
Vol. 00, No. 0, Xxxxx 0000, pp. 000–000
ISSN 0025-1909 | EISSN 1526-5501 | 00 | 0000 | 0001

INFORMS

DOI 10.1287/xxxx.0000.0000
© 0000 INFORMS

Authors are encouraged to submit new papers to INFORMS journals by means of a style file template, which includes the journal title. However, use of a template does not certify that the paper has been accepted for publication in the named journal. INFORMS journal templates are for the exclusive purpose of submitting to an INFORMS journal and should not be used to distribute the papers in print or online or to submit the papers to another publication.

Are Women to Blame for Preserving the Glass Ceiling? The Gender Pay Gap and the Mediating Role of Pay Expectations Among Top Business School Students in a Top Gender-Equal Country

Emelie Fröberg

House of Innovation, Department of Entrepreneurship, Innovation and Technology, Stockholm School of Economics, Sveavägen 65, PO Box 6501, SE-113 83 Stockholm, Sweden. Phone: +46 8 736 90 00, emelie.froberg@hhs.se

Jenny Säve-Söderbergh

The Swedish Institute for Social Research, Stockholm University, SE-10691 Stockholm, Sweden, jenny.save-soderbergh@sofi.su.se, jennys@sofi.su.se

Richard Wahlund

Department of Marketing and Strategy, Stockholm School of Economics, Sveavägen 65, PO Box 6501, SE-113 83 Stockholm, Sweden. Phone: +46 8 736 90 00, richard.wahlund@hhs.se

Understanding the origins of the glass ceiling and the gender pay gap is fundamental to achieving gender equality. A large body of literature documents a gender gap in pay expectations that is likely to influence the subsequent pay gap. Top business school alumni also experience a glass ceiling. However, little is known about the direct link between pay expectations and subsequent pay. Using rich panel data, we first show that even among a subset of highly competitive students at a top business school in Sweden, there is a persistent sticky gender gap in career entry pay expectations, robust to controlling for a large set of employer and student characteristics. This is also true for pay expectations referring to the same named employer. Second, we provide a causal link showing that, in contrast to male students, female students do not adjust their pay expectations when the mean pay of contemporary female graduates improve. Third, the very same sample of female students, with lower pay expectations than male students, later attain lower career entry pay than the male students. Fourth, the gap in career entry pay is fully mediated through pay expectations, even after adding controls for contemporary pay at the most-preferred employer, field of study, working abroad, preferred industry, grade point average, and working hours. Although we cannot claim a causal interpretation, our study's policy implications are to use early interventions to boost women's pay expectations, as expectations on career entry pay were stated years before the actual pay was realized.

Key words: Gender Pay Gap, Glass Ceiling, Career Entry Pay Expectations, Gender Equality

History: This paper was first submitted on March 16, 2021.

1. Introduction

There is a consensus among many countries that gender equality is a fundamental human right and that achieving it would lead to a "peaceful, prosperous and sustainable world" (United Nations 2015). Yet, even forty years after the women's liberation movement, women face a pay gap in most countries.¹ In one of the most gender-equal countries in the world—Sweden (e.g., Adams and Funk 2012, Kleven et al. 2019)—women are at least as educated as men, both male and female parents take parental leave, and there is almost equal representation by gender in the government (Swedish Institute 2019). Nevertheless, in Sweden, women are paid 89 percent of what men are paid (Statistics Sweden 2018) and, albeit lower, a gender gap also persists after controlling for differences in education and work-related characteristics. In developed countries, including Sweden, the gender pay gap mainly derives from the glass ceiling effect, a metaphor of the invisible ceiling that prevents women from advancing to top positions with top pay and that the top of the pay distribution is over-represented by men (e.g., Anderson et al. 2019, Albrecht et al. 2003, Albrecht et al. 2015, Arulampalam et al. 2007, Blau and Kahn 2017, Boschini et al. 2020, Christofides et al. 2013, Fortin et al. 2017).² Understanding the origins of the glass ceiling effect and the gender pay gap is thus a fundamental aspect of achieving gender equality (e.g., Kiessling et al. 2019, Sterling and Fernandez 2018), especially seeing that more female managers, or role models, with high pay have been shown to reduce inequalities (see, e.g., Auspurg et al. 2017, Cohen and Huffman 2007, Joshi et al. 2015, McGinn and Milkman 2013, Meier et al. 2017).

Previous research shows that, as students, young women expect to be paid less than men before even entering the job market and that the gender gap in *ex ante* pay expectations could drive the gender gap in subsequent outcomes (e.g., Filippin and Ichino 2005, Chevalier 2007, Kiessling et al. 2019, Major and Konar 1984, Osikominu and Pfeifer 2018). However, little is known about the direct link between early expectations and subsequent outcomes. Illuminating to what extent and how early expectations reflect a glass ceiling or gender pay gap is particularly important to guide interventions. If a glass ceiling is expected among young individuals before entering the

¹See Blau and Kahn (2017) for a recent review and OECD (2019) for recent international data.

²Other evidence of a glass ceiling is that even when female executives possess superior skills, they earn less than male executives although their economic benefits to firms are higher (Schmid and Urban 2018, cf. Carter et al. 2010).

job market, they may behave accordingly, and thus the mere expectation of a glass ceiling may perpetuate differences by gender in the future. In particular, pay expectations could drive career, employer and industry choices. This, in turn, may influence school effort, or later, job effort. Another consequence of expecting a gender gap in future pay may be different behaviors when negotiating career entry pay. Consequently, if there is a gender gap in expectations that mediates subsequent pay, interventions need to be made early to reduce the gender pay gap, the glass ceiling and, ultimately, improve gender equality.

In this paper, we study top business school students in a gender-equal country that still has a glass ceiling, posing the following research questions: (a.) Is there a gender gap in expected pay? (b.) Does improved mean pay among similar alumni influence expected pay? (c.) Is there a gender gap in career entry pay? and (d.) Is career entry pay mediated by pay expectations?

To study our research questions, we rely on rich panel data where individuals are surveyed both as students and subsequently as alumni at the highest-ranked business school in Scandinavia.³ Alumni from this business school have historically attained high positions in the Swedish and, to some extent, the international, society and economy.⁴ The business school is highly competitive in terms of admittance (more or less top grades exclusively are required), thus a benefit of our study context is that it focuses on the groups likely to be competitive and that end up being the people who are particularly likely to hit a glass ceiling.⁵ We rely on panel data from six annual student surveys (2014 to 2020) with a total of 4,366 responses and six annual alumni surveys (2014 to 2019) of all alumni within five first years upon graduation, with a total of 4,656 responses. Expected career entry pay is matched with actual career entry pay on an individual level for a total of 1,224 alumni responses. We thus exploit unique panel data to link the same individual in

³All programs of the school have the highest rating in the Financial Times Business Education Ranking among all ranked programs in Scandinavia. The school is also part of several networks of leading business schools in Europe and worldwide. Moreover, in 2020, The Swedish Higher Education Authority released a report about returns to education and showed that the business school had a higher payoff than other education programs in Sweden—with a premium of 20 percent compared to the second-best school after adding several controls (UKA 2020).

⁴Table EC.1 in the appendix shows labor market outcomes for the 2009 cohort of students 2, 3—10, and more than 10 years after graduation. Although there are gender gaps in several outcomes, women graduating from the school also have good labor market opportunities: 28 percent of women have top management positions after 10 years, including 15 percent (of the total respondents) who have board member positions. However, men are more likely to land these positions after 10 years; 51 percent of male graduates hold upper management positions. Similarly, although men are more likely to earn pay in the highest category (above 1,000,000 SEK in yearly pay), at 45 percent versus 32 percent, female students could reasonably expect to have a well-paid career upon attaining a degree from the business school. See more in Wahlund (2010).

⁵Further benefits of our context is that the education is free for all European citizens (we add controls for non-European students in our models and these are just a small proportion of our samples), so there are no financial constraints hindering admission to start with (cf. Delavande and Zafar 2019). The dropout is also low and the proportion of students with a job upon graduation is high, so students believe in a career upon admission (cf. Gong et al. 2020, Jacob and Wilder 2010, Kunz and Staub 2020, Stinebrickner and Stinebrickner 2012).

terms of expectations as a student of a future career and pay and the subsequent labor market outcome as a graduate. To account for different observable achievements during their studies and to the extent it may be a proxy for ability, we also link administrative records of the students' grade point averages to their career outcomes.

We provide four sets of results. First, we find a significant, substantial, and persistent gender gap in both expected and actual career entry pay among these top business school students in Sweden. Years before having a job, female students expect to be paid 88 percent of their male counterparts for their first full-time job after graduation. This implies that even women who have applied for, thus self-selected into, a business school that has a high probability of leading to a top job, already at the outset of their schooling expect to be paid a lower monthly pay for their *first* job than their male student counterparts expect to be paid. This gender gap in pay expectations is robust. It persists at 93 percent when controlling for observable achievements during studies, the student's preferred industry and employer, and learning over time.

Second, when exploiting the panel data structure further by estimating fixed-effects models, we provide causal evidence of both male and female students raising their own pay expectation when alumni at their most-preferred employer are doing better. Notably, only male students raise their own pay expectation when this improvement is relatively more oriented towards female graduates than male graduates. Female students instead are insensitive in forming their expectations as to these relative improvements by gender. Thus, we find a notable inflexibility in the pay expectations of female students. In combination with male students' revision of their expectations, the overall effect is a sticky gender gap in expectations even before embarking on a career.

Third, we find that female students are paid less than their male counterparts in their first job, despite completing a degree from the same top business school, with the same grade point average, working in the same industry, in the same position, with the same field of study, after controlling for selecting different employers and working different hours. Female graduates are paid around 97 percent of what male graduates from the same school are paid in their first year upon graduation after adding all these controls.

Fourth, analyzing if the early expectations are reflected in the career entry pay, our mediation analysis shows that while there is only a weak direct effect of gender on alumni pay, there is a strong indirect effect of gender on pay mediated through the pay expectations. This mediating effect is also robust to controlling for the mean pay of alumni working at the most-preferred employer at that time. Our results thus show that a student with lower pay expectations starts their career with

lower alumni pay than a similar student who starts a job with the same characteristics, who has accomplished the same grades during the studies, and who has the same observable characteristics in terms of field of study and age. While we cannot claim that these findings are necessarily causal, we emphasize that the expectations were formed years before the actual pay was realized and as the mean pay of alumni at the time of forming the expectations are exogenous, we can address some of the empirical issues that would otherwise work against a causal interpretation of our findings.

In all, our study contributes in general to the rich literature on the gender pay gap (e.g., Bertrand et al. 2010, Blau and Kahn 2017, Fortin et al. 2017, Hoisl and Mariani 2017, Kleven et al. 2019, Sterling and Fernandez 2018), the glass ceiling (e.g., Adams and Funk 2012, Albrecht et al. 2003, Arulampalam et al. 2007, Christofides et al. 2013, Schmid and Urban 2018), and, especially, the gender gap in pay expectations of students (see e.g., Chevalier 2007, Filippin and Ichino 2005, Kiessling et al. 2019, Jackson et al. 1992, Major and Konar 1984, Osikominu and Pfeifer 2018). Similar to this rich literature, we also document a gender pay gap in expectations among students. Notably, we find the same level of raw gender gap in average, career-entry-pay expectations as was found among a large sample of German students (Kiessling et al. 2019). We extend this finding by showing that the gender gap in expectations is associated with the outcome *for the same student*. Previous research has found a contemporaneous and consistent gender gap in pay expectations with a gender pay gap among alumni in Italy (Filippin and Ichino 2005) and among students in Germany (Kiessling et al. 2019). To the best of our knowledge, this is the first study to follow the same individual, thus documenting a direct relationship between the gender gap in pay expectations and the gender pay gap. A student who, years before working, expects a lower future pay at a named employer also ends up with a lower realized pay than a student who expects higher pay at the same employer. This result is robust to a large set of student and employer characteristics. Finally, our study contributes to previous literature by providing new evidence that the gender gap in expectations is sticky; over their time as students, women do not change their pay expectations when the labor market becomes better for a highly similar contemporary peer group while men do.

The remainder of the paper is organized as follows. Section 2 describes the data and provides summary statistics while Section 3 reports the results. Section 4 discusses our findings and Section 5 offers concluding remarks.

2. Data

We merge data from three registries: (a.) the *Student Panel*; (b.) the *Alumni Panel*; and (c.) administrative records. The final dataset includes unique identifiers of individuals and employers

(with at least five employed alumni), such that responses are anonymous to the researchers, but individuals and employers can be tracked for empirical analyses. In this section, we first describe the student panel participation and the mechanics of the survey, and second, likewise, the alumni panel. We then describe the administrative records. Finally, we provide summary statistics of our data. In the appendix, we provide more detailed descriptions of the measures.

2.1. Student Panel

2.1.1. Participants. Our pay expectations data are gathered from an annual survey—hereafter referred to as the *Student Panel*—that has been carried out from 2014 to 2020, except for 2015, among all B.Sc. and M.Sc. students at the school. The response rate has varied between 27 percent (2014) and 44 percent (2020). In the Electronic Companion (EC), Table EC.2, reports details on observations in each year, the number of students in the total population, number of responses and the response rate, split by gender.⁶ Response rates are, in general, lower for students who have studied longer than more recently admitted students.

2.1.2. Materials. The questionnaire aims at capturing students' aspirations and expectations of a future career: the most attractive employer to them, what industries to work in, the importance of different characteristics of the employers and work offers, how they wish to work, how they wanted to be informed by employers and in what countries they wish to work.

More importantly, students were asked about their expected career entry pay (this question is referred to as Q1):

"When you get your first job after having completed your [Degree] at [the Business School], what full-time salary before taxes do you then expect to get, in today's monetary value?"

Full-time salary (pay) expectation is our dependent variable after currency and time conversion.⁷ Students also report their three most-preferred (unranked) industries (out of nine possible), their top three preferred employers, and whether they have a Swedish, an EU or a non-EU citizenship. We use also a different version of the above measure to measure pay expectations at a named top employer. Upon providing the name of the most-preferred employer, participants were also asked (referred to as Q2):

⁶We remove outliers; we keep stated expected monthly pay between 10,000 SEK and 200,000 SEK.

⁷From 2020, participants can report this in SEK, USD or EUR, and choose between an annual or monthly basis. We use conversion rates of 10.51 and 9.62 for EUR and USD, respectively. The great majority reports in SEK.

”What full-time salary in [currency] do you think you would get from this employer for a full-time job after having completed your [Degree] at [Business School], before taxes and in today’s monetary value? State the [monthly/annual] salary you expect to get.”

2.1.3. Procedure. The surveys have been distributed digitally via Qualtrics between January to March every year (but 2015). Several reminders were sent each time, the final two from the president of the business school. Participants were offered a chance to win a gift voucher for dinner at a nice restaurant for two people, for literature or a movie ticket.

2.2. Alumni Panel

2.2.1. Participants. Our actual pay data are gathered from an annual survey—hereafter referred to as the *Alumni Panel*—that has been carried out from 2014 to 2019 among all alumni five years after finishing their degree. In the electronic companion in Table EC.3, we show the distribution of the surveyed alumni. We have a total of 4,656 responses (75 percent, of a total of 6,214 possible responses). However, because we aim to investigate the outcome for the first job after graduating of the students answering the *Student Panel*, we limit our analysis to employed participants and their first response per individual—thus exploring career entry pay. In total, we have 1,777 non-missing responses.⁸

2.2.2. Materials. The *Alumni Panel* is used for the ”Placement Report” or ”Employment Report” of the business school. Participants are asked to self-report information about their current employment status, working conditions and pay. The variables we use are the monthly gross pay in SEK (before taxes, not including bonuses, commissions or other benefits), if the alumni work abroad or in Sweden, job experience in terms of time (or years since graduation), work industry, working hours (including overtime hours), employer, and company size.

We exploit that contemporary alumni pay is exogenous to student expectations by estimating measures of *EmployerPay*, *RelativePay*, and *GenderRatio*. This estimate is done as follows. For each year and employer, we calculate the average pay among the alumni (meaning students who graduated from the school and reported their pay in the *Alumni Panel*), in total and by gender. We match these measures based on the most-preferred employer for each participant and year in the *Student Panel*. The *EmployerPay* is the mean pay of alumni working at the most-preferred employer in the year the student is forming their pay expectation. For example, the mean pay

⁸We remove outliers; we keep stated monthly pay between 10,000 SEK and 200,000 SEK.

among all alumni who work at employer "A" in 2017 is a proxy for the contemporary employer pay of a student who preferred to work for employer "A" in 2017. We use the natural logarithm in all analyses. We estimate *RelativePay* as the mean female-graduate pay per employer, divided by the mean male-graduate pay per employer in each year for the most-preferred employer in that year (thus requiring both female- and male-graduate-reported pay among the 25 most-preferred employers). If the *RelativePay* is above 1 (below 1), female graduates are paid more (less) than male graduates at their most-preferred employer in that year, on average. In our data, this measure varies between 0.7–1.70. Finally, we estimate the *GenderRatio* as the ratio of the average employer pay by gender to the total average employer pay, matched with preferred employer, year and gender. If a female student prefers to work for employer "A" with an average total pay of 38,000 SEK, a female-average pay of 34,200 SEK and a male-average pay of 41,800 SEK, she would face a gender ratio of 0.9, whereas a male student would face a gender ratio of 1.1. This way, we account for the fact that male and female students are observing different employer pay related to their gender.

2.2.3. Procedure. Telephone interviews were used during the spring and summer every year to collect responses and to ensure a high response rate. Data are stored in a database governed by the program office.

2.3. Administrative Records

Apart from the above survey data, we access administrative records for all surveyed students and alumni, including gender, birth year, admission grades, grade point average (GPA) in early 2020 (for alumni, that means the final GPA), and field of study.

2.4. Summary Statistics

Starting with the *Student Panel*, Table 1 reports summary statistics for all 6 survey years. Combined, we have 3,950 observations with non-missing values on our variables of importance over all 6 years from 2,511 students. Out of these, 2,301 are observations from male students (1,436 individuals), and 1,649 are observations from female students (1,076 individuals).

We find a large difference in average pay expectations between male and female participants. On average, male students expect to earn around 39,900 SEK per month (about 49,800 USD per year) compared to 35,200 SEK per month (about 43,900 USD per year) among female students (note that both are higher than the median and average pay in Sweden; see more below). Female students thus expect to earn 88 percent of what male students expect. This difference amounts to

Table 1 Summary Statistics of All Student Panel Participants

	Mean/sd	All min	max	Men Mean/sd	Woman Mean/sd	T-test p-value
Expected Pay	37962.86 (10851.13)	10000	120250	39941.51 (11306.12)	35201.86 (9521.25)	0.00
Age	23.14 (2.97)	17	64	23.21 (3.24)	23.03 (2.54)	0.05
Study Years	1.94 (0.93)	1	4	1.95 (0.94)	1.92 (0.91)	0.33
BSc BE	0.41 (0.49)	0	1	0.44 (0.50)	0.37 (0.48)	0.00
BSc RM	0.10 (0.29)	0	1	0.07 (0.25)	0.14 (0.35)	0.00
MSc Fin	0.12 (0.33)	0	1	0.16 (0.37)	0.07 (0.26)	0.00
MSc IB	0.07 (0.26)	0	1	0.07 (0.25)	0.08 (0.26)	0.36
MSc MBM	0.15 (0.36)	0	1	0.12 (0.32)	0.20 (0.40)	0.00
MSc ECON	0.07 (0.26)	0	1	0.07 (0.25)	0.08 (0.28)	0.03
MSc Acc	0.08 (0.27)	0	1	0.08 (0.27)	0.07 (0.25)	0.16
Swedish	0.74 (0.44)	0	1	0.73 (0.44)	0.75 (0.44)	0.35
EU citizen	0.17 (0.37)	0	1	0.19 (0.40)	0.13 (0.34)	0.00
Non-EU citizen	0.09 (0.29)	0	1	0.07 (0.26)	0.12 (0.33)	0.00
Finance	0.52 (0.50)	0	1	0.62 (0.48)	0.38 (0.48)	0.00
Media	0.19 (0.39)	0	1	0.13 (0.34)	0.27 (0.45)	0.00
Consulting	0.69 (0.46)	0	1	0.73 (0.44)	0.63 (0.48)	0.00
Manufactur	0.14 (0.34)	0	1	0.17 (0.37)	0.09 (0.29)	0.00
IT	0.21 (0.41)	0	1	0.26 (0.44)	0.14 (0.35)	0.00
Accounting	0.10 (0.30)	0	1	0.10 (0.30)	0.09 (0.29)	0.30
Marketing	0.28 (0.45)	0	1	0.17 (0.38)	0.44 (0.50)	0.00
Public Adm	0.18 (0.39)	0	1	0.18 (0.38)	0.19 (0.39)	0.22
Other Industry	0.24 (0.43)	0	1	0.22 (0.41)	0.28 (0.45)	0.00
GPA	4.03 (0.43)	2	5	4.06 (0.44)	3.99 (0.42)	0.00
<i>N</i>	3950			2301	1649	3950

Notes: Standard deviations in parenthesis

approximately 4,700 SEK per month, approximately 490 USD per month or about 5,900 USD per year. There is a larger variation in pay expectations among men than women. A Kolmogorov test of the equality of the distributions of pay expectations by male and female students is also rejected ($p < .0001$).

Yet, Table 1 also shows a large heterogeneity between which program male and female participants are enrolled in at the school. At the B.Sc level, more male participants (44 percent) compared to female participants (37 percent) study Business and Economics (BE) compared to Retail Management (RM) (7 and 14 percent, respectively). At the M.Sc. level, slightly more male participants are enrolled in Finance (Fin) (16 and 7 percent, respectively). More female participants are enrolled in Management (MBM) (12 and 20 percent, respectively) and Economics (ECON) (7 and 8 percent, respectively). Female and male participants also differ in citizenship; male participants are less likely to come from a non-EU country (7 and 12 percent, respectively) and more likely to come from an EU country (19 and 13 percent, respectively) than female participants. There was no gender difference in the length of study when the students answered the survey (1.95 and 1.92 years, respectively). Table 1 further shows large discrepancies by gender in the choice of the three most-preferred industries to apply to upon graduation. Male participants are more likely to choose finance (62 vs. 38 percent), consulting (73 vs. 63 percent), IT (26 vs. 14 percent), and manufacturing (17 vs. 9 percent) while female participants prefer media (13 vs. 27 percent) and marketing (17 vs. 44 percent) industries. Finally, male participants have a slightly higher GPA than female participants (4.06 vs. 3.99 out of 5.0).

In the *Alumni Panel*, we have 1,777 observations with non-missing values on our variables of importance over all 5 years (we only keep the first observation if one graduate has responded several times). Out of these, 1,069 are observations from male graduates, and 708 are observations from female graduates. In total, we link prior pay expectations on an individual level for 902 individual career entry pay levels. The average difference between participating in the *Student Panel* and participating in the *Alumni Panel* is at least 1.7 years (over 20 months), 95 % CI [1.64, 1.77].⁹

Table 2 reports a raw gender pay gap after graduation. On average, male alumni earn 40,800 SEK compared to 35,400 SEK among female alumni; women thus earn 86.8 percent of what men earn in career entry pay. The raw difference by gender in actual pay is about 5,400 SEK on average (about 560 USD per month or 6,700 USD per year). Notably, female and male alumni who have

⁹The responses for the *Student Panel* was collected during the winter, whereas responses for the *Alumni Panel* was collected during the spring and summer. Excluding participants where the time between responding to the *Student Panel* and the *Alumni Panel* is less than 13 months does not change reported results.

graduated from this top business school are, on average, paid more than an average (median) Swede, paid 35,300 SEK (31,700 SEK) per month in 2019 (Statistics Sweden 2020) even though the participants are only at the beginning of their careers. This higher pay confirms that these students are more likely to end up in the jobs in which a glass ceiling may pertain. Note here that the expected pay is gathered several years earlier. Because both the alumni pay and expected pay are in nominal terms, a difference is expected due to inflation.

Table 2 Summary Statistics of All Participants in the Alumni Panel

	Mean/sd	All min	max	Men Mean/sd	Woman Mean/sd	T-test p-value	Student Panel Mean/sd
Alumni Pay	38644.80 (13101.29)	10104	130865	40787.07 (13942.84)	35410.23 (10958.57)	0.00	37951.34 (11776.78)
Expected Pay	36713.51 (10218.68)	12500	90000	39044.76 (10470.73)	33316.16 (8809.77)	0.00	36713.51 (10218.68)
Abroad	0.43 (0.50)	0	1	0.46 (0.50)	0.38 (0.49)	0.00	0.45 (0.50)
Job Finance	0.26 (0.44)	0	1	0.33 (0.47)	0.17 (0.37)	0.00	0.26 (0.44)
Job Consulting	0.30 (0.46)	0	1	0.30 (0.46)	0.29 (0.46)	0.66	0.34 (0.47)
Job IT	0.05 (0.21)	0	1	0.05 (0.22)	0.05 (0.21)	0.74	0.04 (0.19)
Job Retailing	0.07 (0.26)	0	1	0.04 (0.21)	0.12 (0.32)	0.00	0.07 (0.26)
fewer than 50 emp	0.19 (0.39)	0	1	0.19 (0.40)	0.19 (0.39)	0.78	0.17 (0.38)
50-499 emp	0.16 (0.37)	0	1	0.15 (0.36)	0.18 (0.39)	0.04	0.17 (0.38)
500-4 999 emp	0.15 (0.35)	0	1	0.15 (0.36)	0.14 (0.34)	0.27	0.14 (0.34)
5 000-49 000 emp	0.26 (0.44)	0	1	0.27 (0.44)	0.25 (0.44)	0.48	0.28 (0.45)
+50 000 emp	0.24 (0.42)	0	1	0.23 (0.42)	0.24 (0.43)	0.87	0.24 (0.43)
Working Hours	52.74 (12.89)	8	105	54.73 (12.88)	49.73 (12.32)	0.00	52.89 (12.34)
Senior Position	0.09 (0.28)	0	1	0.10 (0.31)	0.06 (0.25)	0.00	0.12 (0.33)
Middle Position	0.17 (0.38)	0	1	0.17 (0.38)	0.17 (0.38)	0.97	0.11 (0.31)
Junior Position	0.59 (0.49)	0	1	0.58 (0.49)	0.62 (0.49)	0.09	0.68 (0.47)
Other Position	0.15 (0.36)	0	1	0.15 (0.36)	0.15 (0.36)	0.96	0.09 (0.29)
<i>N</i>	1777			1069	708	1777	902

Notes: Standard deviations in parenthesis

Table 2 also shows a large heterogeneity in the male and female students' work patterns as alumni. The most important differences are found in pay and working hours. Male graduates work, on average, 55 hours per week while women work 50 hours per week; thus, both work overtime¹⁰, yet men estimate to work more hours than women. Male and female graduates also work in different industries to some extent; while men more often have a job in finance (33 percent vs. 17 percent), women have jobs more often in retail (4 percent vs. 12 percent). In terms of career climbing, there is no average difference by gender in reaching a junior, middle or senior position as alumni. The large bulk of the sample has a junior position; 58 percent of male participants and 62 percent of female participants. To compare the representativeness of the students who answered both the *Student Panel* and the *Alumni Panel*, the last column solely compares the matched subset of participants who participated in both the *Student Panel* and the *Alumni Panel*. Alumni pay is lower among those *Student Panel* participants, even though they have responded, on average, 1.78 years later than non-participants, 95% CI [1.68, 1.89]. However, more importantly, participation in both panels or only the *Alumni Panel* does not differ based on gender $\chi^2(1, N = 1,777) = 0.11, p = 0.743$.

In Table EC.4, we also display background characteristics of the alumni when they were students. We note some differences in educational background among female graduates; a smaller share of responding graduates have studied the BE-program than the sample of women answering the *Student Panel* (only student survey, or both student survey and alumni survey). Instead, there is a larger share of women who have studied the MBM-program, and to some extent, the ACC-program, in the alumni sample compared to the *Student Panel* sample. This pattern can also be seen among men. Hence, there is no concern about the representativeness across survey samples with regards to gender. Finally, there is a great similarity between the realized outcome and the expected outcome, on average, when comparing the industries in which the alumni worked and their expectations about which industry they preferred to work in. The gender gap found in the preferred industry among the students where male and female students aspired towards different industries is the same later across alumni. On average, only to a small extent (a difference of three percent among men and five percent among women) have aspirations of a future job industry not corresponded to the realized job industry. For both men and women, a slightly larger share ended up in jobs in the consulting industry, while a slightly smaller share ended up in jobs in the finance sector compared to the shares aspired to by the students.

Finally, in Table 3 we show summary statistics of the mean pay among similar alumni, the *EmployerPay*, the *RelativePay* and the *GenderRatio*.¹¹ The following observations are made.

¹⁰The regular hours per week according to Swedish law is 40, see law 1982:673.

¹¹In Table EC.5 we show the same statistics based on the seven education programs instead of the most-preferred employer.

First, male students prefer employers with higher mean pay among similar alumni compared to female students. The gap in *EmployerPay* is 91.5 percent. Second, there is a small difference in the relative pay, where the preferred employers of male students have somewhat higher gender equality. Among the most-preferred employers, gender equality varies between 0.67 to 1.82 with a median of 0.92 and a mean of 0.98. Third, and as expected, male students are able to observe male graduates with higher pay than the female graduates whom female students are able to observe within the same employer.

Table 3 Summary Statistics of Contemporary Alumni Pay

	Mean/sd	All min	max	Men Mean/sd	Woman Mean/sd	T-test p-value
Employer Pay	44906.80 (8769.58)	24000.00	60717.79	46485.27 (8096.21)	42547.93 (9206.20)	0.00
Relative Pay (0.7-1.7)	1.00 (0.16)	0.70	1.70	1.01 (0.16)	0.99 (0.15)	0.03
Gender Ratio	1.00 (0.07)	0.68	1.36	1.00 (0.06)	0.99 (0.08)	0.00
<i>N</i>	1115			668	447	1115

Notes: Standard deviations in parenthesis

3. Results

In this section, we report our results under four separate headings. We first estimate the gender gap in expected pay using the *Student Panel*. Second, we estimate a causal link between changes in the gender gap in expected pay and older peers similar to the groups we study attaining higher mean pay and if that increase in pay was larger for female relative to male peers. Third, we estimate the successive outcomes in terms of pay of the students as alumni using the *Alumni Panel*. Finally, we estimate a model showing how the realized pay among alumni is mediated by the expectations of a student set years prior using our matched data.

3.1. Student Expectations of Career Entry Pay

To address our question of whether there is a gender gap in pay expectations, we employ pooled OLS or random-effects linear regression models using controls for individuals' characteristics and aspirations, ultimately employing the following empirical specification:

$$\begin{aligned}
 \ln(\text{ExpectedPay})_{it} = & \alpha_0 + \beta_1 \text{Female}_i + \beta_2 \text{Edu}_{it} \\
 & + \beta_3 \text{Citizen}_i + \beta_4 \text{StudyYear}_{it} + \beta_5 \text{Industry}_{it} + \beta_6 \text{GPA}_{it} \\
 & + \beta_7 \text{Top5Company}_{it} + \gamma_t + v_{it} + \epsilon_{it}
 \end{aligned} \tag{1}$$

All variables are defined in the appendix, except that we also add γ_t for yearly fixed effects, v_{it} for individual random effects, and that the standard errors ϵ_{it} are clustered on individuals. We report the results of the regression analysis in Table 4. We show regression estimates only for the variable of interest—the female dummy coefficient (β_1)—for expected pay. Table EC.6 displays all estimates of the control variables.

Table 4 Regression Analysis of Students' Expected Pay

	Pooled				RE
	ln Expected Pay (1)	ln Expected Pay (2)	ln Expected Pay (3)	ln Expected Pay (4)	ln Expected Pay (5)
Female	-0.121 (0.010)***	-0.071 (0.010)***	-0.069 (0.010)***	-0.066 (0.010)***	-0.077 (0.010)***
Year FE	Yes	Yes	Yes	Yes	Yes
Controls Industry	No	Yes	Yes	Yes	Yes
Controls Edu	No	Yes	Yes	Yes	Yes
Controls Citizen	No	Yes	Yes	Yes	Yes
Controls StudyYear	No	Yes	Yes	Yes	Yes
Controls GPA	No	No	Yes	Yes	Yes
Controls Top5Employers	No	No	No	Yes	Yes
OBS.	3950	3950	3950	3950	3950
R2	0.091	0.193	0.204	0.220	
ADJUSTED R2	0.089	0.188	0.199	0.214	
INDIVIDUALS					2511
R2-WITHIN					0.135
R2-BETWEEN					0.221

Notes: Clustered standard errors in parentheses

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

Model 1 of Table 4 shows pooled regression results in which we only control for yearly fixed effects according to survey year, thus accounting for differences in expectations over time. We thus control for inflation, market conditions or other changes in exchange rates of foreign currencies over the years. We find that the average gender gap in expected pay is over 12.1 percent (equivalent to 4,800 SEK or 500 USD per month).

3.1.1. Different Career Choices Within the Top Business School. As shown in Table 1, female students, to a larger extent than male students, self-sort into fields of study and preferred industries with potentially lower pay. Gender percentages also varied according to nationality. Because students in their first year(s) may think about the pay they could expect in the future, after years of study when pay levels could be expected to increase in general, or indulge in more wishful thinking, or be less aware of reasonable pay levels than older students, years of study may also

influence expectations (discussed further below). Therefore, in Model 2 of Table 4, we control for the field and year of study, whether the participant is Swedish, an EU citizen or a non-EU citizen, and industry dummies for the most-preferred industries for a future job (the respondent can choose three industries among eleven as their most-preferred industry). Accounting for all these variables largely reduces the gender gap to 7.1 percent (2,800 SEK or 290 USD per month). Not unexpectedly, the gender gaps in field of study and preferred future job-industry help explain a significant portion of the gender gap in pay expectations. On the other hand, the expectations gap is only to a small degree explained by pay expectations among students from other cultural backgrounds; the great majority of participants are raised in one of the most gender-equal countries in the world, and the expectations gap remains after adding controls for background. The gender gap in pay expectations is thus accounted for by the field of study men and women choose, citizenship, and the industry the students aspire to work in. However, a large share of the gender gap remains unaccounted for by these factors. This gender gap is also constant across the expected pay distribution, suggesting that it is not driven differently by those expecting the lowest or the highest future pay.¹²

3.1.2. Observable Achievements During Studies. One explanation for the gender gap above could be that, even if all students are high-achievers based on the school's admission requirements, male and female students make different observable achievements in terms of grades once admitted to the business school. Some potential mechanisms could be that male students put in more effort in their course work, courses could be more male-oriented, for example, by the material or examples being more useful related to male than female students, or teachers could exhibit a positive bias towards male students when grading exams and/or assignments. In addition, there could be a stronger positive selection in terms of ability among male students compared to female students admitted into the school (as admission score may simply be a lower bound in measuring ability). In Model 3 of Table 4, we add a control for the student's GPA. Although a higher grade point average is associated with expecting higher future pay, the gender gap remains essentially unchanged from that shown previously at 6.9 percent (2,800 SEK or about 290 USD per month). Consequently, observable achievement while studying in terms of grades, or to the extent grades reflect ability, only accounts for the gender gap in pay expectations to a limited extent.

¹²This analysis is done by estimating quantile regression models of the pay expectations following the model specification in Table 4. We find that the gender gap in pay expectations is, in fact, constant across the distribution of pay expectations, apart from an increase at the very top of the distribution (although this increase is not statistically significantly different from the gender gap across the other parts of the distribution).

3.1.3. Different Preferred Future Employers. One reason to favor a certain employer is that the employer offers a higher pay. Even if female and male students attend the same education, want to work for the same industry, and achieve the same GPA during the school years, it could be that male and female students differently self-sort to employers (companies or similar) that offer different benefits, and that higher expected pay is driven by expectations of working at employers with higher pay. If male students are systematically more interested in finding employers offering higher pay, that could drive a pay gap in expectations between genders. Therefore, in Model 4 of Table 4, we add controls for having preferred any of the five most popular (unique) employers. The unaccounted gender gap as to pay expectations is then still high at 6.6 percent (2,600 SEK or about 270 USD per month). At the same time, when analyzing pay expectations of each most-preferred employer, we find that those wanting to work for the second, third, fourth and fifth most-popular employers have lower expectations for future pay compared to less popular employers. The reason may be that other factors than pay levels make some employers more attractive to many students, and that other employers offering higher pay attract fewer students. Thus, adding all 25 most-preferred, employer-specific dummies (see Table EC.7), shows that different preferences for future employer significantly reduce the gender gap in pay expectations to 5.2 percent (2,400 SEK or 250 USD per month). Pay expectation differences by gender can, in part, be explained by men and women aiming for different, well-paying employers, but it does not close the gap.¹³

3.1.4. Learning over Time. Some reasons why years of study may influence pay expectations have been mentioned, leading to including years of study as a control variable. At the same time, each year of study may give the students different experiences, having different effects on expected pay. For example, new students may be much more uncertain, unaware of where their education may lead or more ignorant about actual pay levels, making pay expectations simply strong guesses. Potentially then, in guessing, the gender gap is driven by female students guessing a lower expected pay while male students guess a higher expected pay as a result of lack of knowledge or realistic insights. Yet, presumably, the longer the student has been at the school, the more opportunity that student has to learn more about the market potential of being a student there, leading to male and female beliefs becoming more similar and the gender gap disappearing.

To address this concern, we consider if and how the pay expectations evolve during studies at the school and if they evolve differently by gender. Note that we account for year fixed effects, accounting for time differences in answering the survey.

¹³In Model 5 of Table 4, we also show that the gender gap in pay expectations remains after accounting for individual random effects, as opposed to using a pooled OLS regression. Note that standard errors are clustered at the individual level in all models. We again find that the gender gap is statistically significant at more or less the same level as when using the pooled OLS specification with clustered standard errors.

Table 5 Panel Regression Analysis of Students' Expeted Pay using Random and Fixed Effects Models

	RE-model	RE-model	Male FE	Female FE
	ln Expected Pay	ln Expected Pay	ln Expected Pay	ln Expected Pay
	(1)	(2)	(3)	(4)
Female	-0.077 (0.010)***	-0.085 (0.013)***		
Studyyear=2	-0.014 (0.008)	-0.024 (0.009)*	-0.012 (0.018)	-0.016 (0.030)
Studyyear=3	-0.028 (0.009)**	-0.025 (0.012)*	-0.008 (0.034)	-0.073 (0.058)
Studyyear=4	-0.030 (0.014)*	-0.038 (0.019)*	-0.042 (0.056)	-0.111 (0.074)
Female x Studyyear=2		0.024 (0.015)		
Female x Studyyear=3		-0.007 (0.017)		
Female x Studyyear=4		0.021 (0.025)		
Controls Industry	Yes	Yes	Yes	Yes
Controls Edu	Yes	Yes	Yes	Yes
Controls Citizen	Yes	Yes	Yes	Yes
Controls GPA	Yes	Yes	Yes	Yes
Controls Top5Employer	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
OBS.	3950	3950	2301	1649
R2			0.159	0.223
ADJUSTED R2			0.148	0.209
INDIVIDUALS	2511	2511	1436	1076
R2-WITHIN	0.135	0.137	0.159	0.223
R2-BETWEEN	0.221	0.222	0.072	0.040

Notes: Clustered standard errors in parentheses
 * p<0.05, ** p<0.01, *** p<0.001

Table 5 shows the results of the same models as above with dummy variables for the student's year of study when answering the question. We find that, compared to those answering the survey during their first year at the school, the updated beliefs of the expected pay move in the negative direction, and the differences are statistically significant between year 1 and the following years. To test if this updating of beliefs over the years of study differs by gender, we add interaction effects between the study year and gender in Model 2. Accounting for a gendered pattern in updating the belief of the expected pay during the years in school, we find a constant average difference by gender in pay expectations and no statistically significant difference by gender in updating beliefs over time. Further exploiting the panel data structure, we estimate fixed-effect models for male and female students separately in Models 3 and 4. With this model specification, we can

estimate if another year of study for an individual leads to a change in the pay expectations while simultaneously accounting for a constant difference in pay expectations between individuals. We find no statistically significant difference in the change of beliefs of the expected pay during the study time for male or female students.

Finally, we test if there is a gender gap in expected pay when assessing every study year separately. The gender gap is significant in all years of study, apart from among those who responded to the survey in the last years (however, there are only 261 observations), reported in Table EC.8.

3.1.5. Expected Pay at Named Top Employer. Despite accounting for field and year of study, aspired future employer industry, performance at the school, and despite analyzing students who have self-selected into a well-known competitive environment, there is a robust significant gender gap in pay expectations of around 6–7 percent. However, because these expectations are derived from a question, Q1, posed as a general pay level for a first employer, one could argue that female and male students may answer the question differently because they envision different career paths at different types of employers paying different levels of pay. To address this potential bias, we proceed to test if there is a gender gap in the pay expectations when answering about their expected future pay at a specific firm or employer—in the question, the *same* named employer—and at the students’ most-preferred company, as in question Q2. Using these more specific pay expectations, we should limit the bias in what males and females implicitly attach to an employer as we are certain that they answer about the pay at a specific employer.

Table 6 shows the equivalent estimates as those shown in Table 4 instead using the pay the student expects to get at their most-preferred, named employer (Q2) when also reporting which specific employer they refer to. Again, we find a general gender gap in pay expectations of 7.4 percent in Model 1, with the same controls as those used Table 4, which is reduced to 6.7 percent in Model 2 when also controlling for the five most-preferred employers. The gender gap in expected pay is thus lower in general when asked about the pay at a specific, named employer compared to the above more general pay expectation. In Model 3, we also add firm-specific fixed effects, thus controlling for the pay expectation being for the same company. Notably, we find that female students expect to be paid 5.6 percent less than male students even when they expect to begin working at the same employer. The result is robust to applying a random-effects model instead of a pooled OLS regression; see Model 4.

Table 6 Regression Analysis of Students' Expected Pay at Most Preferred Employer

	Pooled			RE
	ln Exp Pay Top Emp (1)	ln Exp Pay Top Emp (2)	ln Exp Pay Top Emp (3)	ln Exp Pay Top Emp (4)
Female	-0.074 (0.019)***	-0.067 (0.018)***	-0.056 (0.018)**	-0.058 (0.021)**
Year FE	No	No	Yes	Yes
Controls Industry	Yes	Yes	Yes	Yes
Controls Edu	Yes	Yes	Yes	Yes
Controls Citizen	Yes	Yes	Yes	Yes
Controls StudyYear	Yes	Yes	Yes	Yes
Controls GPA	Yes	Yes	Yes	Yes
Controls Top5Employer	No	Yes	No	No
Controls Firm ID	No	No	Yes	Yes
OBS.	3464	3464	3464	3464
R2	0.110	0.123	0.149	
ADJUSTED R2	0.105	0.116	0.138	
INDIVIDUALS				2253
R2-WITHIN				0.070
R2-BETWEEN				0.159

Notes: Clustered standard errors in parentheses
 * p<0.05, ** p<0.01, *** p<0.001

3.2. Does Improved Mean Pay among Similar Alumni Influence Pay Expectations?

Above, we found a sticky persistent gender gap in pay expectations despite accounting for a large set of characteristics of the job and the student, updating of expectations over the years of study and even though the students answered about their expected pay at the same named employer. A question then is why are these differences in pay expectations by gender so persistent?

In this section, therefore, we test if, or how, pay expectations change when alumni mean pay vary and when these changes in market conditions are relatively more or less gender equal, by using the variables *EmployerPay* and *RelativePay* (see definitions in Section 2.2.2). Assume pay expectations are determined not only by an individual component (e.g., education, ability, preferences for employer), but also by judging how similar peers are doing in the market. If so, students might be primed in forming expectations about their career entry pay based on the mean pay among similar alumni (i.e., among a sample having similar observable achievements that the student is aspiring for). In particular, we are interested in testing the causal link of whether a change in alumni mean pay affects students' pay expectations. Moreover, we test if students might be differently primed depending upon the relative gender balance of these changes in mean alumni pay, potentially caring more about changes related to alumni of their own gender. Although we

cannot know if the students are aware of the mean alumni pay at their preferred employer when they form expectations, students have several opportunities to gain such knowledge. For instance, students can read the yearly employment report from the school, attend recruitment events where potential future employers communicate mean pay, or even meet alumni and asking them directly about their pay.

In sum, we aim to test the following: Do male and female students change their pay expectations over time as the older peers—the alumni from the school—who just started working at their most-preferred firm increase or decrease their pay? Does the relative gender balance of that progress influence male and female students differently?

Table 7 shows the results of our analysis of the effect of changes in mean pay among alumni and the relative gender balance on student pay expectations. Full results are shown in Table EC.9.¹⁴ In Model 1, we first use mean alumni pay and gender relative pay only as controls to show that the gender gap in pay expectations is still robust. We also show that, on average, the pay expectation of a student who considers the pay at a specific employer is positively associated with better outcomes of contemporary students, and the higher the relative outcome of female graduates compared to male graduates, the higher is the pay expectation of the student. More importantly, exploiting the panel data and applying a fixed-effects model, see Models 2-4, we find that an increase in the mean alumni pay between the years in which a student answered the *Student Panel* affects the pay expectations of the student. Higher mean alumni pay, that is, a better outcome for those working at their preferred employer leads to students increasing their pay expectation in that year. Thus, expectations are malleable with respect to market conditions, and the coefficient is statistically significant for both male and female students.

Second, turning to the relative pay of female to male graduates, we find a notable interaction effect of gender. While a higher relative pay of female to male graduates leads to a increased pay expectations, only male students react to this change by adjusting their pay expectations. While male students expect higher pay for themselves when women’s relative pay increases over time, female students do not change their pay expectations even if female graduates employed at their most-preferred employer close the gender pay gap. That is, female expectations of a future gender pay gap is sticky and not subject even to changes indicating improvements of similar female peers.

¹⁴In Table EC.10, we show the same analysis based on the seven education programs instead of most-preferred employer. Students are insensitive to changes in market conditions related to the field of study, indicating that these categories are too broad.

Table 7 Panel Regression of Expected Pay on Changes in Employer Pay and Relative Pay

	All RE	All FE	Female FE	Male FE
	ln Exp Pay Top Emp (1)	ln Exp Pay Top Emp (2)	ln Exp Pay Top Emp (3)	ln Exp Pay Top Emp (4)
Female	-0.098 (0.017)***			
Employer Pay	0.658 (0.041)***	0.431 (0.113)***	0.453 (0.085)***	0.498 (0.205)*
Relative Pay (0.7-1.7)	0.337 (0.058)***	0.590 (0.156)***	-0.009 (0.243)	0.571 (0.150)***
Female x Relative Pay (0.7-1.7)		-0.443 (0.212)*		
Year FE	Yes	Yes	Yes	Yes
Controls StudyYear	Yes	Yes	Yes	Yes
OBS.	815	815	329	486
R2		0.283	0.273	0.343
ADJUSTED R2		0.277	0.260	0.335
INDIVIDUALS	714	714	288	426
R2-WITHIN	0.222	0.283	0.273	0.343
R2-BETWEEN	0.363	0.242	0.266	0.211

Notes: Clustered standard errors in parentheses
 * p<0.05, ** p<0.01, *** p<0.001

3.3. Alumni Career Entry Pay

So far, we have shown a sticky and persistent gap in pay expectations. To address our question whether there is a gender gap in actual career entry alumni pay, we employ the following empirical specification:

$$\ln(\text{AlumniPay})_i = \alpha_0 + \beta_1 \text{Female}_i + \beta_2 \text{Edu}_i + \beta_3 \text{Abroad}_i + \beta_4 \text{GradYears}_i + \beta_5 \text{Industry}_i + \beta_6 \text{GPA}_i + \beta_x \text{CompanySize}_i + \delta_i + \gamma + \epsilon_i \quad (2)$$

where all variables are described in the appendix. We let β_x denote the group of beta coefficients used to control for different employer characteristics, and we add δ_i as a dummy to denote if an individual also participated in the *Student Panel*, γ for yearly fixed effects, and standard errors ϵ_i . We report the results of the regression analysis in Table 8, and all coefficients are reported in Table EC.11.

Starting with the gender gap in pay among alumni, we find a strong and significant gender gap in Table 8, thus a strong and significant gender gap in career entry pay. Female graduates are paid 13.2 percent less per month than male graduates in the same year. The average alumni pay gap thus corresponds well to the gender gap expected as students (about 500 USD per month in expectation vs. about 560 USD per month in realization, both in nominal terms).

Table 8 Regression Analysis of Pay among Alumni

	ln Alumni Pay (1)	ln Alumni Pay (2)	ln Alumni Pay (3)	ln Alumni Pay (4)
Female	-0.132 (0.016)***	-0.103 (0.016)***	-0.090 (0.015)***	-0.059 (0.014)***
Control Student Panel	Yes	Yes	Yes	Yes
Controls Edu	No	Yes	Yes	Yes
Controls Work Industry	No	Yes	Yes	Yes
Controls Abroad	No	Yes	Yes	Yes
Controls GradYears	No	Yes	Yes	Yes
Controls GPA	No	No	Yes	Yes
Controls Work Hours	No	No	No	Yes
Controls Employer Size	No	No	No	Yes
Controls Career Position	No	No	No	Yes
Year FE	Yes	Yes	Yes	Yes
OBS.	1777	1777	1777	1777
R2	0.041	0.151	0.197	0.327
ADJ. R2	0.037	0.139	0.185	0.313

Notes: Clustered standard errors in parentheses

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

Table 8 shows that male and female students differentially self-select into field of study, preferred work industries and so forth, potentially explaining a difference in careers as alumni. In Model 2 of Table 8, we control for field of study, work industry, working abroad and year of graduation. The gender gap in pay is then reduced to 10.3 percent, where predominantly working in the finance or consulting industry or abroad explains higher pay (see Table EC.11). In Model 3 in Table 8, we control for GPA, reducing the gap to 9.0 percent. Finally, adding characteristics that relate either to the firm or the student's number of hours as an employee in Model 4 reduces the gap substantially to 5.9 percent, where more working hours largely explains higher pay (see Table EC.11).^{15,16}

3.4. The Mediating Effect of Pay Expectations on Realized Pay.

Finally, we explore the mediating role of expected pay by employing a structural equation model (SEM). We estimate coefficients by maximum likelihood rather than OLS to overcome possible bias and to avoid violating assumptions of OLS (i.e., uncorrelated error terms). The unexplained variance is captured in the error terms in our previous models. If, for example, socioeconomic factors would influence both expected pay (e.g., if parents' pay influence expectations) and alumni

¹⁵Restricting the regression estimation to those alumni who also answered the student survey renders the same pattern, see Table EC.12.

¹⁶Potentially, our findings may be driven by male and female students ending up working at different employers as alumni and, by that, a gender gap in alumni pay appears. Reducing the sample (N=540) notably, using employer dummies in Table EC.13, shows an even smaller pay gap, $b = -0.026$, $t(501) = -1.44$, $p = 0.151$.

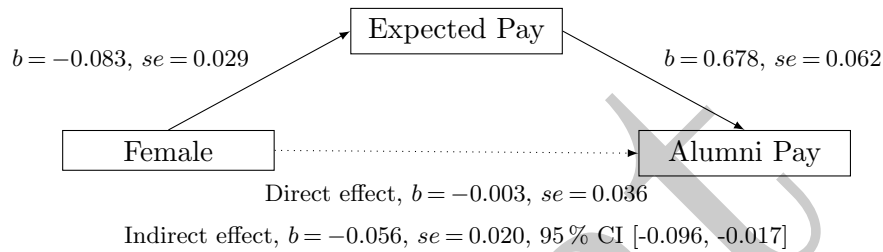


Figure 1 Mediation Analysis including Controls

pay (e.g., if parents refer their child to a job), the error terms of expected pay and alumni pay would be correlated because the socioeconomic factors are captured in the error terms in both cases. With SEM, we can model pay and expected pay as endogenous variables, where we impose that the covariances of their error terms are zero. Shaver (2005) explains how to estimate mediating effects when error terms are correlated.

Our results are illustrated in Figure 1, where we include controls for employer pay, gender ratio, education program, working abroad, preferred industry, GPA and working hours.¹⁷ The total negative effect of gender on alumni pay is fully mediated by the indirect effect of pay expectations of 6 percent (expected pay on female, 9 percent, times pay on expected pay, 68 percent). Note that for every 1 percent higher expected pay, the actual subsequent pay is 0.68 percent higher. As an example, anticipating to be paid 1,000 SEK more per month as a student years before starting to work, compared to the average expected pay of 38,000 SEK (2.6 percent higher expectations), is associated with attaining 680 SEK more in career entry pay (1.8 percent higher pay). Because the model also controls for contemporary pay at the most-preferred employer, the results imply that women are systematically paid less because of their own lower expectations—not because their expectations simply reflect current market conditions.

4. Discussion

Our study provides evidence of a persistent, sticky gender gap in expected career entry pay even among a sample of—most likely competitive—top students, a gap that does not change even with rising labor market prospects of female peers. We further find that this gender gap in expected pay

¹⁷In Table EC.14 we include three different models, with and without controls for education program, working abroad, preferred industry, GPA and working hours: (a.) Expected pay (Q2) at most-preferred employer matched with alumni pay at the most-preferred employer, controlling for mean alumni pay and gender ratio at the same employer when forming expectations (Model 1) and with controls (Model 2); (b.) Expected pay (Q2) at most-preferred employer matched with alumni pay, regardless of employer, controlling for contemporary employer pay and gender ratio at the most-preferred employer upon forming expectations (Model 3) and with controls (Model 4); and (c.) Expected pay (Q1) matched with alumni pay, controlling for contemporary employer pay and gender ratio for alumni from the same education program (Model 5) and with controls (Model 6). We present Model 4 in Figure 1.

is also reflected in the subsequent career entry pay of the same students. Thus, the early gender gap in expectation persists into a gender gap in actual pay. Although we do not observe the peak of the participants' careers, this career-entry pay gap is likely to have an important bearing on the strong glass ceiling in Sweden. First, alumni from the top business school are paid above-average pay in Sweden at their career entry regardless of gender and are thus likely to contribute to the glass ceiling because their pay trajectories from an above-average starting point will be different (cf. Kiessling et al. 2019). Second, male graduates from the top business school have historically been more likely than female graduates to hold executive positions (Wahlund 2010, see also Table EC.1).

Yet, as neither student attributes like education or grades nor the choice of expected employer or industry could explain the whole gap in pay expectations, what can? First, a commonly suggested mechanism for differences in actual pay by gender, which we cannot elicit in our study, is different preferences for, or responses to, family formation (Bertrand et al. 2010, Kleven et al. 2019). Potentially, these preferences or responses are already embedded in the pay expectations we see, explaining a persistent gender gap. For instance, women are more likely to choose occupation, sector, and employer based on family friendliness and, in turn, suffer lower pay and fewer opportunities for promotion (Kleven et al. 2019). Therefore, the anticipation of starting a family and having a future career break may influence women to expect less pay at the beginning of their careers (Chevalier 2007, Kiessling et al. 2019). However, in the context of Sweden, the anticipation of family formation is likely not to be a satisfying explanation for differences in pay expectations in our sample. Gender equality is one of the cornerstones of Swedish society. First, gender discrimination in the workplace has been illegal since 1980 in Sweden (cf. e.g., Coffman et al. 2021b). Second, the rate of working women is the highest in the EU at 78.3 percent (Swedish Institute 2019). Third, Sweden is renowned worldwide for its generous policies of subsidized parental leave and childhood care. Both expectant mothers and fathers can anticipate a career break upon family formation. Children between the ages of 1 to 5 years are guaranteed subsidized childhood care and preschool.¹⁸ Moreover, what we have estimated in this paper are pay expectations for the students' *first* job after graduation, not the pay expectations of a career, and even with the same employer in mind.

A second mechanism that we have not addressed is a potential perceived ability gap by gender. Maybe females perceive themselves to have a lower economic worth on the labor market than male

¹⁸Parents also make use of the subsidized childhood care; 88 (97) percent of the children below (above) 3 years of age are enlisted in preschool or family daycare, and those children not enlisted are, to a large extent, children in lower-income families (Garvis 2018).

students, although they have the same ability and aim to pursue similar initial careers in terms of education or employer. The persistent gender gap in pay expectations we find also resembles research addressing a commonly found gender gap in confidence. In that gender gap, although both men and women are overconfident, men are generally more so than women (see, e.g., Niederle and Vesterlund 2007). In particular, recent experimental research by Exley and Kessler (2019) shows a robust gender gap in the evaluation of own performance, with women evaluating their performance less favorably than equally performing men. This gap was persistent to being informed about their absolute and relative performance and to providing information about the average self-evaluations of others. In the light of our findings, knowing how male and female students judge their relative potential on the labor market and the link to their pay expectations could be a potent avenue for further research.

In a similar vein, we do not know the students' beliefs about what they think others expect to be paid. We have measured changes in pay expectations that indirectly come from changes in the labor market progress of others. Our result that female students were insensitive to stronger female-oriented improvements of similar peers, while males were not, could then be aligned with women having lower or insensitive beliefs about what others are being paid in the labor market. Thus, a third mechanism could be differences in the beliefs of others by gender. Osikominu and Pfeifer (2018), for instance, show that the gender gap in pay expectations to a large extent was explained by female and male students having different average expectations of what they expect others will earn within the same field that they are aiming for. Similarly, Major and Konar (1984) showed that US management students doing an internship differed in both their career entry expected pay (women expected 83.5 percent of what men expected) and their career peak expected pay (women expected 54 percent of what men expected). The main explanations were that women thought that others in their field earned less than men did. Men also valued high salaries more than women did when choosing a career (see also Gino et al. 2015, Wiswall and Zafar 2018), but the difference in comparison pay estimates explained more of the expected pay difference than the expected career path. Jackson et al. (1992) replicated the results in a later study and included "fair pay" as a factor. Men and women greatly diverged in their beliefs of what was fair pay for equal work, which even better explained the expected pay gap among students. Finally, recent studies show that different beliefs based on gender are linked to stereotypes of gender, where the beliefs of average group differences are key (Coffman et al. 2021a,b). Based on their results, we would expect that the participants in our studies also have different beliefs about what others are making, what is fair pay, and stereotypes based on gender.¹⁹

¹⁹Related research also shows that among recent graduates in Sweden in pay negotiations for their first job, the most important explanation for a gender gap in pay requests was a difference in their beliefs about what an ideal candidate applying for the same job should ask for (Dreber et al. 2020).

In all, if these women in Sweden in the group most likely to pursue top-paid careers expect to be paid less even before they enter the job market, it is not surprising that the glass ceiling is preserved—even in one of the most gender-equal countries in the world. While numerous reasons for the glass ceiling have been suggested in the literature, for example, differences in human capital, personalities or preferences leading to a gender gap in top pay, we show that the gap prevails even before these factors come into play. Our findings thus imply that not even in a relatively highly gender-equal context are women expecting to be paid equally upon career entry, thus suggesting that interventions are needed long before students enter the job market (cf. Baldiga and Coffman 2018, Beaman and Magruder 2012, Fernandez-Mateo and Fernandez 2016, Milkman et al. 2015, Samek 2019, Sterling and Fernandez 2018).

Can we say that women are actually to blame for preserving a glass ceiling? While there is a strong indirect effect of pay expectations on actual pay, it remains a question whether raising self-pay expectations would increase actual pay. Given that female students believe that others are making less than what male students believe (Auspurg et al. 2017, Major and Konar 1984, Osikominu and Pfeifer 2018), one may argue that women (at least to some extent) can start taking matters into their own hands by adjusting their self-pay expectations. This study does support that women with higher expected pay also subsequently realize higher pay. However, this result is not causal but remarkably holds a time effect where expected pay is collected years before realized pay and where we additionally control for exogenous contemporary mean pay among alumni. If expectations were only a mirror of the market conditions women are facing, there would be no effect upon controlling for mean pay among alumni at the most-preferred employer. Nevertheless, it is plausible that raising self-pay expectations would not help, for example, if women are treated differently than men when asking for higher pay (Artz et al. 2018) or when performing well in their studies (Quadlin 2018). Moreover, there is plenty of evidence showing that women must expect lower pay simply for being women (see, e.g., Bowles et al. 2007, Coffman et al. 2021b, Hoisl and Mariani 2017, Quadlin 2018) and thus, higher expectations could only be optimistic expectations.

5. Concluding Remarks

This paper shows a sticky gender gap in expected career entry pay, robust to numerous aspects explaining the gender gap. We also show an insensitivity on behalf of women about changing their expectations with the labor market progress of women. In contrast, men increase their own pay expectations with the progress of others. The female graduates also earn lower pay as employees. Notably, we show that the gender gap in career entry pay is fully embedded in the expectations

of young students years before they enter the workforce. Consequently, our results emphasize the importance for societies, employers and business schools to be aware of the gender expectations gap being formed in school and promoting early interventions to combat gender gaps in the future.

Acknowledgments

We are grateful for valuable comments from seminar participants at the House of Innovation and Center for Media and Economic Psychology brown bag seminar series. We thank Mariya Arshaluysyan, Antonia Spath, Christina Norrby, Natalia Antsiferova, and Lars Henriksson for their help with data collection. Finally, we thank all participants of the longitudinal surveys.

References

- Adams RB, Funk P (2012) Beyond the Glass Ceiling: Does Gender Matter? *Management Science* 58(2):219–235, ISSN 0025-1909, URL <http://dx.doi.org/10.1287/mnsc.1110.1452>.
- Albrecht J, Björklund A, Vroman S (2003) Is There a Glass Ceiling in Sweden? *Journal of Labor Economics* 21(1):145–177, ISSN 0734-306X, URL <http://dx.doi.org/10.1086/344126>.
- Albrecht J, Thoursie PS, Vroman S (2015) Parental Leave and the Glass Ceiling in Sweden. *Gender Convergence in the Labor Market*, volume 41 of *Research in Labor Economics*, 3–89 (Emerald Group Publishing Limited), URL <http://dx.doi.org/doi:10.1108/S0147-912120140000041010>.
- Anderson D, Bjarnadóttir MV, Dezsó CL, Ross DG (2019) On a Firm's Optimal Response to Pressure for Gender Pay Equity. *Organization Science* 30(1):214–231, ISSN 1047-7039, URL <http://dx.doi.org/10.1287/orsc.2018.1248>.
- Artz B, Goodall AH, Oswald AJ (2018) Do Women Ask? *Industrial Relations: A Journal of Economy and Society* 57(4):611–636, ISSN 00198676, URL <http://dx.doi.org/10.1111/irel.12214>.
- Arulampalam W, Booth AL, Bryan ML (2007) Is There a Glass Ceiling over Europe? Exploring the Gender Pay Gap across the Wage Distribution. *ILR Review* 60(2):163–186, ISSN 0019-7939, URL <http://dx.doi.org/10.1177/001979390706000201>.
- Auspurg K, Hinz T, Sauer C (2017) Why Should Women Get Less? Evidence on the Gender Pay Gap from Multifactorial Survey Experiments. *American Sociological Review* 82(1):179–210, ISSN 0003-1224, URL <http://dx.doi.org/10.1177/0003122416683393>.
- Baldiga NR, Coffman KB (2018) Laboratory Evidence on the Effects of Sponsorship on the Competitive Preferences of Men and Women. *Management Science* 64(2):888–901, ISSN 0025-1909, URL <http://dx.doi.org/10.1287/mnsc.2016.2606>.

- Beaman L, Magruder J (2012) Who Gets the Job Referral? Evidence from a Social Networks Experiment. *American Economic Review* 102(7):3574–3593, ISSN 0002-8282, URL <http://dx.doi.org/10.1257/aer.102.7.3574>.
- Bertrand M, Goldin C, Katz LF (2010) Dynamics of the Gender Gap for Young Professionals in the Financial and Corporate Sectors. *American Economic Journal: Applied Economics* 2(3):228–255, ISSN 1945-7782, URL <http://dx.doi.org/10.1257/app.2.3.228>.
- Blau FD, Kahn LM (2017) The Gender Wage Gap: Extent, Trends, and Explanations. *Journal of Economic Literature* 55(3):789–865, ISSN 0022-0515, URL <http://dx.doi.org/10.1257/jel.20160995>.
- Boschini A, Gunnarsson K, Roine J (2020) Women in top incomes – Evidence from Sweden 1971–2017. *Journal of Public Economics* 181:104115, ISSN 00472727, URL <http://dx.doi.org/10.1016/j.jpubeco.2019.104115>.
- Bowles HR, Babcock L, Lai L (2007) Social incentives for gender differences in the propensity to initiate negotiations: Sometimes it does hurt to ask. *Organizational Behavior and Human Decision Processes* 103(1):84–103, ISSN 07495978, URL <http://dx.doi.org/10.1016/j.obhdp.2006.09.001>.
- Carter DA, D’Souza F, Simkins BJ, Simpson WG (2010) The Gender and Ethnic Diversity of US Boards and Board Committees and Firm Financial Performance. *Corporate Governance: An International Review* 18(5):396–414, ISSN 09648410, URL <http://dx.doi.org/10.1111/j.1467-8683.2010.00809.x>.
- Chevalier A (2007) Education, Occupation and Career Expectations: Determinants of the Gender Pay Gap for UK Graduates. *Oxford Bulletin of Economics and Statistics* 69(6):819–842, ISSN 0305-9049, URL <http://dx.doi.org/10.1111/j.1468-0084.2007.00483.x>.
- Christofides LN, Polycarpou A, Vrachimis K (2013) Gender wage gaps, ‘sticky floors’ and ‘glass ceilings’ in Europe. *Labour Economics* 21:86–102, ISSN 09275371, URL <http://dx.doi.org/10.1016/j.labeco.2013.01.003>.
- Coffman KB, Collis M, Kulkarni L (2021a) Stereotypes and Belief Updating, URL https://www.hbs.edu/ris/PublicationFiles/19-068_1eae1493-f7a1-49b6-b14d-321fface1911.pdf.
- Coffman KB, Exley CL, Niederle M (2021b) The Role of Beliefs in Driving Gender Discrimination. *Management Science* mns.2020.3660, ISSN 0025-1909, URL <http://dx.doi.org/10.1287/mns.2020.3660>.
- Cohen PN, Huffman ML (2007) Working for the Woman? Female Managers and the Gender Wage Gap. *American Sociological Review* 72(5):681–704, ISSN 0003-1224, URL <http://dx.doi.org/10.1177/000312240707200502>.
- Delavande A, Zafar B (2019) University Choice: The Role of Expected Earnings, Nonpecuniary Outcomes, and Financial Constraints. *Journal of Political Economy* 127(5):2343–2393, ISSN 0022-3808, URL <http://dx.doi.org/10.1086/701808>.
- Dreber A, Heikensten E, S ave-S oderbergh J (2020) Why do Women Ask for Less? *SSRN Electronic Journal* ISSN 1556-5068, URL <http://dx.doi.org/10.2139/ssrn.3703813>.

- Exley C, Kessler J (2019) The Gender Gap in Self-Promotion. Technical report, National Bureau of Economic Research, Cambridge, MA, URL <http://dx.doi.org/10.3386/w26345>.
- Fernandez-Mateo I, Fernandez RM (2016) Bending the Pipeline? Executive Search and Gender Inequality in Hiring for Top Management Jobs. *Management Science* 62(12):3636–3655, ISSN 0025-1909, URL <http://dx.doi.org/10.1287/mnsc.2015.2315>.
- Filippin A, Ichino A (2005) Gender wage gap in expectations and realizations. *Labour Economics* 12(1):125–145, ISSN 09275371, URL <http://dx.doi.org/10.1016/j.labeco.2004.03.004>.
- Fortin NM, Bell B, Böhm M (2017) Top earnings inequality and the gender pay gap: Canada, Sweden, and the United Kingdom. *Labour Economics* 47:107–123, ISSN 09275371, URL <http://dx.doi.org/10.1016/j.labeco.2017.05.010>.
- Garvis S (2018) Quality of employment in childcare. Country report: Sweden. Technical report, European Federation of Public Services, Leuven, Belgium, URL <https://www.epsu.org/sites/default/files/article/files/CountryreportSwedenchildcare.pdf>.
- Gino F, Wilmut CA, Brooks AW (2015) Compared to men, women view professional advancement as equally attainable, but less desirable. *Proceedings of the National Academy of Sciences* 112(40):12354–12359, ISSN 0027-8424, URL <http://dx.doi.org/10.1073/pnas.1502567112>.
- Gong Y, Stinebrickner T, Stinebrickner R (2020) Perceived and actual option values of college enrollment. *Journal of Applied Econometrics* 35(7):940–959, ISSN 0883-7252, URL <http://dx.doi.org/10.1002/jae.2795>.
- Hoisl K, Mariani M (2017) It's a Man's Job: Income and the Gender Gap in Industrial Research. *Management Science* 63(3):766–790, ISSN 0025-1909, URL <http://dx.doi.org/10.1287/mnsc.2015.2357>.
- Jackson LA, Sullivan LA, Gardner PD (1992) Explaining Gender Differences in Self-Pay Expectations: Social Comparison Standards and Perceptions of Fair Pay. *Journal of Applied Psychology* 77(5):651–663.
- Jacob B, Wilder T (2010) Educational Expectations and Attainment. Technical report, National Bureau of Economic Research, Cambridge, MA, URL <http://dx.doi.org/10.3386/w15683>.
- Joshi A, Son J, Roh H (2015) When Can Women Close the Gap? A Meta-Analytic Test of Sex Differences in Performance and Rewards. *Academy of Management Journal* 58(5):1516–1545, ISSN 0001-4273, URL <http://dx.doi.org/10.5465/amj.2013.0721>.
- Kiessling L, Pinger PR, Seegers PK, Bergerhoff J (2019) Gender Differences in Wage Expectations: Sorting, Children, and Negotiation Styles.
- Kleven H, Landais C, Søgaard JE (2019) Children and Gender Inequality: Evidence from Denmark. *American Economic Journal: Applied Economics* 11(4):181–209, ISSN 1945-7782, URL <http://dx.doi.org/10.1257/app.20180010>.
- Kunz JS, Staub KE (2020) Early subjective completion beliefs and the demand for post-secondary education. *Journal of Economic Behavior & Organization* 177:34–55, ISSN 01672681, URL <http://dx.doi.org/10.1016/j.jebo.2020.05.015>.

- Major B, Konar E (1984) An Investigation of Sex Differences in Pay Expectations and Their Possible Causes. *Academy of Management Journal* 27(4):777-792, ISSN 0001-4273, URL <http://dx.doi.org/10.2307/255878>.
- McGinn KL, Milkman KL (2013) Looking Up and Looking Out: Career Mobility Effects of Demographic Similarity Among Professionals. *Organization Science* 24(4):1041-1060, ISSN 1047-7039, URL <http://dx.doi.org/10.1287/orsc.1120.0778>.
- Meier K, Niessen-Ruenzi A, Ruenzi S (2017) The Impact of Role Models on Women's Self-Selection in Competitive Environments. *SSRN Electronic Journal* ISSN 1556-5068, URL <http://dx.doi.org/10.2139/ssrn.3087862>.
- Milkman KL, Akinola M, Chugh D (2015) What happens before? A field experiment exploring how pay and representation differentially shape bias on the pathway into organizations. *Journal of Applied Psychology* 100(6):1678-1712, ISSN 1939-1854, URL <http://dx.doi.org/10.1037/ap10000022>.
- Niederle M, Vesterlund L (2007) Do Women Shy Away From Competition? Do Men Compete Too Much? *The Quarterly Journal of Economics* 122(3):1067-1101, ISSN 0033-5533, URL <http://dx.doi.org/10.1162/qjec.122.3.1067>.
- OECD (2019) Gender wage gap (indicator). URL <http://dx.doi.org/10.1787/7cee77aa-en>.
- Osikomimu A, Pfeifer G (2018) Perceived Wages and the Gender Gap in STEM Fields. Technical Report 11321, URL <http://dx.doi.org/DOI:11321>.
- Quadlin N (2018) The Mark of a Woman's Record: Gender and Academic Performance in Hiring. *American Sociological Review* 83(2):331-360, ISSN 0003-1224, URL <http://dx.doi.org/10.1177/0003122418762291>.
- Samek A (2019) Gender Differences in Job Entry Decisions: A University-Wide Field Experiment. *Management Science* 65(7):3272-3281, ISSN 0025-1909, URL <http://dx.doi.org/10.1287/mnsc.2018.3107>.
- Schmid T, Urban D (2018) The Economic Consequences of a 'Glass-Ceiling': Women on Corporate Boards and Firm Value, URL <http://dx.doi.org/10.2139/ssrn.2344786>.
- Shaver JM (2005) Testing for Mediating Variables in Management Research: Concerns, Implications, and Alternative Strategies. *Journal of Management* 31(3):330-353, ISSN 0149-2063, URL <http://dx.doi.org/10.1177/0149206304272149>.
- Statistics Sweden (2018) Average monthly salary, SEK by sex and year. URL http://www.statistikdatabasen.scb.se/pxweb/en/ssd/START__AM__AM0110__AM0110B/LonYrkeAlderA/table/tableViewLayout1/#.
- Statistics Sweden (2020) Salary structures, whole economy. URL <http://www.scb.se/am0110-en>.
- Sterling AD, Fernandez RM (2018) Once in the Door: Gender, Tryouts, and the Initial Salaries of Managers. *Management Science* 64(11):5444-5460, ISSN 0025-1909, URL <http://dx.doi.org/10.1287/mnsc.2017.2880>.

- Stinebrickner T, Stinebrickner R (2012) Learning about Academic Ability and the College Dropout Decision. *Journal of Labor Economics* 30(4):707–748, ISSN 0734-306X, URL <http://dx.doi.org/10.1086/666525>.
- Swedish Institute (2019) Gender equality in Sweden. URL <https://sweden.se/society/gender-equality-in-sweden/>.
- UKA (2020) Hur värderas högre utbildning? Analys av arbetsmarknadens lönepremie för högskoleutbildning. Technical report, Universitetskanslersämbete, URL <https://www.uka.se/download/18.1b11a8f316f1aba2e828d2f/1579002182206/rapport-2020-02-14-hur-varderas-hogre-utbildning.pdf>.
- United Nations (2015) Goal 5: Achieve gender equality and empower all women and girls. URL <https://www.un.org/sustainabledevelopment/gender-equality/>.
- Wahlund R (2010) The SSE Alumni Economic Forecast Spring 2010: SSE Alumni's Expectations about Economic Developments, URL https://econpapers.repec.org/RePEc:hbb:hastba:2010_008.
- Wiswall M, Zafar B (2018) Preference for the Workplace, Investment in Human Capital, and Gender*. *The Quarterly Journal of Economics* 133(1):457–507, ISSN 0033-5533, URL <http://dx.doi.org/10.1093/qje/qjx035>.

Appendix. Variable Descriptions

A. Student Panel

Expected Pay. Q1: Expected pay at first job after completing current degree (full-time, before taxes, in nominal terms). Converted to SEK and monthly basis.

Age. Age at the time of responding to the questionnaire (based on administrative records and reported in the panel).

Industry. Selection of three (unranked) preferred industries, among nine possible: Finance, Media, Consulting, Manufacturing, IT, Accounting, Marketing, Public Administration, and Other.

Citizen. Swedish, European or non-European.

Top5Employer. Dummies to indicate if the participant's top three preferred employers are any of the top five preferred employers based on all participants in all years.

Exp Pay Top Emp. Q2: Expected pay at the most-preferred employer.

B. Alumni Panel

Alumni Pay. Monthly gross pay (before taxes), not including bonuses, commissions or other benefits, converted to SEK in survey year.

Abroad. Dummy to indicate if the participant is working abroad, with pay in a currency other than SEK.

Job Experience. Years between graduation year of highest accomplished diploma and survey year.

Industry. Dummies for Finance, Consulting, IT, Retailing, or Other.²⁰

Employer. Characteristics of the company the participant is working for: Dummies for Employed, Self-employed/Entrepreneur, Studying, Looking for a job, or Other; In hours, average workload per week including overtime working hours; Dummies for Senior Position, Middle Position, or Junior Position; Dummies for Employer Size.

Employer Pay. Average Alumni Pay, by year and employer.

Relative Pay. Average female Alumni Pay divided by average male Alumni Pay by year and employer.

Gender Ratio. Ratio of average Alumni Pay to average Alumni Pay, by year, employer and gender.

C. Administrative Records

Female. Dummy to indicate if the participant was registered as female (or male) at birth.

Edu. Seven different programs: (1.) BSc Program in Business and Economics (BE); (2.) BSc Program in Retail Management (RM); (3.) MSc Program in Finance (Fin); (4.) MSc Program in International Business (IB); (5.) MSc Program in Business & Management (MBM); (6.) MSc Program in Economics (ECON); and (7.) MSc Program in Accounting & Financial Management (Acc).

StudyYear. Years since enrollment in the current education program.

GPA. Grade Point Average as reported in early May 2020. For alumni, we use the highest accomplished diploma.

²⁰Note that Finance, Consulting, and IT are coded in both panels, whereas the *Student Panel* had Media, Manufacturing, Accounting, Marketing and Public Administration in addition to Other, compared to only Retailing in addition to Other in the *Alumni Panel*.