period investigated, some more subtle changes may have taken place such as a shift in the occupational structure of apprenticeship positions. Whether these phenomena occurred and how they may have affected intergenerational links is beyond the scope of the present paper, but still constitutes an interesting avenue for further research.

Appendix: Additional Tables

Table A1: School Track Probabilities, Marginal Effects (Cohort 1920–39), SHP

	Women			Men		
	Lower	Vocational	Higher	Lower	Vocational	Higher
<i>Parental variables</i>						
Secondary education	–0.320*** (0.0347)	0.267*** (0.0369)	0.053*** (0.0191)	–0.152*** (0.0262)	0.023 (0.0383)	0.130*** (0.0324)
Tertiary education	–0.405*** (0.0329)	0.160** (0.0769)	0.245*** (0.0792)	–0.155*** (0.0202)	–0.231*** (0.0760)	0.386*** (0.0777)
Parent(s) employed	–0.080 (0.0834)	0.143* (0.0789)	–0.063 (0.0542)	0.049 (0.0554)	–0.048 (0.0802)	–0.001 (0.0648)
Swiss mother	0.026 (0.0634)	–0.012 (0.0630)	–0.015 (0.0219)	–0.012 (0.0524)	0.017 (0.0597)	–0.005 (0.0369)
Swiss father	–0.081 (0.0736)	0.092 (0.0707)	–0.011 (0.0246)	–0.042 (0.0679)	0.115 (0.0784)	–0.073 (0.0587)
Mother missing	0.057 (0.0693)	–0.040 (0.0679)	–0.017 (0.0202)	0.063 (0.0608)	–0.034 (0.0659)	–0.029 (0.0387)
Father missing	–0.030 (0.0607)	0.042 (0.0606)	–0.011 (0.0179)	0.025 (0.0515)	–0.041 (0.0576)	0.016 (0.0412)
<i>Situation during youth</i>						
Some financial trouble	–0.014 (0.0429)	0.018 (0.0424)	–0.003 (0.0115)	0.059 (0.0373)	–0.045 (0.0404)	–0.014 (0.0241)
Constant financial trouble	–0.018 (0.0402)	0.0638 (0.0402)	–0.046*** (0.0110)	0.006 (0.0317)	0.058 (0.0358)	–0.064*** (0.0218)
Intra-cohort time trend	–0.004 (0.0029)	0.004 (0.0029)	0.001 (0.0009)	–0.004 (0.0023)	0.005* (0.0028)	–0.001 (0.0019)
Predicted probability	0.4693	0.4906	0.0401	0.1642	0.7247	0.1111
Observations	1082			879		
Pseudo R^2	0.0889			0.0709		

Notes: Multinomial logit model, robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The reference person has the following characteristics: low education parent(s), no financial trouble during youth, both parents in the household at age 15, foreign mother (father).

Table A2: School Track Probabilities, Marginal Effects (Cohort 1940–49), SHP

	Women			Men		
	Lower	Vocational	Higher	Lower	Vocational	Higher
<i>Parental variables</i>						
Secondary education	–0.264*** (0.0321)	0.184*** (0.0377)	0.080*** (0.0276)	–0.092*** (0.0209)	0.027 (0.0388)	0.065* (0.0352)
Tertiary education	–0.236*** (0.0270)	–0.031 (0.0656)	0.267*** (0.0678)	–0.067*** (0.0157)	–0.274*** (0.0631)	0.341*** (0.0636)
Parent(s) employed	0.050 (0.0927)	–0.014 (0.109)	–0.036 (0.0756)	–0.016 (0.0584)	0.075 (0.108)	–0.059 (0.0960)
Swiss mother	0.046 (0.0590)	–0.039 (0.0675)	–0.008 (0.0469)	–0.047 (0.0541)	0.171** (0.0777)	–0.124* (0.0674)
Swiss father	–0.075 (0.0737)	0.059 (0.0762)	0.016 (0.0420)	–0.026 (0.0513)	0.108 (0.0760)	–0.082 (0.0626)
Mother missing	0.073 (0.0787)	–0.043 (0.0804)	–0.030 (0.0385)	–0.026 (0.0374)	0.023 (0.0724)	0.003 (0.0625)
Father missing	–0.022 (0.0578)	–0.031 (0.0616)	0.052 (0.0475)	0.039 (0.0567)	–0.091 (0.0799)	0.052 (0.0651)
<i>Situation during youth</i>						
Some financial trouble	0.012 (0.0422)	–0.015 (0.0442)	0.004 (0.0249)	–0.013 (0.0251)	0.050 (0.0390)	–0.037 (0.0318)
Constant financial trouble	0.001 (0.0375)	0.039 (0.0389)	–0.040* (0.0213)	0.034 (0.0282)	0.028 (0.0376)	–0.061** (0.0276)
Intra-cohort time trend	–0.009* (0.0051)	0.006 (0.0054)	0.003 (0.0033)	–0.003 (0.0034)	0.012** (0.0051)	–0.009** (0.0042)
Predicted probability	0.2914	0.6082	0.1004	0.0812	0.7823	0.1364
Observations	1069			862		
Pseudo R^2	0.0595			0.0847		

Notes: Multinomial logit model, robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The reference person has the following characteristics: low education parent(s), no financial trouble during youth, both parents in the household at age 15, foreign mother (father).

Table A3: School Track Probabilities, Marginal Effects (Cohort 1950–59), SHP

	Women			Men		
	Lower	Vocational	Higher	Lower	Vocational	Higher
<i>Parental variables</i>						
Secondary education	-0.123*** (0.0281)	0.047 (0.0342)	0.076*** (0.0260)	-0.034* (0.0185)	-0.085** (0.0350)	0.119*** (0.0322)
Tertiary education	-0.160*** (0.0250)	-0.162*** (0.0534)	0.321*** (0.0556)	-0.034** (0.0165)	-0.319*** (0.0552)	0.354*** (0.0568)
Parent(s) employed	-0.056 (0.0938)	-0.090 (0.0942)	0.145*** (0.0102)	-0.051 (0.0799)	0.046 (0.116)	0.006 (0.100)
Swiss mother	0.001 (0.0437)	0.027 (0.0472)	-0.028 (0.0288)	-0.038 (0.0361)	0.027 (0.0507)	0.012 (0.0436)
Swiss father	0.024 (0.0454)	-0.004 (0.0507)	-0.020 (0.0314)	0.030 (0.0234)	0.010 (0.0571)	-0.041 (0.0558)
Mother missing	0.155** (0.0679)	-0.147** (0.0681)	-0.007 (0.0393)	-0.002 (0.0333)	0.056 (0.0492)	-0.054 (0.0391)
Father missing	-0.035 (0.0413)	0.057 (0.0459)	-0.021 (0.0277)	0.012 (0.0312)	-0.041 (0.0521)	0.029 (0.0471)
<i>Situation during youth</i>						
Some financial trouble	0.016 (0.0376)	0.013 (0.0397)	-0.029 (0.0208)	-0.040** (0.0186)	0.062* (0.0369)	-0.022 (0.0335)
Constant financial trouble	0.141*** (0.0373)	-0.104*** (0.0391)	-0.036* (0.0205)	0.025 (0.0257)	0.035 (0.0360)	-0.060** (0.0285)
Intra-cohort time trend	-0.005 (0.0042)	0.003 (0.0045)	0.001 (0.0025)	0.001 (0.0027)	0.002 (0.0042)	-0.003 (0.0036)
Predicted probability	0.2297	0.6577	0.1126	0.0721	0.7769	0.1590
Observations	1446			1225		
Pseudo R^2	0.0608			0.0539		

Notes: Multinomial logit model, robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The reference person has the following characteristics: low education parent(s), no financial trouble during youth, both parents in the household at age 15, foreign mother (father).

Table A4: School Track Probabilities, Marginal Effects (Cohort 1960–69), SHP

	Women			Men		
	Lower	Vocational	Higher	Lower	Vocational	Higher
<i>Parental variables</i>						
Secondary education	–0.111*** (0.0234)	0.008 (0.0336)	0.103*** (0.0293)	–0.033** (0.0138)	–0.109*** (0.0376)	0.142*** (0.0362)
Tertiary education	–0.133*** (0.0182)	–0.222*** (0.0522)	0.355*** (0.0551)	–0.025*** (0.0092)	–0.352*** (0.0682)	0.376*** (0.0694)
Parent(s) employed	0.000 (0.0708)	0.224* (0.128)	–0.224* (0.136)	0.048*** (0.0063)	0.036 (0.139)	–0.083 (0.139)
Swiss mother	–0.041 (0.0319)	0.092** (0.0381)	–0.051* (0.0288)	–0.034** (0.0161)	0.053 (0.0333)	–0.020 (0.0304)
Swiss father	0.072*** (0.0241)	–0.022 (0.0357)	–0.050* (0.0297)	0.007 (0.0105)	0.003 (0.0317)	–0.01 (0.0304)
Mother missing	0.024 (0.0473)	0.073 (0.0522)	–0.097*** (0.0274)	0.015 (0.0280)	0.118*** (0.0366)	–0.133*** (0.0252)
Father missing	0.038 (0.0338)	0.011 (0.0380)	–0.048** (0.0243)	–0.001 (0.0140)	0.052 (0.0330)	–0.050 (0.0309)
<i>Situation during youth</i>						
Some financial trouble	–0.035 (0.0275)	0.059* (0.0348)	–0.024 (0.0249)	0.030 (0.0198)	0.033 (0.0317)	–0.062** (0.0261)
Constant financial trouble	–0.014 (0.0268)	0.074** (0.0332)	–0.061** (0.0239)	0.005 (0.0167)	0.103*** (0.0295)	–0.108*** (0.0255)
Intra-cohort time trend	–0.012*** (0.0033)	0.011*** (0.0040)	0.001 (0.0028)	–0.004** (0.0015)	0.001 (0.0035)	0.003 (0.0032)
Predicted probability	0.1713	0.6883	0.1403	0.0376	0.8164	0.1459
Observations	1720			1410		
Pseudo R^2	0.0584			0.0743		

Notes: Multinomial logit model, robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The reference person has the following characteristics: low education parent(s), no financial trouble during youth, both parents in the household at age 15, foreign mother (father).

Table A5: School Track Probabilities, Marginal Effects (Cohort 1970–79), SHP

	Women			Men		
	Lower	Vocational	Higher	Lower	Vocational	Higher
<i>Parental variables</i>						
Secondary education	-0.110*** (0.0305)	-0.018 (0.0576)	0.128** (0.0564)	-0.063*** (0.0167)	-0.166** (0.0648)	0.229*** (0.0647)
Tertiary education	-0.069*** (0.0211)	-0.346*** (0.0620)	0.415*** (0.0660)	-0.036*** (0.0109)	-0.470*** (0.0752)	0.505*** (0.0767)
Parent(s) employed	-0.091 (0.0927)	-0.050 (0.108)	0.141* (0.0724)	-0.052 (0.0593)	-0.032 (0.110)	0.084 (0.0914)
Swiss mother	0.007 (0.0284)	-0.000 (0.0480)	-0.007 (0.0429)	-0.034* (0.0207)	0.096** (0.0461)	-0.062 (0.0426)
Swiss father	-0.041 (0.0321)	0.070 (0.0473)	-0.029 (0.0429)	0.017 (0.0112)	0.050 (0.0445)	-0.067 (0.0433)
Mother missing	0.082 (0.0592)	0.028 (0.0779)	-0.110* (0.0622)	0.020 (0.0308)	0.035 (0.0658)	-0.055 (0.0602)
Father missing	0.040 (0.0334)	-0.044 (0.0474)	0.005 (0.0437)	0.019 (0.0184)	0.039 (0.0385)	-0.057 (0.0349)
<i>Situation during youth</i>						
Some financial trouble	0.007 (0.0360)	0.043 (0.0555)	-0.050 (0.0488)	0.009 (0.0198)	0.098** (0.0405)	-0.106*** (0.0363)
Constant financial trouble	0.056 (0.0429)	0.025 (0.0605)	-0.081 (0.0516)	-0.031** (0.0122)	0.054 (0.0634)	-0.024 (0.0622)
Intra-cohort time trend	0.002 (0.0033)	-0.012** (0.0050)	0.010** (0.0044)	0.006*** (0.0018)	-0.014*** (0.0043)	0.008** (0.0041)
Predicted probability	0.1119	0.6313	0.2567	0.0390	0.7714	0.1896
Observations	1236			1113		
Pseudo R^2	0.0676			0.1022		

Notes: Multinomial logit model, robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The reference person has the following characteristics: low education parent(s), no financial trouble during youth, both parents in the household at age 15, foreign mother (father).

References

- BACKES-GELLNER, USCHI, and SIMONE TUOR (2010), "Risk-Return Trade-Offs to Different Educational Paths: Vocational, Academic and Mixed", *International Journal of Manpower*, 31 (5), pp. 495–519.
- BAUER, PHILIPP, and REGINA RIPHAHN (2006), "Timing of School Tracking as a Determinant of Intergenerational Transmission of Education", *Economics Letters*, 91 (1), pp. 90–97.
- BAUER, PHILIPP, and REGINA RIPHAHN (2007), "Heterogeneity in the Intergenerational Transmission of Educational Attainment: Evidence from Switzerland on Natives and Second Generation Immigrants", *Journal of Population Economics*, 20(1), pp. 121–148.
- BECKER, GARY, and NIGEL TOMES (1986), "Human Capital and the Rise and Fall of Families", *Journal of Labor Economics*, 4 (3), pp. S1–39.
- CATTANEO, ALEJANDRA, SANDRA HANSLIN, and RAINER WINKELMANN (2007), "The Apple Falls Increasingly Far: Parent-Child Correlation in Schooling and the Growth of Post-Secondary Education in Switzerland", *Swiss Journal of Economics and Statistics*, 143 (2), pp. 133–153.
- CHECCHI, DANIELE, and LUCCA FLABBI (2007), "Intergenerational Mobility and Schooling Decisions in Italy and Germany: The Impact of Secondary School Track", *IZA Discussion Paper* No. 2879.
- CONLON, GAVAN (2005), "The Determinants of Undertaking Academic and Vocational Qualifications in the United Kingdom", *Education Economics*, vol. 13, pp. 299–313.
- DUSTMANN, CHRISTIAN (2004), "Parental Background, Secondary School Track Choice, and Wages", *Oxford Economic Papers*, vol. 56, pp. 209–230.
- OECD (2009), *Economic Survey of Switzerland, 2009*, OECD, Paris.
- HAVEMAN, ROBERT, and BARBARA WOLFE (1995), "The Determinants of Children's Attainments: A Review of Methods and Findings", *Journal of Economic Literature*, 33 (4), pp. 1829–1878.

SUMMARY

Intergenerational links are often investigated by computing educational attainment correlations between parents and children, even though parental background may influence outcomes at earlier stages of the educational path. Because of early school track selection and widespread vocational training, this effect may be quite important in the Swiss context. We first investigate the importance of parental background variables for upper secondary educational attainment over the last 6 decades. We next estimate the impact of parental background on earnings. This effect is shown to depend on the magnitude of intergenerational correlations, the returns to qualifications and the availability of further training for those having ended up in a low educational track at age 15. The impact of tracking at age 15 on wage inequality is found to be relatively small in Switzerland, comparing to results for Germany. Relatively low returns from academic education best explain this pattern.