

Assessing the Value of Incomplete University Degrees: Experimental Evidence from HR Recruiters

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Abstract

A university degree is a risky investment because of the non-negligible risk of having to drop out of university without graduating. However, the costs of this risk are controversial, as it is often argued that even an uncertified year of study has a value in the labor market. To determine this value causally, however, alternatives to studying must also be considered, which is done here with the help of a discrete choice experiment with a representative sample of over 2,500 HR recruiters. The result is that dropping out of university with a major closely related to an advertised job leads to similar labor market outcomes as if someone had not studied at all. Without a direct link to a job, however, dropping out of university significantly reduces lifetime earnings. Furthermore, HR recruiters clearly prefer applicants who have used the years without studying for human capital accumulation in an alternative way, for example in the form of a traineeship.

Keywords: Dropouts, hiring decisions, discrete choice experiment, sheepskin effect, willingness to pay, tertiary education

JEL classification: I26, J23, J24, J31, M51

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1 Introduction

A university education not only involves a substantial investment of time and money by students and society but is often also a risky investment. Not only in terms of the return on education, but especially in terms of the risk of having to drop out of university. Although the magnitude varies by country and institution, dropouts from university studies are a phenomenon that is present practically everywhere and to a substantial extent in some cases. This is, in turn, one of the reasons why policymakers and other stakeholders are increasingly interested in whether a course of study makes sense, particularly when pre-university performance suggests a high risk of dropping out. As an argument for why dropping out of university may not be a big problem, it is often argued that dropouts have learned a considerable extent of relevant knowledge for the labor market during their years of study, even if these have remained incomplete and have not been certified with a diploma.

In scientific literature, there are two approaches to evaluating the value of unfinished studies. First, the comparison of labor market outcomes (typically wages in the form of a return on education) of a year of study with graduation and a year of study without graduation, i.e., without certification. This literature on the so-called sheepskin effect (Hungerford & Solon, 1987; Jaeger & Page, 1996) focuses somewhat less on the value of the uncompleted studies than on the added value provided by certification of a successful degree. Despite all the difficulties in determining this added value empirically, this strand of the literature clearly concludes that there is significant added value from certification, even if the extent of this added value is difficult to determine (Barrett, 2012; Bauer et al., 2005; Berlingieri & Bolz, 2020; Carruthers & Sanford, 2018; Di Stasio & van de Werfhorst, 2016; Ferrer & Riddell, 2002; Giani et al., 2020; Heigle & Pfeiffer, 2019; Neugebauer & Daniel, 2022; Silles, 2007; Turner, 2016; Zeidenberg et al., 2015).

Although all the evidence suggests that successfully completing a degree significantly improves labor market outcomes more than the same investment in human capital without a degree, the return on investment without a degree is usually positive as well. Indirectly, a positive return on education also means that studying even without a degree was still worthwhile compared to the alternative of not studying (assuming that the return on education is higher than the time preference). Interestingly, however, the second strand of literature, which does not compare dropouts with successful students, but directly with those who could have studied but never tried, does not always find advantages for the (discontinued) studies. These comparisons, in contrast to the first, come to rather mixed and different results.¹ Some studies find higher employment probabilities (Giani et al., 2020; Matković & Kogan, 2012), higher probabilities of job quality (Heigle & Pfeiffer, 2019; Schnepf, 2017) and higher salaries (Berlingieri & Bolz, 2020; Carruthers & Sanford, 2018; Giani et al., 2020; Grubb, 1997) for individuals with some tertiary education compared to high school graduates who never enrolled in tertiary education. Other studies, however, find no systematic differences (Berlingieri & Bolz, 2020; Ghignoni et al., 2019; Grubb, 1997; Heigle & Pfeiffer, 2019; Marcotte et al., 2005; Matković & Kogan, 2012; Neugebauer & Daniel, 2022; Turner, 2016) or even worse

¹ Some of these divergent results can be explained by the different institutional contexts of the empirical studies. The cross-country comparisons by Berlingieri and Bolz (2020) suggest that university dropouts are less disadvantaged in terms of earnings in countries with a lower share of tertiary graduates and with more flexible labor market policies. Similarly, Neugebauer and Daniel (2022) find evidence that differences in hiring opportunities are more pronounced in closed labor markets than in open ones. There is also evidence that employers value the importance of particular characteristics of job-candidates differently in different countries. For example, employers in England select candidates primarily based on their final grade, while Dutch employers place more emphasis on the subject studied or job-specific qualifications (Di Stasio & van de Werfhorst, 2016).

employment prospects (Ghignoni et al., 2019; Hällsten, 2017; Neugebauer & Daniel, 2022) for university dropouts and at least one study (NcNamara, 2020) shows distinctively different results by gender.

One of the most important reasons, however, why neither the sheepskin effect nor the comparative advantage or disadvantage of studying at a university can be well analyzed empirically is the fact that selection effects do not allow for a comparison in which one can compare like with like. To what extent does the value of completing a degree reflect certification versus actual differences in academic achievement and human capital accumulation between successful students and dropouts? And even if there were no differences, whether a student graduates or drops out might indicate differences in ability, motivation, and other non-cognitive skills. Furthermore, successful and unsuccessful students often pursue different career paths where job characteristics rather than certification status might drive outcomes. And the same reservations must be made when comparing dropouts with people who have not attended university.

Our contribution to the literature is that, in view of the many empirical problems involved in comparing the labor market outcomes of university dropouts and people who have never studied, we choose a different approach, namely, to conduct an analysis using a discrete choice experiment with experts, namely HR recruiters. To determine the causal added value of a university dropout, more than 2,500 HR recruiters had to decide several times between a candidate who had not started a university degree program and a candidate who had started a university degree program but dropped out after one or two years. This approach, while hypothetical, is realistic for the respondents and allows us to determine the willingness to pay for different educational paths and thus ascertain whether studying and dropping out of college is still time well spent compared to not going to college at all. The experiment also allows us to consider two further aspects that are discussed in the existing empirical literature. On the one

hand, the similarity of the content of the degree program to the job for which the students are applying, and on the other hand, the duration of unsuccessful studies.²

We find, first and unsurprisingly, that recruiters are willing to offer substantially higher wages to applicants who studied a subject that is related to the advertised job, compared to applicants who studied a subject that has little or no relation to the job. Second, we find that dropping out after two years may increase recruiters' willingness to pay higher wages compared to dropping out after one year; however, spending an additional year in non-academic activities is compensated for by similar or even higher wage increases. Third, and rather surprisingly, we find that dropping out of university in comparison with people who have never studied and who have instead spent time working and traveling offers a comparable chance on the labor market in only one case. By contrast, when comparing university dropouts with non-students who had spent the same time in a trainee program, the latter always fare significantly better. In summary, our findings show that in terms of expected entry salaries, university dropouts would have done equally well—or in the case of non-job-related study programs, much better—if they had spent

² Regarding the proximity of the study program to the job for which the non-completers are applying the empirical results are unanimous in showing that non-completers can improve their labor market chances compared to people without a degree if the abandoned degree program had at least taught job-relevant skills and experience (Daniel et al., 2019; Di Stasio & van de Werfhorst, 2016; Neugebauer & Daniel, 2022). As concerns the results regarding the duration of the unsuccessful degree program the findings are contradictory. Some studies suggest that a later dropout date has a negative impact on the probability of employment (Daniel et al., 2019; Ghignoni et al., 2019; Neugebauer & Daniel, 2022), while a study with data from Serbia and Croatia shows that students with longer study experience find better jobs than those who dropped out early in Serbia but not in Croatia (Matković & Kogan, 2012).

their time working and traveling instead, and substantially better had they completed a traineeship.

The remainder of the paper is organized as follows. After a short introduction into the institutional Swiss background in section 2, we outline our experimental setup in section 3, followed by a description of the data and methods in section 4. We then present our empirical results in section 5 and back-on-the-envelope calculations of the impact on lifetime earnings in section 6, and section 7 concludes.

2 Institutional Background

In Switzerland, students complete compulsory education at the age of 15-16 and can then choose one of the following three types of upper-secondary education: 1. the baccalaureate school (i.e., grammar school), 2. another general education school, and 3. basic vocational training. However, access to baccalaureate schools is very selective. Only about 22% of compulsory school leavers can follow this path and graduate with a baccalaureate certificate. Switzerland thus has one of the lowest baccalaureate rates in the world. One of the reasons for the low baccalaureate rate is that the baccalaureate gives free access to all universities and, except for medicine and sports science, also free choice of study subjects.

Most baccalaureate holders go on to higher education: within the first two years after leaving school, 77% enter a university and 16% enter a university of applied sciences or a university of teacher education (total: 93%). The proportion of those entering the labor market directly is, therefore, quite small. However, of those who enter university, almost a quarter do not complete a bachelor's degree at a university, and around two-thirds of students who drop out of university do so within the first two years of study. Although more than half of those dropping out go on to study at a university of applied sciences or a university of teacher education, the fraction of university students remaining with no degree at all remains quite high,

given the selective system granting university access. Furthermore, the costs of an interrupted course of study should not be neglected for those who graduate from a different type of higher education institution, as they usually take one, two, or more additional years to do so, which significantly reduces their return on education.

The dropouts are partly explained by selection mechanisms: since universities are not allowed to select their students, they apply a selection process in the first years of study that is stronger or weaker depending on the subject and the university. Students who fail the exam can repeat the academic year. In some programs, it is also possible to retake individual exams. Students who fail the exam twice are not allowed to continue their studies in the previous field of study. The performance requirements and the associated stress and overload are, therefore, important reasons for students to drop out. On the other hand, false expectations of studying (doubts about the purpose of studying, desire for different experiences, etc.) are also a common reason for dropping out. The decision to drop out of university is, therefore, often involuntary but sometimes also voluntary.

3 Experimental Setup

Discrete Choice Experiments (DCEs) are increasingly used in economics to elicit individual preferences across diverse life domains, including job characteristics, healthcare treatments, or environmental policies.³ This stated preference method is grounded in random utility maximization (McFadden, 1974) and Lancaster's consumer choice theory (Lancaster, 1966), positing that an individual's utility can be broken down into the utility derived from key attributes of a good or service. These known attributes are valued differently by individuals, making certain combinations more appealing than others. In DCEs, participants make trade-off

³ Overviews are provided in, e.g., Ryan et al. (2008), Bliemer and Rose (2024), and Shang and Chandra (2023).

decisions among given attributes in hypothetical scenarios with multiple alternatives. This study applies the DCE methodology to examine how recruiters assess various applicant characteristics for an open executive assistant position.

The DCE methodology offers significant advantages in eliciting recruiters' preferences for job applicants and addressing key challenges associated with using real-world hiring data. First, it circumvents the difficulty of identifying the actual alternative applicants considered for each position. Second, it mitigates potential biases arising from correlations between observable and unobservable applicant characteristics in real hiring scenarios. Our DCE approach allows us to observe recruiters making repeated choices between hypothetical applicant profiles, each defined by a specific set of attributes. By explicitly stating that the applicant profiles differ only in these specified attributes, we reduce the risk of omitted variable bias, providing a clearer picture of how recruiters value different applicant characteristics in their decision-making process.

While stated preference methods such as DCEs have gained popularity in various economic fields, some reservations persist regarding their external validity, particularly concerning potential biases stemming from their hypothetical nature (e.g., Forster & Neugebauer, 2024; Loomis, 2011; Menapace & Raffaelli, 2020). However, as argued by Cattaneo et al. (2024) and Datta (2019), and supported by studies comparing individuals' preferences as elicited in DCEs and their later actual choices (Mas & Pallais, 2017; Wiswall & Zafar, 2018), DCEs represent an optimal method to closely approximate real market choices, particularly if they assess individuals' preferences for goods or services for which they already have real-life reference points. Furthermore, some studies show that the empirical results based on hypothetical vacancy designs are similar to those based on real vacancies (e.g. Gutfleisch et al., 2021). Our study exemplifies such a scenario by examining recruiters' preferences for

specific applicant characteristics within a concrete job context, thereby mirroring the real-world decision-making processes they regularly engage in during their work.⁴

In our DCE, recruiters are presented with three varying choice sets of two hypothetical job applicants for a position as an executive assistant, with one applicant being a university dropout and an alternative applicant who did not enroll in university after high school. The job of an executive assistant was chosen for two reasons. First, it is not a function that exclusively requires a specific education or level of education, i.e., people without a university degree could be considered for the role, including those who have never studied and those who have dropped out of university. Second, it is a function that occurs in most companies, i.e., the HR recruiters we interviewed in the experiment can clearly imagine what the function is, regardless of the industry and usually also of the size of the company, and have often recruited people for this or similar functions.

To assess how recruiters weigh the job-relatedness of incomplete academic programs, our dropout applicants differ in whether they were enrolled full-time in either business administration or law, or German studies or philosophy. For the position of executive assistant, we consider business administration and law to be two good examples of job-related majors, as they provide knowledge in business operations, legal processes, and professional etiquette that are likely beneficial to the role of executive assistant. On the other hand, we include German studies and philosophy as non-job-related majors because they provide knowledge in areas that have little to do with an executive assistant's field of work. We also allow our alternative applicants, who have not begun any higher education, to vary based on whether they have spent

⁴ We apply a similar strategy as in Humburg and van der Velden (2015) who elicited employers' preferences for skills attributes of university graduates with two discrete choice experiments.

their time since graduating from high school in job-related activities, i.e., whether they have completed a traineeship or have spent their time working and traveling.

Table 1

Candidate attributes and levels

Attribute	Level
Years since graduation	1
	2
Activity since graduation	Dropped out of Bachelor's studies in (<i>business administration/law</i>) at a university after x years
	Dropped out of Bachelor's studies in (<i>German studies/philosophy</i>) at a university after x years
	Traineeship at a financial company
	Work and travel
Gender	Female
	Male
Gross annual salary demand (CHF) ⁵	60,000
	70,000
	80,000
High school final grade	5.0 (Good)

The additional attributes in which the two applicants vary are their gender, their wage demands, and the number of years since high school graduation, and were selected based on the literature on hiring preferences. To study the potential role of the gender of the applicant, applicants are randomly presented as either a female or a male candidate. To account for the effect of wages, the study incorporates wage demands ranging from CHF 60,000 to CHF 80,000, reflecting the typical entry-level salary range for executive assistants in Switzerland (Federal Statistical Office, 2024). To assess the impact of post-high school experience duration,

⁵ 1 CHF = approximately 1.1 US\$ or 1.05 Euro.

we varied the timeframe between one and two years since graduation. This allows us to examine how recruiters value the length of applicants' post-graduation experiences, whether in university, traineeships, or other activities when evaluating them for the executive assistant position. Finally, we stated that all the applicants presented graduated from high school with the same (good) GPA.

Figure 1

Example of a Choice set

Imagine that your company needs to fill a 100% vacancy for an executive assistant. Below we show you three profiles of hypothetical applicants for this position. All applicants successfully graduated from high school some time ago with an average grade of 5.0. However, the applicants pursued different activities since graduating from high school and have different wage demands.

Please indicate which of the two applicants you would prefer for the executive assistant position.

	Candidate A	Candidate B
Activity since graduation	1-year traineeship at a financial company	Dropped out of a Bachelor's degree in Law at a university after 2 years
Annual gross wage demand (CHF)	60,000	80,000
Gender	Female	Male
Your choice		

The next step in developing our DCE involved selecting the choice sets to present to surveyed recruiters. Our design, comprising four attributes with two to three levels each, yielded 576 possible choice sets. To efficiently capture key trade-offs between our attributes of interest while minimizing respondent burden, we employed a D-efficient fractional factorial design of 21 choice sets using the software Ngene (Bliemer & Rose, 2024). The 21 choice sets were optimally divided into 7 blocks of 3 choice sets each to accommodate survey space constraints while still allowing for efficient estimation of preferences across all respondents (Louviere &

Woodworth, 1983).⁶ Participating recruiters were randomly assigned to one block, with the order of choice sets randomized within each block as well as the order of the alternatives randomized within each choice set. Figure 1 illustrates an example choice set, including its introductory text.⁷

4 Data and Methods

The DCE described in the previous section was incorporated into the so-called *Nahtstellenbarometer* [Barometer for the school-to-work transition] survey among companies conducted bi-annually on behalf of the Swiss State Secretariat for Education, Research and Innovation and administrated by *GFS Bern*, a private market research firm. The survey is conducted twice a year and surveys school leavers at the end of compulsory schooling and firms. The aim of the survey is to provide the national and local authorities with timely information about the first phase of transition from school-to-work. Firms are surveyed to provide information about their intention to offer training places (apprenticeships) to school leavers. The sample of firms is provided by the Swiss Federal Statistics Office using the official business register data. Although the main interest of the survey of firms is the provision of apprenticeship positions, the sample includes training as well as non-training firms. One advantage of our experiment is the fact that the people who answer the questionnaire are typically from the Human Resources (HR) department and are usually responsible for recruiting young employees. In other words, it is typically the same recruiters who would be responsible

⁶ The full choice set universe is shown in Table A.1 in the appendix.

⁷ A screenshot of an actual choice set is shown in Figure A.1.

for hiring individuals who have dropped out of college or never even started college in the first place, i.e., the individuals who are the focus of our experiment.

Our analysis sample comprises data from 2,568 recruiters. Because of the official nature of the survey, the response rates are unusually high for this type of research. The survey achieved a response rate of 63% in the spring wave and 79% in the summer wave.⁸

Table B.1 in the appendix shows summary statistics for our sample of recruiters. Of the 2,568 recruiters, the majority work for small firms with 2 to 9 employees (72%), followed by medium firms with between 10 and 99 employees (25%), and large firms with 100 or more (3%). Two-thirds (67%) of the recruiters are employed by firms providing services, while one-fifth (20%) are in the manufacturing industry and the remaining 13% are in the agricultural field.

As in Cattaneo et al. (2024), to examine recruiters' preferences for applicant attributes, our analysis utilizes McFadden's (1974) random utility model. The utility that recruiter i derives from choosing applicant j in choice set s is given by:

$$U_{isj} = CP_{isj} + e_{isj} \quad i = 1, \dots, N; s = 1, 2, 3; j = A, B \quad (1)$$

where CP_{isj} represents the systematic component of the overall utility, and e_{isj} is a random term. We assume the recruiter chooses applicant A or B if they provide higher utility than the

⁸ Due to the nature of the survey, the experiment had to be conducted in two waves. In the spring wave, companies that do not train apprentices were surveyed, and in the fall survey, companies that do train apprentices were surveyed. Because the number of companies in the second survey is larger than in the first, we have a response rate of 76% across both waves. Analyses of differences between the two types of companies show no differences regarding our experiment, which is why we always base our analyses on the entire sample.

other option in the choice set. Assuming e_{isj} to be independently extreme value type-I distributed, the probability of choosing j takes the form:

$$\text{Prob}(y_{is} = j) = \frac{\exp(CP_{isj})}{\sum_{l=A,B} \exp(CP_{isl})} \quad (2)$$

where y_{is} denotes the choice observed for recruiter i in choice set s . Given the likelihood that preferences for different job alternatives or parameters vary among individuals, we employed a mixed logit model to flexibly approximate preferences for applicant attributes. In the mixed logit (see, for example, McFadden & Train, 2000), individual heterogeneity is accounted for by assuming individual-specific parameters. Here, we consider a linear specification for CP_{isj} of the form:

$$CP_{isj} = \alpha_{ji} + A_{isj}'\delta_i \quad (3)$$

where A_{isj} is the vector of the four attributes describing applicant j for recruiter i in choice set s . The parameter vector δ_i is the main interest of our study as it describes the recruiters' individual preferences for the different career path attributes, while α_{ji} is an alternative-specific intercept estimated alongside δ_i . As usual, α_{ji} must be interpreted in relative terms describing general preferences of individuals for one alternative (in our case option B) over the other alternative (in our case option A). We assume the parameters in the mixed logit to be normally distributed except for the wage parameter, which we presume to follow a log-normal distribution. All random parameters are allowed to correlate with each other.⁹

While the preference parameters δ_i delineate the marginal utility of the various attributes, it is often more intuitive to interpret these parameters in monetary values and as a marginal rate of substitution with a monetary reference attribute. This helps convey individuals' willingness

⁹ For a detailed description of mixed logit models and their estimation, see McFadden & Train (2000).

to pay (WTP) per unit of each attribute. Derived from contingent valuation theory, WTP assesses how much consumers are willing to pay on average for a change in a specific attribute, keeping their level of utility the same. WTP can be positive or negative depending on whether individuals derive a utility or disutility from the given change of the attribute. We estimate the model in the preference space, which gives a better goodness-of-fit (see also Hole & Kolstad, 2012), where parameters have utility units, and then we compute the WTP by dividing the parameters by the parameter associated with the wage attribute.

5 Results

5.1 Mixed Logit Estimates and WTP

Table 3 presents the results of our mixed logit model estimations. Column 1 shows the estimated coefficients of our baseline specification with all attributes included in the model. The outcome is a dummy variable on whether an applicant is chosen or not. Because our model includes three categorical variables—activity since graduation, applicant gender, and years since graduation—reference levels need to be defined. Consequently, the coefficients are to be understood as preferences compared to a male applicant who has worked and traveled in the one year since graduation.

Interestingly, on average and compared to the reference candidate, recruiters do not show a preference for applicants who dropped out of a job-related university major. However, they strongly prefer applicants who have been working and traveling (WT) to those who studied a job-nonrelated major and dropped out. Of all hypothetical candidates, recruiters show the strongest preference for applicants who did not study at all but have completed a traineeship. Furthermore, recruiters seem to be indifferent, on average, between male and female applicants and generally prefer those with an additional year since graduation from high school. Finally,

and unsurprisingly, higher salary demands reduce the chances of recruiters choosing an applicant, holding all else equal.

Table 3

Mixed logit estimates and WTP for career path attributes

	(1) Estimated coefficients	(2) WTP
Dropout: Job-related major	0.113 (0.0945)	1398.7 (1140.3)
Dropout: Job-nonrelated major	-1.251*** (0.139)	-15522.5*** (1828.2)
Traineeship	2.097*** (0.190)	26013.1*** (2049.0)
Female	0.0676 (0.0807)	838.5 (1010.4)
Additional year since HS graduation	0.365*** (0.0819)	4523.6*** (964.5)
Annual gross salary demand (10,000 CHF)	-0.355*** (0.107)	
<i>N</i>	15,376	15,376

Notes: For column 1, the outcome is a dummy variable on whether an applicant is chosen. WTP in column 2 is calculated by the ratio of the estimate for the respective applicant attribute and the estimate for annual gross wage demand in column 1, times 10'000 CHF. The reference is a male applicant who spent his one year since graduation working and traveling. Population weights are applied, standard errors are shown in parentheses, and * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Column 2 illustrates the WTP for the applicant attributes as derived from the mixed logit model estimates in column 1. First, recruiters have a high negative WTP for applicants who dropped out of a job-nonrelated major; in fact, they would pay them CHF 15,522 less in annual gross wage than an applicant who has been working and traveling since graduation. Or, in other words, they would be indifferent between a WT applicant and a job-nonrelated dropout if the latter demanded CHF 15,522 less in annual gross wage. This value is calculated as the ratio of the coefficient -1.251 in column 1, representing the effect of a job-nonrelated dropout instead

of a WT applicant on the likelihood of choosing an alternative, to the geometric mean of the log-normal wage coefficient, 0.806, multiplied by 10,000.¹⁰ In contrast, an applicant who has completed an internship can expect to earn CHF 26,012 more than if they had spent the time since graduation working and traveling. Additionally, recruiters exhibit a WTP of CHF 4523 for applicants with two instead of one year since graduation. At this point, it remains unclear whether this “additional-year bonus” is due to applicants having spent more time in the specific post-graduation activities or if recruiters simply favor candidates whose graduation is further in the past, possibly expecting them as more mature or settled in their career paths.

5.2 WTP by university major

Our results in Section 4.1 indicate that, on average, recruiters are indifferent between WT applicants and those who dropped out of job-related university majors, while strongly preferring both over applicants who dropped out of non-job-related majors. Since we included four specific university majors in the choice sets presented to recruiters, we can further analyze how these majors influence the likelihood of an applicant being selected.

Table 4 presents the WTP results from Table 3 in column 1, alongside WTP estimates from a mixed logit model that differentiates by university major in column 2. First, the results reveal that recruiters assess business administration and law differently. Specifically, the WTP for business administration dropouts is positive and statistically significant at the 95% level, indicating that they are, in fact, preferred to WT applicants.

¹⁰ Due to the estimation of the wage coefficient in log-normal space, the wage coefficient has to be transformed into natural space first, this is done using the geometric mean of its estimation in log-normal space.

Table 4
WTP by major program

	(1) WTP: Major type	(2) WTP: Major program
Dropout: Job-related major	1398.7 (1140.3)	
Business administration		3034.6* (1347.6)
Law		-4094.2 (2211.7)
Dropout: Job-nonrelated major	-15522.5*** (1828.2)	
German studies		-15307.5*** (2472.1)
Philosophy		-16971.8*** (4259.5)
Traineeship	26013.1*** (2049.0)	22840.9*** (2674.6)
Female	838.5 (1010.4)	2039.8 (1314.7)
Additional year since HS graduation	4523.6*** (964.5)	6095.8*** (1174.8)
<i>N</i>	15,376	15,376

Notes: Column 1 replicates the WTP estimates from Table 4, column 2, based on the mixed logit model distinguishing only by post-graduation activity. Column 2 shows WTP based on a mixed logit model, additionally distinguishing between individual major programs as they were used in the experiment. The reference is a male applicant who spent his one year since graduation working and traveling. Population weights are applied, standard errors are shown in parentheses, and * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

In contrast, the WTP for law dropouts is negative and not statistically significant. Notably, a Wald Test shows that the WTP for business administration dropouts is significantly higher than for law dropouts at all conventional levels of statistical significance. Second, our results suggest that recruiters do not differentiate between German studies and philosophy dropouts; although the WTP for a philosophy dropout is slightly lower, a Wald test indicates that the difference between the two WTPs is not statistically significant.

5.3 WTP with interactions

In our survey experiment, we varied the number of years applicants spent in their post-graduation activities. The findings in Section 5.1 indicate that recruiters generally value an additional year, as evidenced by the positive WTP for two years since graduation instead of one. To explore how such a “second-year bonus” depends on the post-graduation program, Table 5 shows WTP derived from a mixed logit model that includes interactions between post-graduation activity and a dummy variable, which is equal to one if two years were spent in the activity and zero if only one year.

First, for applicants who dropped out of a job-related major, an additional year does not seem to affect how recruiters evaluate them, as indicated by the insignificant coefficient for the interaction with the dummy variable representing the additional year. Second, for applicants who dropped out of a job-nonrelated major—who generally face the lowest WTP from recruiters—an additional year increases the recruiters' WTP by CHF 5422. Third, recruiters show a significantly higher WTP for applicants who completed a two-year traineeship compared to those with only a one-year traineeship. Finally, even for WT applicants, an additional year spent working and traveling raises the wage recruiters are willing to offer.

Table 5
WTP with time interactions

	(1) WTP	(2) WTP: Time interactions
Dropout: Job-related major	1398.7 (1140.3)	1719.8 (1525.6)
× additional year		2648.9 (1768.7)
Dropout: Job-nonrelated major	-15522.5*** (1828.2)	-17063.8*** (2492.0)
× additional year		5422.3* (2500.3)
Traineeship	26013.1*** (2049.0)	22870.1*** (2349.4)
× additional year		8657.4*** (2617.6)
Work and travel × additional year		5506.2** (1854.8)
Female	838.5 (1010.4)	1111.9 (1111.8)
Additional year since HS graduation	4523.6*** (964.5)	
<i>N</i>	15,376	15,376

Notes: Column 1 replicates the WTP estimates from Table 4, column 2. Column 2 presents WTP based on a mixed logit model that includes interactions between post-graduation activity and a dummy variable if graduation occurred two years ago rather than one. The reference is a male applicant who spent his one year since graduation working and traveling. Population weights are applied, standard errors are shown in parentheses, and * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

5.4 WTP Differences by Firm Characteristics

Since each recruiter in our survey evaluated three choice sets featuring two hypothetical applicants, we can explore the underlying heterogeneity in recruiter preferences for applicant attributes, with a particular focus on post-graduation activities. Figure 2 shows the distribution of posterior estimates of the individual-specific estimates of the WTP for job-related dropouts,

job-nonrelated dropouts, and trainee graduates compared to WT applicants. The graph illustrates that the relative WTP for dropouts from job-nonrelated majors ranges from about CHF -50,000 to CHF 40,000, with most recruiters indicating a negative relative WTP for these applicants. In contrast, the WTP for trainee graduates spans from about CHF -10,000 to CHF 50,000, with most recruiters expressing a positive WTP. Meanwhile, the WTP for dropouts from job-related majors is distributed relatively close to zero.

Figure 2

Distribution of individual-level WTP for career path attributes

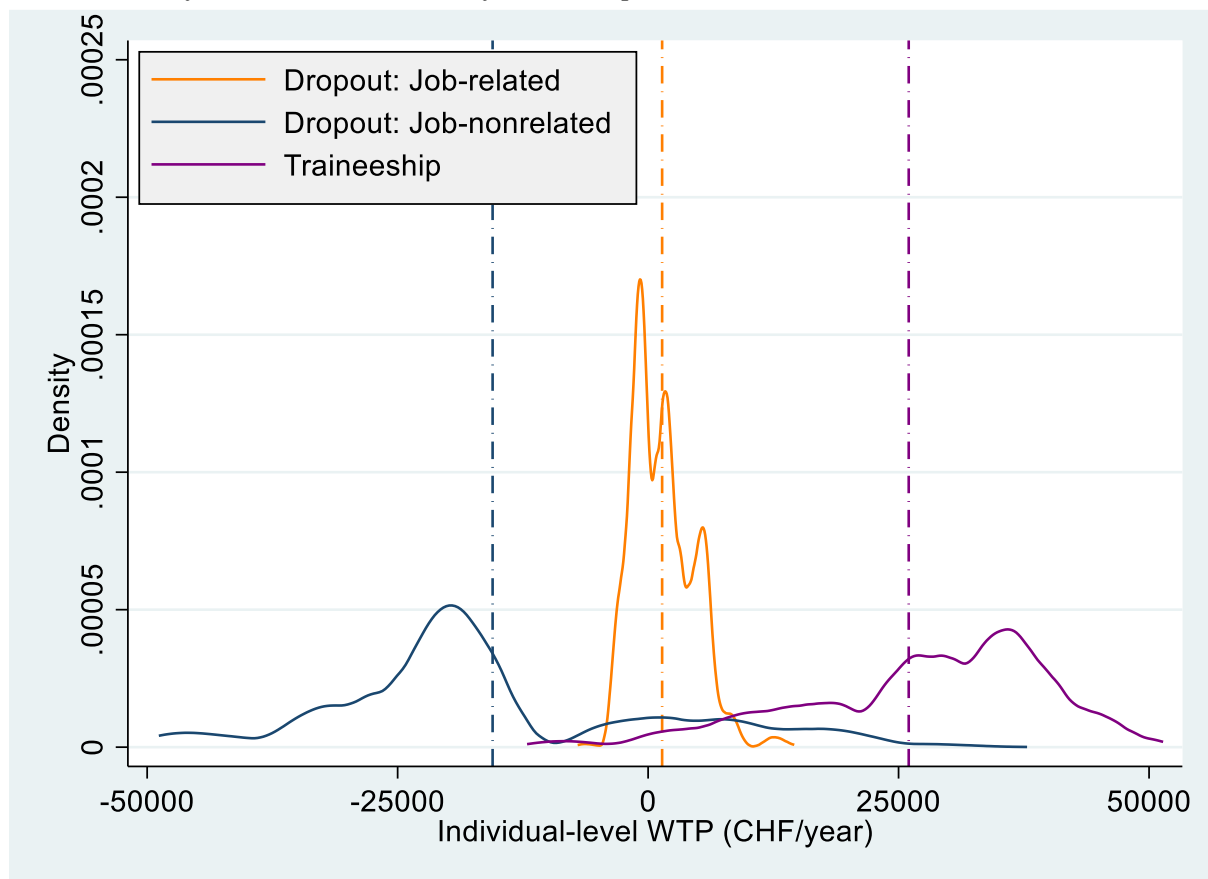


Table 6*Individual determinants of WTP for applicant characteristics*

	(1)	(2)	(3)
	WTP: Job- related dropout	WTP: Job- nonrelated dropout	WTP: Traineeship
Medium firms (10 – 99 employees)	107.6 (159.4)	-527.7 (833.2)	1453.0* (619.2)
Large firms (100+ employees)	-110.5 (177.4)	41.78 (963.8)	2363.5*** (709.1)
NOGA sector 2 (manufacturing)	-134.2 (431.1)	105.4 (2131.3)	315.2 (1563.3)
NOGA sector 3 (services)	-64.18 (421.0)	580.2 (2115.5)	960.3 (1523.9)
French region	-352.0* (171.4)	-3962.5*** (890.6)	1877.4** (632.9)
Italian region	1083.3*** (294.7)	6252.8*** (1503.4)	-542.0 (1550.2)
Urban municipality	485.0* (204.1)	2441.5* (1152.2)	-520.5 (821.8)
Agglomeration	370.2 (206.5)	-0.0843 (1061.2)	366.3 (799.3)
Constant	1252.4** (427.6)	-16288.2*** (2035.8)	25249.0*** (1554.4)
<i>N</i>			2568

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: Multivariate regression of WTP for applicants' post-graduation activities on the firm size, industry, language region, and type of municipality in which the firm is located. The constant states the WTP estimation working for a small firm in the agriculture sector in a rural municipality in the German language region. The reference candidate is a candidate who has spent his time working and travelling and has never taken up a degree program.

Along with our survey experiment, we gathered data on the firms where the responding recruiters are employed, enabling us to examine how WTP for applicants' post-graduation activities varies according to firm characteristics. Table 6 presents the results of a multivariate regression of WTP for applicants' post-graduation activities on the firm size, sector, language region, and type of municipality in which the firm is located. First, WTP for dropouts from job-related majors does not seem to differ much based on the firm characteristics accounted for; WTP for such applicants is highest in the Italian region, followed by the German region (the reference), and a slightly lower WTP in the French region. Additionally, this WTP is slightly higher in urban areas than in rural areas. Second, WTP for dropouts from job-nonrelated majors varies strongly between language regions and municipality types, with the highest WTP in the Italian region and urban municipalities and the lowest WTP in the French region. Third, WTP for trainee graduates seems to increase with firm size and is higher in the French than in the German region. Finally, the sector of the firm does not appear to have a systematic relationship with recruiters' preference for the applicants' post-graduation activities.

6 Back of the Envelope Calculations

For the dropouts from fields of study that have no closer relation to the sought-after position, the low willingness to pay shows without further analysis that the years invested in their studies will most certainly not pay off in monetary terms. It is somewhat more complex for the dropouts whose studies were related to the advertised job. Here, it must be considered that the years of study are associated with direct educational costs on the one hand and with opportunity costs on the other. We, therefore, did a small back-of-the-envelope calculation, for which we first selected the starting wages from our experiment. Second, we modeled wage development over the working life using coefficients from a Mincer wage regression with data from the Swiss Labor Force Survey (the coefficients for experience and experience squared).

Third, we take an average salary for trainees and people who work without qualifications, and fourth, we discount the income with a discount rate of 5%, which reflects the time preference.

Table 7

Lifetime income differences compared to the reference group of non-studiers who traveled and worked in percent

Study duration	Traineeship	Business Administration	Law	German literature	Philosophy
1 year	28.80	-0.14	-11.04	-26.20	-28.44
2 years	34.40	-0.17	-11.02	-22.00	-24.17

The calculations in Table 7 show that of all options considered in our survey experiment, completing a traineeship is by far the best option in terms of lifetime earnings. In the case of business administration, the life income is almost equal to not studying and instead working and traveling, while for law, the relative loss of income is 11% for both one and two years to unsuccessful studies. For dropouts whose field of study was not related to the job, the lifetime earnings loss amounts to approximately one-quarter. Finally, the calculations reveal that the losses in lifetime earnings after two years of study are lower for non-job-related studies, and the wage gain for trainees is higher, suggesting that HR recruiters value the human capital accumulation in two years compared to only one year in these activities higher than for the reference group and for job-related dropouts.

7 Conclusions

In this research paper, we present an assessment, based on an experimental study and from the perspective of over 2,500 HR recruiters, of students who have dropped out of university compared to those who have never started university. The internal validity and, with respect to the economy as a whole, the external validity of this study benefits from the fact that

the selection of HR recruiters covers the entire spectrum of industries and company sizes, that the official nature of the survey results in an unusually high response rate, and that it can be assumed that non-participation in the experiment is not related to our research question.

We find three key results: First, studying unsuccessfully for a degree directly related to a job can still yield positive returns in terms of wages compared to activities not focused on formal human capital accumulation, such as working and traveling. However, back of the envelope calculations show that these increases just cover the direct and opportunity costs of studying. Second, HR recruiters view years of unsuccessful study without a direct link to a job as “lost” years, offering substantially lower wages to such applicants compared to people who have a university entrance diploma but have never studied. Third, we find that recruiters highly value alternative forms of human capital acquisition, and may largely prefer it to unsuccessful university studies. In the scenario we used, HR recruiters showed a strong preference for people without a degree who had completed a company-based traineeship. In sum, these results suggest that a failed degree is rarely a worthwhile investment—at least in the eyes of HR recruiters.

Our study has certain limitations. For example, we can say little about the mechanisms by which HR recruiters are unwilling to hire university dropouts at higher wages. We cannot estimate whether it is the assessment of the value of the human capital acquired at the university in the one or two years of study, or whether it is perceptions of unobserved factors. It is possible that HR recruiters imagine that university dropouts are a negative selection of people in terms of motivation, talent, and other factors, while the non-students benefit from the fact that it is not known whether they would have succeeded in a degree program or not.

Finally, questions of external validity arise regarding our findings. Both in relation to the subjects, scenarios and the job that needed to be filled, as well as in relation to other countries and educational systems. As for the former, we note that we cannot make any statements regarding specific fields of study, but only that it makes a difference whether one's field of

study involves acquiring skills that are relevant to the targeted job. If we had used a recruitment scenario in which a publishing editor's assistant was to be recruited, then German literature dropouts would most probably have outperformed business administration dropouts. As for other countries, different results could certainly arise here too, depending on the way higher education is organized, the selection systems into university, who succeeds and who does not, and the way the labor market is organized. Nevertheless, we can conclude that in a selective system, where both university attendance and graduation are limited to a relatively small share of the population, around one-fifth, and where we are essentially comparing above-average dropouts with above-average non-students, unsuccessful university studies only rarely have added value in the eyes of HR recruiters.

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Appendices

Appendix A: Discrete Choice Experiment

Figure A.1

Print version example of a German choice set including its introductory text

- 22.** Stellen Sie sich vor, Ihr Unternehmen muss eine 100%-Stelle als Assistent:in der Geschäftsleitung neu besetzen. Im Folgenden zeigen wir Ihnen dreimal je zwei Profile von hypothetischen Bewerber:innen für diese Stelle. Alle Bewerber:innen haben vor einiger Zeit das Gymnasium erfolgreich mit einer Durchschnittsnote von 5.0 abgeschlossen. Allerdings haben die Bewerber:innen seit ihrem Maturabschluss unterschiedliche Tätigkeiten ausgeübt, und sie stellen unterschiedliche Lohnforderungen.

Bitte geben Sie jeweils an, welche der beiden Bewerber:innen Sie für die Stelle als Assistent:in der Geschäftsleitung bevorzugen würden.

Auswahl 1

	Bewerber:in A	Bewerber:in B
Tätigkeit seit Maturabschluss	2-jähriges Traineeship bei einem Finanzunternehmen	1 Jahr Bachelor-Studium in Jura an einer Universität, Abbruch nach 1 Jahr
Forderung Brutto-Jahresgehalt (CHF)	70'000	60'000
Geschlecht	Weiblich	Weiblich

- ☐₁ Bewerber:in A
☐₂ Bewerber:in B

Table A.1*Choice sets used in the DCE*

Choice set	Alternative	Annual gross wage demand (CHF)	Post-graduation activity	Gender	Block
1	1	70,000	Dropped out of Bachelor's studies in Business Administration at a university after 2 years	Male	2
1	2	70,000	2-year traineeship at a financial company	Male	2
2	1	70,000	Dropped out of Bachelor's studies in German studies at a university after 2 years	Male	6
2	2	80,000	1 year working, 1 year traveling	Male	6
3	1	60,000	Dropped out of Bachelor's studies in Law at a university after 1 year	Female	1
3	2	70,000	2-year traineeship at a financial company	Female	1
4	1	70,000	Dropped out of Bachelor's studies in German studies at a university after 2 years	Male	3
4	2	60,000	6 months working, 6 months traveling	Male	3
5	1	80,000	Dropped out of Bachelor's studies in Philosophy at a university after 1 year	Female	5
5	2	80,000	1 year working, 1 year traveling	Female	5
6	1	80,000	Dropped out of Bachelor's studies in Business Administration at a university after 1 year	Female	1
6	2	80,000	6 months working, 6 months traveling	Male	1
7	1	60,000	Dropped out of Bachelor's studies in German studies at a university after 2 years	Female	4
7	2	60,000	6 months working, 6 months traveling	Female	4
8	1	70,000	Dropped out of Bachelor's studies in Business Administration at a university after 2 years	Male	5
8	2	60,000	1 year working, 1 year traveling	Female	5
9	1	60,000	Dropped out of Bachelor's studies in Law at a university after 2 years	Female	4
9	2	80,000	2-year traineeship at a financial company	Male	4
10	1	60,000	Dropped out of Bachelor's studies in Philosophy at a university after 1 year	Female	6
10	2	60,000	1-year traineeship at a financial company	Male	6
11	1	80,000	Dropped out of Bachelor's studies in Law at a university after 1 year	Female	5

11	2	60,000	1-year traineeship at a financial company	Male	5
12	1	70,000	Dropped out of Bachelor's studies in Business Administration at a university after 1 year	Male	4
12	2	60,000	1 year working, 1 year traveling	Male	4
13	1	70,000	Dropped out of Bachelor's studies in Law at a university after 2 years	Female	2
13	2	70,000	1-year traineeship at a financial company	Female	2
14	1	80,000	Dropped out of Bachelor's studies in German studies at a university after 2 years	Male	2
14	2	80,000	1-year traineeship at a financial company	Female	2
15	1	60,000	Dropped out of Bachelor's studies in Business Administration at a university after 1 year	Male	7
15	2	80,000	1-year traineeship at a financial company	Female	7
16	1	70,000	Dropped out of Bachelor's studies in Law at a university after 1 year	Male	7
16	2	70,000	2-year traineeship at a financial company	Female	7
17	1	80,000	Dropped out of Bachelor's studies in Philosophy at a university after 1 year	Male	1
17	2	60,000	2-year traineeship at a financial company	Female	1
18	1	80,000	Dropped out of Bachelor's studies in Law at a university after 2 years	Female	6
18	2	70,000	6 months working, 6 months traveling	Female	6
19	1	60,000	Dropped out of Bachelor's studies in Philosophy at a university after 1 year	Male	3
19	2	80,000	6 months working, 6 months traveling	Male	3
20	1	80,000	Dropped out of Bachelor's studies in Philosophy at a university after 2 years	Female	7
20	2	70,000	2-year traineeship at a financial company	Male	7
21	1	60,000	Dropped out of Bachelor's studies in German studies at a university after 2 years	Female	3
21	2	70,000	1 year working, 1 year traveling	Female	3

Appendix B: Descriptives

Table B.1

Descriptive statistics of the sample

	Full Sample
Small firms (2 – 9 employees)	0.724
Medium firms (10 – -99 employees)	0.246
Large firms (100+ employees)	0.030
NOGA sector 1 (Agriculture)	0.129
NOGA sector 2 (Manufacturing)	0.203
NOGA sector 3 (Services)	0.668
German Region	0.741
French Region	0.205
Italian Region	0.054
Offering apprenticeship positions	0.852