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What wages do people expect for vocational and academic education backgrounds in Switzerland?

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Abstract

Correctly anticipating the earnings for different education profiles is pivotal in making informed education decisions. In this paper, leveraging unique survey data, we study the wage expectations for academic and vocational education backgrounds in Switzerland. Personal reference points matter in forming these wage expectations as we find significant heterogeneity in their distributions by gender, age, socioeconomic status, region of residence, and migration background. Asymmetries exist between beliefs for academic and vocational backgrounds since relative differences in wage expectations also vary by respondents' characteristics. These heterogeneities are vital for education policy because our analyses show that the wage expectations are associated with preferences for specific educational tracks for the own (hypothetical) child. If education decisions are ill-informed, this possibly leads to educational mismatches and related adverse effects later in life.

Keywords Wage expectations, Beliefs, Educational preferences, Reference points

JEL Classification I20, D84, J31

1 Introduction

Most of the literature agrees that the perceived returns to education are a central factor for human capital investment (see, for example, Jensen, 2010; Attanasio & Kaufmann, 2014, 2017; Delavande & Zafar, 2019; Boneva & Rauh, 2019; Attanasio et al., 2020; Giustinelli, 2022). Less research has been devoted to the question of how potential wage misconceptions are formed and whether knowledge gaps exist regarding the wages that people can expect for different educational tracks. If a person's wage beliefs do not correspond to the salaries paid in the labor market, this can lead to ill-informed decisions, educational mismatches, and an inefficient allocation of resources. Such a misallocation, in turn, can have

long-run consequences for the person and the economy as a whole in terms of lower realized individual and social returns to education.

In this paper, we analyze whether people are aware of the labor market rewards associated with different educational paths, more precisely, the rewards related to academic or vocational education. We leverage novel data from Switzerland on the wage expectations for people of a certain age with either vocational or academic educational backgrounds. First, we analyze the determinants of these wage expectations, focusing on common socioeconomic and demographic characteristics. Second, we study the distribution of these wage expectations to understand better the segments of the population that are more likely to have more extreme wage beliefs and whether there are differences between wages expected for an academic or vocational education background. The latter are important insofar as they can shed light on a key decision related to educational tracking made early on in the Swiss education system, and whether particular

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groups of the population require additional information that can help them make more informed decisions.

We focus on the wage expectations of the adult population, who have, for the most part, already made their schooling decisions. However, their opinions can still be an indication of future educational choices. It is most likely that adults' beliefs, whether they belong to parents, teachers, counselors, or other mentors, are pivotal in influencing the future plans and expectations of younger generations, for example, by sharing experiences and beliefs about the economic prospects of different options. To this end, we examine whether wage expectations are associated with respondents' preferences regarding the educational path of their own (hypothetical) child. Other choice dimensions, like occupational reputation, job security, or a good work-life balance, are, of course, also important in determining educational decisions, but they are not the focus of our analysis.

Switzerland is an interesting case to study wage expectations. First, there is a strong tradition of vocational education embedded in the dual-track system, with about two-thirds of young people choosing the vocational track and one-third choosing an academic route. Only the latter track provides direct access to university education. Decisions for one or the other track are typically made at the ages of 12–15. Even though the system allows for permeability between tracks, expectations about potential rewards are formed early on. Second, Switzerland has three geographically segregated language regions, which are culturally distinct and characterized by different education systems and labor markets. All that can influence educational preferences and wage expectations. Third, Switzerland has one of the highest shares of migrants among all OECD countries, with migrants often coming from countries with a less established vocational education system. This fact is expected to influence preferences for different educational paths, and wage expectations for people having a specific background, since wage distributions across occupations may look very different in other countries.

Our findings indicate that wage beliefs differ significantly by gender, age, socioeconomic status, region of residence, and migration background. Women, in general, have lower wage expectations than men for both vocational and academic education backgrounds, which could be a reflection of the lower wages they receive in the labor market. We also find a clear age gradient, with younger people having lower and older people having higher wage expectations, especially for academic education. This translates into relative wage differences expected between academic and vocational education backgrounds that are significantly higher and not aligned with actual wage differences observed in the labor market

in the age group 40+. This might be problematic as this group is composed of precisely those people who may have children at crossroads deciding about their educational path. Individuals with a vocational background, in general, have higher wage expectations for university graduates than individuals with an academic background. And vice versa, the latter estimate higher salaries for people with a vocational background. While part of this result may be attributable to socioeconomic status, confirmed by the positive income gradient, the asymmetric misconceptions may also be related to the own educational background and possibly biased beliefs about the "other" path.

Contrary to this argument, however, we find that people with a migration background have lower wage expectations than natives. This holds especially true for academic wages, even though the proportion of individuals with a vocational background is significantly lower in the migrant group. A possible reason for this result is not a pessimistic wage expectation within the migrant group but rather an optimistic one of Swiss natives, especially the wages they expect for persons with an academic profile. Finally, the results show that the relative wages expected for vocational, as opposed to academic education, are higher in the French- and Italian-speaking parts of Switzerland than in the German-speaking part. This could be indicative that the choice between academic and vocational education is not based on economic considerations only because it contrasts with the proportion of people who have an academic education background, which is higher in the French- and Italian-speaking regions. Nevertheless, people in these regions still believe that absolute wages are lower for both types of education, which reflects actual local wages and thus is consistent with a geographical reference point.

The results for women, migrants, and language regions show that people's answers reflect their own situation and that people likely do not know or insufficiently take into consideration averages on the population level when forming their wage beliefs. Age and socioeconomic status are also associated with wage expectations, and personal reference points are again a likely explanation for the heterogeneity found in the distribution of wage beliefs. All this is of concern to education policy since complementary analyses indicate that wage expectations are significantly associated with educational preferences for the own (hypothetical) child. This, in turn, could lead to an inefficient resource allocation if parents' advice and ambition for their child's education, due to their own misconceptions, does not match the child's actual abilities, leading to, for example, low performance, early dropouts, reduced chances in the labor market, and related long-term consequences.

The remainder of the paper is structured as follows. Section 2 presents our hypotheses and the related literature. Section 3 provides a brief overview of the Swiss education system. Section 4 introduces the data and methods. Section 5 reports the results, first looking at the determinants of wage expectations, and then investigating the implications concerning vocational vs. general education preferences. Section 6 concludes.

2 Hypotheses and previous literature

Human capital theory states that individuals will invest in education if, and only if, the expected rate of return exceeds the costs of investment (Becker, 1962). In reality, educational decisions are complex and made under uncertainty, given that the benefits of completing a particular educational degree are not perfectly known *ex-ante* (Hanushek et al., 2022; Hartog & Bajdechi, 2007; Kunz & Staub, 2020).

Regarding the monetary benefits of vocational or academic education, people who follow one path might be unaware of the returns to the other, also *ex-post*. If this were the case, parents could unintentionally mislead their children, who are about to choose their educational path, by sharing their labor market misconceptions. There is some evidence in the literature that gaps in educational aspirations among young people are due to the fact that individuals whose parents do not have a background in higher education may underestimate the returns to university education and overestimate its costs (Lergetporer et al., 2021). On the other hand, studies show that university students tend to overestimate the returns to university education (e.g., Fernandes et al., 2021). If wage perceptions continue beyond graduation, we expect to observe that respondents with university education are more likely to have higher wage expectations for this path, in absolute and relative terms, compared to people with vocational education.

The pay gap between men and women is one of the most investigated topics in economics (e.g., Blau & Kahn, 2017). One of the explanations in the literature for the gap is that women have, in general, lower wage expectations (e.g., Filippin & Ichino, 2005; Reuben et al., 2017) and, therefore, might be more likely to accept a low-paying job offer. If this were the case, differences in wages between men and women would not start with realized wages but already before entering the labor market (Oesch et al., 2017; Reuben et al., 2017; Kiessling et al., 2019; Combet & Oesch, 2019; Fernandes et al., 2021; Briel et al., 2022). Moreover, gender differences in expected returns (e.g., Perini, 2014) and occupational preferences (e.g., Kuhn & Wolter, 2022, 2023) may matter for building wage beliefs. Briel et al. (2022) find that biased beliefs are key in explaining gender differences in wage expectations.

Based on these arguments, we expect that women are more likely to estimate lower absolute earnings than men. However, given that women tend to underestimate labor market rewards in general, we expect no significant differences in their perception of relative wages for people with vocational and university degrees.

A vast amount of literature shows that immigrants have an earnings disadvantage in the destination country. Explanations revolve around differential returns to completing a degree and acquiring labor market experience in a foreign country (Friedberg, 2000; Bratsberg & Ragan, 2002; Chiswick & Miller, 2009; Sanroma et al., 2015; Basilio et al., 2017), differences in the quality of education (Sweetman, 2004) or productivity (Chiswick & Miller, 1995; Dustmann & Van Soest, 2002), and discrimination (Aydemir & Skuterud, 2008; Bartolucci, 2014). Based on these findings, we expect that people with a migration background will generally estimate lower wages than natives. However, it is less clear how this will translate into relative wage differences expected for university versus vocational education. On the one hand, migrants may expect lower wages for both university and vocational education so that the perception of the relative premium for an academic vs. vocational degree is the same as for natives. On the other hand, studies have shown that migrants prefer academic education for their children (Abrassart et al., 2020). As in Becker's human capital theory, the decision of which educational path to choose, vocational or academic, is typically based on the expected rate of return of each option, i.e., people with a migration background may have relatively higher wage expectations for university education than natives.

In line with the previous argument, there is also evidence that people in Switzerland's French- and Italian-speaking regions are more likely to choose an academic education path (Abrassart et al., 2020; Cattaneo & Wolter, 2022). One possible reason is that residents of these regions expect higher relative earnings after university education. Following this line of thought, we expect residents of these two regions to estimate higher relative wages for university versus vocational education compared to residents of the German-speaking part, even though absolute wage expectations may be lower. However, one may also argue that, given that more people choose the academic path in the French- and Italian-speaking regions, returns for this path could be lower.

In general, we expect people's wage expectations for different educational paths to align with what they believe would have been their wages had they chosen that path. Similarly, we expect beliefs to align with what people think or wish would be their children's wages (or any other young adult's) if they chose a particular path. Associated with this, the literature on hypothetical scenarios

and beliefs shows that stated expectations and preferences tend to be close to actual realizations and indicative of people's actual choices and behavior (Wiswall & Zafar, 2016; Mas & Pallais, 2017).

Previous studies for or including Switzerland have investigated wage expectations for specific populations (e.g., Wolter, 2000; Wolter & Zbinden, 2002; Brunello et al., 2004; Schweri et al., 2011; Schweri & Hartog, 2017; Fernandes et al., 2021). More generally, the paper adds to the literature on the role of expected wages and returns when making educational decisions, including staying at school (Jensen, 2010), starting tertiary education (Attanasio & Kaufmann, 2014, 2017; Boneva & Rauh, 2018; Lergetporer et al., 2021; Schweri & Hartog, 2017), major and occupational choice (Arcidiacono et al., 2012; Wiswall & Zafar, 2015a, 2015b) or completing a tertiary degree (Wiswall & Zafar, 2016). In particular, it relates to work that analyzes the determinants of people's awareness of labor market prospects and beliefs about personal economic outcomes, such as wage expectations and parental education (Lergetporer et al., 2021) or gender differences (Reuben et al., 2017; Kiessling et al., 2019; Fernandes et al., 2021; Briel et al., 2022), and our paper also relates to studies for Switzerland that investigate individual perceptions of wage inequalities (e.g., Kuhn, 2011, 2020).

3 Institutional background

At the heart of the Swiss education system is a dual-track system, allowing students to choose between vocational and academic paths after completing lower secondary school. Vocational education is typically organized in two parts: an apprenticeship, where a significant fraction of the training takes place working in a host company, and the rest in a vocational school. However, vocational education can also be completed at a full-time vocational school. What sets apart the Swiss vocational education system from numerous other frameworks is its unique feature of bestowing an educational credential that enables further studies at the tertiary level. Students engaged in this track can choose to work toward a Federal Vocational Baccalaureate, which grants them the opportunity to pursue higher education, either at a University of Applied Sciences, at a University of Teacher Education, or a traditional academic university by undertaking an additional aptitude assessment to qualify for entry. Moreover, even in the absence of a vocational baccalaureate, they retain the option of embarking on a professional education and training pathway, by either attending a College of Higher Education or obtaining an Advanced Federal Diploma or Federal Diploma. These degrees fall under tertiary education in Switzerland—with associated labor market prospects.

The other option pupils have at the end of compulsory school is to follow a general (academic) education. For this, students can enroll either in an academic Baccalaureate school or in an upper-secondary specialized school. Schools in the academic track either require the successful completion of an entry test, which covers core subjects such as mathematics and language skills, or sufficiently high grades in these subjects at the end of primary or lower secondary school, with the exact rules depending on the canton and the type of school. The successful completion of a Baccalaureate school ensures access to all Swiss universities without an entry test (except for some specialized programs such as medicine or sports that require passing an aptitude test).

Several studies have investigated the returns to vocational and academic education in Switzerland; see, for example, Korber and Oesch (2019) or Saltiel (2021). The general conclusion is that vocational education leads to employment prospects that are very similar to academic education, but the earnings profiles over the life course are typically less steep for individuals with a vocational education background. Moreover, the complexity of the Swiss education system is reflected in individuals' knowledge about the system and expectations toward career prospects in the different paths. For example, Bolli and Rageth (2022) find that immigrants who tend to have less knowledge about the Swiss education system have lower preferences for vocational education, a result that is consistent with the findings of Abrassart et al. (2020). For a comprehensive description of the Swiss education system, including specific evidence on the transition to vocational and academic educational pathways, see also SKBF-CSRE (2023).

4 Data and methods

Our analysis builds on data drawn from the *Survey of Public Opinion on Education*, conducted between September and October 2019 (wave 1) and between June and July 2020 (wave 2) by the LINK Institute on behalf of the University of Bern in Switzerland. The survey was conducted online and based on the LINK Internet Panel. The final sample consisted of 9163 observations from all three language regions (German, French, and Italian) aged between 18 and 74. The sample is representative of Swiss citizens, with quotas for age, gender, region of residence, and education. The Italian-speaking region, the smallest in size (approximately 6% of the population), was over-sampled in the data collection to avoid small cell sizes and obtain more accurate estimates. We employ survey weights to ensure the sample's representativeness concerning the Swiss national population in all our analyses. We also control for possible differences between the two waves in the calculations, especially in the regressions

for wage perceptions, even though the distributions are almost identical in both waves despite the different circumstances due to the COVID-19 pandemic coinciding with the timing of the second wave.

We are interested in individuals' perceived labor market rewards for different educational paths and elicit wage perceptions for two different scenarios. We asked respondents what wage they believe, on average, a 30-year-old person with a vocational education degree earns, and what these earnings are for a 30-year-old with a university degree. In addition, we asked respondents about the same wage perceptions for a 50-year-old person. The latter can inform perceived long-term university premiums relative to vocational education or possible cohort premiums for current 30-year-olds compared to current 50-year-olds. More specifically, the two questions were:¹

How much do you think people with a university degree aged 30 (50) earn on average in Switzerland? Please estimate the gross monthly salary.

and

How much do you think people who follow vocational education after compulsory school earn on average in Switzerland at age 30 (50)? Please estimate the gross monthly salary.

In addition to the wage expectations, the survey contained questions on respondents' demographic and socioeconomic backgrounds. Apart from gender and age (included in four age groups: 18–29, 30–39, 40–49, 50+), we consider the person's highest education achieved (obligatory, vocational, academic), monthly household income (categorical: less than 6000 Swiss Francs, between 6000 and 10,000 Swiss Francs, and more than 10,000 Swiss Francs; plus a missing income category as defined by the LINK panel), the region of living (German-, French-, Italian-speaking), whether the respondent has children (yes/no), and whether the respondent has a migration background (yes/no)². The survey also

gathered information on the respondents' political orientation, risk and time preferences, and non-cognitive skills and traits, such as grit. In secondary analyses, we also investigated these variables as predictors of wage expectations, but none of them was significantly associated with the expected returns. Unfortunately, we do not have suitable information on respondents' occupations, which may be a relevant determinant of wage expectations, and therefore cannot investigate related reference points.

Table 1 shows basic summary statistics of the data. On average, respondents expect a monthly wage of approximately 7600 Swiss Francs for persons with an academic degree at age 30 and about 5300 Swiss Francs for persons of this age with a vocational degree. These numbers can be compared to statistics from the *Swiss Labor Force Survey* 2019, which show 7400 (7100) and 5800 (5600) Swiss Francs for the mean (median) monthly full-time wages in this age group for the two educational groups, respectively.³ Even though the median wages are below the means due to the skewness of the wage distribution, the order of magnitude seems comparable. If anything, people tend to estimate wages for persons with an academic degree on average slightly higher than the actual average, and slightly lower for persons with a vocational degree. For persons aged 50, respondents expect approximately 10,800 Swiss Francs with an academic degree and 6,700 Swiss Francs with a vocational degree, on average. Comparison values from the *Swiss Labor Force Survey* indicate for the means (medians) about 12,500 (10,900) and 7600 (7000) Swiss Francs, respectively. Thus, respondents' wage expectations for this age tend to be smaller than the actual averages.

The summary statistics show the anticipated distributions for gender, age, and region of residence. The data are also representative of educational background, with around 5% having an obligatory school degree, almost 69% with a vocational degree, and 26% with an academic degree. The income distribution also corresponds to our expectations, although it should be noted that approximately 15% of the respondents in the sample have missing income information. For this reason and to avoid losing a large fraction of the data, we include a dummy variable for missing income along with dummies for the other observed income categories in the regression models below. Finally, almost 60% of the respondents have children, and nearly 30% have a migration background.

In a first attempt to investigate our hypotheses stated in Sect. 2, Table 2 summarizes mean values of the wage expectations for the academic and vocational education

¹ There were only 4 to 14 missing values per question, i.e., negligible non-response in the stated wage expectations. However, there were several implausible answers, probably due to people not having read the question carefully and providing an estimate for the annual instead of monthly wages. We corrected this in the 2019 wave by transforming large values into monthly salaries. In the 2020 wave, the survey design restricted respondents' answers to be below a maximum value and alerted them to think again if their initial answer was below a lower or above an upper threshold.

² Only people with Swiss citizenship were included in the survey (about 75% of the entire population). We define persons as having a migration background if they were born abroad or born in Switzerland but have foreign-born parents (country of birth and country of birth of parents were included in the survey); see Federal Office of Statistics (2022) for details on the population with migration background.

³ In the calculations using the *Swiss Labor Force Survey*, tertiary degrees (universities, universities of applied sciences, and universities of teacher education) are included in the academic category.

Table 1 Description of variables and basic summary of the data

	Mean	Std.Dev
<i>Main outcome variables</i>		
Wage expected at age 30 with academic education	7602.5	2380.7
Wage expected at age 30 with vocational education	5308.9	1435.0
Relative wage difference expected at age 30	0.463	0.462
Wage expected at age 50 with academic education	10,817.0	4016.2
Wage expected at age 50 with vocational education	6715.1	1839.6
Relative wage difference expected at age 50	0.646	0.608
<i>Demographic and socioeconomic background</i>		
Female (yes/no)	0.492	
<i>Age</i>		
18–29	0.214	
30–39	0.135	
40–49	0.277	
50+	0.374	
<i>Educational background</i>		
Obligatory	0.046	
Vocational	0.690	
Academic	0.264	
<i>Monthly household income</i>		
Less than 6000	0.246	
6001–10,000	0.334	
More than 10,000	0.263	
Missing	0.157	
Parent (yes/no)	0.595	
Migration background (yes/no)	0.272	
<i>Region of living</i>		
German	0.721	
French	0.238	
Italian	0.041	
Number of observations	9163	

Source: Survey of Public Opinion on Education 2019–2020

The table reports mean values (standard deviations) of the variables shown. Main outcomes are respondents' expectations of the wage for persons with an academic or a vocational education background at age 30 or 50. Relative wage differences are calculated as the ratio of the wage expected for persons with an academic over the wage expected for persons with a vocational education background (minus 1). Respondents' educational background is based on the highest education achieved or current education attended. Respondents' household income is surveyed in categorical form as shown

profiles, and means of the relative wage differences between the two (in percent converted to decimal values), for different subgroups of the population. Men, on average, expect higher wages than women for academic wages in particular, and, as a consequence, the relative differences in wage expectations are also higher for them. We observe an age gradient, with the older age groups (40+) expecting higher wages and relative wage differences. Educational background influences wage expectations as well. On the one hand, people with a particular background (academic or vocational)

seem “better” at estimating the wages of persons with the same profile, with smaller deviations to statistics of the *Swiss Labor Force Survey* for the respective educational backgrounds. On the other hand, there is likely an individual reference point since respondents with obligatory schooling as highest education achieved have the lowest wage expectations. That the personal context matters in forming wage expectations is also confirmed by the other subgroups, with higher income groups, non-migrants, people with children, and from the German-speaking region on average expecting higher wages for both education profiles than their counterparts.

Building on these descriptive statistics, we will aim in the following sections to better understand the distribution of wage expectations for the two education profiles. Methodologically, we will consider log-linear regressions for the wages expected for each educational background, and linear regressions for the relative differences in wage expectations. In the regression models, we include the respondents' background characteristics shown in Table 1 as explanatory variables, i.e., instead of the simple bivariate comparisons by subgroup shown in Table 2, we regression-adjust the comparisons. More formally, we specify the models as follows:

$$\log(\text{wage expectation}) = x'\beta + u \quad (1)$$

with x denoting the vector of explanatory variables, β denoting the vector of parameters that describe the association of the background characteristics with the wage expectations (interpreted in relative terms when multiplied by 100% due to the log-linear functional form), and u denoting an error term. We run the regression shown in (1) separately for the wage expectations respondents have for persons with an academic or a vocational education background at ages 30 and 50, i.e., four regressions in total.

For the relative differences in wage expectations, we specify the same type of regression model but replace the dependent variable with the ratio of the wage expected for a person with an academic background and the wage expected for a person with a vocational education background. Similar to Eq. (1), we estimate the model once for a person's expectations at age 30 and once for the expectations at age 50, allowing for age-specific heterogeneity in the parameters to describe the relative differences in wage expectations. In further analyses (results available upon request), we estimated pooled versions of these regressions by calculating an average of the wage expectations at ages 30 and 50, but the results are robust to this alteration of the dependent variable.

Table 2 Heterogeneity in wage expectations over selected subgroups

	Age 30			Age 50		
	Academic	Vocational	Relative difference	Academic	Vocational	Relative difference
<i>Gender</i>						
Male	7723 (2372)	5360 (1375)	0.471 (0.467)	10,972 (3894)	6774 (1775)	0.654 (0.594)
Female	7478 (2383)	5256 (1493)	0.454 (0.456)	10,657 (4133)	6654 (1902)	0.637 (0.622)
<i>Age</i>						
18–29	7172 (2241)	5250 (1255)	0.389 (0.408)	9843 (3774)	6577 (1916)	0.530 (0.568)
30–39	7163 (2010)	5120 (1270)	0.421 (0.390)	10,159 (3544)	6567 (1476)	0.563 (0.510)
40–49	7753 (2278)	5317 (1282)	0.485 (0.470)	11,159 (3875)	6739 (1542)	0.685 (0.602)
50+	7897 (2589)	5405 (1669)	0.503 (0.500)	11,359 (4273)	6830 (2091)	0.713 (0.652)
<i>Educational background</i>						
Obligatory	6901 (2875)	5094 (2449)	0.438 (0.736)	9241 (4057)	5966 (1983)	0.597 (0.757)
Vocational	7752 (2445)	5293 (1390)	0.494 (0.471)	11,105 (4221)	6671 (1794)	0.698 (0.637)
Academic	7336 (2048)	5387 (1301)	0.385 (0.352)	10,340 (3286)	6961 (1886)	0.519 (0.464)
<i>Monthly household income</i>						
Less than 6,000	7267 (2681)	5050 (1462)	0.468 (0.534)	10,123 (4248)	6321 (2050)	0.647 (0.698)
6001–10,000	7791 (2304)	5320 (1402)	0.495 (0.450)	11,196 (4036)	6702 (1683)	0.701 (0.605)
More than 10,000	7806 (2123)	5552 (1315)	0.434 (0.408)	11,263 (3686)	7155 (1704)	0.605 (0.529)
<i>Family status</i>						
Non-parents	7344 (2311)	5262 (1413)	0.425 (0.467)	10,299 (3954)	6619 (1827)	0.588 (0.605)
Parents	7779 (2411)	5341 (1449)	0.488 (0.456)	11,169 (4020)	6780 (1846)	0.685 (0.607)
<i>Migration background</i>						
Non-migrants	7725 (2398)	5350 (1444)	0.476 (0.477)	11,005 (4032)	6749 (1797)	0.666 (0.616)
Migrants	7275 (2303)	5199 (1404)	0.426 (0.414)	10,315 (3931)	6625 (1947)	0.593 (0.583)
<i>Region of living</i>						
German	7955 (2371)	5461 (1371)	0.490 (0.474)	11,284 (4087)	6867 (1849)	0.683 (0.619)
French	6759 (2157)	4970 (1456)	0.390 (0.422)	9785 (3560)	6419 (1707)	0.556 (0.581)
Italian	6307 (2098)	4607 (1818)	0.409 (0.402)	8584 (3335)	5759 (1926)	0.515 (0.480)
Number of observations	9163					

Source: Survey of Public Opinion on Education 2019–2020

Notes: The table reports mean values (standard deviations) of wages expected for persons with an academic or a vocational education background at age 30 or 50 and related relative differences by subgroup indicated in the first column. See also the notes of Table 1

5 Results

We will first present the results of Eq. (1) using ordinary least squares regressions, i.e., focusing on the mean of the distribution of wage expectations. In a second step, we will consider quantile regressions because, as seen in Tables 1 and 2, there is substantial dispersion in the distribution of wage expectations, possibly driven by respondents' background characteristics. In a final step, we will present a supplementary analysis exploring the potential implications of high (or low) wage expectations in determining respondents' preferences for academic over vocational education.

5.1 How do average wage expectations differ by subgroups of the population?

Table 3 shows that women expect between 1.4 and 2.5% lower wages than men for persons with a vocational

and an academic education background, respectively. This result holds conditional on the other covariates in the model, i.e., differences are not driven by, for example, differences in educational achievements or household income. However, even though gender differences are more considerable in wage expectations for persons with an academic background, the differences are relatively modest and not big enough on the individual level to translate into significant relative differences in wage expectations between the academic and vocational education backgrounds.

Regarding age, we confirm the gradient found descriptively above. People in the age groups 40–49 and 50+ have significantly higher wage expectations for people with an academic background than the younger age groups. However, when looking at the expectations for a vocational education profile, this gradient disappears

Table 3 Linear regression results for wage expectations

	Age 30			Age 50		
	Academic	Vocational	Relative difference	Academic	Vocational	Relative difference
Female	−0.0251*** (0.0061)	−0.0167*** (0.0046)	−0.0137 (0.0101)	−0.0244*** (0.0071)	−0.0139** (0.0047)	−0.0110 (0.0132)
<i>Age (reference: 18–29)</i>						
30–39	−0.0202 (0.0106)	−0.0303*** (0.0080)	0.0086 (0.0168)	0.0061 (0.0125)	−0.0010 (0.0086)	−0.0005 (0.0216)
40–49	0.0456*** (0.0103)	0.0026 (0.0076)	0.0665*** (0.0182)	0.0885*** (0.0116)	0.0198* (0.0081)	0.1140*** (0.0223)
50+	0.0596*** (0.0102)	0.0135 (0.0077)	0.0808*** (0.0168)	0.1029*** (0.0115)	0.0290*** (0.0082)	0.1391*** (0.0212)
<i>Educational background (reference: obligatory)</i>						
Vocational	0.0923*** (0.0188)	0.0422** (0.0157)	0.0318 (0.0366)	0.1434*** (0.0201)	0.0921*** (0.0143)	0.0670 (0.0386)
Academic	0.0643*** (0.0192)	0.0611*** (0.0161)	−0.0512 (0.0361)	0.1107*** (0.0206)	0.1317*** (0.0148)	−0.0750 (0.0391)
<i>Monthly household income (reference: less than 6000)</i>						
6001–10,000	0.0708*** (0.0085)	0.0500*** (0.0060)	0.0184 (0.0141)	0.0969*** (0.0099)	0.0578*** (0.0064)	0.0407* (0.0187)
More than 10,000	0.0825*** (0.0088)	0.0904*** (0.0064)	−0.0285 (0.0147)	0.1161*** (0.0103)	0.1153*** (0.0068)	−0.0318 (0.0195)
Parent	0.0233** (0.0076)	0.0088 (0.0057)	0.0201 (0.0133)	0.0261** (0.0086)	0.0124* (0.0058)	0.0194 (0.0164)
Migration background	−0.0252*** (0.0069)	−0.0104* (0.0051)	−0.0234* (0.0106)	−0.0277*** (0.0079)	−0.0093 (0.0055)	−0.0296* (0.0144)
<i>Region of living (reference: German)</i>						
French	−0.1588*** (0.0074)	−0.0976*** (0.0056)	−0.0889*** (0.0113)	−0.1293*** (0.0084)	−0.0661*** (0.0057)	−0.1097*** (0.0150)
Italian	−0.2245*** (0.0107)	−0.1772*** (0.0087)	−0.0736*** (0.0149)	−0.2591*** (0.0120)	−0.1758*** (0.0085)	−0.1570*** (0.0184)
<i>F-test overall significance</i>	91.0***	81.6***	22.0***	94.0***	82.3***	31.0***
<i>R-squared</i>	0.118	0.096	0.029	0.113	0.101	0.041
Number of observations	9163					

Source: Survey of Public Opinion on Education 2019–2020

The table reports estimated coefficients from linear regression models for the log of wages expected for persons with an academic or a vocational education background at age 30 or 50 (as indicated in the column headers) and for the related relative differences of wage expectations as dependent variables (see also the notes of Table 1). All regressions control for a year effect (2020 vs. 2019) and missing income information. Robust standard errors are shown in parentheses. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

or becomes much weaker and is mostly insignificant. Therefore, and in contrast to the gender gap in wage expectations, these results translate into a significant age gradient in the relative wage expectations between academic and vocational education.

A potential explanation for the age gradient in wage expectations could be a returns-to-experience effect, with older individuals typically having higher wages until age 50 when earnings profiles flatten out. However, this does not necessarily explain the age gradient in the relative wage expectations because earnings profiles could be

similar in both educational paths. Another explanation could be a cohort effect, with a trend observed in more recent years toward academic education. If the personal context matters, then the older age groups may be more likely to have higher wage expectations and overestimate the “average” wage for an academic profile. At the same time, the younger age groups may be more likely to have biased views of the vocational profile. This explanation is at least partly confirmed in the regressions when looking at the respondents’ education, household income, and parental background. For example, for education,

we find that respondents with a vocational, as opposed to academic background, expect wages for persons with an academic profile to be around three percentage points higher. In contrast, they expect wages to be about 2–4 percentage points lower for persons with a vocational education profile. The asymmetry in the wage expectations translates into relative differences in wages expected for academic compared to vocational education backgrounds, which are significantly higher for those with a vocational background.

Additionally, consistent with our hypothesis, we find significantly lower wage expectations in the French- and Italian-speaking parts of Switzerland than in the German-speaking part, irrespective of the education profiles. However, in contrast to our expectations based on revealed preferences through educational choices (academic education being the more prominent path in the French- and Italian-speaking parts), we find that the wages expected for an academic are relatively higher than wages expected for a vocational education background in the German-speaking part.

Finally, concerning migration background, we confirm our hypothesis that migrants, on average, have lower wage expectations than natives for both education profiles, but more so for persons with an academic profile. For this reason, we also find significantly lower relative differences in wage expectations for migrants than for natives. Note that the regression models control for other socioeconomic and demographic backgrounds, i.e., differences in these characteristics between the migrant and native populations cannot explain the differences found by migration background. However, a potential explanation for the differences between natives and migrants could lie in the comparison to realized returns, where the factors mentioned above, such as quality and acknowledgment of foreign education, or discrimination, possibly translate into actual returns paid in the labor market. If migrants have internalized those factors, they may also express lower wage expectations, and even more so for academic backgrounds.

5.2 Are there heterogeneities in the distribution of wage expectations?

The results of the previous section highlight which subgroups of the population have higher or lower wage expectations on average for persons with an academic or vocational education background. However, the analysis provides little information on differences in the wider distribution of wage expectations, absolute and relative, for the two education profiles. To shed light on this question, we will consider these distributions in more detail, first graphically by using boxplots, and then using

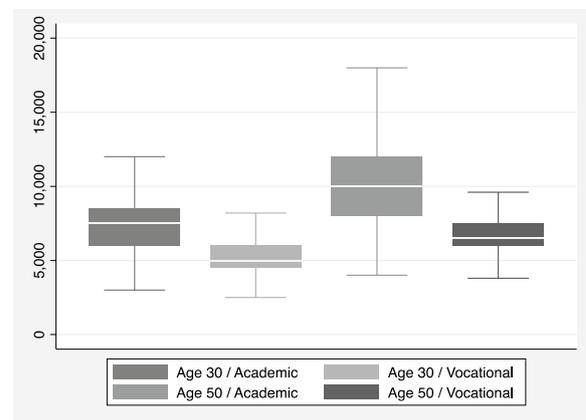


Fig. 1 Distribution of wage expectations. *Source:* Survey of Public Opinion on Education 2019–2020. *Notes:* The figure shows boxplots of the distribution of the wage expected for persons with an academic or a vocational education background at age 30 or 50. The boxes show the first quartile (lower end of the box), median (white line), and third quartile (upper end of the box) in the distribution, respectively. The whiskers show the smallest/largest values in the distribution that are not considered outliers according to the 1.5x interquartile range rule. For example, the median wage expected for persons with an academic background at age 30 is 7500 Swiss Francs, the first quartile is 6000 Swiss Francs, and the third quartile is 8500 Swiss Francs

quantile regressions to study the heterogeneity in the distributions by subgroups of the population.

Figure 1 displays the distributions of wage expectations for the two education profiles (academic/vocational) and the two reference ages (30/50) in boxplots. Several patterns can be inferred. First, wage expectations have a much wider spread for the academic than the vocational education profile, indicating a high degree of uncertainty in the expectations, especially for persons with an academic profile. Second, compared to the actual mean wages for persons with a vocational education profile at age 30 or 50 (5,800 and 7,600 Swiss Francs, respectively; see above), wage expectations seem to be relatively low, even though there are respondents who estimate wages for this group also significantly higher. Third, and in contrast to the expectations for the vocational education profile, wage beliefs for persons with an academic profile seem to be better aligned with actual mean wages observed for this group (7400 and 12,500 Swiss Francs, respectively). The pattern of the wage expectations for the two education profiles translates into relatively large relative differences in expectations between the two educational backgrounds, especially at age 30, as shown in the left boxplot in Fig. 2. This result is particularly striking because, if interpreted as an individual short-cut estimate of the returns to academic vs. vocational education (as in Psacharopoulos, 1981), this would provide evidence

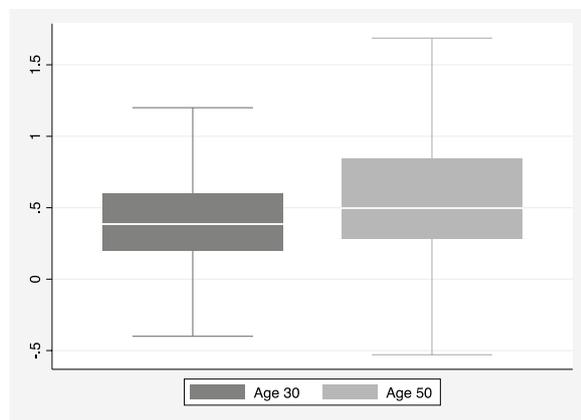


Fig. 2 Distribution of relative differences in wage expectations. *Source:* Survey of Public Opinion on Education 2019–2020. *Notes:* The figure shows boxplots of the distribution of the relative differences of the wage expected for persons with an academic over the wage expected for persons with a vocational education background at age 30 or 50. For a description of the boxplots, see the notes of Fig. 1. As a reading example, the median relative difference of the wage expected for persons with an academic over the wage expected for persons with a vocational background at age 30 is 0.38 (i.e., 38% larger for academic vs. vocational), the first quartile is 0.2, and the third quartile is 0.6

of an overestimation of the actual returns to academic vs. vocational education, which are estimated at around 20%, or less, in the literature (e.g., Perini, 2014; Saltiel, 2021; SKBF-CSRE, 2023).

In the next step, we consider the results of the quantile regressions. Figures 3a–d display the estimated regression coefficients (and 95% confidence intervals) from the 5th to 95th percentile of the distribution of wage expectations for the academic and vocational education profiles at age 30 and 50 using the same specifications as in Table 3. The results indicate that subgroup differences in wage expectations found in the linear regressions are relatively stable over the entire distribution, especially for the vocational education profile, with the exception of educational background, age, and household income that show heterogeneities across the distribution of wage expectations.

While individuals under 40 have homogeneous wage expectations, those in the 40+ age range are similar to those younger only regarding the lower wage expectations. The differences are more dispersed with increasing age toward the higher wage expectations, especially for the academic education profile, and more so for the wage expectations at age 50 than age 30. Explanations for this age pattern could again be personal reference points with a wage-experience effect, but also potential cohort effects. The age pattern in the dispersion of wage expectations directly translates into differences in the

distribution of the relative differences between the two education profiles (see Fig. 4), indicating comparatively higher wages expected for persons with an academic than a vocational education background with increasing age of the respondents.

In contrast, the differences in wage expectations by household income and educational background are more pronounced in the lower parts of the distribution, while the wage expectations are more homogeneous in the 80th and higher percentiles. This holds for the academic profile at both ages. On the other hand, differences in the distribution of wage expectations for the vocational education profile do not differ much for individuals with different household incomes or educational backgrounds.

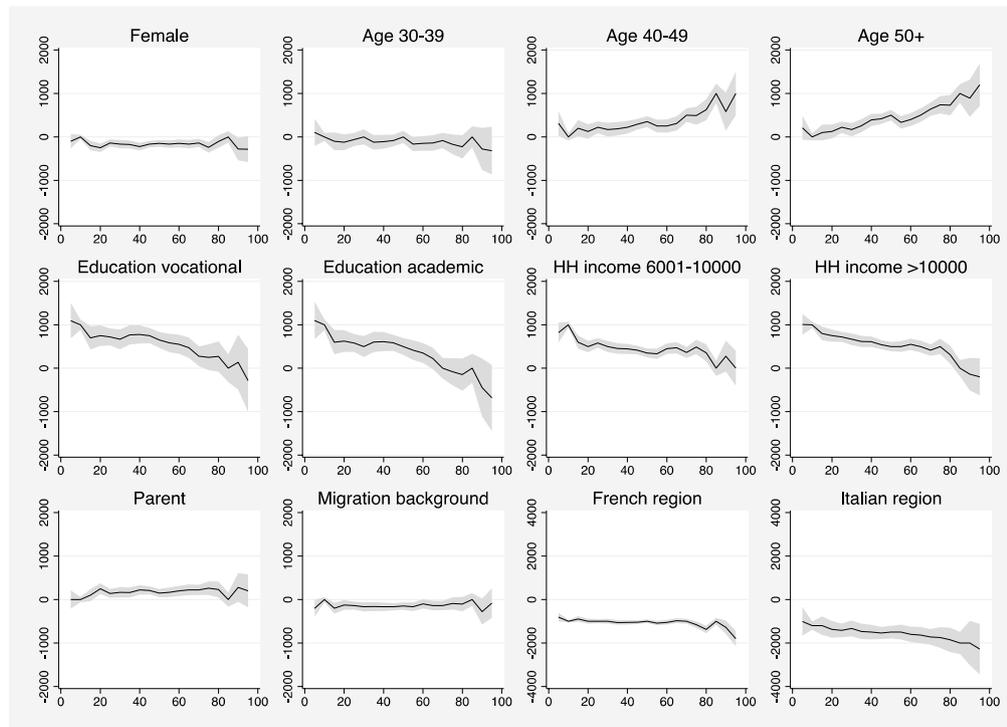
5.3 Are wage expectations associated with preferences for educational pathways?

Building on the literature that studies the role of wage expectations in determining educational decisions, we use respondents' stated preferences for academic over vocational education. More specifically, respondents were asked in the 2019 wave of the survey whether they would prefer general or vocational education for their children (hypothetically for those without children). Answer categories were: (1) baccalaureate schools, (2) rather baccalaureate schools, (3) rather apprenticeship, or (4) apprenticeship. Based on this information, we created a simple binary variable indicating categories (1) or (2) (academic) vs. (3) or (4) (vocational), as in Cattaneo and Wolter (2022), and we used this variable as a dependent variable in logistic regression models. Since the question was embedded in an information experiment, we only used the subsample of the data in the control group, without additional information to influence respondents' preferences. As regressors, we used the socioeconomic and demographic characteristics shown in Table 1. In addition, we included the wage expectations for persons with an academic or vocational education profile (or their relative difference) to study whether wage beliefs are associated with educational preferences.⁴

Table 4 summarizes the results. Column (1) shows the average probability changes for the subgroups listed in the rows relative to the reference group for all background variables, i.e., without including the wage expectations. Consistent with earlier results of Cattaneo and Wolter (2022), there is no indication of differences in

⁴ It should be noted that there may be a dynamic aspect in how wage expectations and educational preferences are associated, i.e., parents may consider future developments in the labor market and anticipate the labor market prospects for different occupations when advising their children. Unfortunately, our data do not allow us to investigate this question further, but future research may address how parents build their wage expectations depending on the decision context.

a) Wage expected for persons with an academic education background at age 30



b) Wage expected for persons with a vocational education background at age 30

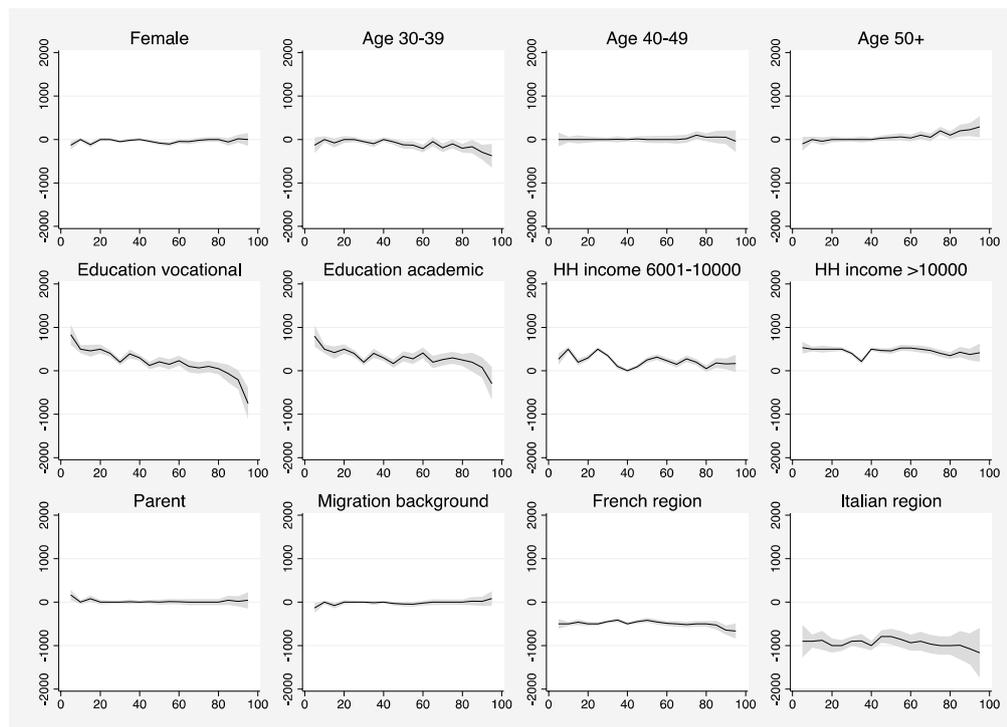
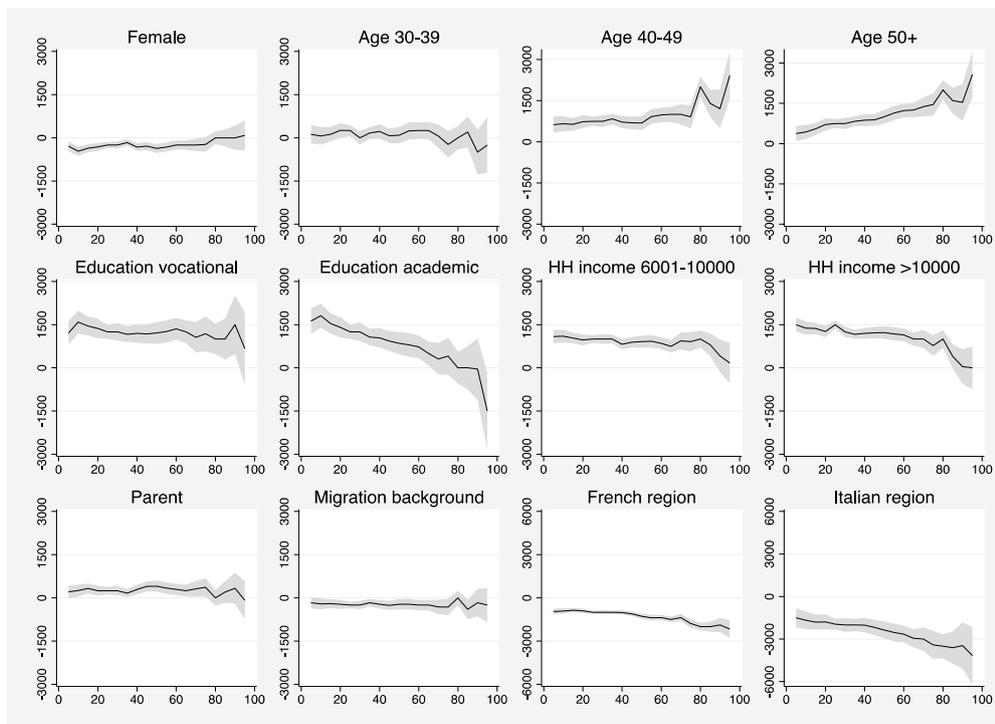


Fig. 3 Quantile regression results for wage expectations. *Source:* Survey of Public Opinion on Education 2019–2020. *Notes:* The figure shows estimated coefficients (and 95% confidence intervals) of quantile regressions for wages expected for persons with an academic or a vocational education background at age 30 or 50 (subfigures a–d). All quantile regressions control for a year effect (2020 vs. 2019) and missing income information

c) Wage expected for persons with an academic education background at age 50



d) Wage expected for persons with a vocational education background at age 50

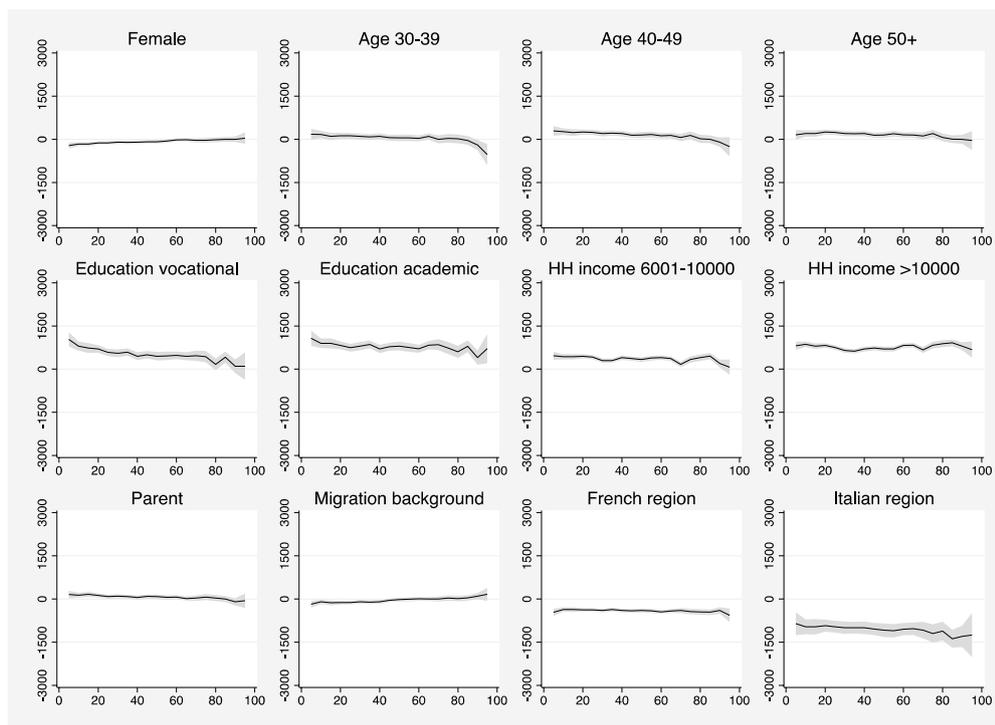
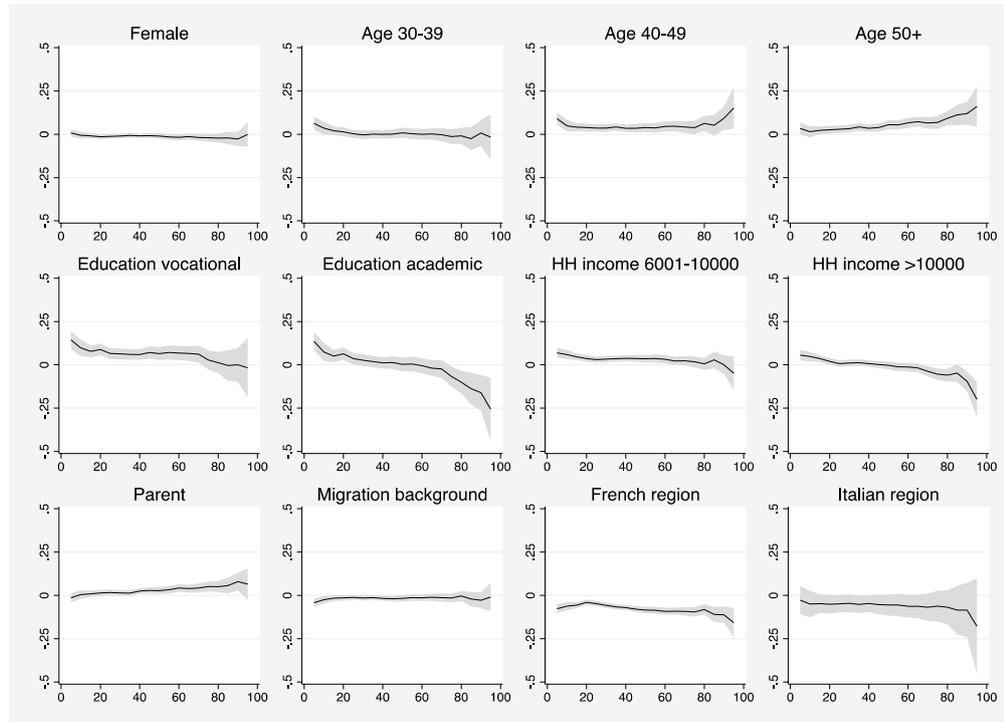


Fig. 3 continued

a) Relative difference in wage expectations at age 30



b) Relative difference in wage expectations at age 50

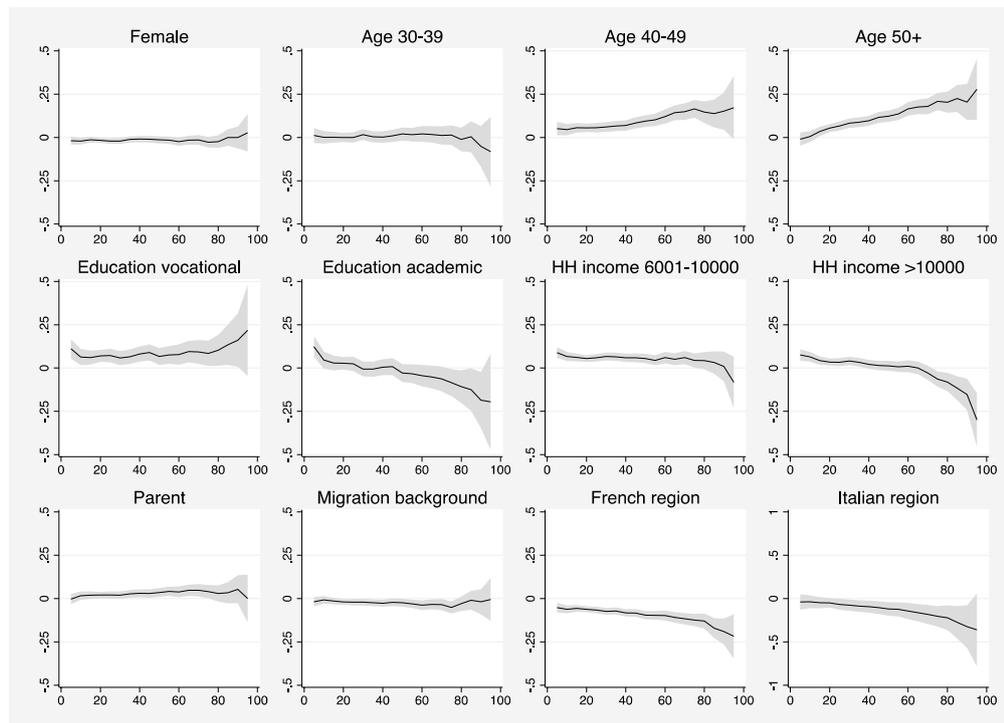


Fig. 4 Quantile regression results for relative differences in wage expectations. *Source:* Survey of Public Opinion on Education 2019–2020. *Notes:* The figure shows estimated coefficients (and 95% confidence intervals) of quantile regressions for the relative differences of the wage expected for persons with an academic over the wage expected for persons with a vocational education background at age 30 or 50. All quantile regressions control for a year effect (2020 vs. 2019) and missing income information

Table 4 Logistic regressions for preferences for academic vs. vocational education

	(1)	(2)	(3)	(4)	(5)
Female	−0.0004 (0.0253)	−0.0007 (0.0252)	−0.0001 (0.0252)	−0.0024 (0.0252)	−0.0008 (0.0251)
<i>Age (reference: 18–29)</i>					
30–39	0.1408** (0.0446)	0.1365** (0.0446)	0.1386** (0.0445)	0.1409** (0.0442)	0.1423** (0.0440)
40–49	0.1687*** (0.0407)	0.1602*** (0.0409)	0.1558*** (0.0412)	0.1591*** (0.0408)	0.1502*** (0.0409)
50+	0.2040*** (0.0403)	0.1941*** (0.0405)	0.1905*** (0.0407)	0.1924*** (0.0403)	0.1857*** (0.0403)
<i>Educational background (reference: obligatory)</i>					
Vocational	−0.1206* (0.0564)	−0.1347* (0.0569)	−0.1479* (0.0586)	−0.1390* (0.0565)	−0.1517** (0.0572)
Academic	0.1893** (0.0623)	0.1815** (0.0627)	0.1697** (0.0644)	0.1834** (0.0622)	0.1717** (0.0630)
<i>Monthly household income (reference: less than 6000)</i>					
6,001–10,000	0.0176 (0.0328)	0.0191 (0.0328)	0.0137 (0.0330)	0.0138 (0.0327)	0.0032 (0.0327)
More than 10,000	0.0458 (0.0359)	0.0519 (0.0360)	0.0456 (0.0364)	0.0493 (0.0359)	0.0325 (0.0366)
Parent	0.0015 (0.0313)	0.0017 (0.0314)	0.0001 (0.0315)	−0.0003 (0.0311)	−0.0021 (0.0310)
Migration background	0.0957*** (0.0284)	0.0949*** (0.0283)	0.0961*** (0.0283)	0.0960*** (0.0284)	0.0990*** (0.0283)
<i>Region of living (reference: German)</i>					
French	0.0356 (0.0306)	0.0430 (0.0305)	0.0525 (0.0312)	0.0436 (0.0303)	0.0537 (0.0304)
Italian	0.0750 (0.0476)	0.0810 (0.0474)	0.0950 (0.0490)	0.0867 (0.0479)	0.1120* (0.0495)
<i>Age 30</i>					
Relative wage difference		0.0703* (0.0299)			
Log(wage expectation academic)			0.1593** (0.0489)		
Log(wage expectation vocational)			−0.0926 (0.0616)		
<i>Age 50</i>					
Relative wage difference				0.0676** (0.0226)	
Log(wage expectation academic)					0.1774*** (0.0415)
Log(wage expectation vocational)					−0.0607 (0.0594)
<i>Chi-squared test overall significance</i>	116.3***	121.0***	124.8***	122.7***	130.1***
<i>Pseudo R-squared</i>	0.073	0.077	0.079	0.079	0.083
Number of observations	1511				

Source: Survey of Public Opinion on Education 2019

The table reports average discrete probability changes for all explanatory variables after logistic regressions for the respondent's probability of preferring academic over vocational education. For a description of the variables, see Table 1. All regressions control for a year effect (2020 vs. 2019) and missing income information. Robust standard errors are shown in parentheses

Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

educational preferences by gender, region of living, income, and family background. However, older individuals, those with an academic background, and migrants prefer academic over vocational education for their children. Adding the relative difference in wage expectations between the academic and vocational education profiles to the regression (column (2)) shows a significant and positive coefficient; an increase in the relative difference by one percentage point is associated with an increase in the probability of preferring academic education by about 0.07 percentage points. While this association seems small, the distribution of the relative differences in Fig. 2 shows an interquartile range in the relative wage expectations of 0.6. Thus, the order of magnitude for changes in educational preferences taking into account this range is up to 4.2 percentage points and, hence, even larger than the differences in educational preferences observed between age groups 40–49 and 30–39, i.e., in that age range when respondents likely provide most guidance to their children in terms of educational decisions.

Looking separately at the wage expectations for academic and vocational education profiles shows that it is mainly the former driving educational preferences, independent of the age reference. This result is particularly relevant since it confirms that wage expectations, especially for the academic track, which requires more initial investments due to the track-specific access restrictions, are significantly associated with educational preferences and, hence, may influence educational decisions.

6 Conclusion

In this paper, we investigate wage expectations for academic and vocational education backgrounds in Switzerland. Our results suggest significant heterogeneity in the distribution of wage expectations for given education profiles by gender, age, socioeconomic status, language region, and migration background. The formation of wage expectations seems to be related to reference points, i.e., context (demographic, personal, social, economic) matters for the expressed wage beliefs. One of the most striking results is that relative differences in wage expectations between the academic and vocational education profiles are also widely dispersed. These results are important for education policy because our analyses of educational preferences for the own (hypothetical child) show that wage expectations, especially for the academic profile, are positively associated with these preferences. This has implications regarding mismatches in the education system if, for example, the ambition for the child's education does not coincide with the child's abilities and skills but is misled by too high (or too low) wage expectations for the one or the other education path. This, in turn, can lead to poor school performance,

early dropouts, reduced labor market chances, and related long-term impacts at the individual and societal levels. Policy-makers, therefore, should have an interest in increasing wage transparency to avoid biased wage beliefs, a misallocation of resources, and to empower people to make better-informed decisions.

Abbreviations

OECD Organisation for Economic Co-operation and Development
SKBF-CSRE Swiss Coordination Centre for Research in Education

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Author contributions

The article is single-authored and, thus, the author is responsible for all its contents.

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Availability of data and materials

The data used in the study are proprietary and cannot be shared in the public domain.

Declarations

Competing interests

The author declares to have no competing interests.

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