Degrees in Secondary Schooling. Do Labor Market Expectations Matter?

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Abstract: Using data from the German Socio-Economic Panel, I examine the relationship between predicted future labor market outcomes and a student's choice of secondary school degree. Schooling decisions in secondary education are the basis for any later educational choices and career opportunities and hence strongly determine future income and labor market participation. In Germany a student can choose between four secondary school degrees. Depending on the degree a student can continue education in either the vocational or academic track. To analyze the track choice of a student I estimate a structural choice model based on utility maximization. The decision to obtain a certain degree depends on the contemporaneous utility of continuing school, the labor market expectations under counterfactual degree choices and the varying options for further education. First results show that, in addition to the influence of family background, a young persons expectations about future labor market outcomes play a role in the degree decision. The model shall than be used to simulate the effect of changes in the educational system or the wage structure on the qualification level of young people.

Keywords: High school education, vocational education, expected life-cycle earnings

JEL-classification: I21, J24

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1 Introduction

Educational degrees strongly determine future income and labor market participation. Substantial differences of earnings and unemployment risks between educational degrees point to the importance of the chosen educational degree for later labor market outcomes. Given that the secondary school degree is the basis for any further educational options, it is the goal of this paper to understand how young people form their decision about the secondary school degree.

Various studies analyze the secondary school decision, but usually do not take future options and labor market expectations into account. In most countries the completion of a certain number of years in secondary school is the entrance requirement for higher education. Human capital theory assumes that the expected monetary reward drives the decision to invest in education. For the case of secondary education the investment decision does not only depend on the value of the years in secondary school, but includes an additional value of having the option to continue in further education.

The objective of this paper is to analyze the effect of expected labor market outcomes on the secondary schooling decision and to simulate changes in the educational system or the wage structure on the qualification level of young people. Most studies analyze the effect of future earning outcomes or earnings risk on the decision to enter higher education (e.g. University). These studies suggest that expected earnings are important for the decision whether or not to attend college (for example, ?, ? or ?). Other studies find that increasing risk, i.e. the variance in the payoff for education, reduces investments in education (for example, ?, ? or ?. In this study I will go one step behind and investigate if, and to which extend, labor market expectations play a role in the earlier secondary school choice.

Other studies use structural models to analyze schooling decision in secondary schooling but they only consider the choice between attending or dropping out of high school. For example, ? or ? construct models of high school progression. Eckstein and Wolpin construct a model where individuals can work and attend school at the same time to analyze the effect of working on high school performance. Keane and Wolpin formulate a model of occupation and schooling decisions in which individuals decide among attending high school, staying at home and three occupation options. My econometric model will be based on theses study. I extend the model to include more choice options. In my model the students do not only have the option of continuing or dropping out of high school but can choose between different school

tracks which are the basis for different career prospects and labor market outcomes. I use the German educational system as a framework for the analysis. In Germany students can choose between four different secondary school degrees. Depending on the secondary school degree the students have different options for further education and qualification and therefor widely varying labor market outcomes and career opportunities. Only one of the four possible school degrees, the Abitur (upper secondary degree), gives a student the option to enter higher education at the university level. The other degrees are the basis for either vocational training or higher education at a technical college. The impact of expected lifetime earnings on the choice of the secondary school track (academic or vocational) has been estimated by **?**. She estimates a structural model where she links the options available to Spanish students after compulsory schooling to their expected life-cycle earnings. She finds that changing annual earnings associated with certain high school diplomas may alter the qualifications of of Spanish youth and significantly reduce drop out rates in post-secondary education. Also **?** analyzes the track choice. He investigates the way the choice of secondary school is related to parental characteristics in Germany and how future wages are affected by this choice. His study shows that differences in parental background translate, via their association with secondary track school choice, in to sizeable wage differences.

Another vein of literature on school choice has a sociological focus and examines issues like social mobility, social stratification or inequality in educational opportunities. For example, family background is known to have a strong impact on a young student's achievement in school through various channels. One motive for choosing a certain degree might be to maintain the educational status of the parents. Thus, in some families an intermediate degree might already be seen as an achievement and no further education seems necessary. Nevertheless, if the student expects a higher income and better job opportunities with a higher degree he might continue schooling. A higher degree will not only mean that he will have the option to enter university or a technical college but he will also have better access to more prestige vocational training with higher wages. On the other side, students who come from a family background which favors a high secondary school degree, labor market expectations might play a minor role because they are already on "the right track" and do not need any further incentive.

In this study I analyze if, in addition to socio-economic influences, the expectations a student has about future educational- and labor market outcomes play a role in the secondary school degree choice of a student. One issue that arises when test-

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ing the impact of earnings on schooling decision is that earnings are only observed after the schooling investment has been completed. When individuals make their educational choice, they can not be certain about the labor market outcomes from the investment. In the literature there are two approaches to deal with this issue. The first approach is based on **?**. They assume that youths know their potential earnings profile and use it to predict their expected earnings. The second approach, suggested by **?**, considers that young people form their expectations about their potential earnings observing the incomes realized by members of the preceding generations. In this paper I will follow the assumption of **?**. I consider that the young students observe older individuals which are similar in their observable characteristics with the different secondary school degrees. Based on what they observe from the earnings of the older individuals they form their expectations about their future earnings under the counterfactual degree choices.

To analyze the role of labor market expectations[1] on the secondary school choice I will estimate a model in two steps. The student's choice is assumed to depend on future labor market outcomes. Therefore, I have to estimate future labor market outcomes for the young students under counterfactual school decisions. These are the terminal values for each school degree choice. In a second step I use the terminal values as explanatory variables in the choice model.

The model is based on random utility maximization. The utility of continuing to a certain degree depends on the contemporaneous utility of going to school, the varying options for further education and the labor market expectations. The utility of going to school is influenced by family background. The model is estimated with data from the German Socio-Economic Panel (GSOEP).

The model shall than be used to simulate the impact of changes in the educational system and/or the income structure on the qualification level of German students. For example, the just implemented one year reduction of years to the highest degree in Germany, might induce more students to obtain the higher degree since the degree and the option to enter university becomes more attractive when the loss of income while in school is reduced by one year.

The paper is organized as follows: The next section shortly describes the school system and choices of school degrees in Germany. After that, I present the method-ological approach in Section 3. Section 4 describes the data set and gives some descriptive analysis. Section 5 shows some preliminary results and Section 6 con-

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[1]At the moment labor market expectations only consist of expected labor income, I will extend this to include unemployment probability and wage variation of the life-cycle

cludes. Each section is still incomplete.

2 Institutional Background

In Germany students continue school after elementary school in different types of secondary school. The schools curriculum is of different length and students can obtain different secondary school degrees after 9, 10, 12 or 13 years. The school type a student attends after elementary school is decided by a combination of the teacher's recommendation, parents will and/or grades depending on the federal state. In general, students get tracked into one of three different types of schools which lead to different school degrees[2]. The lowest qualifying school is the general school. At this type of school a student can reach a general degree after 5 years of additional schooling. An intermediate school degree can be obtained at an intermediate school after 6 years. At an upper secondary school a student obtains the entrance certificate for technical colleges (technical upper degree) after 8 years and the entrance certificate for university (upper degree) at a upper secondary school after 9 years.[3] The first two degrees, the intermediate degree and the general degree are the basis for further education in the vocational track, while students with a technical or upper degree have the choice to continue with an academic education or vocational training. Conditional on the grades a student can transfer from one school type to another in order to achieve a different degree. For example, a student at an intermediate school can transfer to a technical school or upper school at the beginning of a new school year if his grades are good enough. At the same time, students at an upper secondary school can leave the school after 6 years with an intermediate degree or after 8 years with a technical degree.

3 Data and Descriptive Analysis

3.1 Data

The data used in this article are from the German Socio-Economic Panel waves 1991-2009. I construct two different samples. The first sample includes the young individuals, I use to estimate the choice model. The second sample consists of the

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[2]There are also other types of schools which differ from federal state to federal state. These schools are not considered in the analysis so far

[3]Beginning in 2007 the federal states change the time to the university entrance certificate to 12 years. The last federal state will have shortened the years in 2016.

older cohort which I use to predict the lifetime earnings. For the young cohort, I restrict my attention to a sample of individuals who have been born between 1974 and 1988. I assume that at the age of 21 the decision about the secondary school degree has been made. Because, I do not know the final degree decision of students younger than 21, I exclude individuals who are in the last observation period younger than 21. Of course, students can return to the secondary school system later on to obtain a higher degree but this decision will not be considered here. After further excluding students for who I do not have the relevant information, I am left with 2,512 observations . For all of these individuals I observe the year of graduation, the federal state of graduation from secondary school the type of degree and grades as well as family background variables.

To estimate the model, I need individual wages for all degree options. To predict the expected labor market outcomes of the young students I use the information from older cohorts in the same data set. Following ?, I assume that a young person forms his expectations about future income and unemployment risk by looking at people from a previous cohort with similar characteristics. The information from older, working, individuals in the SOEP are used to predict the expected income of the young people. To predict the income, I use individuals who are in their prime working age and who are observed to be working (i.e. not in education, military service)[4]. I also exclude individuals who are unemployed. Hence, the risk of being unemployed is not included in the income expectations so far. I will include the unemployment risk as a separate variable in a later version of this paper. I use annual equivalent wages and they are deflated with the priceindex in base 2000.

Since the cohort I analyze in the study was born between the years 1974 and 1988, I use people born at least one year before 1970 to estimate the life time incomes. I also exclude people born before 1950. At the moment the lifetime income depends on sex and region. The discounted life time earnings are the terminal values a student can expect from his/her degree choice.

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[4]As prime working age, I define individuals who are younger than 55 and finished education. For individuals with an intermediate degree and vocational education the working age starts at age 20. For individuals with an upper (technical) degree and vocational training, working age starts at age 22 (21). Individuals who attended university are assumed to start working with 23 (technical degree and technical college), 24 (upper degree and technical college) or 25 (upper degree and university). At the moment, I do not consider that individuals might also have earnings while they are in education. I might consider this in a next step.

3.2 Sample Description

As mentioned before each student has a choice set consisting of four secondary school degrees.

Table **??** shows that of the individuals in the sample 22.85 percent of students left secondary school with a general degree and 37.14 percent left school with an intermediate degree.

These students have the option to enter vocational training but are not eligible for (technical-) University. 7.35 percent left school with a technical upper secondary degree and 32.66 percent with an upper secondary degree. Table **??** indicates the further qualification choices. Naturally, all students who left with a general or intermediate degree continued in vocational training.[5] Most students eligible for a technical university actually chose to continue with vocational training (67 percent), while only 33 percent entered a technical university. About half of the students with an upper secondary degree chose university level as their final educational qualification. 15 percent of those with an upper secondary degree chose a technical university and about 30 percent vocational training.

The Germany school system adds one problem to my estimation strategy. As mentioned before, students get tracked into different types of schools after elementary school at the age of around 10 years. Obviously, one can not assume that this initial school choice is based on rational behavior of the young students. Therefore, for my estimation strategy I have to assume that the students can revise their initial school choice during the course of their school career. The majority of students continues at their initial school track to obtain their degree. Anyhow, students can transfer between schools. Table **??** shows the percentage of students who finished with a different degree than the degree they were supposed to obtain at their initial school choice. To show evidence of school transfers, I can only use a subsample of students for who I have information on their initial school. The subsample consists of 1,557 students. Of the students who attended a general school after elementary school, around half finished school with a general degree. 29 percent achieved the next higher degree, the intermediate degree. Around 12 percent of students who started at a general school obtained a upper or technical degree. 5 percent left school without a degree or a degree from a foreign school. From the students who started at an intermediate school around 65 percent continued at this school type to the end. 11 percent did not continue intermediate school to the end and received

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[5]As mentioned above individuals who decided to enter the labor market without post-secondary education are, for the time being, excluded. I will include this group in a following version.

Table 1: Secondary school degree: by first secondary school attended (%)

Secondary Degree	General degree	Intermediate degree	Technical degree	Upper degree	Without degree/ Foreign degree
General school	53.58	29.01	3.58	8.87	4.95
Intermediate school	11.08	65.21	6.96	14.18	2.58
Upper secondary school	2.16	19.47	3.61	72.36	2.40

Source: SOEP, waves 1990-2009. Individuals born after 1970 and older than 21 years. Subsample of 1,557 individuals for who information about the first secondary school are available.

a general degree. About 21 percent of the students from an intermediate school transferred to an upper secondary school and received a technical or upper degree. 2.6 percent left without or with an foreign degree. More than 70 percent of students who first got tracked at an upper secondary school finished this type of school with an upper degree. 19 percent left the school earlier with an intermediate degree. Only very few students at the upper secondary school left school with a general or without a degree. The numbers show that the initial school track is not fully determined for the actual secondary degree, but is highly correlated with the final degree choice.

4 Methodology

In the analysis I focus on students who left secondary school with a degree. I therefor exclude around 8 percent of students who leave school without a having obtained a secondary degree. I assume that students choose the high school degree that maximizes his/her lifetime utility. The value of a degree depends on the utility of going to school (i.e. not working) and the expected future labor market outcomes. In my model the utility of going to school mainly depends on family characteristics. The expectations on future labor market outcomes depend on the students characteristics such as sex and region. The expected labor market outcomes also strongly depend on the future options for further education the student has and which option he takes up. I only use information the student has at the time he makes his/her secondary school decision. At this point in time the student does not know with certainty which further educational track he will choose (vocational training or university). For that reason, I estimate the entrance probability to the post-secondary educational tracks conditional on the obtained school degree from older cohorts.

Since the tracking of students into the different secondary school types takes place when the student is 6 or 7 years old, it can not be assumed that the transition after elementary school follows a rational utility maximizing process of the student. This decision is determined by a mix of parents and teachers decisions and will not

be modeled here[6]. Here I assume that students at the age of around 17 years make the degree decision by either following the school track they are in or by changing to another school track. Nevertheless, the initial school decision (elementary school) is not determined by the students themselves it strongly affects later educational decisions. For that reason I will take the initial school choice into account in some specifications of the model. I will only be able to estimate a specification which controls for the initial school for a subsample of individuals for whom I have information on the first secondary school they attended. This is not included in this version of the paper, but will be included soon. It is very seldom that a student, who got tracked into a general school continues to the upper degree, while some students at an intermediate school will decide to continue education to the technical or upper level. For that reason, I will only look at the decision of an intermediate, a technical, and an upper degree and leave out students who leave school with a general degree.

4.1 Expected Lifetime Income

For each young person I estimate 5 counterfactual terminal values which incorporate the post-secondary educational choice. The wage profiles for the five degree options are pictured in figure ?? and in figure ?? For the choice of the intermediate degree only one terminal value has to be estimated. For the other degrees more values have to be determined because of the different options for post-secondary education. The decision to continue to the technical degree can be followed by either vocational training or technical universities. These further educational tracks will lead to different earning outcomes later on. Hence, two terminal values have to be estimated. One value for when the student continues in vocational training after the secondary degree and one expected value for the decision to continue in a technical university. For the highest degree three further educational paths have to be considered, since the student has the option to enter all three paths of further education. Because, the students do not know with certainty which further educational track they will choose after secondary school, I will estimate the entrance probabilities with information from the older cohort. For the degrees, for which more than one option for further education is possible, I will weigh the terminal values with the entrance probability (p) of a student in the further paths. The entrance probability for the further educational path is estimated using the student´s grades in math

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[6]An overview on the tracking system in Germany and its implication for further educational choices if given by ?

Table 2: Expected lifetime income: By educational choices (in Euro), male

Educational Choice	Observations[1]	Mean	Min	Max
Intermediate degree + Vocational training	4534	481362.9	266910.2	714500.9
Technical degree + Vocational training	4534	563384.8	300567.5	866558
Upper degree + Vocational training	4534	541112.8	315557.1	803871.4
Technical degree + Technical college	4534	647528.4	369534.8	1024840
Upper degree + Technical college	4534	640866.1	349324	956875.8
Upper degree + University	4534	716773	442892.3	1038492
Weighted				
Technical degree	2512	534601.8	259521.3	912409.8
Upper degree	2512	593072.5	327312.8	962118.8

Source: SOEP, waves 1991 to 2009.

Notes: To calculate the lifetime income I used gross annual income from labor of people observed working who are younger than 55 years.

[1] For the weighted income observations are lost because grades are not available for all individuals.

and German language in his last report card when aged 17 years. Table **??**

shows that the probability to enter university is much higher for students with very good grades than for students with worse grades in the two subjects. While 70 percent of students with a very good mean grade in Math and Language enter university after secondary school, only 40 percent of students with a satisfactory or fair grade do so.

The mean values of the expected life time income of the different educational choices are given in table **??**. As expected earnings with an intermediate degree are lowest (earnings with a general degree are not discussed here, because I will exclude students with a general degree in my estimations as described later). For all individuals with vocational training, earnings vary with respect to the secondary degree. It is interesting to note that individuals with a technical degree and vocational training have on average higher earnings than individuals with an upper degree and vocational training. The last two rows in table **??** show the expected average earnings of individual with an upper or technical degree after weighing the expected incomes with the entrance probability into the post-secondary educational track.

4.2 The choice model

In my model I assume that a student at the age of around 17 can choose between three high school degrees. As mentioned before, the actual degree choice is strongly determined by the school type the student got tracked into after elementary school. Nevertheless, table **??** showed that a student might revise the initial school choice during the course of his school career. Thus, after 10 years of schooling a student

can decide to leave school with an intermediate degree. After 12 years he can leave with the technical degree and one additional year will lead to the upper degree. A student in the 10th grade of either an intermediate school or an upper secondary high school is assumed to choose to leave school with an intermediate degree or to continue for 3 more years to obtain the university entrance certificate or continue for two more years and receive a technical high school degree. Once a student leaves school with either an intermediate degree or an high school degree, he has the option for further education at the vocational or academic level, depending on his/her degree. Of course, the student can also directly enter the labor market without further qualification. In Germany this option is only very seldom taken. I exclude this choice from the choice set.

The empirical strategy is based on a Random Utility Model. A student decides to continue schooling to receive the university entrance degree if the value of continuing schooling exceeds the value of leaving school with an intermediate degree. The decision following the secondary school degree, academic or vocational post-secondary education, is incorporated into the secondary school choice decision through the expected life time income. The student chooses the degree that has the highest value. The value of the secondary school degree is assumed to be composed of two additive elements. The first term U_i represents the contemporaneous value of the school degree (continuing school) , while V_i^d may be considered as the investment value of the degree. The investment value is a function of the sum of the expected future average annual income with degree d. The contemporaneous utility U_i^d of continuing school is assumed to depend on the parents education and parents interest in school as well as a variable controlling for the overall trend towards higher educational degress.

$$V_(^d X_i) = U^d(X_i) + \beta E(V_{t+1}^d(Z_i)) \tag{1}$$

The expected value of the life time income differs for the chosen degree. This is especially true, because of the differing options for further education. Students who obtain the secondary degree have the option to enroll in university, enter a technical college or starting vocational training. The decision on post-secondary schooling is still uncertain to the student at the time he makes the degree decision. The student enters a certain post-secondary track with a certain probability (p)

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\begin{aligned}
E(V_{t+1}^{up}(Z_i)) = max[& p_1 NPV^{uni|up}(uni = 1) \\
& +p_2 NPV^{tcol|up}(tcol = 1) \\
& +p_3 NPV^{voc|up}(voc = 1)]
\end{aligned}
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A student with a technical degree can chose between technical college and vocational training.

$$E(V_{t+1}^{tech}(Z_i)) = max[p_4 NPV^{tcol|tech}(tcol = 1)$$
$$+p_5 NPV^{voc|tech}(voc = 1)]$$

A student who leaves school with an intermediate degree is determined to enter vocational training (since the option to enter the labor market is excluded).

$$E(V_{t+1}^{int}(Z_i)) = NPV^{voc|int} \tag{4}$$

Using the data described below, I will estimate the parameters of this simple model to answer the question of the role of labor market expectations on the degree choice.

5   Preliminary Results

I estimate a conditional logit model with choice specific interaction terms for the variables which do not vary by alternative.

5.1   Conditional logit model

In the model a student faces the choice between three different degrees. The probability of choosing a certain degree is based on choice specific attributes, the terminal values, and individual specific characteristics. To be able to estimate the conditional logit model the variables that do not vary over the alternatives are interacted with a choice specific dummy.[7] Table **??** shows the coefficients of the conditional logit estimation with intermediate degree as the baseline alternative. The estimation shows that the expected income with a certain degree increases the probability of choosing that degree.

Table **??** gives the effects of a marginal change in the expected income on the degree choice. In column 1 we can see that an increase in the expected income with an intermediate degree would increase the percentage of students to choose this type of degree. At the same time the increased expectations with an intermediate degree would decrease the number of students choosing the upper degree or technical

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[7]a description of the estimation method will be given in a later version of the paper.

Table 3: Conditional Logit: Marginal effects, Expected income (in 10,000 Dollar) , Males

Degree	Intermediate degree		Technical degree		Upper degree	
	Marginal Effect	s.e.	Marginal Effect	s.e.	Marginal Effect	s.e.
Intermediate	0.0037***	0.00088	-0.00057***	0.00014	-0.0031***	0.00074
Technical	-0.00057***	0.00014	0.0012***	0.00031	-0.00068***	0.00017
Upper	-0.0031***	0.00074´	-0.00068***	0.00017	0.0038e***	0.0009
Pr(choice=y|1 selected)	0.41		0.09		0.5	

Source: Estimations based on SOEP Data waves 1991-2009, individuals born between 1974 and 1988. (***/**/*): indicates significance at the 1%- / 5%- / 10%-level.

degree. The interpretations for the other degrees are similar. If one of the other degrees becomes more attractive because of an increase in expected income, students substitute away from the other degrees. The results suggest that altering the expectations a student has on his future income streams under different educational choices could alter the qualification level of German students.

5.2 Simulation of School Reform

The model can be used to simulate a variety of policy changes on the secondary school qualification of the German youth. I start with estimating a reform which has just been implemented in Germany which reduces the years of schooling necessary to to obtain the higher degree. Secondary school leavers in Germany are relatively old compared to their counterparts in other countries. By the time a German student graduated from secondary school with an higher degree students are at least 18, mostly 19 years old. When they decide to enter an academic education most students are at least 26 years old when entering the labor market. The old age at which the secondary school leaving degree is received can have a negative impact on choosing an academic education, since the academic education will mean further loss of income, while in vocational training some income is earned and the education period is a lot shorter. For male the problem of age at the time of starting post-secondary education in Germany was (until this year) even severe. German male had to serve a 10 month civil service or military service. A reform of the military abolished the service as of July 2011. Taking the two reforms into account the entrance age for post-secondary education has been reduced by two years for male and by one year for female. I simulate the effect of the reforms for men and women with respect to the probability to obtain the higher degree. If the percentage of students obtaining the higher degree, which is the university entrance certificate, can be increased by the reforms, the aim of the government to have a high qualified population and a high number of university students could be would be supported.

To estimate the effect of the reform, I predict the lifetime income for the choice of the higher degree while assume that students finish the degree one year earlier than in the baseline model. I then estimate the effect of the additional income on the probability to choose the higher degree. The one year reduction of time to the higher degree results in an increase of lifetime income of 27035.2 Euro. Increasing the lifetime income of students with a higher degree by this amount will increase the probability to obtain the higher degree by 1 percentage points from (marginal effect from table **??** times the amount). At the same time the probability of choosing an intermediate or technical degree will decrease by the same amount (the years to obtain these degrees stays unchanged).

Next, I estimate the effect of the two reforms for men. Therefor, I estimate the model only for men and predict the lifetime income for the choice of the higher degree while assume that students finish the degree two years earlier than in the baseline model. The results show that the parallel introduced reforms lead to a 1.2 percentage points (from 46 percent to 47.2 percent) increase of male students with a higher degree. Although the change is very small the increase could at least lead to a convergence of higher degree rates from men and women, since so far women have a higher probability to obtain the higher degree.[8]

6   Conclusion and Outlook

I tested the assumption that the expectations about future earning impacts the choice of the first school degree of students who obtained their degree in the last fifteen years. The estimations of the counterfactual life time income show that there are substantial differences in the earning possibilities of the chosen degree with the differing options for further education which have an impact on the students degree choice. The results suggest that shortening the years of schooling necessary to reach the highest school degree and therewith increase the expected lifetime income, can serve as an instrument to increase the number of high qualified school leavers, especially for male students.

Further steps have to be taken to fully understand the decision making process of the young people. First of all I would like widen the definition of labor market outcomes to include unemployment risk and variance of income. The young people might not only make their decision based on the expected amount of income but

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[8]the relevant tables and further discussion of the policy reforms will be included in the paper in a next version.

might also take the income risk into account that is connected to each degree choice. Secondly, it would be interesting to look at variations in the decision making process over time. The labor market opportunities for students with lower degrees has changed significantly over the years, since the number of school leavers with an upper degree increased strongly over the last years. As more and more students leave school with an upper degree, the expectations for students who leave with a lower degree might have been worsen. In turn, the lower expectations with a general or intermediate degree might increase the impact of labor market expectations on the decision to obtain a higher qualifying degree over time.

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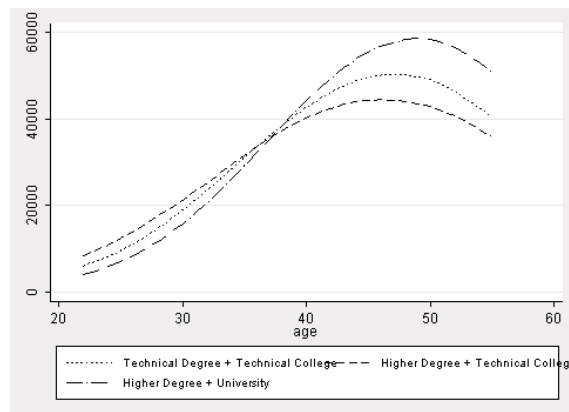
7 Appendix

Figure A1: Lifetime Income: Students with Vocational Training
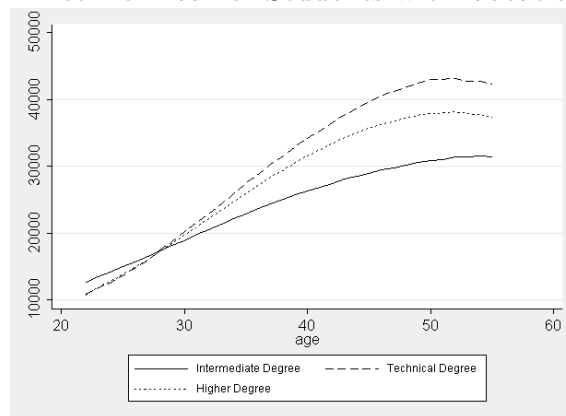
Source: Own depiction. SOEP, waves 1991-2009.

Figure A2: Lifetime Income: Students with Academic Education

Source: Own depiction. SOEP, waves 1991-2009.

Table A1: Sample distribution %

Male	49.30
Final secondary school degree	
General degree	20.74
Intermediate degree	39.56
Technical secondary degree	6.51
Upper secondary degree	33.18
Father´s education	
General degree	43.56
Intermediate degree	29.74
Upper or technical secondary degree	21.51
Other degree	6.57
Foreign/other degree	4.08
No degree	1.11
Mother´s education	
General degree	40.20
Intermediate degree	37.83
Upper or technical secondary degree	15.34
Other degree	17.09
Foreign/other degree	3.45
No degree	3.18
Region	
North	13.03
Middle	31.40
South	26.65
East	28.92
Number of Observations	
4534	

Source: SOEP, waves 1991-2009. Individuals born after 1974 and who are observed between the age of 21 and 39.

Table A2: Choice of Qualification: By School Degree (%)

Secondary Degree	Vocational Training	Technical University	University
General degree	100	–	–
Intermediate degree	100	–	–
Technical secondary degree	67.09	32.69	–
Upper secondary degree	30.46	15.25	54.29

Source: SOEP, waves 1991-2009. Individuals born after 1974 and older than 21 years.

Table A3: Post-Secondary Educational Choice: By Grade, Students with an Upper Degree[1] (%)

Grade	Vocational Training	Technical University	University
very good	18.03	12.02	69.95
good	33.74	15.85	50.41
satisfactory/fair	45.73	11.89	42.38

Source: SOEP, waves 1991-2009. Individuals born after 1974 and older than 21 years.
[1] Mean of the grade in Math and German Language in the last transcript when the student was 17 years old.

Table A4: Estimated Coefficients: Conditional Logit (with choice specific interaction terms for case specific variables).

Variable	Technical degree Coeff.	s.e.	Upper Degree Coeff.	s.e.
Expected life time income of choice	1.52e-06***		3.62e-07	
Parent´s showed	0.123	0.172	-0.026	0.105
interest in education				
born before 1980	-0.408**	0.181	-0.485***	0.115
Fathers´s vocational qualification				
constant: no vocational qualification				
vocational training	-0.173	0.303	-0.921***	0.165
higher vocational training	1.509**	0.629	0.892**	0.452
academic degree	0.107	0.355	0.611***	0.188
Mother´s education				
constant: no degree				
vocational training	0.018	0.267	-0.222	0.152
higher vocational training	0.305	0.624	0.881**	0.343
academic degree	0.575*	0.341	0.995***	0.194
constant	-1.333***	0.372	0.835	0.208
Number of Observations	7092			