University or Polytechnic? Family Background Effects on the Choice of Higher Education Institution

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1   Introduction

Substantial reforms in the Swiss higher education system led to two new types of tertiary institutions alongside the traditional academic universities: Polytechnics, officially named universities of applied sciences[1], and teachers colleges, named also universities of teacher education[2]. These transformations of the tertiary system were motivated by two arguments: First, the opening of the higher education system with the establishment of further types of institutions was meant to better satisfy the growing demand for a better qualified workforce. Second, the polytechnics and to a lesser degree the teachers colleges offered alternative entries to tertiary level studies and thus enabled a broader public to complete higher education studies. Thus, graduates of a vocational training obtained the possibility to train at tertiary level (ISCED 5A) if they had acquired at least a vocational baccalaureate. Likewise, for the training of the teachers it was argued that their education should be brought up to the tertiary level in order to conform to the increasing requirements of the teaching profession and to ensure inter-cantonal and international recognition and mobility.

Considering the higher education system as a whole, the polytechnics were not meant to double university structures; rather they were set up with different orientations. Regarding the social and professional status, they were defined as "separate but equal" (Message CF, 1994). Given this declaration, the choice of a high-school graduate whether to study at a regular academic university or at a University of applied sciences, should depend only on individual preferences of specific subjects of study and training programs. However, comparisons of the student's profile reveal important differences in family background and other individual characteristics between the types of higher education institutions. Compared to students at polytechnics or the teachers colleges, students at regular universities come more frequently from a privileged background (Boegli et al., 2007; de Luigi and Boegli, 2008). Also

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1   Fachhochschule/Haute école spécialisée.
2   Pädagogische Hochschule/Haute école pédagogique.

considering the unequal general regulations as to the academic prerogatives (e. g. the right to award doctoral degrees), the polytechnics cannot really be considered as equal to the academic universities (Pätzmann, 2005). This evokes the question of the equity in higher education.

Studies describing inequality in higher education in Switzerland compare the student body of different types of higher education. Yet, the inequality they identify results from selection processes at the end of the lower secondary level. Children from a higher socio-economic status have a greater probability to pursue studies at high school and hence to prepare for university studies whereas socio-economically lower positioned children are more likely to opt for an apprenticeship with the study option at the polytechnics. The question however, that we are interested in and that so far hasn't been studied is whether there is a socially unequal selection into higher education at the end of high school. Is the educational choice at this point of time only a matter of interest and ability or is the family background intervening here as well as it does at the end of the lower secondary level? Evidence from previous studies on the self-selection of high-school graduates into teacher education revealed significant differences in terms of social background (Denzler and Wolter, 2008, 2009). Yet, the question remains whether this socially heterogeneous self-selection only holds for the case of teacher education or whether such a sorting occurs generally along the line that separates the binary higher education system, i. e. traditional academic universities vs. universities of applied sciences. The above cited studies point indeed to a rather general sorting into higher education; but the general choice behaviour with regard to higher education, has so far not been clearly identified.

The goal of the present study is therefore to test on which ground high-school graduates – which represent a socially rather homogeneous population – choose their future study careers. Do they choose among the several institutional options more or less at random or are there any social effects that influence the educational decisions? The research questions are first whether the decision to study at the end of high school is conditioned by social origin, and second whether the choice of the different institutional options is influenced by social background.[3] These questions are studied on the basis of new data. The training and career choices of high school students are analysed and the determinants of self-selection are identified. The article is broken down as follows: After a short presentation of the Swiss higher educational system, the research hypotheses are placed in their theoretical and empirical context. After a section on methodology, the empirical results are discussed, followed by the final conclusions.

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3   To analyse self-selection into higher education, we need a relatively homogeneous sample such as high-school graduates. The fact that graduates of the vocational baccalaureat differ in terms of social background from the high-school graduates with a general (academic) baccalaureat is well established (cf. Pätzmann, 2005; Boegli et al., 2007) and is not the subject of the present analysis.

2   Higher education system in Switzerland

Besides the traditional academic universities, there are polytechnics offering applied (i. e. vocational oriented) studies in the fields of engineering, business and economics, social sciences, health, natural sciences and the fine arts. In some fields of study (e. g. nursing, music, fine arts etc.) training is offered only at the polytechnics. With the exception of the latter, students entering the polytechnics usually come from a vocational background and have acquired as admission certificate a vocational baccalaureate. But the polytechnics are also open to high-school graduates with an academic baccalaureate, provided – at least in some subjects – that they have a certain work experience.

The technical as well as the teachers colleges (both officially belonging to the institutional type of universities of applied sciences) thus represent an additional higher education option alongside the traditional universities. Consequently, high-school graduates not only have to choose what they want to study but also the type of higher education institutions they want to study at. Technical and teachers colleges differ from regular universities in terms of courses of study, duration of studies, scientific reputation, staff qualifications and the right to award doctoral degrees. In general, they have a lower emphasis on research and a greater vocational focus. It is open to question whether potential students interpret this to mean that scientific standards are lower at a polytechnic than at a traditional academic university. The purpose of this study therefore was to ascertain to what extent socioeconomic background affects educational choices at the end of high school.

3   Theoretical framework and empirical findings

3.1   Theories of educational decisions

Micro-theories of individual choice provide a suitable approach to explain educational choice and inequalities in the education system. They are usually based on an economic model of rational choice theory (e. g. Mincer, 1962; Boudon, 1984; Becker, 1993; Erikson and Jonsson, 1996 or Breen and Goldthorpe, 1997; for an overview see Kristen, 1999). According to these theories, individuals evaluate a set of educational alternatives and select the option that maximizes utility. This economic reasoning is the basis for modelling educational decisions and selection issues. Social differences in educational choice are thus understood as the product of individual decisions made on the basis of available resources and constraints. Focus of analysis is set at the different transition points in the school system.

The basic notion of the classical human capital theory is that individuals choose among educational alternatives those that serve their interests best. This decision is made upon an evaluation of the different options with respect to costs, benefices

and the probability to realize these goals. In order to explain social differences in the educational career, micro social theories of rational choice argue that the cost-benefit analysis and the probability of success, associated with educational alternatives, vary considerably among different social groups (Boudon, 1984; Esser, 1991; Erikson and Jonsson, 1996 or Breen and Goldthorpe, 1997). Educational choices are socially heterogeneous primarily because school performance and educational aspirations of the parents are socially determined. These differences are at the core of the observed disparities in education.

The differentiation between primary and secondary effects of social background has turned out to be a fruitful concept in order to explain unequal attendance of higher education. Broadly spoken, primary effects arise from the transmission of cognitive skills within the families, and secondary effects stem from the educational choices throughout the educational career. Erikson and Jonsson (1996) argue based on Boudon (1984) that children of a higher status have better school performances due to their more favourable environment. Their probability to succeed in school increases with the educational level of the parents. Lower status children are disadvantaged for instance in terms of cognitive support by their parents. This primary effect of social origin explains why educational attainment varies among social groups. Secondary effects result from choices on the educational career which differ substantially between different socio-economic groups for the expected cost and benefit of an educational career vary according to the socioeconomic position (Boudon, 1984; Breen and Goldthorpe, 1997). For students from less privileged backgrounds costs of studying at university are higher and their benefit probably smaller than for university graduates' offsprings. Otherwise, loss in status would be greater for high status families in case their offsprings would not pursue a higher education career; their benefit would therefore be greater than for status lower persons. These mechanisms can explain why given educational choices are evaluated and aspired differently according to the social background (Esser, 1999).

Furthermore, local availability of institutions of higher education can affect the choice of studies on both economic and social grounds. The distance to the nearest university has a direct cost impact on the individual concerned. In economic terms, distance to university can be seen as transaction costs of higher education (Spiess and Wrohlich, 2010): For people who live outside the catchment area of a university, opting for university studies implies direct financial costs, such as added expense in the form of higher living costs for living away from home or from commute, as well as indirect costs, such as opportunity costs, but also emotional costs associated with leaving home or the loss of social networks – factors which generally lower the inclination to study (see, for example, Frenette, 2006). Financial costs, associated with a greater distance to university affects lower social status students to a greater extend and thus explain why they are less likely to choose university studies. In Switzerland, technical and teachers colleges are more decentralized, forming a

denser network than universities. It may therefore be assumed that the preference for university studies increases with the proximity to university.

Beside rational choice approaches, motivation theories might be drawn on in explaining educational choices. Motivational beliefs, values and the importance the individual attaches to the various educational options affect these choices as well (see Eccles et al., 1998; Eccles, 2005). According to Eccles, expectations of success on the one hand and the value and importance of a particular education for the individual on the other hand, affect educational and occupational choices. Thus, an individual's interests e. g. in scientific work or in pursuing a career and his long term goals shape the importance attributed to different educational options. Risk aversion and time preference for instance, though often correlated with social background can have a direct effect on the educational choice. Also, the choice of study profiles (individual specific options) at high school can be regarded – at least under the assumption of a free choice – as the expression of individual preferences.

3.2   Empirical evidence

The international evidence documents fairly stable social disparities in the participation rates at higher education level, even though there has been a certain decrease of social disparities over the time (e. g. Shavit and Blossfeld, 1993). However, participation rates at high schools and at the tertiary level have not changed much in terms of social disparity (Schimpl-Neimanns, 2000).

Various authors show that study intentions are socially dependent – concerning either the choice whether to study or not (Butlin, 1999; Becker, 2000a, 2000b; Christofides et al., 2001), the choice of type of higher education institute (Trautwein et al., 2006) or academic discipline (e. g. de Jiménez and Salas-Velasco, 2000). Beginning students from families with graduate parents tend to prefer university, opt more frequently for medicine or law and less so for linguistics or teaching, and often choose longer studies (e. g. de Jiménez and Salas-Velasco, 2000; Watermann and Maaz, 2004; Maaz, 2006).

For Germany, Baumert and Schümer (2001) show considerable social disparities especially at high schools that can be explained with primary and secondary effects. This results in the fact that 85% of the privileged students acquire the university entrance diploma (Abitur) whereas among the underprivileged students only a third achieves this goal (Isserstedt et al., 2004). This discrepancy gets accentuated at the transition to higher education. High-school graduates surveys confirm these socially heterogeneous patterns of study intention: Thus, 80% of the high-school graduates from university educated families decide to start university studies, yet among graduates from non-university graduate fathers this ratio is only about 60% (Heine et al., 2006). This finding is confirmed in multinomial regression analysis controlling for individual and institutional characteristics: The probability to take up studies is twice as high for students from graduates' households than for those

without university graduate parents. Furthermore, study intention is positively influenced by male gender, younger age, migration status and motives such as "interest in scientific work" (Heine et al., 2006). As to the type of higher education institution, data for the last 20 years reveal relatively stable differences in the family background between students of universities and polytechnics (Watermann and Maaz, 2004).

Different types of higher education institutions have specific incentives as they differ in regard of study duration, the relation between theoretical and practical or vocational teaching and study content, and the opportunity to earn money or the cognitive standards (Watermann and Maaz, 2004). Based on a German longitudinal dataset (TOSCA), Watermann and Maaz (2004) find higher disposition rates to university studies for men with academic family background, living in an urban environment, who have better school marks, lower time preferences and who are more intrinsically motivated (Watermann and Maaz, 2004). PISA revealed also for Switzerland's education system a relatively high social selectivity (OECD, 2001, 2004; Coradi Vellacott and Wolter, 2005). Students of lower socioeconomic background are underrepresented in the upper school system. Furthermore, parents' socioeconomic status and educational level exert a significant influence on their children's educational achievement. The effect works directly and indirectly via the social and cultural environment (OECD, 2001, 2004).

As to the transition and access to higher education in Switzerland, research is rather scarce. Data are available from a bi-annual graduate survey and from specialised surveys on the social and economic conditions of student life. Several reports on the social and economic conditions of students at higher education institutions in Switzerland have been published recently pointing to the fact of socially heterogeneous access to higher education: More than 36% of all students come from university educated fathers whereas in the respective age group in the overall population (54 to 65 years) only about 19% have acquired a higher education diploma (ISCED 5A). This percentage increases up to 42% for (academic) university students whereas it averages only 23% for students at universities of applied sciences (UAS) (Boegli et al., 2007; de Luigi and Boegli, 2008; HIS, 2008).

3.3   Research hypotheses

For the transition to higher education, it can be deduced from these approaches that social class affects study intention as well as the self-selection to the different institutions of higher education. Based on a rational choice framework, study intention and the choice of the higher education institution can be modelled as depending on the individual evaluation of costs and benefits associated with various options, which varies according to socio-economic position, scholastic ability, academic discipline and personal preference.

As far as the different types of institutions of higher education in Switzerland are concerned, on the basis of duration of studies and professional qualifications, it would appear that those high-school graduates who opt for a university of applied sciences or a teachers college tend to come from lower socio-economic classes as they have a stronger preference for the present and attach greater importance to financial factors when choosing their course of studies.

Thus, the following hypotheses were empirically tested: (a) Study intention in general is higher for students from a more privileged background; (b) as to the institutional type, students from a higher socio-economic background tend more towards studying at a regular (academic) university, (c) students living near a university (i.e. with little distance to university) and with a lower time preference exhibit a greater interest in academic university studies. Finally (d), we presume that persons with a higher scientific interest and in general the more able students have a higher tendency to opt for university studies.

4   Methodology

4.1   Sampling and data collection

The present study has been conducted on the basis of a representative random sample of high-school graduates, thus assuring a very homogeneous sample population with the same educational options: High-school graduates are free to choose any subject (with the exception of medicine where the access is regulated by means of a numerus clausus) at any of the three higher education types.[4] A multilevel cluster sample was designed, with systematic selection of high schools in some cantons and inclusion of all high schools in small cantons. On the second level, inside schools, individual graduating classes were chosen at random.

Over 1 500 high-school students from nine German-speaking cantons were surveyed shortly before taking the school-leaving examination to obtain their academic baccalaureate. The study took place at a point in time when the majority of students completing high school were faced with a concrete decision concerning the study choice; in fact, some of them were already enrolled in the study programs of their choice. Thus, the evidence gathered is not entirely based on a choice of studies already made, but on a concrete, desired but theoretically still open choice. With the known problems of hindsight and foresight in empirical studies on motivation and choice, we think that surveying the motivation of high-school students at the moment of their decision making is more precise in eliciting the factors that influence

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4   For our research question (Is there a social heterogeneous self-selection into higher education among high-school graduates?) it would not be appropriate to include graduates with a vocational baccalaureate (Berufsmaturität) for they do not have the same opportunities as high-school graduates with a general baccalaureate. The fact that they generally come from a lower socioeconomic background is well known (see Boegli et al., 2007; de Luigi and Boegli, 2008).

the decisions of students, as we can rule out retrospective rationalisation. In other words, with this survey design, we won't be able to observe fully performed study choices but rather study aspirations at a decisive moment of the decision phase.

Data was collected in March 2006 by circulating printed questionnaires in the selected graduating classes. The survey was conducted using standardized criteria during regular school hours, under the supervision of the teachers responsible for the classes in question. This approach was intended to guarantee the highest possible data quality and relatively homogenous class samples with a low drop-out rate.[5] The adjusted random sample contains 1454 observations (for descriptive data see appendix).

4.2   Operationalization of the concepts

All students were asked what type of career they wished to pursue and what type of training they wanted to undergo. The data contains further information concerning the person (sex, age, family circumstances, and leisure activities), socio-economic origin (education, socio-professional status and type of parental housing) and the current school situation (school profile or specific option chosen,[6] grades for German, French and mathematics). As school profiles at high-school have proved to vary with school competences (cf. Eberle et al., 2009), they might also serve as a vague indicator for ability. The same holds for the variable age that we use as a normal control variable. But since it is possible to start high-school at either the eighth or the ninth grade, the age of the students tends to correlate with achievement.

Based on the parents' educational achievement and their occupational position an index on socio-economic status (SES) was constructed which served as reference to rank individuals into three classes: high, middle and low socio-economic status. Also, a dummy variable indicating whether father or mother has an academic degree (at least a Master's degree from university) was created. In order to test the influence of the geographical proximity of available study opportunities on the choice of studies, a distance variable was constructed, measuring the minimal time required to travel from home to the nearest university using public transports.

In addition, predetermined items were used to collect information on various motivations, attitudes and preferences in relation to the choice of studies and career as well as general goals in life. By means of factor analysis, some of these items were aggregated to measure concepts or dimensions such as time preference,[7]

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5   Owing to missing data from schools, it was not possible to perform a non-response analysis. However, a distortion can be ruled out on account of the very low drop-out rate. In addition, classes with a response ratio of less than 0.66 were excluded from the sample.

6   Students at high-school choose between different specific options (old/modern languages, mathematics/science, economics/law, music/fine arts) and are assigned accordingly to their option to classes of the same profile.

7   Item example for time preference: "It's important for me that my studies are short"; for scientific interest: "I'm interested in scientific findings". Variables on risk and debt aversion were constructed using variables on different types of risk as well as on attitudes towards borrowing money.

scientific interest, and risk (for details of the three scales see Appendix) or debt aversion. The latter is based on a variable indicating different attitudes towards borrowing money.

5   Empirical analysis

Complex random samples such as the cluster samples used here refute the assumption of the statistical independence of the survey units. It must be assumed that elements from the same cluster are more similar than elements from different clusters. Consequently, random sampling errors with parameter evaluation cannot be estimated using the usual standard procedure. In cluster random samples, standard estimation errors tend to rise in tandem with increases in the homogeneity of the elements within a cluster in relation to the homogeneity of the elements of different clusters. To avoid this kind of cluster effects, a corrective procedure was used with all regression analyses that allows for the structure of the available random sample and corrects the current estimates accordingly. In addition, weights were used to deal with differences in cluster size.

5.1   Descriptive statistics

The vast majority (over 90 percent) of the high-school graduates intend to take up studies at the tertiary level, i. e. either at a university, a university of applied sciences (UAS) or at a teachers college. Three quarters of them choose either a university or the Federal institute of technology, 17 percent a technical college (UAS) and about eight percent plan to attend a teachers college (UTE).

Regarding their family background, the descriptive statistics already reveal important disparities: Whereas more than 40 percent of the students at regular universities have a university educated father, there are clearly less students with an university graduated father at the UAS and the UTE. The similar picture holds for the educational background of the mother. There is a remarkably low proportion of university graduated mothers (4.3%) among the future teacher students. Using subdivisions of the socio-economic status (SES), we can observe that among students from middle or higher status, a clearly higher proportion chooses a regular university, whereas among the less privileged students more students opt for one of the colleges (UAS or UTE).

5.2   Regression analyses

The hypotheses are tested by means of binary probit models. The following model was used as the foundation for empirical analysis:

$$y_i = \beta_0 + \beta_1 X_i + \beta_2 F_i + \beta_3 M_i + \beta_4 I_i + \varepsilon_i$$

The dependent variable indicating the study intention (y) is regressed onto a series of covariates: whereby X represents a vector of personal characteristics; F is a vector of variables relating to family origin; M is a vector of motivation-related factors; I stands for institutional factors, such as high-school education, track, and distance; and ε is the stochastic error term. This regression function is estimated by means of probit model or multinomial logistic regressions.

5.3   Results

The results of the first probit regression show the factors affecting the probability that a high-school graduate intends to take up tertiary level studies (Table 1). The model is built up in the following way: In the first specifications (1–3), factors such as school performance or interest in scientific work are tested, controlling for gender, age, institutional aspects (specific option at high-school) and distance to university. The latter is used here as a proxy for possible regional specificities. The group that aspire at higher education studies does not differ much from those who plan not to study. There is only the coefficient of the variable "scientific interest" that is significant. In the following specifications (4–5), we control for socioeconomic background. There is no effect of the family background, neither of the socioeconomic status, nor of the educational background of the father. Time preference is negatively correlated with the intention to study at tertiary level, but there is no joint significance with the covariates (SES, time preference, risk aversion and debt aversion). Whether in terms of socio-economic status or educational achievement, there is no effect of the social background. The only factors that distinguish the two groups are time preference and scientific interest: The higher a high-school graduate's preference for the present (comprising also the preference for leisure time) and the less he's interested in science, the lower is his probability to take up studies at a tertiary institution (university, technical or teachers college). Thus students that are not interested in studying are those with a minor interest in science and with a higher time preference. In Switzerland, their proportion is very small for they do not account for more that about 10% of a high school cohort.[8] Therefore, the first hypothesis cannot be confirmed: Conditional on high school attendance, there is no evidence of social selectivity in the overall study intention. We explain this observation with the fact that high-school graduates are already a highly selective group and that the unequal educational decisions take place at an earlier stage of the educational career, notably at the transition from compulsory school to upper secondary (cf. Coradi Vellacott and Wolter, 2005). Unlike the situation in other countries, the decisive moment in the educational career is at the end of compulsory schooling. And the majority of those that enter high school will eventually continue at university.

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8   The vast majority of high-school graduates take up studies at a higher education institution (ISCED A). Within two years, almost 90% graduates of a high school cohort have taken up studies at the tertiary level (CSRE, 2006).

Table 1   Intention to study at tertiary level (University/University of applied science/Teachers college) vs. other training (VET, trainee-program etc.)
Coefficients of probit regression (standard errors in parenthesis)

	(1)	(2)	(3)	(4)	(5)	(marginal effects)
Woman (d)	−0.15 (0.15)	−0.15 (0.15)	−0.01 (0.17)	0.01 (0.17)	0.02 (0.17)	0.00 (0.02)
Grades math	0.07 (0.09)	0.06 (0.09)	0.02 (0.10)	0.01 (0.10)	0.01 (0.10)	0.00 (0.01)
Grades German	0.08 (0.05)	0.08 (0.05)	0.10 (0.05)	0.08 (0.05)	0.08 (0.05)	0.01 (0.00)
Distance	−0.01 (0.06)	−0.02 (0.06)	0.03 (0.07)	0.01 (0.07)	0.02 (0.07)	0.00 (0.01)
Age		−0.05 (0.06)	−0.02 (0.07)	−0.01 (0.07)	−0.01 (0.07)	−0.00 (0.01)
Language profile (d)			ref.	ref.	ref.	ref.
Science profile (d)			0.11 (0.28)	0.07 (0.29)	0.09 (0.29)	0.01 (0.02)
Economy/law profile (d)			−0.17 (0.22)	−0.21 (0.21)	−0.22 (0.21)	−0.02 (0.02)
Music profile (d)			−0.25 (0.15)	−0.25 (0.15)	−0.24 (0.15)	−0.02 (0.02)
Science interest			0.30 (0.06)***	0.29 (0.06)***	0.29 (0.06)***	0.03 (0.01)***
SES low				ref.	ref.	ref.
SES middle				0.02 (0.13)		
SES high				−0.12 (0.20)		
Father university (d)					−0.02 (0.16)	−0.00 (0.01)
Time preference high (d)				−0.16 (0.06)*	−0.15 (0.06)*	−0.01 (0.01)*
Risk aversion				−0.04 (0.06)	−0.04 (0.06)	−0.00 (0.01)
Debt aversion				−0.06 (0.07)	−0.06 (0.07)	−0.01 (0.01)
Constant	1.70 (0.13)***	1.70 (0.13)***	1.76 (0.15)***	1.80 (0.18)***	1.78 (0.15)***	
F	1.24	1.30	8.02	4.58	5.29	5.29
N	1420	1420	1420	1420	1420	1420

Survey probit regression, standard errors (in parenthesis) are clustered on school/class.
Legend: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; ref. = reference category.
Source: CSRE.

However, although the decision whether to study at tertiary level is not dependent on social background, the choice of the institutional type (i. e. the choice on where, on which institution to study) reveals heterogeneous patterns of self-selection (see Table 2). The empirical model is specified stepwise; the restricted models (1–3) test for the effect of cognitive factors (i. e. school performance), controlling consecutively for gender, distance, age and the specific options at high-school. One could presume that confronted with the choice of a more academic study course or a rather applied one, factors such as cognitive performance or the interest in scientific work should affect most such decisions. The results seem to confirm this. The negative coefficient of the age variable can also be interpreted in terms of educational achievement.[9] Such a correlation can be found in the data. Finally, the variables on the high-school profiles as well as the variable on the general interest in scientific work seem to serve all as indicators of educational achievement. The significant effect of the school performance in mathematics vanishes in the model 3; the effect seems to be mediated through the music and fine arts profile as well as through the general interest in scientific work.

When controlling for social background (models 4–5) and other factors that we hypothesized to be correlated with socioeconomic status (i. e. time preference risk aversion and debt aversion), we don't find a direct SES-effect, but the coefficients of the variables time preference and debt aversion are significantly negative. Tests of joint significance confirm this relation with the SES. In addition, the significant effect of the distance variable (throughout all specifications) is another indicator of a heterogeneous access to university. Distance to university is, beside other aspects, related with higher (direct and indirect) costs. Since the geographical density of universities is smaller than that of polytechnics and teachers colleges, we interpret the finding that the intention to study at a university decreases with the distance to the nearest university as an indication of such a cost factor (hypothesis c). According to the theoretical arguments exposed earlier, higher educational costs however impair particularly the access of lower status individuals.

Looking more precisely at the effect of social background, a specification with a dummy variable for a university degree of the father confirms the second hypothesis: High-school graduates from a more privileged background have a higher probability to choose to study at regular (academic) universities than the less privileged. The direct effect of the socioeconomic background however, is probably quite small, bearing in mind the homogeneous population at high-school. The effect associated with the higher economic position is rather mediated through aspects such as distance, time preference or risk and debt aversion: Lower social status generally involves a higher preference for the present and a greater aversion against risk and debt.

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9   The correlation between age and marks is highly significant. A linear regression of the school
     marks on age, controlling for gender, specific options and socioeconomic background indicates
     a clear and significant impact.

Table 2   Intention to study at university vs. university of applied sciences
Coefficients of probit regression (standard errors in parenthesis)

	(1)	(2)	(3)	(4)	(5)	(marginal effects)
Woman (d)	−0.73 (0.10)***	−0.73 (0.10)***	−0.53 (0.10)***	−0.48 (0.10)***	−0.45 (0.10)***	−0.14 (0.03)***
Grades math	0.14 (0.05)*	0.12 (0.05)*	0.05 (0.06)	0.04 (0.06)	0.03 (0.06)	0.01 (0.02)
Grades German	0.18 (0.05)***	0.16 (0.05)**	0.19 (0.06)**	0.17 (0.06)**	0.16 (0.06)**	0.05 (0.02)**
Distance	−0.21 (0.08)*	−0.21 (0.08)*	−0.18 (0.07)*	−0.18 (0.06)**	−0.17 (0.06)*	−0.05 (0.02)*
Age		−0.21 (0.06)***	−0.17 (0.06)**	−0.15 (0.06)*	−0.13 (0.06)*	−0.04 (0.02)*
Language profile (d)			ref.	ref.	ref.	ref.
Science profile (d)			0.03 (0.13)	0.01 (0.14)	0.04 (0.14)	0.01 (0.04)
Econ/law profile (d)			−0.11 (0.14)	−0.17 (0.14)	−0.16 (0.15)	−0.05 (0.05)
Music profile (d)			−0.66 (0.13)***	−0.68 (0.13)***	−0.66 (0.12)***	−0.23 (0.04)***
Science interest			0.40 (0.05)***	0.40 (0.06)***	0.39 (0.05)***	0.12 (0.02)***
SES low				ref.	ref.	ref.
SES middle				0.13 (0.09)		
SES high				0.16 (0.15)		
Father university (d)					0.27 (0.11)*	0.08 (0.03)**
Time preference high				−0.25 (0.05)***	−0.25 (0.05)***	−0.08 (0.02)***
Risk aversion				−0.04 (0.05)	−0.04 (0.06)	−0.01 (0.02)
Debt aversion				−0.15 (0.04)**	−0.12 (0.04)**	−0.04 (0.01)**
Constant	1.08 (0.11)***	1.07 (0.10)***	1.17 (0.12)***	1.10 (0.12)***	1.05 (0.13)***	
F	22.70	20.71	21.35	28.05	25.91	25.91
N	1420	1420	1420	1420	1420	1420

Survey probit regression, standard errors (in parenthesis) are clustered on school/class.
Legend: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; ref. = reference category.
Source: CSRE.

In order to examine more precisely the channels of these effects and the way they are linked to the family background, interaction terms are constructed with the academic status of the father (see Table 3). This procedure reveals that most of these effects are socially heterogeneous. The interaction term of a high time preference with a non-university educated father is significant (model 1). Likewise, debt aversion has a significant effect on study choice only for those from lower educated parents (model 2). That is to say that these negative effects on the study decision work indirectly through time preference and debt aversion, but it applies only for those from non-university educated fathers. For individuals with a university educated father, all these aspects are less important for their educational choices. These findings can be interpreted as empirical evidence for the presence of secondary effects; factors that affect the cost-benefit calculations of families confronted with their children's educational choices.

Though, the effect of social background on study choice seems to be mediated mainly through the educational background as one can see in the last specification (model 5): High-school graduates with a university educated father are significantly more incline to opt for university studies. The results thus confirm the hypothesis of a class-specific self-selection into different higher education careers. Students from families with lower educational background reveal to have a higher tendency to choose the shorter and less academic study programmes at either technical or teachers colleges. The fact that the educational background, i.e. the university education of the father, seems to be the decisive factor, points in particular towards the existence of primary and secondary effects.

Besides the socioeconomic effect, there is an apparent gender effect to be observed which remains stable throughout all specifications. Among the high-school graduates, women compared to men, are generally less likely to choose a university career. This finding however is consistent with the rational choice theory. Women's return to education is quite different to that of men (see Wolter and Weber, 1999). Withdrawal from the labour market or part time occupation due to family obligations and wage discriminations result in very different life time earning developments with the consequences that women have a much higher time preference than men: Therefore, a short duration of their tertiary education matters even more for them.

High-school achievement (notably school grades in German) and higher motivation for scientific contents reveal to be relevant and distinct factors for the choice of the institutional type of higher education; they are not mediated solely through the SES-status. This means that this effect cannot be interpreted as evidence of a primary effect of social background. Primary effects are probably more influent at earlier stages of the educational career than at the end of high-school. The above described direct and indirect effects of SES are better interpreted as secondary effects, reflecting different cost and benefit calculations of different social groups.

Table 3   Intention to study at university vs. university of applied sciences
                 Coefficients of probit regression (standard errors in parenthesis)
                 with interaction terms

	(1)	(2)
Woman (d)	−0.45 (0.10)***	−0.45 (0.10)***
Grades math	0.04 (0.06)	0.04 (0.06)
Grades German	0.16 (0.06)**	0.16 (0.06)**
Distance	−0.17 (0.06)**	−0.17 (0.06)*
Age	−0.13 (0.06)*	−0.13 (0.06)*
Language profile (d)	ref.	ref.
Science profile (d)	0.05 (0.14)	0.04 (0.15)
Econ/law profile (d)	−0.16 (0.15)	−0.15 (0.15)
Music profile (d)	−0.65 (0.12)***	−0.66 (0.12)***
Science interest	0.39 (0.05)***	0.39 (0.05)***
Father university	0.27 (0.11)*	0.29 (0.11)*
Time preference high		−0.25 (0.05)***
Debt aversion	−0.12 (0.04)**	
Risk aversion	−0.04 (0.06)	−0.04 (0.06)
Father non-univ. × timepreference	−0.29 (0.06)***	
Father univ. × timepreference	−0.16 (0.09)+	
Father non-univ. × debt aversion		−0.16 (0.05)**
Father univ. × debt aversion		−0.04 (0.08)
Constant	1.05 (0.13)***	1.05 (0.13)***
F	23.89	23.88
N	1420	1420

Survey probit regression, standard errors (in parenthesis) are clustered on school/class.
Legend: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; ref = reference category.
Source: CSRE

The presence of a constant effect of the school achievement in German is a further evidence for the rational choice approach. Cognitive performance and respectively the subjective expectancies on the academic performance are taken into consideration in the cost and benefit calculations of educational alternatives.

In sum, having tested individual, structural and institutional factors affecting the educational choice, we have identified effects of social disparity that work directly through the family's educational background and indirectly through factors such as time preference or debt aversion. We can thus confirm our second hypothesis of a heterogeneous self-selection into the different types of higher education tracks. In line with rational choice theory, the choice of institutional alternatives at the tertiary level can be explained as based on individual cost-benefit calculations taking into account direct and indirect costs of the alternatives, the benefit in terms of expected returns and social prestige as well as the subjective expectancies of success.

In the light of a rational choice approach, the fact that students from a university graduate father less often opt for a technical or a teacher college must be interpreted as evidence of relevant differences between the institutional alternatives (university, technical or teachers college) in terms of status and prestige. University graduates take care that their sons or daughters study at a university. On the other hand, those students from non-university graduate fathers that successfully accomplish high school, eventually tend to choose studying at a UAS or a UTE rather than taking up academic university studies. We interpret these patterns as evidence of secondary effects of social disparities: Educational decisions are made differently on account of the social background. This confirms the expectancy-value approach by Esser (1999).

Furthermore, it seems that the choice whether to study at a university or at a more professional oriented college depends also on other factors. The finding that the school profile, notably the music and fine arts profile as well as school performance or general interest and motivation for science, turn out to be quite decisive in the institutional choice indicates that the self-selection into the UAS study programs is not solely dependent on social factors but also on gender, skills and motivation. Considering all options of high-school graduates, one can state that those who choose the new institutional options, i.e. technical college (UAS) or teachers colleges do clearly differ from their classmates. They prove to be more likely female, come from a lower socio-economic status and tend to exhibit a lower school performance.

6   Conclusion

Concerning the case of Switzerland, one can conclude that at the end of upper secondary school, there is no conditional social disparity regarding the general decision

to study at all. As to the question of whether to study or not, high-school graduates do not differ in their socio-economic background. But social disparities exist when it comes to the choice of the institutional type of higher education: Students from a lower socioeconomic background, and in particular those from a father with no university degree, are less inclined to study at a regular (academic) university.

However, it is important to recall that we have not compared students of universities with those of technical or teacher colleges. Rather we have shown that among the socially homogeneous student body of high schools, social disparities still do exist when it comes to the decision at what type of higher education to study. Or in other words, the institutional choice, which is sometimes intermingled with the choice of the field of study, is conditioned by the socio-economic background of the students. Further factors such as distance to university, time preference and attitudes towards risk and debt affect the choice of higher education options. Yet, educational choices of the high-school graduates also depend on motivation and educational achievement, and the findings bring some evidence of a negative selection into the UAS. However, the picture is not so clear-cut and we cannot clearly determine to which degree the observed achievement effect is due to primary effects of social disparities. In sum, we find evidence of socially unequal self-selection patterns into the different institutional types of higher education which are motivated also by considerations of status and prestige.

The reform in the higher education sector with the establishment of universities of applied science and the teachers colleges indeed opened the access to higher education to a broader public but the creation of these new types of higher education was probably rather about upgrading existing educational options to the tertiary level than opening the access to regular university. The integration of the technical and teachers colleges into the tertiary sector (ISCED 5A) clearly resulted in higher education rates at the tertiary level and in a more equal distribution of higher education students but the social disparity now occurs between the types of higher education institution. For if – as we can observe – parents with a university background motivate their offsprings to a far lesser degree to study at the new tertiary institutions, it will be rather questionable whether the intended equivalence also in terms of social status of the three higher education options will ever be reached.

Our analysis is however limited by the fact that we surveyed high-school students just before taking their school-leaving examination . Their educational choices thus are declared intentions and not effective decisions. It remains open to question to which degree these educational aspirations will be implemented. Anyway, we believe that our approach to assess study choices at this moment in the educational career has the advantage that the declarations are not biased by retrospective rationalisations. But admittedly, the analysis would of course profit form a longitudinal design that would allow to follow the students and to compare their declared study goal with the realised option two or four years later.

7   References

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