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# Gender differences in French undergraduates' academic plans and wage expectations

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## ABSTRACT

Gender differences in wage expectations may affect investment in human capital and increase inequalities in the labour market. Our research based on a survey of first-year students at a French university aims to focus on expectations at the beginning of the career. Our results show that anticipated earnings differ significantly between men and women. One year after graduation, we find a gender gap in pay of 16%. A wage decomposition method indicates that most of this effect is due to anticipation of discrimination. Ten years after graduation, anticipated discrimination is still almost as dominant in explaining the gender gap in pay. Finally, using a survey of recent college graduates, we show that growth in the anticipated gender gap differs greatly from growth in the observed gender gap. Our findings highlight the importance of policies promoting higher educational aspirations for young women. Career guidance counselling for students may play a decisive role in contributing to give women more ambitious aspirations, which may in turn serve to reduce inequalities in the labour market.

## KEYWORDS

Expected wages ; gender wage gap; Oaxaca–Ransom decomposition

### 1. Introduction

Although women are often academically more successful than men, they still earn far lower wages than men in the labour market. In Organisation for Economic Cooperation and Development countries, men earn on average 16% more than women for similar full-time work (OCDE 2012). At the top-end of the wage scale, the gap reaches 21%, highlighting a greater gender discrepancy in wages for top jobs. Many factors explain these inequalities. An extensive literature, in labour economics in particular, has sought

to investigate the influence of gender discrimination in the labour market (Stanley and Jarrell 1998; Jarrell and Stanley 2004). Most of these studies reveal the existence of discrimination by employers who value women's productive characteristics such as level of education less than men's. Other researchers focus on the effects of gender socialisation on occupational choices made by men and women (Eccles 1994; Okamoto and England 1999). They generally underline the importance of the gradual transformation of academic and professional plans that would enable women to have access to jobs that are more highly valued in the labour market.

In this last explanation, gender difference in wage expectations may play a major role. Empirical research in economics, sociology, and psychology shows that, among 10–14 years old pupils, wage expectations of girls are generally lower than those of boys. Some of these studies suggest that students anticipate a higher gender gap in pay in mid-career than in early career. For example, Major and Konar (1984), referring mainly to social psychology studies, identify five factors that may explain differences in salary expectations: type of academic and professional careers chosen by women, stereotypes about job and competence, women's perceptions of their own-job-related inputs, subjective values of job-related rewards and social comparisons that women make. Their empirical results show that a significant part of women's expectations is due to the average wage to which they refer: they are more likely to look at the women average observed wages. The results of Heckert et al. (2002) lead to the same conclusions: men and women do not share the same perception of average wages in the labour market. They also emphasise that the characteristics of the occupation in connection with the possibilities of reconciling work and family life are also important, as is the possibility of interrupting their careers to look after their children. However, Smith and Powell (1990) found that while women and men have good information about the earnings of college graduates, they differed over expectations about their own wages. Men are more likely to anticipate higher wages than their peers, while women's expectations do not make distinction between themselves and other women.

Some economists (Brunello, Lucifora, and Winter-Ebmer 2004; Jerrim 2011) were also asked about the implications of these differences in expectations for young people's path during their education and then on the labour market. First, these expected wage differences may affect their educational choices in terms of educational levels or fields of study. They may also influence their reservation wage, defined as lower wage that a person will accept in order to take a job, when looking for work, after graduating, and their first job negotiation. Women's lower reservation wages are then likely to keep women in low-paid jobs, regardless of their academic abilities and their true productivity in the labour market (Orazem, Werbel, and McElroy 2003). In addition, because of a smaller women's gap between expectation and reality, this finding may also explain why there are few differences in job satisfaction between women and men,

although women's salaries are much lower.

These studies highlight the influence of labour market expectations on gender differences in educational aspirations. More specifically, the anticipated benefit of educational investment is expected to play a decisive role. In this research, we use surveys of first-year students at a French university and recent graduates to investigate gender difference in wage expectations. This article is divided into five sections. The second section briefly reviews the literature, essentially the economic literature, focusing on the value that men and women attribute to investment in education following Becker's model and on the structuring effect of the segmentation of the labour market and the gendered segregation of professions. We focus on the contributions provided by feminist economics and how these approaches go beyond basic human capital theory. The third section presents our data and the methodological framework. The fourth section highlights the main results and the fifth section draws some conclusions.

## 2. Gender differences in wage expectations: a literature review

Among economic explanations for the wage gap between men and women, the human capital approach is frequently considered the most relevant theory in the neoclassical economics literature. This literature focuses on the labour supply side by analysing individual choices in education and employment. This theoretical framework explains how women and men's earnings depend on their respective investment in human capital, which is acquired mainly through formal education and on-the-job training. The basic human capital model argues that the decision to pursue further study is rational and based on comparing the costs and future benefits of human capital acquisition. Therefore according to this model, wage expectations play a major role in the investment decision during schooling. Linking expected lifetime work and anticipated wages, Polachek (1975, 1981) explains young women's lower wage expectations by the fact that they expect interruptions in their careers due to family responsibilities. These interruptions may lead them to spend less time in the labour market and consequently to suffer from lower acquisition of on-the-job training and from skill obsolescence or skill atrophy if skills are not sufficiently used for a long period of time. According to this 'skill atrophy' hypothesis, women choose jobs that value professional experience less and prevent skill obsolescence but that have higher starting wages. Polachek's hypothesis has been criticised by several feminist economists who challenge this theory with observed data on women's careers (e.g. England 1985); a major criticism came from researchers using data on students' wage expectations. Blau and Ferber (1991) tested Polachek's hypothesis on 722 students of Management at the University of Illinois. Their results show that while starting salaries of men and women are similar,

women anticipate significantly lower wages in the following years, even under the assumption of an uninterrupted career. In other words, they do not validate the hypothesis defended by Polachek. Even if women expect to work fewer years than men, the authors show that this does not explain the observed differences in the expected wage profiles (i.e. the smaller increase in salary). From a theoretical point of view, several feminist economists also criticise the human capital approach in terms of rational choice. Nelson (2008) stresses that in the neoclassical theory; the lower earnings of women in the labour market can only be explained in terms of individual strategies. More fundamentally, as argued by Ferber and Nelson (2009), the main criticism concerns the failure to take into account the different relationships to power, dependence, interdependence and tradition.

Concerning gender difference, feminist economists and sociologists focus on the social construction of the labour market and its effects on gender relations. Bergmann (1974) argues that men and women are put in separate labour segments because of discrimination, and sectors of the labour market said to be dominated by women are easier to fill, making them more crowded with women than sectors associated with men's work. This process leads to a widening gap in pay differentials between men and women in the labour market. Preferring a broader explanation of segregation, England and Folbre (2005) conclude in their literature review that job segregation may be explained by several non-exclusive factors, including gender-related cultural norms, sometimes embedded in institutions, social capital, and networks or rational decisions. For example, Harris and Firestone (1998) and Firestone, Richard, and Lambert (1999) focus on gender role attitudes defined as 'opinions and beliefs about the ways that family and work roles do and should differ based on sex' (1998, 239). They show that these attitudes might influence the observed earnings compared by gender group, controlled for human capital variables, occupational context, and ascribed characteristics. Several studies also examine the extent to which the observed gender-group segregation in the labour market seems to influence students' wage expectations, which in turn can enhance the segmentation process. For example, Schweitzer et al. (2011) tested the 'pipeline theory': an increase in the proportion of women in male-dominated occupations should reduce the gender gap in pay if women and men in the 'pipeline' expect comparable careers. Using a survey on career expectations among 23,431 Canadian post-secondary students, their findings indicate that even when women have access to more male-dominated jobs, such as in science, engineering, and business administration, the expected wage gap remains high for women and not for men (for the first salary and for the five-year salary). Young women also anticipate that the time required for promotion will be longer than for men, even if their expected earnings in male-dominated jobs are higher than that in female-dominated jobs. Finally, all the results suggest that gender-group differences in expected wages are greater

within the pipeline in male-dominated fields. These findings confirm the results of previous research taking into account job segregation to explain gender-group differences in wage expectations (Gasser, Oliver, and Tan 1998, 2000). For example, Gasser, Flint, and Tan (2000) found that men expect higher starting salaries and job promotions in traditionally male-dominated jobs. The same gender-group difference in wage expectations is found in mid-career in male-dominated jobs. In contrast, men expect lower starting earnings in female-dominated jobs, whereas women have higher hopes of promotion in female-dominated jobs.

Using a different methodological framework, various studies have also examined the differences between expected and observed gender gaps in pay based on information on the labour market. They test the consistency of young women's expectations with the skill atrophy hypothesis in the context of human capital theory. Generally, these studies compare surveys of students' wage expectations with surveys of graduates who have already entered the labour market. Filippin and Ichino (2005), using surveys of students and graduates of an Italian university, show that the anticipated wage gap between male and female students is consistent with the real wage gap in their early careers. They show, however, that the gender-group wage gaps widen throughout the career: on average, male and female students anticipate a constant wage gap, while the real wage gap widens. The authors explain this result, contrary to the atrophy hypothesis, by suggesting that once they have found a job, women invest less than men in activities that are likely to be rewarded in the labour market. Research by Carvajal et al. (2000) using data on earnings reported by recent college graduates and earnings expected by college seniors at Florida International University also finds similar results for starting wages. At the beginning of the career, female students seem to anticipate accurately their wage penalty on the labour market. In addition, Carvajal et al. (2000) find that the disparities between students' expectations and labour-market outcomes are mainly influenced by several factors concerning the job they found or they expect to find in the labour market. For young women, the expected salary does not depend on the number of hours worked, whereas expected salary and number of hours worked seem to be related for young men. In addition, expected wages depend more on age for women than for men, while for recent graduates, only men's real wages are influenced by age. Both these findings do not provide evidence in support of Polachek's hypothesis. Indeed, women do not seem to anticipate a lower wage profile than men because of a possible career interruption.

Finally, it seems to be a consensus that young women generally expect lower wages than young men. To our knowledge, no study has examined anticipated wage gap between men and women in the particular context of the French labour market. The main studies on differences in pay expectations were conducted in North America or in some specific European countries such as Italy. However, these studies depend on

specific institutional and cultural contexts in social policy and labour market. As Anxo et al. (2011) point out, France is characterised by a very specific situation with a family policy more favourable to women's careers compared to other countries, but where women encounter difficulties in the labour market characterised by high unemployment. We can ask if women's wage expectations in France are different from those observed in other countries. The purpose of our research is to examine these issues from the exploration of a quantitative survey of French students. As we have seen in the literature review, explanations of differences in wage expectations between men and women are diverse. These differences may be explained by different choices of studies and disciplines according to the logic of human capital. They can also be part of processes of employment segregation: young men and women do not anticipate the same wages when seeking male-dominated or female-dominated jobs. The pipeline theory suggests that increasing the number of women in fields of study and careers generally considered as male-dominated should reduce the gender gap in pay in these jobs. According to this perspective, it would seem that women expect higher wages when they imagine progressing within traditionally male-dominated jobs. As Schweitzer et al. (2011) point out, analysing the career expectations at the beginning of the pipeline has the advantage of better understanding the performances of students before having experienced a specific discipline socialisation.

A contribution to this research is to test the potential impact of these different factors on expected gender gap in pay.

This research particularly focuses on the following questions:

1. Is there a difference in expected wages between female and male students in early career? Is this the same gender gap in pay in mid-career?
2. Can these differences in expected wages be explained by different educational and professional projects between women and men?
3. Are there differences between the wages anticipated by students and the wages that can be observed on the labour market by gender group?

### 3. Data and method

Research on wage expectations generally focuses on quantitative surveys of high school or university students. So, it is possible to compare the data on expectations collected from these surveys to the wages that are actually observed in the labour market. In this article, we adopted this strategy using two types of data. The main survey covers first-year students enrolling at a French university. We were interested in first-year students because they have just made an important choice of orientation and specialisation that can affect both their academic and professional career. The second

data set used covers two surveys of graduates who entered the labour market. They allow us to compare the consistency of men and women's wage expectations with what can be observed in the labour market.

### 3.1. Sample

Data are from a 2010 survey among first-year students at the University of Burgundy in three fields of study: social and economic administration, psychology, and law. The survey was conducted by the Institute for Research in the Sociology and Economics of Education under a research project on students' skills financed by the French National Research Agency. In September 2010, the number of students enrolled in these three fields is 1493. For practical reasons, all of these students have not been interrogated. Finally, in February 2011, some 918 students filled in a questionnaire during a lecture whose attendance was mandatory. The questionnaire addressed their working methods, any difficulties encountered in the course of the academic year, their past educational record, their future educational plans, and wage expectations.

#### 3.1.1. Measures

Expected level of education and wages. Several empirical methods are widely used to measure wage expectations. Students can be interviewed about different earnings distributions using computer processes as in the study by Dominitz and Manski (1997). Alternatively they can be asked about their expected future wages, one or more years after graduation, taking into account the education level they expect to obtain, or they can be questioned about the starting wages for several occupations and levels of qualification (Betts 1996). Because of the survey constraints (large sample, limited interview duration), we used the direct method. Students were asked two questions :

- What is the highest level of education you plan to achieve by the end of your higher education?
- In your opinion, what will your net monthly earnings be one year after completing higher education ... , and 10 years after completing higher education?

In addition, when we conducted the survey, we asked students to assume that they would find a full-time job when they left university, an assumption relatively consistent with observed data about the first jobs occupied by French master's graduates.

In all, 615 students<sup>1</sup> responded about their expected earnings after one year and 570 about earnings after 10 years.

Job intention. Students were also asked about any career plans they had:

- Do you have a career plan, what job do you want to do after graduation?

From the students' responses, two variables were constructed for the type of expected occupations. Using the French occupational classification, we have created a variable that takes the value 1 if the student expects a top management position and 0 if he or she does not. A second variable was constructed concerning the occupation gender composition. For each student's professional project, we have found the percentage of women in this occupation using data from the Ministry of Labour. This variable allows us to test the pipeline theory. If we follow this theory, we could expect that young graduate women in traditionally male-dominated occupations will report higher salary expectations compared to women in female-dominated occupations.

Table 1 shows gender differences in individual and expected occupational characteristics. Fields of study differ widely by gender group. Men are overrepresented in Law, which is normally considered to be the most prestigious field of study, whereas women are overrepresented in Psychology. Administration seems to be more neutral, although men are slightly dominant. In accordance with other studies (Heckert et al. 2002), we find no gender-group differences in anticipated education level. As expected, more women than men anticipate entering women-dominated jobs. However, we do not observe any gender difference in expected senior management positions.

### 3.2. Graduate sample

In order to compare the actual gender gap with the expected gender gap of undergraduates at Burgundy University, we had to find similar data on young graduates who had already entered the labour market.

Two national surveys carried out by Céreq in 2001 and 2010 were used. These surveys covered some 25,000 young people having left the education system at all levels of qualification and questioned about their entry into the world of work for their first three years of their working lives. We selected three samples in order to compare real and expected wages. First, the 'Génération 2007' survey conducted in 2010 was used to ascertain the mean gender gap in pay of young people one year after leaving the education system (in 2008) by International Standard Classification of Education level

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<sup>1</sup> From the administrative records of registered students of the University of Burgundy, we could verify that the socio-demographic characteristics of respondents were similar to that of non-respondents (cf. Lambert-Le Mener 2012).

and discipline. We selected a subsample of some 350 young graduates from the three disciplines and the different levels of qualification covered by our local survey. Second, the ‘Generation 98’ survey of 1998 graduates surveyed in 2008 was used to compare the wage gap after 10 years.

Table 1. Descriptive statistics Students sample.

	Men (206)	Women (409)	All (615)	Gender sign.
Fields of study (%)				
Law (300)	60	43	49	***
Psychology (207)	16	42	34	
Administration (108)	24	14	18	
All (615)	100	100	100	
Intended degree (%)				
Bachelor’s degree (112)	19	18	18	ns.
Master’s degree (419)	65	70	68	
Doctorate (50)	10	7	8	
Others (post-secondary degree ... ) (34)	6	5	6	
All (615)	100	100	100	
Expected hierarchical position (%)				
Managerial position (237)	35	40	39	ns
Non-managerial position (378)	65	60	61	
All (615)	100	100	100	
Percentage of women in the expected occupation <sup>a</sup>	0.46	0.55	0.52	***

Notes: Numbers are in brackets. Chi square test and Student test.

<sup>a</sup>Using national labour statistics, we calculate the gender composition of each occupation.

\*\*\*Significant at the 1% level.

Following the same principle, we were able to extract a subsample of approximately 190 graduates with the same students’ characteristics. Third, using the longitudinal structure of the ‘Generation 98’ survey, we calculated wage growth in the first 10 years of work. Thus, we have a longitudinal indicator corresponding to the same cohort, who left higher education in 1998.

It would have been better to have data from the same university. However, the gender gap in pay in Burgundy is very close to the national wage gap in France (respectively, 23% and 24%<sup>2</sup>). In addition, the geographical mobility of graduates of the University of Burgundy is high: over 38% of graduates leave the region during the first year in the labour market (Perret and Roux 2004). Consequently, the bias resulting from comparison is limited. Descriptive statistics of graduate samples are provided in Annex 1.

### 3.3. Analysis

Economists have developed several methods for analysing the wage gap in order to account for much of the gap by explanatory variables such as skills and educational characteristics, socio-economic background, job characteristics, and other environmental factors. The basic method is to include gender group as an independent variable in an ordinary least squares regression, termed an earning equation or Mincer equation. The independent variable is the logarithm of individual hourly or monthly wages and other independent variables are included (number of years of education, work experience, etc.). Following the pioneering works of Blinder (1973) and Oaxaca (1973), another possibility is to use the separately estimated earning equations for women and men to decompose the difference in their mean wages into an unexplained term and an explained term. The first term represents the portion of the gap resulting from different characteristics of men and women, the 'explained' component, frequently referred to as the human capital component because it includes education and work experience variables. The second term is the 'unexplained' component, which is potentially due to discrimination. This estimation assumes the existence of a non-discriminatory wage structure. It is a variant of the initial decompositions Oaxaca and Ramson proposed for estimating this non-discriminatory wage structure from a pooled sample including women and men. The unexplained component can be broken down into two parts: male advantage and female disadvantage. This decomposition technique was used in our study to identify the factors explaining the gender gap in pay expected by students.

Because of the sample size for the graduate survey, we chose another strategy to compare anticipated and real wages. Following Filippin and Ichino (2005), we estimated the same regression on the student sample and graduate sample, including gender group as an independent variable. Then, a Chow test on the gender-group coefficient was used to test the difference between the expected and observed gender gap in pay. Annex 2 presents the detailed methodology.

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<sup>2</sup> Source: French national institute of statistics and economic studies (2010).

## 4. Results

### 4.1. Expected gender gap in pay

Table 2 provides a first look at gender differences in expected monthly earnings. Anticipated earnings differ significantly between men and women.

Table 2. Descriptive statistics of earnings.

	All	Male	Women	Difference
Expected earnings 1 year after completing higher education (n = 615)	1612 (545)	1808 (644)	1513 (458)	295***
Expected earnings 10 years after completing higher education (n = 570)	3169 (2222)	3648 (2249)	2918 (2249)	730***
Expected annual earnings growth (in log) (n = 570)	0.058 (0.04)	0.062 (0.003)	0.055 (0.002)	0.006**

Notes: Standard deviations are in brackets. Student test.

\*\*Significant at the 5% level.

\*\*\*Significant at the 1% level.

One year after completing their studies, men expect an average earning of 1808 euros against 1513 euros for women, a gender gap in pay of 295 euros (16.3%). This expected gap then increases: 10 years after completing higher education, the expected wage for men is 3648 euros, but only 2918 euros for women, a difference of 730 euros (20%). Men also anticipate higher annual salary growth than women (6.2% against 5.5%). In other words, these first results confirm that women expect lower wages than men in the course of their careers.

Figures 1 and 2 provide another view of the expected wage gap. They show the densities of wages 1 and 10 years ahead by gender group. As expected, the male wage density is shifted to the right compared to the female wage distribution. In addition, men anticipate higher expected wages at the upper tail of the distribution.

These expected differences may depend on certain educational characteristics or on young women's career plans. The results presented in Table 3, based on earnings equations for men, women, and all students, show that the return on these characteristics differs by gender, after 1 year and after 10 years. The return on higher education appears greater for men than for women. This is also the case for law, a discipline that is valued more highly by men. By contrast, women expect a higher return from management positions, which are assumed to correspond to their studies.

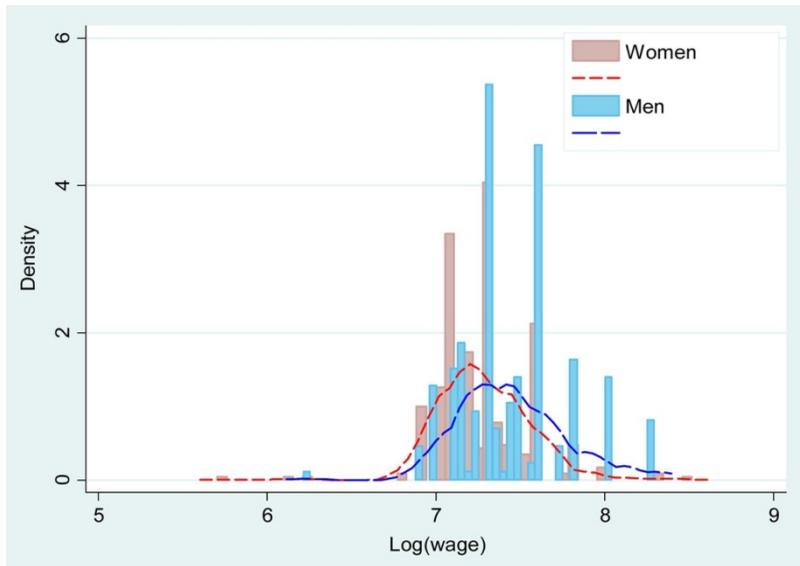


Figure 1. Densities of 1-year wages.

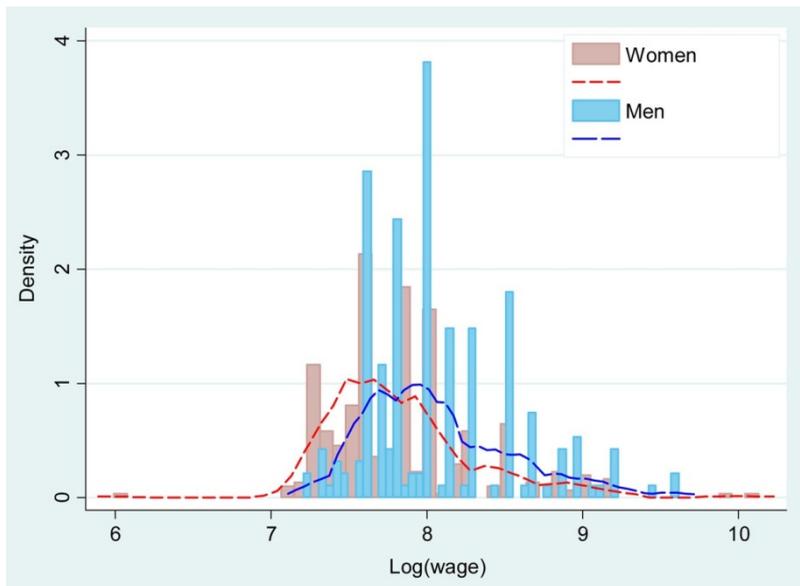


Figure 2. Densities of 10-year wages.

Recent researches (Luzzo and McWhirter 2001; Mello 2008) show that young women anticipate more barriers in their career advancement than men. These perceptions may lead them to raise their occupational ambition (Mello 2009). The percentage of women in the occupation has no significant impact whatever the gender group. Contrary to the

pipeline theory (Gasser, Flint, and Tan 2000), our results do not provide evidence that young graduate women in female-dominated occupation have lower salary occupations. Women do not expect an advantage or a disadvantage in planning to work in a gender-dominated occupation. However, this result is affected by the field of study: the lowest expected earnings are found in the most feminised field, psychology. This result is stronger for men, as also observed by Schweitzer et al. (2011).

To progress in the analysis, Table 4 presents the Oaxaca–Ransom decomposition results. This decomposition measures the proportion of the expected wage gap that can be explained by differences in student characteristics (second line) and the proportion due to women expecting less value for certain characteristics. This second effect is largely dominant in explaining 1-year wage expectations: it explains the wage gap twice as much (71%) as the productive characteristics (29%). This effect can be attributed to the anticipation of discrimination in the labour market since, with identical degrees, fields of study, and career plans, women expect lower wages for a full-time job.

After 10 years of professional experience, the share of anticipated discrimination in the explanation of the gender gap in pay decreases slightly but is still the main component. The anticipated degree, field of study, and career plan explain 45% of the gap.

However, due to the overall increase in the 10-year expected wage gap, the difference in wages associated with an anticipation of discrimination practically does not change between the two periods: it remains about 12%. So it seems that students do not expect an increase in wage discrimination by gender group during their careers.

Table 3. Wage equations by gender.

	1-year earnings			10-year earnings			Annual growth		
	All	Male	Female	All	Male	Female	All	Male	Female
Degrees Ref. First Degree and other									
Master's degree	0.14***	0.22***	0.11***	0.22***	0.27***	0.19***	0.007**	0.006	0.007
Doctoral degree	0.19***	0.23***	0.15***	0.32***	0.38***	0.26***	0.014**	0.016*	0.010
Fields of study ref. Law									
Psychology	-0.22***	-0.25***	-0.18***	-0.42***	-0.45***	-0.38***	-0.019***	-0.021***	-0.019***
Administration	-0.05	-0.06	-0.05	-0.16***	-0.08	-0.24***	-0.011**	-0.001	-0.019***
Managerial position	0.06**	0.06	0.07**	0.17***	0.11	0.20***	0.010***	0.006	0.013***
Percentage of women in the profession	0.03	0.07	0.06	-0.08	0.22	-0.14	-0.009	0.018	-0.022
Constant	7.27***	7.28***	7.22***	7.89***	7.80***	7.89***	0.061***	0.049***	0.067***
R <sup>2</sup> aj.	0.18	0.17	0.14	0.25	0.19	0.25	0.09	0.055	0.11
N	615	206	409	570	196	374	570	196	374

\*Significant at the 10% level.

\*\*Significant at the 5% level.

\*\*\*Significant at the 1% level.

Table 4. Oaxaca–Ransom decomposition.

	1 year		10 years		Annual growth	
		%		%		%
Difference	-0.163***		-0.233***		-0.006**	
Explained	-0.048***	29	-0.106***	45	-0.005***	85
Unexplained	-0.115***	71	-0.127***	55	-0.001	15

\*\*Significant at the 5% level.

\*\*\*Significant at the 1% level.

This result on earnings 10 years after graduating may seem contradictory to other studies such as Blau and Ferber (1991), but the decomposition method allows us to better identify different explanations of the wage gap. In addition, the differences in anticipation of annual wage growth between men and women confirm a constant discrimination throughout their careers. Almost all of the difference in annual wage growth is explained by differences in individual and job characteristics ; the unexplained portion, which is attributed to discrimination anticipated by women, is not significant. In other words, women do not expect to be penalised a second time, with lower returns on professional experience. This result may also indicate that women do not consider career interruption when they form their wage expectations.

#### 4.2. Comparison of expected and observed gender gaps in pay

An important question is whether these expected differences are consistent with what men and women can observe in the labour market.

Table 5 allows us to compare expected and observed earnings by gender group.

One

year after graduation, the difference between expected and observed earnings is higher for men. Although both overestimate their earnings, women's expectations seem to be more realistic. The result is reversed after 10 years. Women expect earnings 45% higher than actual earnings, versus 26% for men. This suggests that women have less accurate information about the long term. These findings show that the differences between expected and observed gender gaps in pay vary after the early career period. The wage gap expected by students 1 year after graduating is wider than the observed wage gap among

graduates, 16% against 9.2%. By contrast, after 10 years, the expected wage gap is 20% and the observed wage gap 30.4%. However, this may be due to differences in individual and job characteristics. Table 6 shows the results of the earnings equations for wages expected by students and the real wages of graduates from the same fields of study.

Table 5. Expected and observed earnings by gender.

	Expected	Observed	Accuracy <sup>a</sup>
<i>1 year</i>			
Men	1808	1575	0.15
Women	1513	1429	0.06
Gender Gap	16%	9.2%	
<i>10 years</i>			
Men	3648	2894	0.26
Women	2918	2013	0.45
Gender gap	20%	30.4%	

a  $\frac{\text{Expected wage} - \text{Observed wage}}{\text{Observed wage}}$

Table 6. Earnings equations and gender wage gap.

	1 year		10 years		Annual growth	
	Students	Graduates	Students	Graduates	Students	Graduates
Gender gap	0.13***	0.06**	0.15***	0.22***	0.003	0.016**
Degree Ref. First Degree						
Master's degree	0.15***	0.08***	0.25***	0.27***	0.009**	0.008
Doctoral degree	0.18***	0.21***	0.33***	0.29***	0.01**	-0.001
Fields of study ref. Law						
Psychology	-0.20***	-0.001	-0.41***	-0.19***	-0.02***	-0.009
Administration	-0.06*	0.02	-0.16***	0.01	-0.01**	-0.003
Managerial position	0.06**	0.17***	0.17***	0.18***	0.01***	0.00
Percentage of women in the profession	0.04	-0.13*	-0.01	-0.32**	-0.001	-0.01
Constant	7.21***	7.18***	7.77***	7.56***	0.055**	0.059**
Chow test: gender gap Prob > $\chi^2$	0.09*		0.33		0.08*	*
R <sup>2</sup> aj.	0.20	0.27	0.28	0.37	0.11	0.03
N	580	320	538	187	538	187

\*Significant at the 10% level.

\*\*Significant at the 5% level.

\*\*\*Significant at the 1% level.

The earnings equations results do not change the previous results even if the wage gap narrows slightly. In the first job, the real wage penalty for women (6%) is lower than the expected wage penalty (13%); the Chow test is significant at 10%.

After 10 years, the expected wage gap is narrower than the observed wage gap, 15% against 22%. However, the difference in wage gaps between the two samples is not significant. These results indicate that students do not anticipate significant changes in the gender gap in pay in the course of their careers. They anticipate a much more stable gender gap in pay than actually occurs. Indeed

the observed wage gap widens greatly in the 10 years after graduating. Results for annual growth from longitudinal data on a cohort of the same graduates confirm this disconnection. The difference in annual growth between men and women is strongly significant for graduates' observed wages, whereas it is not significant and close to zero for students' expectations.

## 5. Discussions and conclusions

This research contributes to explain the relation between education and gender inequalities in the labour market. Our different results show that women expect to earn lower wages than men. Part of this difference seems to be explained by differences in educational aspirations. Men's expected wages depend more on anticipated educational level and field of study than women's expected wages. However, we find no evidence that the gender job segregation influences expected earnings. Contrary to the pipeline theory, students who plan to enter a female-dominated job do not anticipate lower earnings than in other jobs. In addition, the main part of the wage gap in the first job is unexplained by individual and job characteristics. We can interpret this result as an anticipation of gender discrimination in the labour market. This expectation remains relatively stable during their early career: this wage penalty does not change during the first 10 years in the labour market.

It might be thought that these expectations are relatively rational if the observed gender gap in pay in the labour market were close to the expected gender gap in pay. Our detailed results show that this is not the case if we analyse the development of the gender gap in pay. In their first jobs, wage differences between male and female students are higher than the observed gender-group wage gap, but it seems that women's expectations about starting wages are more realistic. However, women expect comparable returns to men on professional experience over the next 10 years, while their actual returns are much lower. Our data allow us to make assumptions about women's expectations only.

The first explanation would be that women fail to anticipate career interruptions and wage penalties when they have family-related career breaks. The national database provides some evidence of women not wanting to interrupt their careers: 10 years after graduation, women have the same labour market experience as men.

The second hypothesis would be that young women have a partial view of

discrimination. They only consider discrimination in hiring at the beginning of their careers, whereas discrimination is exercised throughout the career. For example, they fail to anticipate glass-ceiling barriers that may limit their career advancement. This finding is also consistent with previous research showing that aspirations of young men and women concerning their future work and in their family life are closer, whereas differences in behaviour persist (Tinklin et al. 2005; Schoon and Polek 2011).

If we refer to the literature on wage expectations, the risk of underestimation is more problematic than the risk of overestimation (Jerrim 2011). Overestimation may have more potential positive effects. For example, students can put more effort into their studies or job hunting after graduation. On the contrary, underestimation can lead them lower their educational aspirations, alter their job search strategies, and reduce their wage negotiation ability. For example, Orazem, Werbel, and McElroy (2003) show that women's lower pay expectations before graduation lead them to lower reservation wages during their first job search and, consequently, lower starting wages when they find a job. Nevertheless, their results also suggest that women's pay expectations are more sensitive to career planning than men's. Our research does not support claims that women underestimate their future wages, but it underlines differences between the expected and the observed wage gap between women and men in the course of their careers. Compared to men, the fact that the expected wage gap is wider than the observed wage gap in a first job is likely to increase women's difficulties in their subsequent careers. An implication of this result is that student career guidance and counselling should provide more information to women about higher paid and prestigious career opportunities at the beginning of their careers, because accepting lower starting wages has serious negative consequences on subsequent career outcomes.

This research has several limitations. First, the survey used in this research covers a wide range of questions about student life, whereas information about career expectations is limited. A broad set of variables concerning several aspects of career aspirations (job characteristics, full-time or part-time job, and career priority) or questions about job stereotypes would have been useful. In addition, the sample is restricted to three relatively narrow academic disciplines. The issue of unequal ambition is more addressed in other fields like science where young women leave the pipeline at various stages (secondary school, university, and on the labour market) (Blickenstaff 2005). Moreover,

the deviations between expected earnings and actual earnings in the labour market correspond to samples of students who are not necessarily graduates of the same university even if they relate to the same diplomas and same disciplines and if the differences between local and national gaps are very small.<sup>3</sup> It is also possible that women and men anticipate differently the changes in workforce and more specifically, in the women's status in the labour market. In addition, generational effects may bias the comparison between expected and observed wages, especially for graduates observed 10 years after leaving university. The next step from a research perspective would be to implement a longitudinal survey monitoring the students interviewed during their studies and at the beginning of their career as done by Orazem, Werbel, and McElroy (2003) in the USA and Webbink and Hartog (2004) in the Netherlands. For example, Danziger and Eden (2007) show that during their later academic years, young women reduce their occupational aspirations and change their career-style preferences.

Despite these limits, it is important to look into the way students see their future careers and especially their earnings. Gender differences with regard to expected earnings may continue to explain wide disparities at different career stages, even though the gap in educational aspirations is closing.

It is necessary to continue to promote higher educational aspirations for young women and better inform them of all of the educational options available to them, including the most prestigious academic tracks. However, public policies aimed at reducing gender differences in aspirations are not sufficient. Indeed, it is crucial to take into account the structuration of gender inequalities along the career. A specific focus on transition from school to work is crucial but, as underlined by Figart (1997), a policy against gender discrimination does not begin and end with the recruitment decision made by the employer. It is important to promote the advancement of women within the firm, by acting on salary and promotion negotiations. Another direction may be to integrate more systematically a gender perspective into policy programmes (Rubery 2005). For example, Kergoat (2010) underlines the French paradox concerning the apprenticeship system. Whereas this training is partially funded by public subsidies and highly valued by the employers, young women's access to apprenticeship is made more difficult whatever the training specialty. Gender

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<sup>3</sup> In addition, it is not sure that being from different universities is likely to be an important factor when making the comparisons.

differences in on-the-job training may be also viewed as a source of potential discrimination. Evertsson (2004) shows that, compared to women, men have higher access and return than women from training programmes that increase promotion opportunities.

These multiple factors may explain why women graduates find it difficult to anticipate their labour market careers. Further researches and data on the perceptions of gender barrier would be needed.

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## Annex 1. Descriptive statistics of graduate's samples

	Graduates cohort 1998			Graduates cohort 2007		
	Men	Women	All	Men	Women	All
Fields of study (in %)						
Law	67	48	55	65	56	59
Psychology	13	32	25	13	24	21
Administration	20	20	20	22	20	20
Intended degree (in %)						
Bachelor's degree	32	37	35	44	45	45
Master's degree	42	50	47	39	43	41
Doctorate	26	13	18	17	12	14
Expected hierarchical position (in %)						
Managerial position	48	32	38	44	36	38
No managerial position	52	68	62	56	64	61
Percentage of women in the profession	0.52	0.64	0.60	0.51	0.59	0.57

## Annex 2: Methodology

### Decomposition of expected gender wage gap

The decomposition used in our study follows that of Oaxaca Ransom, which is a variant of the Oaxaca-Blinder decomposition:

$$\ln(\bar{w}_M) - \ln(\bar{w}_F) = \underbrace{(\bar{X}_M - \bar{X}_F)\beta^*}_{\text{explained component}} + \underbrace{[\bar{X}_M(\beta_M - \beta^*) - \bar{X}_F(\beta_F - \beta^*)]}_{\text{unexplained component}}$$

Where  $\bar{w}_{M/F}$  are average male/female expected wages,  $\bar{X}_{H/F}$  male/female average individual and occupational characteristics,  $\beta_{H/F}$  returns to male/female characteristics estimated by male/female wage regression,  $\beta^*$  is the returns of the non-discriminatory wage structure. Oaxaca and Ransom assume that  $\beta^*$  is an estimate of the common wage structure obtained from estimation using a pooled sample.

### Comparison of expected and observed gender wage gap:

Second, we compare gender wage gap expected by students and gender wage gap observed on the labor market. We estimate the same regression on students sample and

graduates sample:

$$\ln(w)^k = cste + \beta_{Gender}^k * Gender + \beta^k X + \varepsilon^k$$

where  $k = 1$  for the students sample or  $k = 2$  for the graduates samples (Generation 1998 and Generation 2007).

$Gender$  is a gender dichotomous variable,  $\beta_{Gender}$  is the expected or observed gender wage gap. Then, Chow test on  $\beta_{Gender}$  is used to test the difference between expected and observed gender pay gap.

Finally, we repeat the same estimate using the growth wage as independent variable.

$$\ln(g)^l = cste + \beta_{Gender}^l * Gender + \beta^l X + \varepsilon^l$$

where  $g = \frac{\ln(wage_{10}) - \ln(wage_1)}{10}$  and  $l = 1$  for the students sample or  $l = 2$  for the Generation 1998 graduates sample.