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***Eliciting gendered patterns in labour market preferences
and biases in expectations: an experimental approach***

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Abstract: Since there are certain patterns that remain unaccounted to explain gender differences in the labour market, an experiment has been carried out in order to explore the factors influencing the formation of expectations among university students and to understand the underlying reasons why these differences still exist. Although we could not find gender differences in expectations, we do obtain a relationship between the latter and degree choice. In an attempt to relate levels of risk aversion to labour market preferences, we draw that high levels of risk aversion are unable to explain the preferences for types of public employment, but we stand with a high level of significance that women tend to prefer these jobs. These findings support the presence of the glass ceiling phenomenon and the persistent gender wage gap observed between the public and private sectors.

Keywords: expectations, gender differences, risk aversion, labour market, earnings.

JEL classification: D81, D84, I26, J45, J16

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1 INTRODUCTION

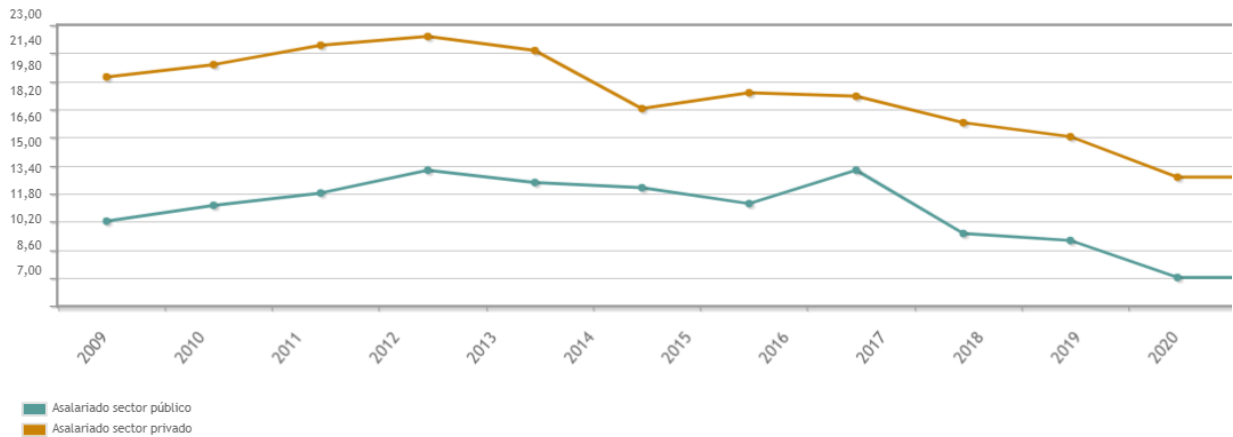
Living in a world full of uncertainty often leads us to wonder what will become of our future. The recent events we are experiencing as a society make us rethink that there are many factors that are beyond our reach and over which we have little or null power. Given this unanticipation, the expectations we formulate about our future play an increasingly important role in our decision making, and the beliefs we have about ourselves or about what we believe may happen can lead us down completely different paths.

The labour market is one of those environments in which the degree of uncertainty is quite high, since most events end up having consequences, both positive and negative, in it. That is why the expectations that young people who are close to entering the labour market provide about it can be a key tool for understanding the imbalances that occur in it.

There is a considerable body of research that demonstrates the reality of a pay gap between men and women, albeit to a greater or lesser extent depending on the country. The glass ceiling phenomenon is exacerbated when it comes to women seeking to assume leadership positions. There is a great void in which questions about the wage gap between men and women and their ability to move up the ladder of power go unanswered. Although it is true that the wage gap in Spain is not as wide as it is in other countries, recent research shows that these differences are greater as the level of education increases. However, numerous studies have shown that the choice of university degree has no influence on subsequent wage differences. Therefore, what remains unaccounted for explaining the reasons why there is an actual gender gap?

The type of job has proven to be one of the reasons why a wage gap between men and women still exists in the labour market. Leaving entrepreneurship aside, the existence of a difference between the salaries of both genders is evident between the public and private sectors. Although the trend of the gap seems to be decreasing through the last years, we can still find differences between both. In fact, most recent data provided by the INE in 2020 shows a wage gap of 7% in the public sector and 13% in the private sector.

Figure 1: Gender gap (not adjusted to individual characteristics) in income hourly by employer's nature (public or private sector) and period



Source: INE

Since we have data recorded, we can observe that the time when the difference between both sectors and when the wage gap percentages were higher, correspond to the years after the 2008 crisis, reaching the peak in 2012, where the gap was at levels of almost 23% in the private sector. There is the possibility and fear that this phenomenon could be repeated again given the crisis we are currently going through, which could clearly influence the preferences and expectations of young students who are close to entering the labour market.

In an attempt to understand the reasons why students differ both in their expectations about future salary and in their preferences regarding the type of work for their future job, we have decided to look for the answer in certain economic experiments that have been shown, through a very extensive literature, to influence behavioural patterns and decision making. Specifically, in this paper we try to link the level of risk aversion and expectations on future employment, both in terms of income and nature of the job. Thus, those with a higher level of risk aversion would be likely to choose public sector jobs, since getting a civil servant position ensures high job stability. It is usually a lower salary than certain private employees but with greater security, so expectations about salary may also be lower. The opposite would be true for preferring entrepreneurship. Becoming entrepreneur involves a high risk in which, in case of success, the expected payments can be very high, but in case of failure it can mean an absolute loss. There is no guarantee that the company will work well and that a high salary will always be maintained, therefore it should be related to a lower level of risk aversion.

Not only is a prospective analysis of students' future decisions necessary, but it can also be interesting if we look backwards to their past decisions. Young people's conception of what they believe they can earn in their future employment may have implications for investment decisions in postgraduate education. Given that education can be measured as an investment susceptible to a certain return, could these expectations be determinant in *Schultz and Becker's* Human Capital Theory? If so, the motivation for this experiment is to look for characteristics, both individual and sociodemographic, that might lead to differences in what students expect to earn in the future, and thus find possible determinants of expectation formation. Above all, this experiment focuses on measuring the extent to which the level of risk aversion is related to job preferences and thus to the future salary expectations of students in different university degrees.

This first section of the paper provides a review of the existing literature on all the topics of interest for our research. Subsequently, it will lead to the formulation of the starting hypotheses on which we will base our data analysis and around which we will create an experimental design, which will be shown below. Finally, a presentation of the results will be provided and so we will draw the appropriate conclusions, given the literature consulted and the hypotheses formulated.

2 LITERATURE REVIEW

Not only in the area of future wages or the labour market, expectations have been considered a useful measure for predicting certain choices, especially in fields with a high level of uncertainty. Armantier et. al. (2013), provide a survey which reports consumers' expectations on inflation and analyse how these expectations may affect behavioural patterns and latter choices on consumption.

Wolpin and van derKlaauw (2008), use the expectations of poor households to try to create a simulation which can help predict the retirement and social security system of the baby boom generation. Expectations have shown to be helpful not only to determine decision-making but also for leading to different ways of behaving. For instance, students who underestimate their abilities by having lower expectations relative to others won't be more likely to succeed in competitive environments, as their incentive to strive for good grades will be diminished. This may help predict certain determinants of school achievement or academic record (Jacob and Wilder, 2011).

It may be that many times, unconsciously, the fact of formulating expectations regarding any subject leads us to take one path or another. Although in the case of our experiment the expectations are given after having made the decision of the university career, it might exist the possibility that this past decision of the students was given by their expectations at the time of deciding, despite we unknow them. In fact, Waswall and Zafar (2015), demonstrate in their study the relationship between students' beliefs in possible future earnings and their own abilities and the college major choice, rather than based on their personal tastes and preferences, thus choosing fields in which they expect to obtain a higher payout. This may lead, unfortunately, to a society whose future workers base their choice exclusively on monetary incentives and not on personal satisfaction, sometimes creating a weak and unmotivated workforce.

Regarding gender differences between men and women's expectations about future income, the possibility that it might be caused because of an actual income gap should also be considered. De la Rica, Dolado, and Llorens (2008), following the Swedish workers' glass ceiling hypothesis, and comparing it with the Spanish labour market, find that the gender gap is notably flatter among Spanish workers than in the Nordic country. However, they analyse a compositional effect behind this pattern when the sample of workers is split by education level. By differentiating men and women between low level of education (primary and secondary) and high level of education (university), they find that among the latter the wage gap increases as the wage distribution advances, while for less educated workers it decreases. Since our sample is

restricted to a population that has received higher education, or at least is in the process of doing so, this hypothesis may be useful to include in our research the assumption of the existence of a wage gap between men and women in order to analyse whether it influences a decrease in the wage expectations of the women in our sample.

In addressing how career choice influences future earnings, numerous studies show high significance of the effects of different choices on future wages. In fact, Daymont and Andrisani (1984) explain that different major choices between men and women do have an effect on the existing wage gap, concluding that the gap is not only due to gender-discriminatory behavioural patterns in the labour market. However, further research such as that of Zafar (2013) shows that the choice of studies is given by background factors such as parental approval or personal tastes. Therefore, neither women's expectations nor their level of confidence are determinants of career choices, so the differences in salary are mainly due to discrimination and lack of female representation in certain sectors of the labour market.

The choice of job type must also be considered when working with expectations and gender differences. More specifically, the division between public and private sector jobs. There is a large body of research relating the level of risk aversion to different types of employment. Bellante and Link (1981), using probit equations, show a clear perception of public employment as mostly stable, so that the probability of choosing a public job increases for risk-averse people. Later, Buurman and Delfgaauw (2012), corroborate this hypothesis and, in addition, obtain that during the first years of work, public employees tend to be more altruistic, while as their experience progresses, this factor is reversed because they consider themselves underpaid. However, after wide bibliographic research there is not much literature found related to wage expectations of students. Needless to say, that on the other hand, low levels of risk aversion play an important role when deciding to start entrepreneurship. Van Praag and Cramer (2001) evidence so and, besides, they find also a positive correlation between intelligence and family income.

Dominitz and Manski (1996) were pioneers in developing an experiment in which high school students and college graduates were asked about their expectations on future income after having completed different education levels.

Due to the fact that the scarce studies concerning this topic were carried out in the United States, Brunello and Lucifora (2001) tried to continue with the investigation, but in this case, comparing between European high schools and universities. For this survey, students had to formulate their wage expectations when entering the labor

market and ten years after. The results that were obtained relate that expectations were significantly correlated with the field of study of the students, familiar background, gender, and the gap between what they think it will take for them to finish the degree and the time ordinarily required. It is worth noting that students of a degree related to economics and finance tend to overestimate their expectations on salary with respect to current wages way more than students of other degrees. This experiment collects elements from both papers, introducing the risk factor, which never had been taken into account in this area.

Risk attitudes do not only affect choices related to education, but they are also linked to the type of employment people end up working on. As mentioned before, existing literature widely supports the negative correlation between risk aversion and entrepreneurship. Cramer et al. (2002) have tested this hypothesis on 1700 people through an econometric model using probit equations, and the results do stand with the initial proposition.

It should also be considered that risk attitudes may change throughout time due to circumstances such as experience, hence altering the results depending on the time gap between their choice to be self-employed and the survey. Brown et al. (2006) make use of proxies in order to approximate an individual's risk attitudes in daily life and thus analyze whether there is relationship between these variables and different types of contract such as fixed wage, performance-related pay and self-employment. Relying on these papers, Di Mauro and Musumeci (2011) also draw a connection between risk aversion and the type of employment, which in this case refers to those with fixed or variable income.

The fact that students might differ from choosing whether to continue or not on future education has also been analyzed in various papers such as the one by Davies et al. (2002), which tries to examine to what extent relative risk aversion theory correlates with educational choices among students through life. Whereas in their study decisions on education are measured in different stages starting from 10th grade in secondary school, our paper focuses rather on postgraduate studies since target students are mainly university undergraduates. The distinction between RRA and human capital theory is also considered in their study. While in the standard human capital theory educational choices are seen as an investment whose expected returns are expressed in monetary terms, the relative risk aversion claims that decisions on educations should be considered from a more sociological perspective, stating that choices about education are made, for instance, to reduce the likelihood of becoming socially inferior to one's

parents. This is the reason why some family background-related variables such as the level of education achieved by parents or family income have been included in our model.

Overall, the work of Reuben, Wiswall and Zafar (2015) brings together all the domains that we have considered of interest for this research. In this paper they also deal with students' expectations about their future salary, but in their case, focusing on high-achieving and high-ability students at New York University. The aim of their research is to find out what are the drivers of college major choices and expectations about their future salary. To do so, they focus on three main measures: the level of risk aversion, competitiveness and overconfidence. This last feature is measured, unlike ours, through an experiment in which participants are told to perform a task. Hence, overconfidence is calculated as the difference between the students' belief about their ranking and their actual rank in the tournament. While risk preferences do not explain the gender differences in expectations, competitiveness and overconfidence do, to the extent that almost 20% of the expectations gap is given by these measures. However, consistent with other literature cited above, none of these factors influence college degree choice.

3 STARTING HYPOTHESES

Our analysis will be based on three main starting hypotheses, which we will try to prove its veracity or falsity.

H1: Women will be more likely to prefer being employees on public sector.

Given that the existing literature has shown that there is a significant difference between the gender pay gap between the public and private sectors, it is likely that women tend to choose public jobs in order to feel less affected by the gender gap. In addition, it is also expected that this inclination towards public jobs is due to the risk-averse nature of women.

H2: Risk-averse subjects will tend to prefer public employment and those risk-loving will rather choose entrepreneurship, and their expected wage will be lower.

An interrelation between levels of risk aversion and type of employment has been demonstrated. As mentioned above, public employment provides greater stability, thus avoiding the risk of layoffs and major changes in salaries. However, public employees do not usually opt for significant salary increases, so their returns are stable but not very high. Entrepreneurship is a risky decision as returns can be very susceptible to variations. If everything works properly, they can achieve quite high returns, but in the case of any malfunction, the losses can also be notorious.

H3: Women tend to underestimate their income since they have lower expectations about future earnings.

Due to the awareness of the existence of a gender gap, it is expected that women tend to have lower expectations about their future salary with respect to the current average salaries. The variable that will measure these differences will be developed later and will capture them in the variable named *Overconfidence*. In addition, certain behavioural patterns, some influenced by social differences between men and women in multiple fields and some others given by intrinsic components, lead women to be less self-confident and to underestimate their potential.

4 EXPERIMENTAL DESIGN

The experimental design of this study consists of two main parts. A questionnaire was provided, through which we have implemented both parts of this study: the survey and the experiment. At the same time, we make distinction of two sections when referring to the survey. The first task of the survey starts with background-related questions, while data about expectations on future income and type of job formulations is collected during the second task. Finally, a risk aversion test is the main feature in our experiment. Since the study is based on the expectations on future salary, unlike the works mentioned above, in our case the questionnaire has only been addressed to higher education students, thus reducing the sample to university students and advanced specific vocational training, and no secondary school or high school students were recruited. Moreover, this being an experimental economics study and using hypothetical monetary incentives, no students under 18 could answer the questionnaire.

4.1 TASK 1: BACKGROUND-RELATED QUESTIONS

On the one hand, a questionnaire was used to collect information from the students. It was carried out on Google Forms platform and sent to the target sample through different vias. This first part of the test gathers some personal questions, among which we can find the following:

- Age
- Gender
- Type of education received: distinguishing between public, concerted and private (more than one option can be selected).
- Current studies: University degree, T&D, Superior Artistic Education.
- Grade
- Degree
- Academic record: measured as average grade.
- Mother's and father's studies
- Familiar Income
- Further studies: regarding to post degree education. Students must specify and give reasons why.
- Existence of a wage gap

The questionnaire was programmed in such a way that every question was a required field to answer. If they were not answered, the questionnaire could not be sent after completion. However, the question on family income was left to be answered freely and, therefore, no subject was forced to respond, since it is often not answered and we did not want to lose these subjects.

4.2 TASK 2: FORMULATING EXPECTATIONS

Once asked about background information, questions about expectations were provided. Each subject should indicate what they believe their salary will be in 15 years. This time period has been chosen based indicatively on previous literature, where salary is asked 10 years after graduation (Brunello, Lucifora, and Winter-Ebmer, (2001)) or the salary they believe they will earn when they are in their 30s and 40s (Dominitz and Manski, (1996)).

Expected wage in our questionnaire has been presented in different ranks starting from “less than 1.000€”, then going through 1.000€ intervals (e.g., “between 2.000€ and 3.000€”) and the highest being “more than 10.000€”. Due to the fact that nowadays, in some labor market sectors there is an excess demand for work, we have distinguished between two questions related to income expectations. Firstly, and according to consulted literature, what students actually expect they will earn, regarding the current labor market in Spain and the poor conditions some sectors might have. Secondly, less realistic but can provide us some interesting information, what they expect in relation to what they believe a person with their studies and formation should earn in fair conditions.

In addition to knowing the future salary expectations of our subjects and trying to find out what the determinants are, this information on expectations is used to create a new variable whose objective is to measure students' level of overconfidence in what they believe their earnings will be compared to what is usually earned on average in their field. Actual data on average gross salaries in each field of study are obtained from the National Institute of Statistics.

Overconfidence is measured, thus, the following way:

$$\text{Overconfidence}_i = \text{Realwage}_{k,i} - \text{Expectedwage}_{k,i}$$

Where i is each individual and k corresponds to the field of study. If the subtraction results in a negative number, meaning that the real wage is less than the expected wage, then the subject is catalogued as overconfident. Otherwise, we say that

the subject is underconfident, since they expect to earn less than the average, perhaps because they underestimate their possibilities or because they believe the labour market will get worse conditions.

4.3 TASK 3: RISK AVERSION TEST

For this task, which is aimed at getting to know the subjects' level of risk aversion, a risk aversion test was provided at the latest section of the questionnaire. In this case, the one created by Holt and Laury (2002) was chosen in order to carry out the experiment. In the classical experimental model participants must choose between two lotteries, named as "Option A" and "Option B". Each of these lotteries has a different expected payoff given a certain probability. While both low and high payoffs remain constant in both options, probability increases as periods go by. Calculating the expected value in each period is necessary in order to analyze whether option A or B is more or less risky given that probability.

The table below shows all expected payoffs, where the expected payoff difference gets its minimum when arriving to period 4, this being 0'16€. From that period on, the difference between both expected values starts to become negative. Thus, the switching point from choosing Option A to Option B will determine the level of risk aversion by categorizing the subjects into risk averse, risk neutral and risk loving. The subjects who have chosen Option A during the first 3 periods will be named as risk loving. Risk neutrals are supposed to switch to option B after choosing option A four times. Risk averse people will switch to option B after period 5.

Table 1: *Holt & Laury lottery panel*

Period	OPTION A					OPTION B				
	High payoff	Low payoff	High payoff	Low payoff	Expected value	High payoff	Low payoff	High payoff	Low payoff	Expected value
1	10%	2	90%	1,6	1,64	10%	3,85	90%	0,1	0,48
2	20%	2	80%	1,6	1,68	20%	3,85	80%	0,1	0,85
3	30%	2	70%	1,6	1,72	30%	3,85	70%	0,1	1,23
4	40%	2	60%	1,6	1,76	40%	3,85	60%	0,1	1,6
5	50%	2	50%	1,6	1,8	50%	3,85	50%	0,1	1,98
6	60%	2	40%	1,6	1,84	60%	3,85	40%	0,1	2,35
7	70%	2	30%	1,6	1,88	70%	3,85	30%	0,1	2,73
8	80%	2	20%	1,6	1,92	80%	3,85	20%	0,1	3,1
9	90%	2	10%	1,6	1,96	90%	3,85	10%	0,1	3,48
10	100%	2	0%	1,6	2	100%	3,85	0%	0,1	3,85

However, some changes have been made since we want to avoid some inconsistencies. Due to the fact that we have a limited sample, and this risk aversion test will only be valid if there is only one switching point, we have modified the way the test

is presented to the subjects. The fact that this is an experiment where payments are hypothetical and participants may not have much incentive to respond, may put them our work at risk if their answers are often random. Therefore, in order to make it easier for them to be more responsive and to avoid inconsistent responses due to more than one switching point, it has been decided to modify the test approach. However, when dealing with inconsistency bias, we should be aware that we may incur other problems such as the order effect. Presenting both options in perfectly ordered periods and keeping the safe option and the risky option at the same place given the probabilities during all periods may cause subjects to be biased towards choosing a particular option simply because of personal taste. Therefore, this experiment has been prioritized on the assumption that we will get order effect problems rather than losing a large part of the sample by having inconsistent subjects.

In our work, the main task in this risk aversion test has not been choosing between option A or B in each period, but indicating in which of the following periods, taking a look at the table, they would rather prefer to choose option B to option A. That is, subjects should designate their switching point. This way, the subjects have been categorized the following way given their answers:

- Risk loving: switching point between periods 1 to 4.
- Risk neutral: switching point between periods 4 to 5.
- Risk averse: switching point between periods 5 to 10.

4.4 PROCEDURES

This experiment was carried out using the Google Forms platform and was sent and addressed to people with the requirement that only those who were university, vocational training and higher artistic education students could respond. The geographical limit was Spain, as it was not only provided to students from Castellón and the Universitat Jaume I, but also to students from other parts of the country.

When answering the questionnaire and in order to avoid biases, the subject registered his or her e-mail address but was restricted so that their identity would not be stored. In this way, by being anonymous, we ensured that no participant felt inhibited in showing their answers and could respond in the most honest way possible given the limitation of not being able to give them monetary incentives with real payments.

The students were informed that this was a Final Degree Project where their participation could be of great help. They were also informed that this was an

experimental economics study where the payments shown throughout the questionnaire were hypothetical and, therefore, they would not obtain any real remuneration given the impossibility of making the payment. Once the questionnaire was answered, the data were transferred directly for further analysis.

4.5 SAMPLE CHARACTERISTICS

A total of 131 students responded to the questionnaire, 125 of whom were university students. Due to the fact that the sample of students from other fields such as Vocational Training (4%) or Artistic Education (1%) is a very small minority and, in addition, due to having certain missing data because these students were not required to specify their field of study, we thought it convenient to exclude them from our model and focus on the data from university students only.

Table 2: Proportions table by subjects' current studies

Currentstudies	Proportion	Standard Error	Logit [95% Conf. Interval]
1	.9411765	.0215694	.8809105 .9719167
2	.0420168	.0183915	.0174369 .0977972
3	.0168067	.0117839	.004147 .0655683

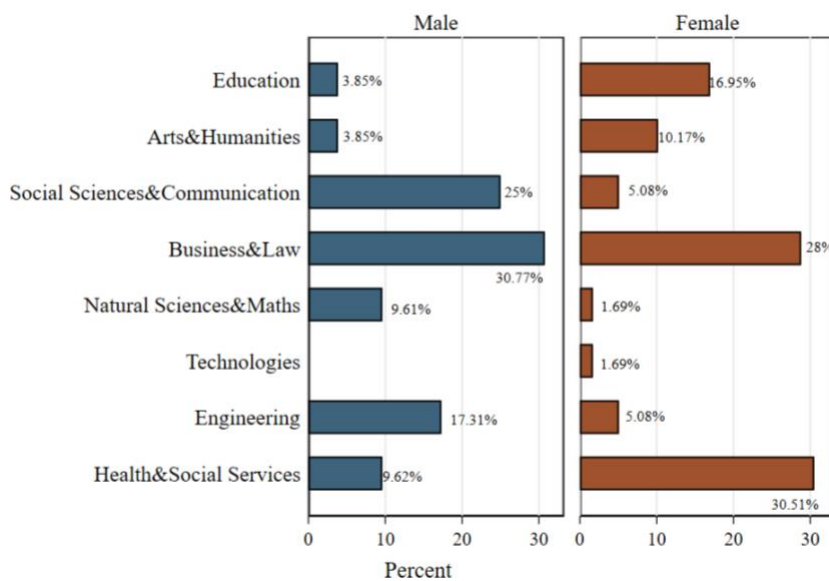
1=University degree, 2=T&D, 3=Superior Art Education

In addition, of the remaining 125 subjects that corresponded to university students, 6 of them have turned out to be inconsistent by not answering certain questions adequately and contaminating the sample and, 8 of the 119 remaining, have some missing data due to not answering to a non-mandatory question (Income). Therefore, of the 125 university students who participated, 111 did not present any type of inconsistency in their answers, so they have been chosen as the definitive sample for our analysis for those regressions in which the variable *Income* was included.

As for gender, and as mentioned above, we have obtained a fairly balanced sample between men and women, the latter constituting about 54%. In this way, we tried to avoid incurring in biases in those variables that are usually closely correlated with gender.

With respect to age, due to the fact that this experiment is exclusively aimed at students, the mean age is between 20 and 21 years, with 18 being the minimum value (corresponding to the first year in which it is usually possible to enter university) and 26 the maximum value. Age, therefore, will not be a decisive factor in our analysis.

Figure 2: Field of studies by female



Regarding to the field of study of our university undergraduates, we can observe certain differences between men and women and their choice of degree. The main differences lie mostly in the fields related to education, social and communication sciences, health sciences and social services and, lastly, engineering. While in those fields that involve caring for or dealing with other people in a closer way (education and health) women predominate, other scientific fields such as engineering or natural sciences continue to be chosen mostly by men, showing that, in these sectors, the idea that certain careers are associated with a specific gender is still ingrained. On the other hand, in the field related to social sciences there is also a strong predominance of men, especially in journalism and audio-visual communication degrees. Degrees related to business and law are fairly evenly matched between men and women. In technology there is also no notable difference, as is the case with the arts and humanities.

5 RESULTS

5.1 SUMMARY STATISTICS

In order to get an in-depth understanding of the data resulting from our work, a table is provided with the main statistics of the concerned variables.

Table 3: *Summary statistics*

Variable	Obs	Mean	Std. Dev.	Min	Max
Age	119	20.98319	1.389935	18	26
Female	119	.5378151	.5006761	0	1
Grade	119	3.168067	1.152149	1	5
Averagegrade	119	2.957983	.9056785	1	5
Income	114	3.578947	1.388287	1	7
Overconfidence	119	.3109244	.4648291	0	1
Underconfidence	119	.2184874	.4149671	0	1
Expectedwage	119	3.260504	1.069311	2	7
Public	119	.4621849	.5006761	0	1
Entrepreneur	119	.1932773	.3965382	0	1
Employee	119	.3445378	.4772267	0	1
Keepstudying	119	.8235294	.382832	0	1
Wagegap	119	.6722689	.4713709	0	1
Riskaverse	119	.8739496	.3333096	0	1
Riskloving	119	.0756303	.2655236	0	1
Riskneutral	119	.0504202	.2197356	0	1

As previously mentioned in the sample characteristics, the participants are undergraduate students, mainly from university. In this case and having ranked the variable *Grade* from 1 to 5, being "1" first year and "5" fifth year (since there are students in the medical degree whose courses go up to the fifth year), the mean is around 3, these being third year students. Closely related to the field of studies, we find the variable that reflects the academic record of our subjects (*Averagegrade*). Starting with "0" as a mark lower than 5, and "5" constituting the grading interval from 9 to 10, we observe that the mean is around 3, which implies that subjects' grades in their university degree is, on average, in the interval between 7 and 8. Furthermore, if we look at the minimum of the observation, this is "1", which implies that there is no subject who has an average grade lower than 5.

Regarding the monetary variables, *Income* and *Expectedwage*, both have been graded in the same way, taking values from 1, which stands for an amount of less than 1.000€, then going by intervals of 1.000€, value 6 implies more than 5.000€ and value 7 more than 6.000€. Therefore, with respect to the variable *Income*, family income has an average of almost 4, this being the interval "3.000€ to 4.000€". In this variable we see that the number of observations is lower than the rest. This is due to the fact that 5 subjects did not want to specify the average income of their family unit, as it was not a mandatory question to answer in the survey. As for *Expectedwage*, our sample has an average future salary expectation of 3, which means a range between 2.000 and 3.000€. It is also worth mentioning that no subject expects an income of less than 1.000€, as the minimum value is 2.

On average, 31% of our sample is overconfident, while 21% is underconfident. About 82% of the subjects affirm that they do want to continue their studies after university (*Keepstudying*), and 62% believe that there is a difference between men's and women's salaries (*Wagegap*).

Finally, there is no great variety in risk preferences among our subjects. In fact, the balance between men and women in our sample did not produce gender differences in the level of risk aversion either, contrary to the existing literature. However, it is common to obtain a higher percentage of risk-averse people in the samples; in our case, 87% of the subjects are categorized as risk-averse, while almost 8% are risk-lovers and 5% are risk-neutral.

Table 4: Proportions table by education received

Education	Proportion	Standard Error	Logit [95% Conf. Interval]
1	.5462185	.0456387	.4553144 .6341418
2	.1260504	.0304258	.0770389 .1995027
3	.0084034	.008368	.0011587 .0583025
4	.2605042	.0402348	.1889349 .3475664
5	.0336134	.0165218	.0125445 .0869522
6	.0252101	.0143704	.0080582 .0760703

*1= Public, 2=Public&Concerted, 3=Public&Private, 4=Concerted,
5=Concerted&Private, 6=Private*

Due to the fact that the question about the education the subjects had received was a multiple-choice question, we had to categorize it from more public to more private, since many of the subjects had not only gone to a public or private school, but many of them had received a combination of both throughout their academic career. Even so, half of our sample (54%) had attended a public education, and a quarter (26%) had received concerted education. It is a minority of subjects who, evidently, have received a combination of public and private, as they are extremes. However, 12% of the students claim to attend both public and concerted schools. The proportion of subjects who have attended exclusively private schools is 2.5%, while those who have received both private and concerted education is only 0.8%. Therefore, the majority of our sample has, at some point in their academic life, received public education.

Table 5: *Proportions table by mother's and father's studies*

Mothersstudies	Proportion	Standard Error	Logit [95% Conf. Interval]	
1	.0347826	.0170862	.0129782	.0898841
2	.226087	.0390063	.1581363	.3124009
3	.0695652	.0237241	.0349088	.1338556
4	.2434783	.0400214	.1730556	.3310847
5	.0086957	.0086578	.0011981	.0602826
6	.4173913	.0459845	.3300195	.5102769

1= Primary Education, 2=Secondary Education, 3=Baccalaureate, 4=T&D, 5=Superior arts education, 6=University degree, 7=Postgraduate studies

Fathersstudies	Proportion	Standard Error	Logit [95% Conf. Interval]	
1	.0695652	.0237241	.0349088	.1338556
2	.2695652	.0413784	.1957402	.3588118
3	.1304348	.031405	.0797586	.206098
4	.2	.0373002	.1360943	.2840473
5	.026087	.0148636	.0083358	.0786419
6	.2956522	.0425535	.2187617	.386208
7	.0086957	.0086578	.0011981	.0602826

1= Primary Education, 2=Secondary Education, 3=Baccalaureate, 4=T&D, 5=Superior arts education, 6=University degree, 7=Postgraduate studies

With respect to the education received by parents, other studies have shown it to be a determining variable in both family income and the level of studies of the children (*Davis-Kean (2005)*), in the same way that, on many occasions, the parents' field of studies has also influenced the choice of the children. It should be emphasized that the division between the mother's and the father's studies is important if we want to take gender differences into account.

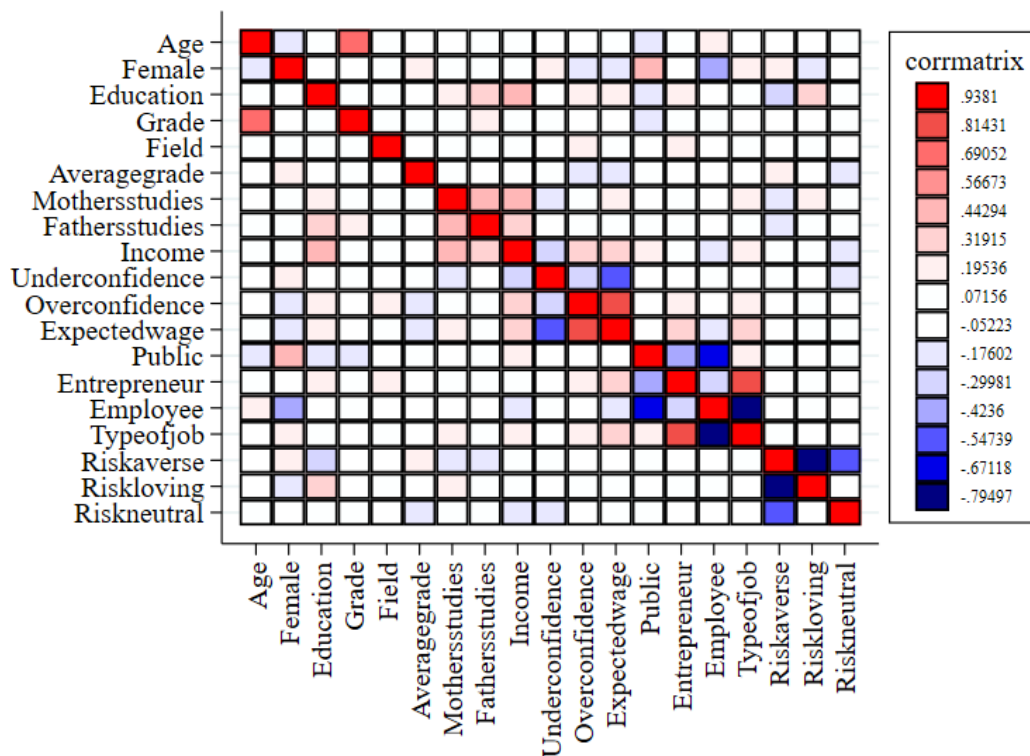
While the father's level of studies is more distributed between secondary education (27%), high school (13%), vocational training (20%) and university degree (30%) in not very disparate proportions, almost 42% of women are university graduates,

24% have completed vocational training and 22% completed secondary education. There is a higher proportion of men who received the minimum education (6% compared to 3% of women) but, on the other hand, no woman has completed postgraduate studies (0.8% of men have).

5.3 CORRELATION TEST

In order to find out how the different variables are related to each other, a correlation matrix has been drawn up that includes each and every one of them. Thus, we will later contrast, by means of econometric analysis, whether this apparent relationship is significant or not. It will also help us to choose the variables that better fit to each model.

Figure 3: Correlation matrix



The matrix shows us that both the *Public* and *Employee* variables are correlated with *Female* at 0.42 and 0.44, the former being a positive relationship and the latter a negative relationship. This seems to be consistent with the current gender gap between both public and private sectors. We also see an apparent positive relationship between income level and the type of education (from less to more private) received, and between income and salary expectations. The strong correlation between *Grade* and *Age* does

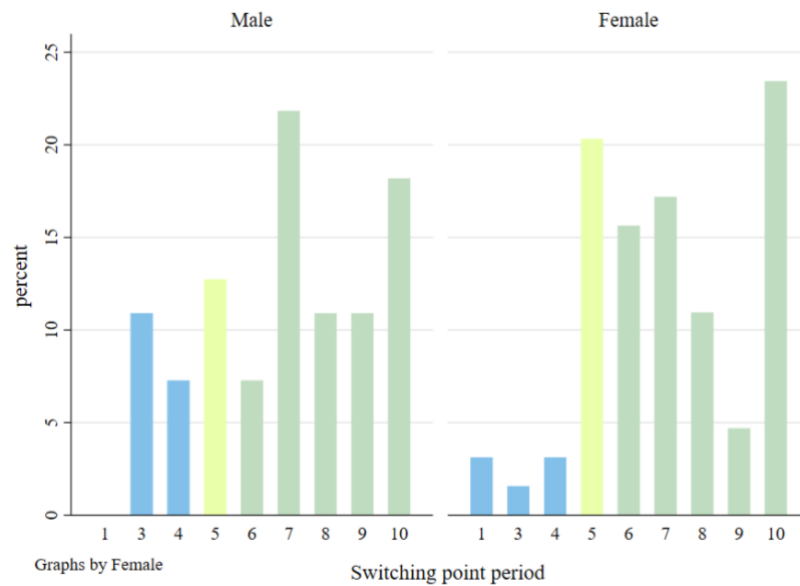
not show us anything interesting, since it is to be expected that as grades advance, so does age. The father's level of studies and the education received by the children have a positive correlation of 0.32, while there is no correlation between the father's level of studies and the mother's studies. It is interesting how there is a higher correlation between the mother's education and the family income rather than the father's education. There is also a negative correlation between the level of *Income* and the level of *Underconfidence*.

5.3 RISK PREFERENCES

Consistent with existing literature, females tend to be significantly more risk averse than males (Eckel and Grossman, 2008; Croson and Gneezy, 2009). However, our sample is mainly risk averse, even though there is no relevant difference between the number of male and female participation in our sample and we have not incurred in gender biases. Moreover, unlike previous literature (Holt and Laury, 2002), the fact that we have used hypothetical payoffs for this experiment has not increased the number of risk-loving subjects, reason why we do not find an answer to the high percentage of risk averse individuals in our sample.

There have been many cases in which the number of inconsistent participants (we refer to inconsistent as those making more than one switching point in the Holt and Laury MPL method) have reached more than 50% of the sample (Jacobson and Petrie, 2009). For this reason, some alternatives were proposed on which we have based our work. Andersen et al. (2006) asked their participants to choose the period at which they preferred Option A to Option B. However, the implementation of this alternative way of eliciting risk preferences may have caused some misunderstandings, hence increasing the number of risk averse people in our sample more than the average.

Figure 4: Switching point period by female



The blue bars refer to the switching points where individuals are considered risk loving. The yellow bar is considered the risk neutral point, while the green ones refer to those periods in which subjects are risk averse. Because the vast majority of our sample has been categorized as risk averse, we found no gender differences between risk preferences and, therefore, risk will not be significant for our analysis. In our case, contrary to what the literature provides, we cannot accept the second hypothesis put forward. Risk aversion will have no significant effect on the choice of job type or any other regression.

5.4 OVERCONFIDENCE

Overconfidence is widely estimated by calculating the difference between one own's thoughts about theirs and others' performance. In our study, in an attempt of linking one's level of confidence with their expectations on future income, the variable overconfidence has been created using both data from personal expectations and actual earnings given the specific field of studies.

These data provided by the National Institute of Statistics show us the average salaries of the total number of deciles in 2021 in Spain at full time in the different fields of study that we analyzed in our experiment.

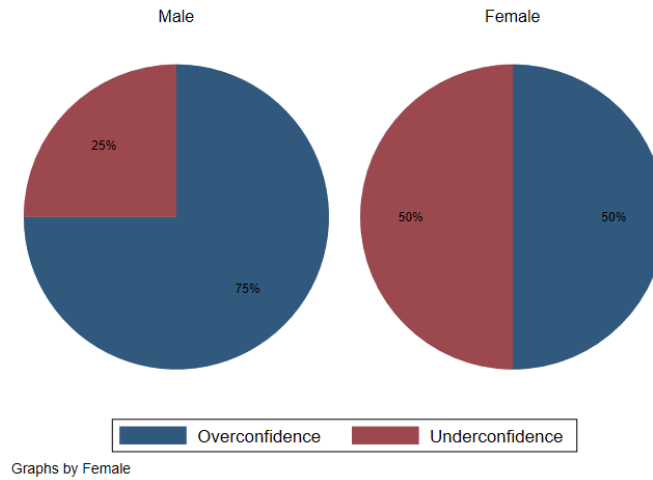
Table 6: *Average monthly gross earnings*

	Total decile 2021
Full-time job	
Education	2.485,27 €
Arts&Humanities	2.585,52 €
Social Sciences&Communication	2.783,37 €
Business&Law	2.640,02 €
Natural Sciences&Maths	2.906,13 €
Technologies	2.853,53 €
Engineering	2.560,61 €
Health&Social Services	2.927,19 €

Note: Data based on average wages by type of working day, level of formation achieved sector and decile downloaded from INE. Own elaboration.

The total decile indicates the average wage for each of the eight categories selected given our subject's field of study specification. We thus obtain an average wage that is in the range of 2.000€, in no case exceeding it or being below. The differences between the average salaries are not really noticeable and hardly existent among some fields of study. However, we can rank health and social services with its salary being the highest, while education is positioned as the lowest. Followed by health, natural sciences and maths ranks second in terms of the highest average salary, along with technology. Between humanities and engineering there is also no great difference in salaries, contrary to popular belief. Needless to say, that within each field there is an infinite number of jobs with a great deal of variability in salaries between them. However, this is only a guideline to take as a reference, given that in this study, since we are working with expectations, we are dealing with hypothetical data.

Figure 5: Overconfidence and Underconfidence pie chart by female



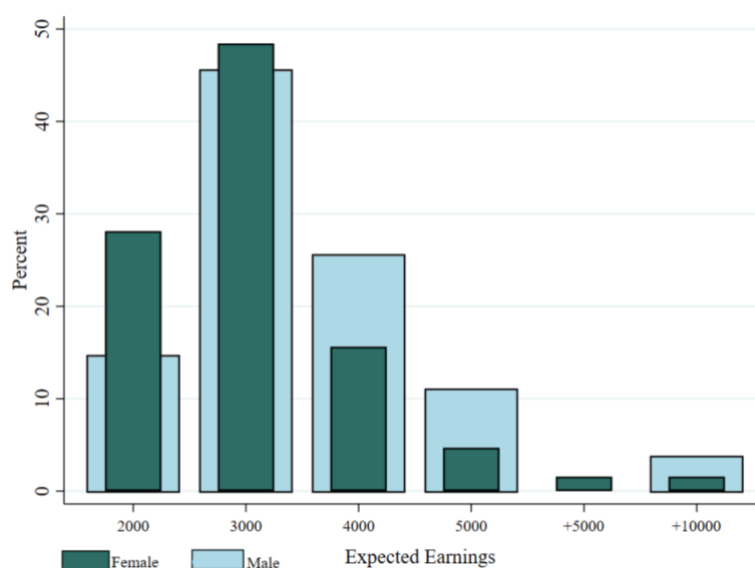
The graph shown above indicates that there are notable differences between men and women regarding to Overconfidence. It is evident that the percentage of overconfident subjects is much higher in men than in women. The sample of women is more equal but, when compared to men, a higher percentage of women expect lower than average salaries, that is, they are underconfident in a more noticeable way.

5.5 WAGE EXPECTATIONS

According to existing literature, some apparent differences between males and females on their expected future earnings are noticeable. While expectations in both genders follow a similar distribution, with the average in both cases around the range of 2,000 to 3,000 euros, a higher percentage of females expect to earn less than 2,000 euros in the future. During the first two intervals there is a greater female predominance (although stronger in the lower range), while, to the right of the mean, the percentage of men is higher than women. We can say that, at first glance, the percentage of women exceeds that of men when the expected salary is lower and vice versa.

The graph below represents a distribution of the expected future salary divided into the intervals explained above, differentiated by gender. The distribution has a positive skew, as its mean is centred on a value located on the left.

Figure 6: Expected earnings distribution by female



The first model carried out for the analysis is the one that takes *Expectedwage* as the explained variable, in order to find which are the factors that may influence the formation of expectations. A linear regression model has been constructed to explain, by using 7 explanatory variables (5 of them are dummy), the effects of these variables on the expected wage.

Because our model includes a qualitative variable (*Field*) that needs a transformation into 8 dummies to be included in the model, a non-parametric test for unpaired data has been employed. The results of the Kruskal-Wallis test with total $k=8$ groups for the *Expectedwage* variable defined by *Field* are shown below. The results obtained suggest that we should reject the null hypothesis that all samples come from the same population and that we should therefore include each sample in our subsequent regression.

Table 7: *Kruskal-Wallis equality of populations rank test*

Field	Obs	Ranksum
1	12	400.50
2	8	317.50
3	16	733.50
4	33	2151.50
5	6	478.00
6	1	87.00
7	12	810.00
8	23	1238.00

Chi-squared = 18.080 with 7 d.f
 Probability = 0.0116
 Chi-squared with ties = 20.687 with 7 d.f
 Probability = 0.0043

The econometric model then goes as follows:

$$\begin{aligned}
 \text{Expectedwage}_i &= \beta_0 + \beta_1 \text{Female}_i + \beta_2 \text{Income}_i + \beta_3 \text{Avgrade}_i + \beta_4 \text{HealthSS}_i \\
 &+ \beta_5 \text{Engineering}_i + \beta_6 \text{Technologies}_i + \beta_7 \text{NaturalSciences}_i \\
 &+ \beta_8 \text{BusinessLaw}_i + \beta_9 \text{SocialSciences}_i + \beta_{510} \text{ArtsHumanities}_i \\
 &+ \beta_{11} \text{Educational}_i + \beta_{12} \text{Entrepreneur}_i + \beta_{13} \text{Public}_i + u_i
 \end{aligned}$$

In this regression, the coefficient of the *Female* variable takes a negative value, which is not far from the literature consulted. A priori, the fact of being female will negatively influence expectations about future salary. The same is true for *Averagegrade*, which is different from the literature that argues that better students predict higher expectations. The positive sign of the beta of *Income* indicates that the relationship between students with higher income and their expectations is positive. For the two job types in our regression (*Employee* has been omitted as it is the case of three dichotomous variables) the signs of the coefficients are also positive, so all will have a

positive effect on the formulation of expectations. For every field of study, the beta coefficients stand a positive effect on the dependent variable.

Table 8: *Model 1, Expected wage linear regression*

VARIABLES	(1) Modelo1 Expectedwage
Female	-0.346 (0.223)
Income	0.219*** (0.080)
Averagegrade	-0.063 (0.121)
HealthSS	0.591 (0.400)
Engineering	1.184** (0.471)
Technologies	1.959* (1.049)
NaturalSciences	0.904 (0.554)
BusinessLaw	0.909** (0.359)
SocialSciences	0.728 (0.447)
ArtsHumanities	0.647 (0.509)
Educational	-
Entrepreneur	0.780*** (0.277)
Public	0.287* (0.133)
o.Employee	-
Constant	2.717***
Observations	106
R-squared	0.246

Normalized beta coefficients in parentheses

*** p<0.01, ** p<0.05, * p<0.1

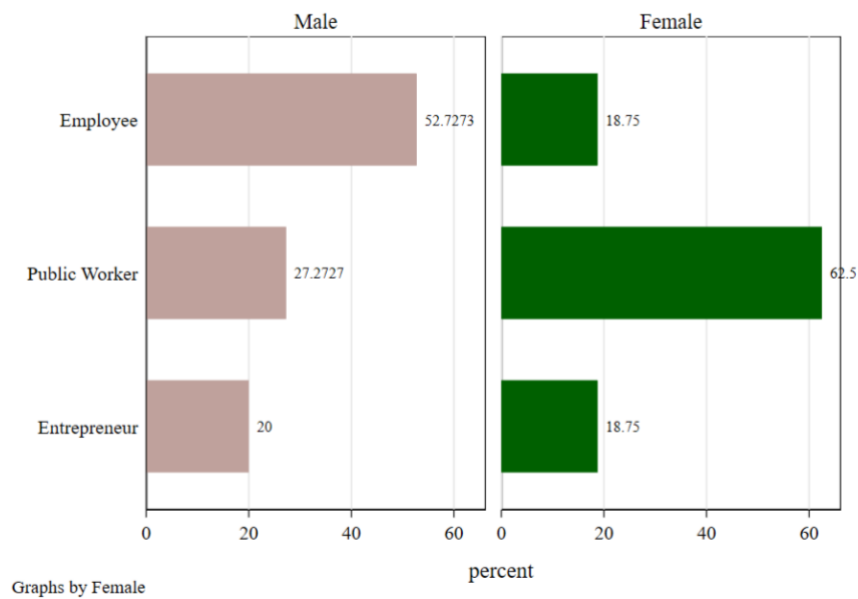
The R-squared value we have obtained indicates that this linear model fits 24.6% of our observations as a whole. However, this statistic alone is incomplete and an analysis of the significance of each variable separately is needed. The OLS results show, contrary to what we expected, no significant effects between *Female* and *Expectedwage*. Hence, we cannot say that females tend to have a lower expected salary than men. Family *income* level, however, is highly significant and suggests that moving from one income range to the next higher range leads to 20% higher expectations at 1% significance. Academic record has no significant effect either on salary expectations.

With respect to the fields of study that individuals are pursuing, we find some differences. Due to the use of 8 dummies that make up the different fields, we have used *Educational* as baseline and, therefore, we have omitted it from our regression. Based on this variable, we can interpret the rest as follows. Those studying grades related to *Engineering* have, at 5% significance level, higher expectations compared to those who study some educational grades. The same happens with *Technologies* and *Business&Law*, having significant effects at 10% and 5% level, respectively. We interpret the variables corresponding to the type of job in the same way. Using *Employee* as baseline, students who want to be entrepreneurs in the future have 78% higher expectations than those whose preference is to be a private employee at 5% significance. With respect to public employment, we found that students who would rather become civil servants expect 28% higher expectations than private employees, but just at the lowest significance level.

5.6 TYPE OF JOB

As can be seen in the graph below, there are notable differences in preferences for the type of future job between men and women. While among men there is a clear preference to work as an employee of private companies, a high percentage of women opt for public positions. Contrary to the literature, the percentage preference for entrepreneurship is practically equal between men and women in our sample, which is a great improvement for gender differences in the labour market. Where emphasis should be placed on is the differences between public and private workers, as the gender variations between these two can be observed at a glance.

Figure 7: Type of job by female



Since our dependent variable is dichotomous (*Public*), which takes a value of 1 when being a public employment and 0 otherwise, we have constructed a logit model in which the probability of success, i.e., of being a civil servant, depends on 7 variables. Among these, 3 are binary variables: *Female*, *Wagegap* and *Right*. The variables related to education have been ranked, as developed above, because of their qualitative nature.

$$P(Y = 1|X) = \Lambda(\beta_0 + \beta_1 Female + \beta_2 Income + \beta_3 Wagegap + \beta_4 Right + \beta_5 Fatherstudies + \beta_6 Motherstudies + \beta_7 Education)$$

When studying the signs of the coefficients of the variables in our model, we obtain that being a woman, being a student with a higher income and believing in the existence of the wage gap may positively influence the calculation of the probability of preferring a public job, as well as the fact that expectations coincide with the average wage (*Right*). We find differences in the signs of the coefficients of the mother's and father's education, with the father's level of education being positive with the preference for public employment and the effect of the mother's education on the willingness to be a civil servant being negative. The education received also has a negative sign, so that a more private education (remember that the ranking of this variable is designed as education from less to more private) will have a negative effect on the probability of preferring public employment.

Table 9: *Model 2 Logit for public*

VARIABLES	(1) Modelo2 Public
Female	1.399*** (1.393)
Income	0.348* (0.952)
Wagegap	0.848* (0.791)
Right	0.287 (0.287)
Fathersstudies	0.0588 (0.206)
Mothersstudies	-0.165 (-0.570)
Education	-0.129 (-0.371)
Constant	-2.166**

Observations	110
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Normalized beta coefficients in parentheses

*** p<0.01, ** p<0.05, * p<0.1

No interpretation of the coefficients can be made due to the impossibility of calculating the probability that each variable provides, since the *ceteris paribus* clause is not satisfied when analysing one variable. We can, however, stand that there is a strong significance (1% level) of the effect that being a female has on public employment. Also, *Income* and *Wagegap* are both significant at a 10%. We can say that individuals who believe in gender differences in the labour market will increase the probability of choosing public employment, as well as those students with higher income. Neither the parents' level of studies nor the type of education received are significant in our analysis, as well as having the same expectations as the actual wages given each field of study (*Right*).

6 CONCLUSIONS

The first conclusion we draw is that, as other studies have shown, there is no significant relationship between risk preferences and future wage expectations. In fact, in our sample, risk preferences have no relationship with any other parameter, since obtaining a more risk-averse population than usual has caused us to incur in biases that have nullified any effect of this variable on any regression. Contrary to our expectations, we are unable to find a significant effect between risk aversion and labour market preferences, as it cannot be shown that more risk-averse individuals are more likely to prefer public jobs. Contrary to the literature, we also find no relationship between risk-loving individuals and entrepreneurship.

Not according to what we expected to obtain, the results do not show any relationship between being a woman and expectations about their future salaries at any significance level. Women do not tend to have lower income expectations relative to men. It is true that the degrees with higher returns are those related to Health and Social Services and, that degrees, have a higher percentage of women. This might be one reason why women did not expect lower future income in our experiment. We can't say, either, that the existence of inequalities in the labour market, especially for more educated women influences the formulation of expectations.

Although experimental measures such as risk aversion do not determine, in our case, expectations and type of work, some of the traditional variables do. Family income, as expected, also proves to be an influential factor in formulating expectations. The fact that students whose family income is high also have higher expectations about their own salary may be explained by the fact that the environment in which they live affects a different view of the future in accordance with the family situation, specifically income. Finally, with respect to the major university choice, we find significant differences with the degrees related to business and engineering with regard to education. It is true that degrees such as teaching have smaller professional paths and their salaries are quite invariable and predictable, so in this case the expectations may be more realistic and closer to the average for their field. However, in degrees related to business or law the huge number of possibilities regarding different job positions creates a great variability of expectations. Moreover, the increasing demand of engineers in almost any field of the labour market has also caused their wages to be higher. The grouping of careers into broad categories in our survey may be a factor that hides significant sources of heterogeneity. However, it is important to consider that, within each specialty, both men and women have the ability to choose very diverse occupations. Goldin and Katz (2011), in fact, have shown that occupational choices differ considerably between genders even

within specialized areas. Therefore, we cannot conclude to what extent our results might change if a categorization by careers rather than by educational branches was employed.

We can say, therefore, that depending on what degree the students are pursuing, it will influence them to have higher or lower expectations, but did these students choose those degrees because they expected higher salaries? Since the major choice occurred before the experiment of formulating expectations, we cannot determine this, as we would incur in reverse causality problems. Therefore, it would be interesting to do future research on expectations at the time of decision making to determine what influences college career choice.

Where we do find fairly significant effects is in job type preferences. From the second regression we obtained a clear and significant preference of women for public jobs. Although it is true that we expected to find a positive relationship between risk aversion (more prone in women) and the preference for public employment, we have not been able to demonstrate any relationship between them. Therefore, we cannot say that the fact that women have a greater inclination towards civil servant positions is due to their high level of risk aversion. On the other hand, we did find a relationship, albeit less significant, between the belief that there is a pay gap and the preference for civil service jobs. These results are quite consistent with the data we obtained from the INE showing differences between the gender pay gap between the public and private sectors, and may be one reason why there is a greater preference among women for public jobs: not so much because of their levels of risk aversion but to avoid a larger pay gap.

In conclusion, if neither risk nor gender differences in expectations can explain the wage gap in certain labour markets, what remains unaccounted for to explain this phenomenon? It seems that the glass ceiling theory does hold true in some markets, especially for women with a higher level of education. It would be interesting, however, to rerun this experiment on a more diverse sample with respect to risk preferences to find out whether the fact of having incurred biases has substantially modified the results of the research.

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8 APPENDIXES

8.1 APPENDIX A

INSTRUCTIONS

Hello! I am an economics student at the Universitat Jaume I and this questionnaire is part of my TFG. I would really appreciate it if you could answer this series of questions honestly. The questionnaire will take you no more than 3 minutes and your participation would be of great help to me.

This is part of an experimental economics assignment, where in the first section of this questionnaire you will have to answer some questions. Secondly, in the next section you will be given a task. This questionnaire is completely anonymous, so remember to be honest with your answers.

Thank you very much for your cooperation and time.

TASK 1

1.Age.

2.Gender.

- Male
- Female
- Don't want to specify

3.What kind of education have you received?

- Public
- Concerted
- Private

*For this question, more than one option could be selected.

4.What are your current studies?

- University degree
- Advanced Specific Vocational Training
- Superior Arts Studies
- None of the above

5.Grade.

- 1st
- 2nd

- 3rd
- 4th
- 5th
- 6th

6. In case of being a university degree student, please specify your degree.

7. Indicate your average grade based on your current studies.

- Less than 5
- Between 5 and 6
- Between 6 and 7
- Between 7 and 8
- Between 8 and 9
- Between 9 and 10

8. When ending your current studies, would you like to continue your formation?

- Yes
- No

9. If your answer above was "yes", please specify in what way. If your previous answer was "no", please indicate why.

10. Level of studies achieved by your father

- Primary Education
- Secondary Education
- Baccalaureate
- Vocational Training
- University Degree
- Postgraduate Studies
- I don't know

11. Level of studies achieved by your mother

- Primary Education
- Secondary Education
- Baccalaureate
- Vocational Training
- University Degree
- Postgraduate Studies
- I don't know

12. Please indicate the net monthly income rank from your parents (jointly)

- Less than 1.000€
- Between 1.000 and 2.000€
- Between 2.000 and 3.000€
- Between 3.000 and 4.000€
- Between 4.000 and 5.000€
- More than 5.000€
- More than 10.000€

13. Do you believe there is an existence of a wage difference between men and women?

- Yes
- No

TASK 2

The following section is an easy task, as you will only have to indicate, within the following ranges, what is the net monthly salary you expect to earn in 15 years.

- Less than 1.000€
- Between 1.000 and 2.000€.
- Between 2.000 and 3.000€.
- Between 3.000 and 4.000€.
- Between 4.000 and 5.000€
- More than 5.000€.
- More than 10.000€.

Now, you must indicate what you expect to be, on average, the net monthly salary in 15 years for a person with the same studies as you.

- Less than 1.000€
- Between 1.000 and 2.000€.
- Between 2.000 and 3.000€.
- Between 3.000 and 4.000€.
- Between 4.000 and 5.000€
- More than 5.000€.
- More than 10.000€.

TASK 3

In this task you will have to choose between two options, A and B. Each of the options will have a certain probability of receiving certain amounts of money. For example:

- option A: there is a 5% chance winning 7€ and a 95% chance winning 3€.
- option B: there is a 5% chance winning 10€ and a 95% chance winning 1€.

Thus, you will have to indicate the period in which you prefer to choose option B rather than option A.

REMEMBER: These payouts are hypothetical, so no payment will be made to the participants.

In which period (grey column on the right) would you rather choose option B over option A?

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

OPCIÓN A	OPCIÓN B	
10% de obtener 2€ y 90% de obtener 1'50€	10% de obtener 3'85€ y 90% de obtener 0'10€	1
20% de obtener 2€ y 80% de obtener 1'50€	20% de obtener 3'85€ y 80% de obtener 0'10€	2
30% de obtener 2€ y 70% de obtener 1'50€	30% de obtener 3'85€ y 70% de obtener 0'10€	3
40% de obtener 2€ y 60% de obtener 1'50€	40% de obtener 3'85€ y 60% de obtener 0'10€	4
50% de obtener 2€ y 50% de obtener 1'50€	50% de obtener 3'85€ y 50% de obtener 0'10€	5
60% de obtener 2€ y 40% de obtener 1'50€	60% de obtener 3'85€ y 40% de obtener 0'10€	6
70% de obtener 2€ y 30% de obtener 1'50€	70% de obtener 3'85€ y 30% de obtener 0'10€	7
80% de obtener 2€ y 20% de obtener 1'50€	80% de obtener 3'85€ y 20% de obtener 0'10€	8
90% de obtener 2€ y 10% de obtener 1'50€	90% de obtener 3'85€ y 10% de obtener 0'10€	9
100% de obtener 2€ y 0% de obtener 1'50€	100% de obtener 3'85€ y 0% de obtener 0'10€	10

8.2 APPENDIX B

LIMITATIONS

The main limitation we encountered in this work was the impossibility of carrying out real payments to encourage individuals to respond as correctly and honestly as possible. However, the payments had to be hypothetical, which is very likely to have influenced the responses, especially those related to the risk aversion test. In addition, the fact that we only targeted both university and T&D students has considerably reduced our target, so the sample we opted for was smaller. Carrying out the questionnaire through Google Forms was also an obstacle, as external factors could also have had an impact. Misunderstanding might have also led to wrong answers since individuals could not ask any doubts due to physical distance.