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DISCUSSION PAPER SERIES

IZA DP No. 15954

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ABSTRACT

Gender Differences in the Early Career Earnings of Economics Graduates*

In contrast to the UK, the USA and Germany, the majority of students in economics in France are female. Using a national survey of three cohorts of French university graduates in economics, we examine the gender differential in early career earnings. There is a significant raw differential in favour of male economics graduates in both starting pay and earnings three years after graduation, and the latter is wider than the former. Between 1998 and 2013 both gaps have narrowed but have not disappeared. The raw male-female pay differential stood at 10% for economics graduates in 2013. An Oaxaca decomposition reveals that nearly all of the gap is due to a persistent unexplained component. The gender differential among economics graduates is compared to that in two scientific subject areas: the female-dominated life sciences, and physics and chemistry (taken together) where a majority of graduates are male. The gender pay gap is smaller and the general level of earnings is lower in both science subject areas compared to economics. The decomposition attributes the limited gap in life sciences mainly to a composition effect, whereas in economics and physics and chemistry it is almost entirely due to the unexplained component. Gender differences in occupation suggest that female economics graduates are under-represented in more technical roles where two in five male graduates are found and where pay tends to be higher. However, even when occupation and sector are included as controls in an Oaxaca decomposition, two thirds of the gender differential remain unexplained.

JEL Classification: J31, J71
Keywords: gender earnings differentials, graduate labour market

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As is the case in many countries, successive cohorts of females in France are increasingly more qualified than males. A less common feature is that there are more females than males studying economics in higher education. This is in marked contrast to the United Kingdom (Crawford et al, 2018) or United States (Buckles, 2019) where less than a third of economics undergraduates are female. Using a national survey of three cohorts of French university graduates over the period 1998 to 2013, we examine gender differences in early labour market outcomes for economics graduates in France.

The French context is of wider interest for a number of reasons. It has been argued that one of the reasons underlying persistent gender differentials in earnings is self-selection into certain academic disciplines: females are over-represented in less technical subjects, which are on average less well-paid (Bertrand, 2020). A corollary of this line of reasoning is that other things being equal if females do enter more technical disciplines, as they do in the case of economics in France, they will also benefit from the superior returns to education. This should cause the gender differential to narrow as a result of the so-called composition component in the Oaxaca decomposition of earnings differentials being reduced. If in spite of the preponderance of female students in economics, there remains a gender earnings differential for this group of graduates, the French case can shed light on the question being considered elsewhere (Lundberg and Stearns, 2019) as to whether encouraging more young females to study economics will also lead among other things to a reduction in gender earnings differentials.

Nearly all previous studies of gender earnings differences among graduates of a specific discipline such as business studies use data for a particular higher education establishment: for example, Bertrand et al (2010) study MBA graduates from the Booth School of Business at the University of Chicago, while for Reimer and Schroder (2006) it is social science students at the University of Mannheim. An early study of graduate gender differentials by Gerhardt (1990) used data on graduates employed in a large firm. Four exceptions are recent contributions by Sanchez-Mangas and Sanchez-Marcos (2021), who undertake a Europe-wide analysis of gender differentials among recently qualified graduates for a single cohort; by Fransesconi and Parey (2018) who study the starting pay of German graduates by pooling several cohorts of students; by Piazzalunga (2018) who examines gender differentials across all academic disciplines in Italy and Tromp and Kwak (2022) for South Korea. The latter two studies are single cohort studies. Each of these studies finds that the field of study explains a large part of the gender differential in early career earnings, although none of these analyses economics graduates as a specific case.

We contribute to this literature in three ways by using three cohorts of French university graduates from a national survey. Firstly, this is the first academic research study to our knowledge to examine the gender differential in the specific case of graduates in economics. Secondly, we analyse earnings after three years as well as starting pay, which is important since initial employment after graduation is often a stepping-stone to a better match. Early career earnings differences are also of interest because confounding influences such as child penalties and glass ceilings are not yet in play. Thirdly, we examine gender differentials separately for each of the three cohorts graduating in 1998, 2004 and 2010 respectively. This turns out to be important since the raw gender differential in both starting pay and subsequent

earnings have declined markedly for graduates in general and for graduates in economics in particular between 1998 and 2013.

One of the main reasons why there are more female undergraduates in this field in France is that economics is first taught as a subject in high school. Economics and Social Science is one of the three broad divisions of the academic baccalaureat programme for the cohorts studied (the other two are scientific and literary) and the majority of students who choose this division are female (Ministère de l'Education Nationale et de la Jeunesse, 2020). The actual formal economics content at this level is limited, and emphasis is on institutions and schools of economic thought rather than economic principles. Students also take courses in mathematics, sociology, philosophy, history and languages. Proceeding to study economics subsequently at university is for many a logical step.

At university economics is a 'major' subject in itself, and is also a substantial component of degrees in business studies and social administration. For the purposes of the current study, economics students are generally defined as graduates who have had an academic, formal economics training in the first two years of university. This is because students are given the option of specialising in their third and final year of an undergraduate degree and, subsequently as postgraduates, in subjects related to economics such as finance, accountancy, and management. The notion of an economics student adopted here is therefore a university graduate who has studied and mastered formal economic principles, whatever the chosen specialisation of the highest diploma obtained. It encompasses all students who could if they so choose continue to study 'straight' economics to the degree level.

The main aim of the paper is to assess whether female graduates in economics attain similar early career outcomes to males in this narrowly defined context. We specifically examine gender differentials in starting pay and in earnings three years after graduation for economics students, and compare these with the same differentials for students in two scientific subject areas: physics and chemistry (taken together) and life sciences. The former is a male-dominated academic subject area, while in the latter the majority of students are female. Both subject areas are technical and like economics, both lead to employment opportunities in teaching and research, as well as jobs in the private and public sectors. The earnings comparisons are undertaken for three cohorts and cover the period 1998 to 2013.

The paper is organised as follows. In the first section, the place of economics in the French system of higher education is presented, along with a description of the 'Generation' cohort surveys. This is followed in section 2 by an examination of gender differences in early career earnings, where it is found that there already exists an earnings gap in favour of males and this is due almost entirely to the 'unexplained' component of the Oaxaca decomposition. However, both the raw and unexplained gaps are significantly smaller for more recent cohorts. In section 3 we undertake a series of robustness checks before proceeding in the penultimate section, to an exploration of various factors that may underly the size of the unexplained earnings gap.

1 Characteristics of economics students

1.1 Economics in the French higher education system

It should be noted that the public higher education system in France has three parallel strands: universities, vocational and technical institutes, and the preparatory classes for competitive examinations to enter the elite Grandes Ecoles. In each of the latter two orientations, into which entry is selective, there can be some teaching of economics and related subjects. Business studies and marketing are taught in the technical institutes but the level to which economics is taught is not generally compatible with undergraduate economics at university. Students at these institutes and other establishments providing post-high school vocational (and less academic) courses are therefore excluded from the sample used here. Students from 'classes préparatoires' who fail the entrance examinations to the Grandes Ecoles generally revert to the university system since they obtain credits for the subjects already taken and usually enter the second or third year of a degree course. They tend to be of higher ability than direct entrants to university. Finally, we include certain students who come into economics having started out in a different academic discipline such as medicine or applied mathematics.

The French university system differs in many ways from the 'Anglo-Saxon' model not least in terms of the negligible tuition fees[1] and the absence of selection at the point of entry. A degree programme will contain a large component of obligatory subjects and students have limited scope for choice in terms of major and minor subjects. For example, an economics student entering the third and final year of their undergraduate degree could probably choose between specialising in economics, finance, management and accountancy. Whatever their choice, these students will all have taken the same core courses in micro- and macro-economic principles, mathematics, probability and statistics as an economics major in the first two years of their degree. Only 'straight economics' undergraduates are certain to have studied third year topics like econometrics and macroeconomic dynamics, although these may be part of other degree programmes as options or core courses. Postgraduate degrees are normally two year programmes and entry is often selective. In the period covered (1998-2010 as far as the public higher education system is concerned) there have been a number of reforms and since 2004 there are essentially two exit levels: after a three-year Bachelor's degree or with a postgraduate Master's degree after a further two years study. Thereafter for a small number of students there is the option doing a doctorate financed by a grant from the government.

Alongside these public institutions, there are private sector business schools which also have some economics teaching in their programmes. These schools are very heterogeneous in terms of programme content and level, and students attending them immediately after high school are not included in the sample. However, university students in economics who subsequently obtain postgraduate diplomas from private business schools are included.

The notion of an economics student adopted here is a university graduate who has studied and mastered formal economic principles, whatever the chosen specialisation of the highest diploma obtained. It encompasses all students who have studied economics at university level

[1] Current fees are around $170 per annum for a Bachelor's degree programme and $245 for a Master's.

for at least two years and who could if they so choose continue to study 'straight' economics to the degree level. The distinction between having a formal economics background and the ultimate choice of occupation is important because few economics graduates actually work as economists. The limited number of economist positions in France are found mainly in high school teaching, academia, government, financial institutions and not-for-profit organisations.

1.2 The 'Generation' surveys

One important factor in a study of this kind is going to be sample size. The Generation survey contains between 32,000 and 55,000 respondents depending on the cohort[2], and is a national survey covering all types of school leaver from lower secondary pupils to postgraduate students (for full details on the conception, collection methods, response rates and coding of the 2010 Generation survey see Barret et al, 2019). Respondents are interviewed by telephone three years after having left full-time education. It is worth noting that while some two thirds of a cohort obtain the baccalaureat and can therefore go into higher education as a right, the subsequent drop-out rate is high. A substantial proportion of students who enter university (more than 30%) do not obtain a diploma higher than the baccalaureat because they fail the exams or drop out. Others leave with an intermediate diploma after two years. Once attention is limited to economics graduates and then partitioned by gender, the resulting sample sizes become fairly small. Thus while there are sufficient observations to undertake regression analysis – usually more than two hundred per gender-subject cell – a more detailed analysis is not always possible. In all statistical analyses weights reflecting the population from which the sample is drawn are used[3].

The sample size issue aside, the survey is very rich in terms of the information collected. Not only is there detailed information on an individual's education from the age of 12 through to the final diploma obtained, there is also a retrospective employment and personal history record provided month-by-month for the three years since leaving full-time education. Since the cohorts are defined by the date they leave full-time education rather than year of birth, the respondents all have roughly the same number of months of <u>potential</u> experience at the time the survey is undertaken. However, their <u>actual</u> labour market experience is known since respondents provide a month-by-month calendar of their employment status along with changes in their personal circumstances.

1.3 The education variable

An individual's educational level is represented by the highest diploma obtained on exit from the education system. In principle, the French equivalent of a bachelor's degree is obtained after three years of study. For the cohorts used here, the next diploma level is usually a two-year postgraduate Master's degree, the second year of which involves specialising either in a high level professional diploma or a postgraduate research degree required for entry onto a

[2] For example, for the 2004 cohort survey, a total of 65,000 individuals were interviewed, compared to 55,000 and 38,000 for the 1998 and 2010 cohorts respectively.

[3] A further issue is that for each cohort, the same individuals are recontacted two years later (or five years after finishing their education). Sample attrition is not unexpectedly substantial, and so the sample size becomes even smaller. We do not use data from these waves.

doctoral programme. It is less common for an individual to finish their higher education after four years with just one year of postgraduate study since the 2004 reforms. Not undertaking the fifth year is usually the consequence of an event such as receiving a job offer, deciding to train to become a high school teacher or experiencing a change in personal circumstances. Thus, in the 2010 cohort, economics students are overwhelmingly (more than 80%) qualified to the postgraduate level (see Appendix Table A.1.). Entering a doctoral programme however tends to be rare compared to scientific disciplines since financial support is selective and profitable career opportunities are narrow (usually academia or working as an economist for government or a not-for-profit organisation).

1.4 The earnings of economics graduates

In what follows, we compare the characteristics and early labour market outcomes of economics students with those of graduates in two scientific subject areas: physics and chemistry (taken together) and life sciences. The comparison with scientific rather than humanities disciplines is apposite in that the teaching of economics in France is highly formalised and, like those in the sciences, undergraduate students in economics are required to be competent in mathematics. The choice of these scientific subjects is also useful for comparisons since physics and chemistry is a male-dominated subject area, while there are more female than male students in life sciences.

< Figure I about here >

Figure I shows that in the Generation surveys more than half of economics graduates are female and the figure is stable at around 55% across the three cohorts studied. This contrasts with the situation in other countries where typically only a third of economics students are female. The physics and chemistry subject area is clearly dominated by male students, while females represent a majority of graduates in life sciences, with the proportion rising from just over one half to nearly two thirds in the period 1998 to 2010.

Three years after graduation, full-time male average earnings are highest in economics, and lowest in life sciences. This is the case across the three cohorts (see Figure I). For females, average pay among economics and physics and chemistry graduates is similar but much higher than in life sciences, even though female earnings in the latter have increased relatively over time. In terms of the raw gender earnings gap, the biggest gender differential in each cohort is consistently found among economics graduates – 18% in 2001 and 11% in 2013. The gap is smallest for life sciences in two of the three cohorts. Finally, the raw gender gap has decreased substantially between 2001 and 2013 in all three disciplines, the most pronounced reduction being in life sciences from 9% to 2%. In short, three years after graduation, pay levels for economics graduates are higher than in the two scientific disciplines, but the raw gender earnings differential is wider[4]. Even though the latter has narrowed over the period studied, the raw gap in male relative to female earnings remains above 10%.

[4] Interestingly these figures in line with the more general phenomenon observed in France, that in the sectors and occupations where female average earnings are highest, the gender gap in average earnings is wider (DARES, 2015).

2. Earnings regressions

Respondents provide a calendar of their different spells of employment (and non-employment) for the three years since leaving full-time education. For each spell, the initial earnings and final pay (monthly and net of social security contributions) declared by the respondent are recorded, along with other aspects of the job such as contract type, sector, full-time status and position occupied. In this section, we begin by analysing the starting pay of the first employment spell recorded after leaving full-time education, noting that this may in certain cases be some time after graduation. For reasons of comparability, respondents who declare that they did not work full-time at the beginning of this first spell are excluded.

Traditionally unemployment has been high among young persons in France. However, the rate is much lower for students with higher educational qualifications (see for example, Bazen and Maman Waziri, 2019). Nevertheless, mainly as a consequence of labour laws, the initial recruitment of a young person takes the form of a fixed-term employment contract in the majority of cases, and this concerns graduates as well as those who are less qualified. In all regressions therefore a dummy variable is included for the type of employment contract.

In order to examine the ceteris paribus gender earnings differential, we first estimate a basic pooled earnings regression including a dummy for gender ($M_i = 1$ for males):

$$ln\ w_i = x_i'\beta + M_i\delta + \varepsilon_i \qquad (1)$$

The vector of explanatory variables (x_i) contains dummies for the highest diploma obtained and type of employment contract (permanent or not). In the certain regressions, where its effect can be identified, x_i also includes the number of years of actual experience. While this pooled regression equation provides a first estimate of the gender gap corrected for differences in characteristics for a reasonable sample size, it is restrictive. It assumes that the vector of coefficients β is identical for the two genders and that the error term (ε_i) has the same distribution for both groups. Estimating a pair of equations, one for each group without the gender dummy, removes these restrictions but entails estimating coefficients with smaller samples:

$$ln\ w_i^G = x_{Gi}'\beta_G + \varepsilon_{Gi} \qquad G = M, F \qquad (2)$$

The estimated coefficients from (2) can then be used to undertake an Oaxaca (1973) decomposition of a measure of the raw earnings gap as follows:

$$\Delta = \overline{\ln w^M} - \overline{\ln w^F} = (\bar{x}_{Mi}' - \bar{x}_{Fi}')\hat{\beta}_M + \bar{x}_{Fi}'\left(\hat{\beta}_M - \hat{\beta}_F\right) \qquad (3)$$

The decomposition applies to the means of the logarithm of earnings (which are equal to the logarithms of the geometric means) and the chosen basis is average female characteristics. The first term on the right-hand side is the 'composition' effect or 'characteristics' component, and the second the 'unexplained' or 'coefficients' component. The latter could be the result of labour market discrimination since $\bar{x}_{Fi}'\hat{\beta}_M$ is the estimated counterfactual average of the logarithm of female earnings in the case of the same returns to characteristics as males.

2.1 Starting wages of economics graduates

The logarithm of monthly starting pay is regressed on a constant and a set of dummy variables which are used to represent the highest diploma obtained and whether the employment contract is a standard one or not. The reference category is an individual with a bachelor's degree only, occupying a job with a fixed-term contract. Part-time employees are excluded from the regression analysis as are the self-employed and so-called 'family workers' (who work in the family business), since the labour incomes of these latter two categories are not determined by the same mechanisms as regular employees. The results for the three cohorts of students in economics are presented in Table I.

< Table I about here >

Pooling the observations and incorporating a gender dummy suggests the existence of a substantial differential in starting wages in 1998 and 2004, but which is declining across cohorts to become insignificant at the 10% level in 2010. In order to undertake an Oaxaca decomposition the equations are estimated separately by gender (see Table II). The size and significance of the coefficients are not the same for the two genders. The decomposition using average female characteristics as the basis shows that the gender differential in the logarithm of starting pay is mainly due to the unexplained component and almost entirely so for the most recent cohort (see Figure II). In view of the fact that recent generations of females are just as qualified as their male counterparts, it is unsurprising that the composition effect (the component due to differences in characteristics) is small (see the Appendix tables for detailed descriptive statistics).

< Table II about here >

< Figure II about here >

It would therefore appear to be the case that while females constitute a majority of economics graduates, their starting pay is on average lower than for male economics graduates. The differential is mainly due to differences in coefficients. While both the raw differential and the unexplained component have decreased substantially between 1998 and 2010, they have not disappeared. In physics and chemistry and the life sciences, where gender differentials in the logarithm of starting pay are smaller, the Oaxaca decomposition attributes a substantial part of the differential to the characteristics component (see Appendix Figure A.1 and Table A.4).

2.2 Earnings after three years

Starting wages may not be the best measure of the early career pay of university graduates for various reasons. Earnings will be lower if the individual is undergoing on-the-job training, for example. In the French context, for individuals entering the labour market, getting a job may be more of a priority for an individual than the initial level of remuneration. An initial inefficient match can be subsequently corrected by further, on-the-job search (see for example Bazen and Maman Waziri (2019)). Furthermore, most first jobs are of a fixed term nature and as is clear from the regression results for starting pay, earnings are higher for individuals on

regular employment contracts. For these and possibly other reasons, we now examine gender earnings differences three years after having left full-time education in order to see whether the gender gap evolves as the cohort gains experience.

For most respondents in the Generation surveys, earnings are recorded at the time of interview which takes place three years after having left full-time education. For those who are not in paid employment at the time of interview, earnings at the end of the most recent spell of employment are used. In what follows where the spell ended more than twelve months prior to interview, the case is excluded along with those who have never worked. Part-time employees are excluded from the main regression analysis. The validity of excluding these latter categories is assessed using a selectivity test – see section 3 below. As with starting pay, the self-employed and so-called 'family workers' (who work in the family business) are also excluded but are not used in the selectivity test.

As was noted above, due to the way in which a cohort is defined, all members will have roughly the same potential experience (i.e. three years). The earnings equations used for starting wages (1) and (2) are augmented by actual experience based on recorded spells of employment, which has been converted into an annual measure (and has a maximum value of 3).

< Table III about here >

< Table IV about here >

The pooled regressions show that other things being equal, the gender earnings differential among economics graduates is wider after three years compared to the gap found in starting pay (Table III). While this deterioration in the gender pay gap over the first three years of activity is less pronounced over time, it stands at close to 10% in 2013. Estimating the earnings equations separately by gender (Table IV) and decomposing the earnings gap reveals that the differential for economics graduates is almost entirely due to the unexplained component (see Figure II). Most of the unexplained difference in the recent cohorts is due to differences in the constant term, and in the annual rate of return to actual experience which is higher for males for the 2004 and 2010 cohorts.

In the two scientific subject areas, the ceteris paribus gender gaps are smaller than in economics. However, the nature of the gap is also quite different (see Appendix Figure A.1). Firstly, the differential in earnings after three years is not always greater that the gap in starting pay. For the 2010 cohort, for graduates in both scientific subject areas the gap in starting pay is bigger than that in subsequent earnings. The earnings differential in life sciences is mainly due to the composition effect while in physics and chemistry the gap is entirely due to the unexplained component.

The conclusion that emerges then is that an initial gender gap in the starting pay of economics graduates is exacerbated over the subsequent two to three years after graduation. While the size of the gap is smaller for the most recent cohort, it remains significant three years after graduation. In the two scientific subject areas, the picture is quite different. In the female-dominated life sciences, the gap is small, narrowing over time, and decreases between starting

and subsequent pay at least for the 2010 cohort. In physics and chemistry where the majority of graduates are male, there is a smaller gender gap than among economics graduates. As in economics, the gap here is due almost entirely to the unexplained component in the Oaxaca decomposition.

Looking more closely at the nature of the unexplained component of the gender differential in earnings for economics graduates, the key differences in parameters are for the constant and the return to experience. For males in 2010 cohort, in percentage terms the latter is five points higher (19.8%) than the return for female economics graduates (13.9%), which would account for the widening of the gap between starting pay and earnings three years after graduation. The difference in the constant terms is 0.11, in favour of males.

3. Robustness checks

The results presented thus far are based on a series of regressions, and in this section we undertake a number of tests in order to see whether the findings are robust. It is important to stress from the outset that while we are using micro data, examining the earnings of narrowly defined groups of graduates means that the sample sizes used in the regressions are not very large compared to those usually deployed in studies of earnings differences. Furthermore, as pointed out above, the survey used does not always have the same sampling rate. In the regressions underlying population weights are used, but the sample size for university graduates is much smaller in 2010 compared to 1998.

The dependent variable used is the logarithm of monthly earnings for full-time employees. This means that inactive and unemployed individuals are necessarily excluded along with those working part-time. In order to examine the reliability of the estimates presented for full-time workers, we first undertake a selectivity test (see Melino, 1982). In the first stage probit, along with the education variable we include additional variables such as age at the moment leaving full-time education, whether the individual lives with their parents or lives with a partner, if the individual was behind in school and if the individual attended a 'classe préparatoire' prior to entering university. These additional variables have varying degrees of statistical significance across cohorts and subject areas, but one or more play a role in determining presence in the sample used for the earnings regressions. The *p* values of the test indicate that excluding the part-time and non-employed individuals does not play a role in any of the regressions for economics graduates except in one isolated case: for males in the 1998 cohort in the regression for starting pay (see Tables II and IV). When we included those part-time employees working three days or four days a week with their monthly earnings converted into a full-time equivalent, along separate dummy variables for the number of days worked, the overall conclusions are not altered. There is no apparent pay penalty in economics for working less than full-time (other than a pro-rata reduction due to fewer hours worked).

The definition of an economics graduate includes some individuals who finish by specialising in a related subject such as finance or accountancy. A dummy variable for a graduate in 'straight economics' is found to be statistically insignificant at conventional levels except in one case – males in the 2010 cohort who apparently are paid slightly less compared to other specialisations chosen by students who have been trained in economics.

The decompositions of the gender gap in earnings indicate that the unexplained component is the main contributor to the difference between the means of log earnings by gender. Using the method proposed by Firpo et al (2012) it is possible to undertake the decomposition at different quantiles rather than solely at the mean. We did not use this method as our main approach because of the limitations imposed by our sample size. However, this decomposition suggests that except for the 1998 cohort the gender differential is found mainly in the middle and upper half of the earnings distribution and as in the Oaxaca decomposition, is overwhelmingly attributable to the unexplained component (see Figure III).

< Figure III about here >

4. What is driving the 'unexplained' component?

While the raw gender pay differential among economics graduates has narrowed over time, the remaining gap three years after graduation is around 10% in favour of males. On the basis of an Oaxaca decomposition, it is found to be due almost entirely to the difference between the coefficients of the human capital based earnings equations for the two sexes. This 'unexplained' component is sometimes attributed to discrimination in the labour market since females and males are not obtaining the same returns to a given set of characteristics. We now explore what may be driving this finding beyond the returns to human capital. We proceed by adding different personal and employment-related variables to the regressions and examine whether the corrected gender gap is reduced and more generally whether the part of the overall gap attributed to the unexplained component decreases.

4.1 Gender differences in individual factors

Certain factors other than human capital accumulation have been considered to explain the gender gap in general. At the individual level the role played by non-cognitive skills, differences in preferences and the notion that men tend to be more confident than women have been emphasised (Bertrand, 2001; Fortin, 2008). While there are no specific measures of ability in the data set, whether a student obtained a distinction in the baccalaureat examination is recorded. There are three levels of distinction: highest honours, high honours and honours. Adding dummies for the three distinctions with a standard pass as the reference group does not alter the overall results. In the pooled regression there is a small increase in the coefficient on the gender dummy variable (Table V) but the decomposition confirms that the raw gap is entirely due to the unexplained part (Table VI).

< Table V about here >

< Table VI about here >

If men are more confident than women, they could systematically target higher paying jobs and be prepared to risk searching for a longer time in order to obtain such a job (Fluchtmann et al.,2021). This may explain the existence of gender wage differential particularly at the beginning of a career (Cortés et al., 2022). In our sample, more than half of males and 46% of

females had one job only in the first three years after graduation, and about the same proportions had a permanent contract in their first job. The time taken by men and women to obtain jobs can be examined in two ways in our data set: the time taken to obtain a first job (with any kind of employment contract), and the time taken to obtain a permanent job. On average, among economics graduates, men do take longer to obtain a first job, regardless of the type of employment contract. However, in a regression, the effect of this variable on pay is negative but it is not statistically significant. In contrast the time taken to obtain permanent employment is significant at 5% but is associated with a slight increase of the estimate of the corrected gender gap to 9.26% (Table V).

If it is the case that males achieve a better match than females then this could give rise to a tenure effect in gender earnings differences, over and above the return to experience. Alternatively, obtaining a better match early in a career will be reflected in less job-changing. However including these as additional variables in the regressions does not alter the overall results since they are both insignificant influences (Table VI). Furthermore similar proportions of both groups (around a fifth) feel that they are over-qualified for their current job (see Table VII).

Finally there may be gender differences in the weight attributed to various aspects of a job related to preferences. It has been suggested that pay may not be as important as other components of a job package for females (see for example Clark, 1997). However, three years after graduation more than 80% of both genders state that they are generally satisfied with their professional life (Table VII). While only three quarters of female economics graduates feel that they are well-paid, there is no significant difference compared to their male counterparts.

< Table VII about here >

Overall the factors driving the unexplained component of the gender gap in early career earnings among economics graduates lie elsewhere.

4.2 Is there a "STEM" factor?

A reason often advanced for the existence of a significant unexplained component of the gender earnings differential *in general* is the observation that men and women often work in different sectors and occupations (Machin and Puhani, 2003; Card et al., 2016). There is under-representation of females in the so-called STEM occupations (Scientific, Technical, Engineering and Mathematics) which tend to be higher-paying jobs. Differences in the share of women more technical and professional positions may also be relevant for economics graduates. We examine next the role of occupational choices and sector of employment of economics graduates in France three years after graduation in 2013.

Table VIII lists the six main occupations of economics graduates three years after entering the labour market which contain about 85% of our sample. The main gender difference in

employment is in 'Engineers and technical executives'[5] where the proportion of males is 40% compared to 20% of females. Table IX lists the five main sectors of activity where economics graduates are employed (covering around 75% of the sample). Higher proportions of females are found in finance, insurance, real estate activities and public administration, and less so in scientific and technological, and information and communication industries. The proportion of female economics graduates employed in the public sector is slightly higher than males.

< Table VIII about here >

< Table IX about here >

In the light of these differences, it is natural to ask whether these allocations across occupations and sectors are relevant for the gender gap in earnings, as Blinder (1973) emphasised. In order to examine the role of these additional differences in explaining the gender wage gap, we add sequentially to equation (1) combinations of dummies for the public/private sector, sector of employment and occupation. Table X presents the results from these pooled regressions. The coefficient for the gender dummy variable in Model (a) measures the relative wage difference between males and females after controlling for human capital, type of employment contract and actual experience. When sector and occupation dummies are included, the corrected male gender differential in wages declines from this baseline estimate of 9%. On average, males are estimated to earn 8.6% more than females when controlling for private or public sector (column (b)); 7.5% more when we include sector of employment variables (columns (c) and (d)), and falls to 5.6% when controlling for occupation (columns (f) and (g)). The inclusion of occupational category rather than sector of employment is the main factor reduces the corrected differential and the unexplained component (table XI). In other words these technical occupations are found in several sectors. The results suggest there is evidence of gender effect of the 'STEM' form whether this be the result of differences in preferences or discrimination in recruitment. Female economics graduates are less present in more technical occupations and are paid less on average as a consequence. However, even after controlling for occupational differences there remains a wage gap in favour of males. The Oaxaca decomposition shows in Table XI that even when occupation and sector of employment are controlled for, two thirds of the gender wage gap is still attributable to the unexplained component. The fact that the unexplained part does not disappear when differences in job characteristics are included is consistent with the presence of gender discrimination.

< Table X about here >

< Table XI about here >

[5] France has a tradition of using the term 'engineer' and 'technical executive' for certain occupations outside the sphere of physics and construction with a high technical content, as such statistician, economist, financial analyst and researcher.

4.3 Is it discrimination?

Interestingly, as part of the questionnaire, respondents are asked about their personal experience of discrimination (see Neumark and McLennan, 1995, for a full discussion of the issues involved with self-reported experience of discrimination). In the 2010 cohort, 13.6% of female economics graduates report that they have experienced discrimination of some kind (see Table XII). However, while the figure for males is lower, the difference is not statistically significant. Specifically on the issue of gender discrimination, 3% of females state they have been a 'victim' (the term used in the questionnaire) and less than 1% of males and here the difference is statistically significant. These figures are however less than those for experience of discrimination due to a person's name, which is 6% for females and 7.5% for males. Gender discrimination on behalf the employer does not seem to main form experienced on the basis of the answers given. That is not to say that there is no actual discrimination since the questions only relate to that which is perceived by the respondent, for example due to missing out on a job because a member of the opposite sex was recruited, or not being promoted.

< Table XII about here >

5. Concluding remarks

The fact that a majority of economics graduates are female in France provides an interesting case study of the possible outcomes in other countries when seeking to encourage more female undergraduates to study economics and the related aim of attracting more women into the economics profession. Like those elsewhere, economics graduates in France have higher average earnings that those from other disciplines, and this is true for both males and females. However, in spite of approximate equality in terms of economics qualifications and a narrowing of the raw gender pay gap over time, there remains a persistent gender earnings differential among economics graduates which is overwhelmingly due to the unexplained component of the Oaxaca decomposition. This finding appears to be robust since it is identified in the first job after graduation and the differential grows over the first few years in the labour market. This sets economics apart from other technical academic disciplines such as the female-dominated life sciences and to a certain extent male-dominated subject areas such as physics and chemistry. It appears that part of the earnings gap is related to gender differences in the kind of jobs taken by economics graduates and suggests that some of these occupations are similar to the STEM category. However, even when occupational differences are taken into account, for the main part the gender pay gap among economics graduates is due to the unexplained component which given that the data concern early career earnings, suggests there could be discrimination against females in recruitment to higher paying positions rather than the existence of glass ceilings or child penalties.

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Table I Starting pay regressions for economics graduates

Cohort	1998	2004	2010
Constant	6.94*** (0.047)	7.036*** (0.058)	7.205*** (0.038)
Master 1 year	0.117** (0.051)	0.173*** (0.062)	0.068 (0.063)
2 years	0.222*** (0.048)	0.203*** (0.051)	0.218*** (0.044)
Ph.D.	0.341*** (0.061)	0.338*** (0.052)	0.394*** (0.052)
Regular contract	0.205*** (0.023)	0.152*** (0.032)	0.131*** (0.034)
Male	0.097*** (0.022)	0.091*** (0.028)	0.048 (0.032)
R^2	0.24	0.15	0.15
Observations	736	408	397

Notes: The table reports results from WLS regressions. The dependent variable is the logarithm of initial net monthly pay. Robust standard errors in brackets. *, ** and *** indicate statistical significance at 10%, 5% and 1% level, respectively. Source: Enquête Generation.

Table II Starting pay regressions for economics graduates: separately by gender

Cohort	1998		2004		2010	
	Females	Males	Females	Males	Females	Males
Constant	6.90*** (0.050)	7.06*** (0.077)	7.13*** (0.073)	7.01*** (0.058)	7.18*** (0.038)	7.28*** (0.065)
Master: 1 year	0.170*** (0.056)	0.071 (0.080)	0.110 (0.078)	0.229*** (0.082)	-0.06 (0.056)	0.119 (0.091)
2 years	0.259*** (0.052)	0.199*** (0.075)	0.125* (0.066)	0.300*** (0.058)	0.268*** (0.052)	0.164** (0.073)
Ph.D.	0.381*** (0.073)	0.315*** (0.090)	0.324*** (0.069)	0.330*** (0.067)	0.451*** (0.071)	0.337*** (0.079)
Regular contract	0.200*** (0.029)	0.212*** (0.036)	0.065 (0.041)	0.252*** (0.046)	0.094* (0.049)	0.163*** (0.048)
Selectivity test (*p value*)	0.86	0.00***	0.51	0.57	0.51	0.29
R^2	0.21	0.19	0.07	0.22	0.17	0.13
Observations	383	353	229	179	203	194

Notes: The table reports results from WLS regressions. The dependent variable is the logarithm of initial net monthly pay. Robust standard errors in brackets. *, ** and *** indicate statistical significance at 10%, 5% and 1% level, respectively. Source: Enquête Generation.

Table III Earnings regression for economics graduates three years after graduating

Cohort	1998	2004	2010
Constant	6.86*** (0.063)	6.822*** (0.073)	6.874*** (0.061)
Master 1 year	0.102** (0.045)	0.192*** (0.056)	0.125 (0.079)
2 years	0.244*** (0.045)	0.230*** (0.040)	0.220*** (0.053)
Ph.D.	0.246*** (0.055)	0.354*** (0.047)	0.316*** (0.059)
Regular contract	0.236*** (0.036)	0.131*** (0.049)	0.181*** (0.043)
Actual experience	0.071*** (0.019)	0.147*** (0.027)	0.155*** (0.024)
Male	0.166*** (0.026)	0.114*** (0.029)	0.091*** (0.031)
R^2	0.28	0.22	0.30
Observations	796	481	409

Notes: The table reports results from WLS regressions. The dependent variable is the logarithm of the net monthly pay after three years. Robust standard errors in brackets. *, ** and *** indicate statistical significance at 10%, 5% and 1% level, respectively. Source: Enquête Generation.

Table IV Earnings regressions for economics graduates three years after graduating: separately by gender

Cohort	1998		2004		2010	
	Females	Males	Females	Males	Females	Males
Constant	6.731*** (0.066)	7.151*** (0.109)	7.018*** (0.096)	6.751*** (0.099)	6.861*** (0.077)	6.960*** (0.105)
Master: 1 year	0.147*** (0.044)	0.071 (0.074)	0.183** (0.074)	0.169** (0.079)	0.113 (0.131)	0.115 (0.106)
2 years	0.335*** (0.041)	0.152** (0.075)	0.186*** (0.057)	0.254*** (0.060)	0.287*** (0.046)	0.152 (0.096)
Ph.D.	0.340*** (0.055)	0.168** (0.084)	0.331*** (0.066)	0.355*** (0.075)	0.381*** (0.051)	0.255** (0.107)
Regular contract	0.223** (0.041)	0.234*** (0.071)	0.062 (0.063)	0.234** (0.065)	0.196*** (0.056)	0.176** (0.072)
Actual experience	0.100*** (0.024)	0.046 (0.029)	0.100*** (0.034)	0.184*** (0.039)	0.130*** (0.032)	0.181*** (0.038)
Selectivity test (*p value*)	0.43	0.19	0.52	0.45	0.07*	0.91
R^2	0.29	0.11	0.11	0.30	0.30	0.28
Observations	437	359	269	212	210	199

Notes: The table reports results from WLS regressions. The dependent variable is the logarithm of the net monthly pay after three years. Robust standard errors in brackets. *, ** and *** indicate statistical significance at 10%, 5% and 1% level, respectively. Source: Enquête Generation.

Table V Gender wage gap among economics graduates after three years: other potential influences

Model	2010 cohort					
	(a)	(b)	(c)	(d)	(e)	(f)
Male dummy	0.090*** (0.031)	0.098*** (0.029)	0.087** (0.031)	0.092*** (0.031)	0.089** (0.031)	0.089*** (0.032)
Baccalaureat with distinction		Yes				
Months taken to obtain first job			Yes			
Months taken to obtain permanent job				Yes		
Tenure in current job					Yes	
Number of jobs in three years						Yes

Notes: The table reports results of the male coefficient from WLS regressions. The dependent variable is the logarithm of the net monthly pay after three years. All specifications include highest diploma obtained, type of employment contract, actual experience. Robust standard errors in brackets. *, ** and *** indicate statistical significance at 10%, 5% and 1% level, respectively. Source: Enquête Generation.

Table VI An Oaxaca decomposition of the gender differential in earnings after three years with additional controls

Model	2010 cohort		
	Raw gap	Explained part	Unexplained part
(a) Baseline	0.090	0.005	0.085
(b) Baccalaureat with distinction	0.090	-0.000	0.090
(c) Months taken to obtain permanent job	0.090	0.003	0.087
(d) Tenure in current job	0.090	0.013	0.078
(e) Number of jobs in three years	0.090	0.013	0.077

Notes: The table reports results of the Oaxaca decomposition. All specifications include highest diploma obtained, type of employment contract, actual experience. Source: Enquête Generation.

Table VII Gender gap in job satisfaction and earnings after three years

	2010 Cohort		
Proportion stating that they are:	Females	Males	Difference
over qualified	0.243	0.254	0.011ns
satisfied professionally	0.800	0.850	0.050ns
well paid	0.768	0.781	0.013ns

Note: ns indicates not significant, at the 5% level. *Source*: Enquête Génération.

Table VIII Occupational composition of economics graduates' employment in 2013

Proportion working as:	Female	Male	Difference
Marketing and administrative managers	0.268	0.221	0.047
Engineers and technical executives	0.204	0.396	-0.192
High level office staff	0.142	0.068	0.074
General office staff	0.102	0.118	-0.016
Supervisors	0.089	0.048	0.041
Technicians	0.075	0.037	0.038
Other	0.120	0.112	0.008

Note: The table reports summary statistics for economics graduates. Shares are reported separately for males and females. Source: Enquête Generation.

Table IX Sector of employment of economics graduates in 2013

Proportion working in:	Female	Male	Difference
Private sector	0.809	0.844	-0.035
Individual sectors:			
Scientific and Technical Services	0.188	0.247	-0.059
Public administration	0.187	0.165	0.022
Finance and Insurance Services	0.180	0.138	0.042
Wholesale and Retail Trade	0.107	0.109	-0.002
Information Media and Telecommunications	0.073	0.110	-0.037
Other	0.265	0.231	0.034

Note: The table reports summary statistics for economics graduates. Shares are reported separately for males and females. Source: Enquête Generation.

Table X Earnings regressions at three years of economics graduates with controls for employment characteristics

	2010 cohort						
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
Male dummy	0.090*** (0.031)	0.086*** (0.031)	0.075** (0.029)	0.074** (0.029)	0.087*** (0.030)	0.056* (0.029)	0.053* (0.029)
Public – private sector		Yes		Yes			Yes
Sector of industry			Yes	Yes			
Share of females in sector					Yes		
Occupation						Yes	Yes

Notes: The table reports results of the male coefficient from WLS regressions. The dependent variable is the logarithm of the net monthly pay after three years. All specifications include highest diploma obtained, type of employment contract, actual experience. Specification (b) includes private and public sector dummies; specifications (c) and (d) include industry dummy variables, specification (e) includes share of female by sector and specifications (f) and (g) include occupational dummies variables. Robust standard errors in brackets. *, ** and *** indicate statistical significance at 10%, 5% and 1% level, respectively. Source: Enquête Generation.

Table XI An Oaxaca decomposition of the gender differential in earnings after three years with employment characteristics

	2010 cohort		
Model	Raw gap	Explained part	Unexplained part
(a) Baseline	0.090	0.005	0.085
(b) Private/public sector	0.090	0.010	0.080
(c) Sector	0.090	0.001	0.089
(d) Share of female/sector	0.090	0.008	0.082
(e) Occupation	0.090	0.028	0.061

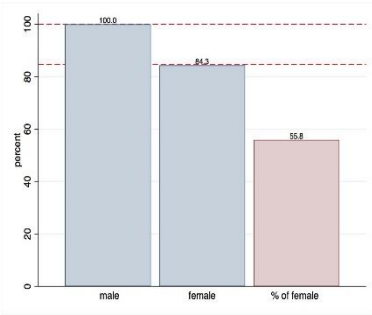
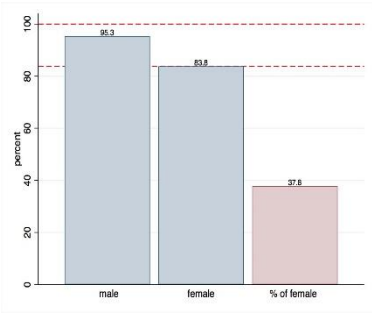
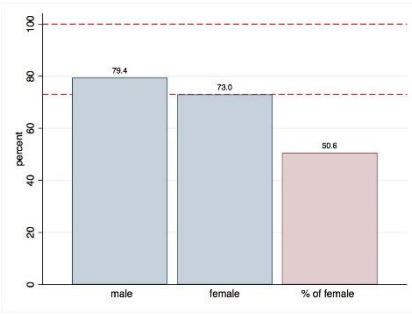
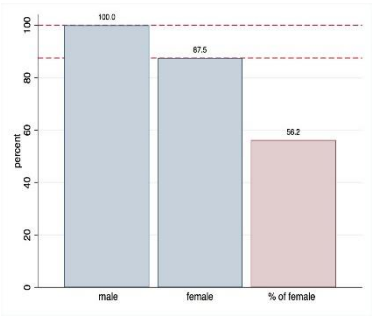
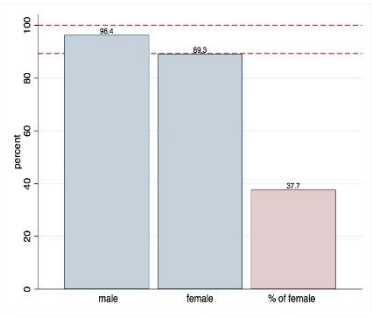
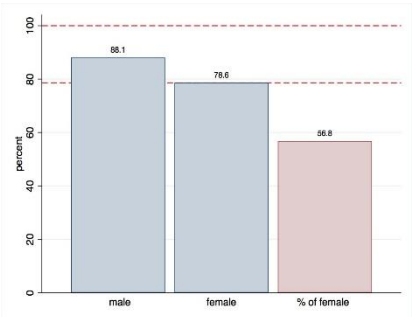
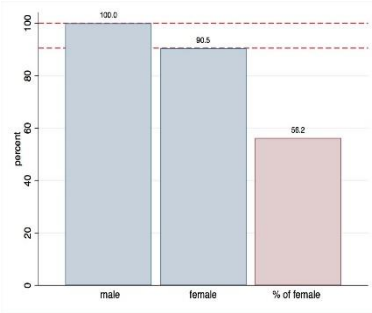
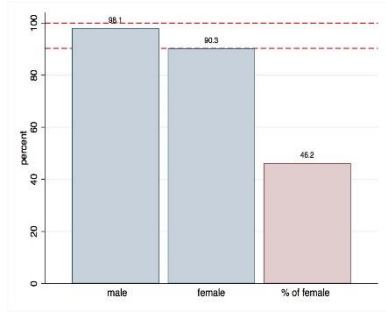
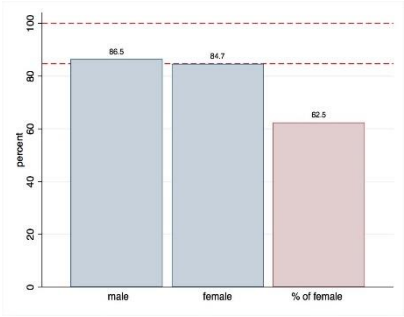
Notes: The table reports results of the Oaxaca decomposition. All specifications include highest diploma obtained, type of employment contract, actual experience. Specification (b) includes employment sector; specification (c) includes industry dummy variables; specification (d) includes share of female in each industry and specification (e) includes occupation variables. Source: Enquête Generation.

Table XII Gender gap in experience of discrimination and job satisfaction, earnings after three years

Cohort	2010		
Proportion stating that they experienced discrimination due to:	Females	Males	Difference
- all sources	0.136	0.127	-0.009ns
- name	0.066	0.075	0.009 ns
- maternity	0.001	0	-0.001ns
- gender	0.029	0.008	-0.021*
- age	0.023	0.008	-0.014ns
- experience	0.004	0	-0.004ns
- origin	0.015	0.042	0.027ns

Note: ns indicates not significant, * and ** indicate statistical significance at 10%, 5% level, respectively.
Source: Enquête Génération.

Figure I Earnings and proportion of female graduates by subject areas (Male average earnings in Economics = 100)

Economics	Physics-Chemistry	Life Sciences
1998 		
2004 		
2010 		

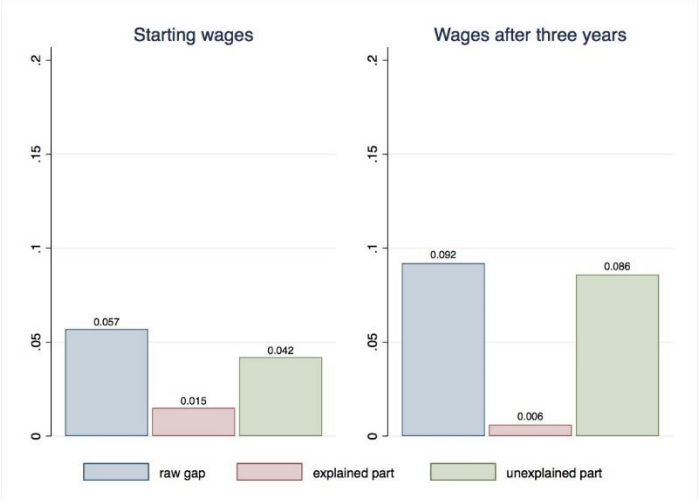
Source: Enquête Génération.

Figure II An Oaxaca decomposition of the gender differential in starting pay and subsequent earnings among economics graduates

1998 Cohort

2004 Cohort

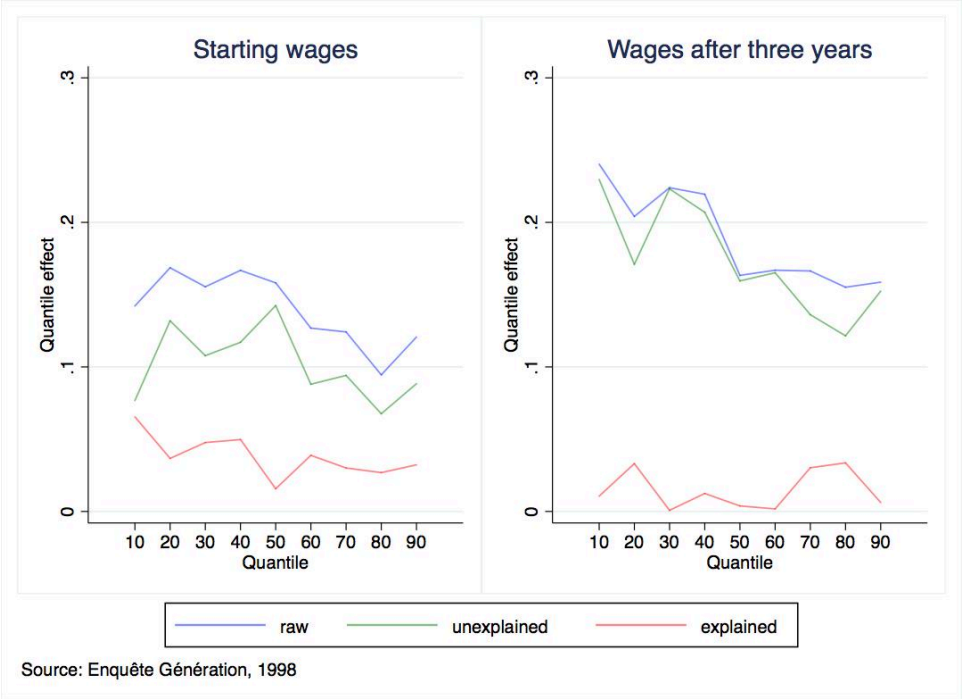
2010 Cohort



Note: Following Blau and Kahn (2017), the decomposition uses as the counterfactual the predicted log earnings of an average woman using estimated male returns ($\overline{x_f}\hat{\beta}_m$).

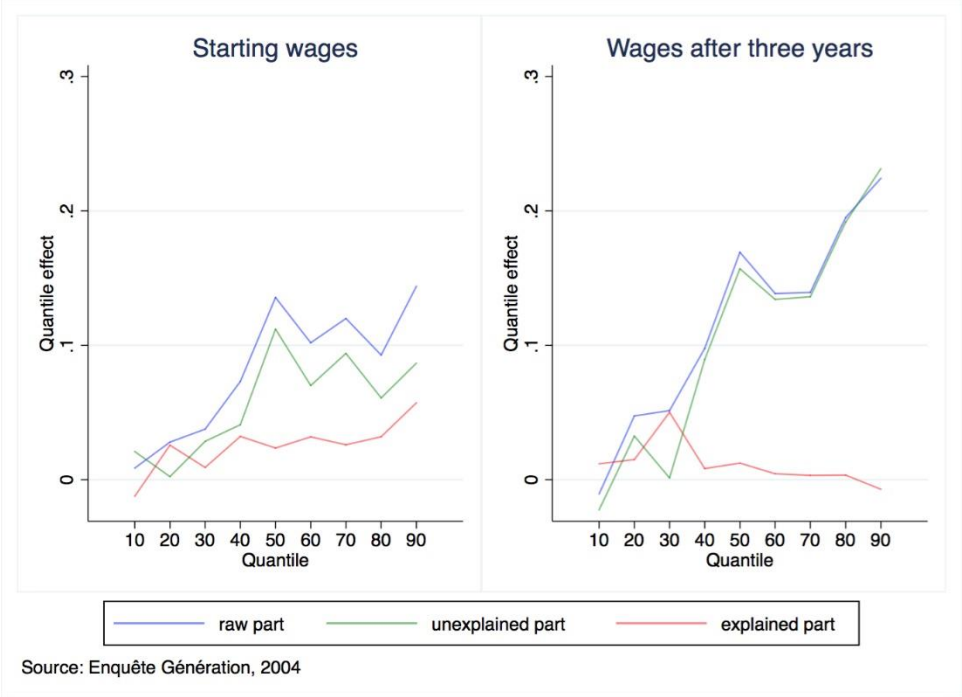
Figure III Quantile decomposition of the gender gap in earnings after three years for economics graduates

1998 cohort



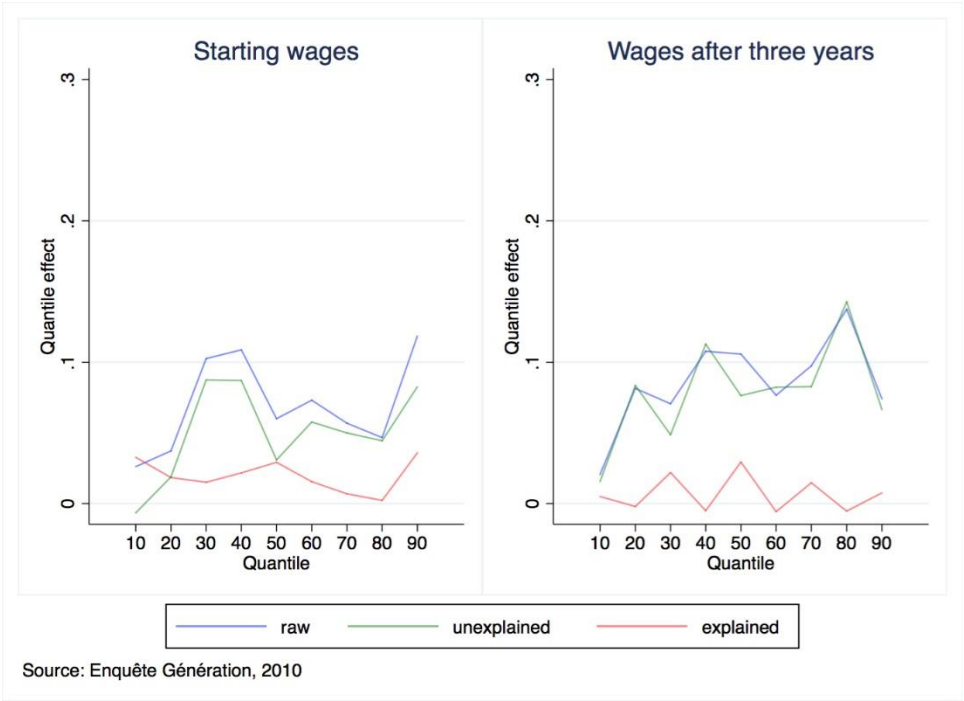
Source: Enquête Génération, 1998

2004 cohort



Source: Enquête Génération, 2004

2010 cohort



Source: Enquête Génération, 2010

Appendices

Table A1: Sample characteristics by gender, Economics

	1998		2004		2010	
	Females	Males	Females	Males	Females	Males
(a) log starting wage						
Age	24.3	24.8	24.2	24.7	24.3	25.2
Highest diploma						
Bachelor	0.056	0.089	0.126	0.094	0.087	0.079
Master						
One year	0.301	0.260	0.186	0.205	0.034	0.077
Two years	0.626	0.618	0.643	0.653	0.847	0.805
P.h.D	0.016	0.031	0.044	0.046	0.030	0.037
Regular contract	0.442	0.620	0.386	0.444	0.467	0.559
Observations	383	353	229	179	203	194
(b) log wage after three years						
Age	27.3	27.9	27.2	27.9	27.5	28.1
Highest diploma						
Bachelor	0.058	0.083	0.120	0.123	0.071	0.090
Master						
One year	0.326	0.264	0.216	0.216	0.034	0.068
Two years	0.590	0.610	0.611	0.584	0.863	0.805
PhD	0.024	0.041	0.052	0.075	0.030	0.036
Regular contract	0.806	0.927	0.805	0.824	0.830	0.811
Actual experience	2.40	2.24	2.38	2.36	2.43	2.50
Observations	437	359	269	212	208	196

Note: Means are reported. *Source:* Enquête Génération.

Table A2 Sample characteristics by gender, Physics and Chemistry

	1998		2004		2010	
	Females	Males	Females	Males	Females	Males
(a) starting wage						
Age	25.6	26.2	25.5	26.6	25.4	26.8
Highest diploma						
Bachelor	0.154	0.168	0.280	0.199	0.030	0.050
Master						
One year	0.153	0.123	0.040	0.075	0.010	0.111
Two years	0.239	0.278	0.290	0.199	0.525	0.199
P.h.D	0.453	0.429	0.388	0.525	0.433	0.638
Regular contract	0.379	0.508	0.367	0.477	0.362	0.345
Observations	189	347	124	259	157	277
(b) wage after three years						
Age	28.3	29.2	28.1	29.3	28.3	30.0
Highest diploma						
Bachelor	0.199	0.152	0.368	0.231	0.033	0.102
Master						
One year	0.206	0.157	0.062	0.082	0.071	0.098
Two years	0.221	0.267	0.249	0.216	0.480	0.182
PhD	0.372	0.422	0.319	0.469	0.414	0.615
Regular contract	0.789	0.822	0.743	0.758	0.727	0.613
Actual experience	2.23	2.28	2.48	2.43	2.50	2.55
Observations	213	361	137	275	159	281

Note: Means are reported. *Source:* Enquête Génération.

Table A3 Sample characteristics by gender, Life Sciences

	1998		2004		2010	
	Females	Males	Females	Males	Females	Males
(a) starting wage						
Age	25.1	25.6	25.3	25.4	26.1	26.2
Highest diploma						
Bachelor	0.258	0.142	0.361	0.133	0.102	0.110
Master						
One year	0.234	0.222	0.074	0.104	0.055	0.028
Two years	0.303	0.444	0.321	0.453	0.448	0.443
Ph.D	0.203	0.189	0.242	0.308	0.393	0.417
Regular contract	0.291	0.337	0.361	0.359	0.182	0.265
Observations	252	211	227	173	322	226
(b) wage after three years						
Age	28.1	28.3	28.2	28.4	28.9	29.1
Highest diploma						
Bachelor	0.221	0.174	0.420	0.141	0.113	0.108
Master						
One year	0.305	0.287	0.070	0.125	0.037	0.023
Two years	0.297	0.380	0.286	0.465	0.482	0.473
PhD	0.175	0.157	0.222	0.268	0.367	0.394
Regular contract	0.597	0.650	0.652	0.642	0.464	0.513
Actual experience	2.16	2.02	2.36	2.19	2.41	2.39
Observations	272	251	238	204	327	240

Note: Means are reported. *Source:* Enquête Génération.

Table A4 Starting wages regressions: separately by gender, Physics-Chemistry and Life Sciences

Cohort	1998		2004		2010	
	Females	Males	Females	Males	Females	Males
Physics-Chemistry						
Constant	6.92***	6.96***	6.98***	7.18***	7.26***	7.18***
	(0.063)	(0.048)	(0.071)	(0.040)	(0.082)	(0.146)
Master:	-0.066	0.095	0.528**	0.231**	0.057	0.058
1 year	(0.084)	(0.071)	(0.151)	(0.099)	(0.097)	(0.175)
2 years	0.232***	0.304***	0.359***	0.259***	0.027	0.275*
	(0.075)	(0.058)	(0.094)	(0.062)	(0.098)	(0.161)
Ph.D.	0.420***	0.428***	0.514***	0.322***	0.307***	0.412***
	(0.063)	(0.052)	(0.067)	(0.036)	(0.085)	(0.152)
Regular	0.125**	0.172***	0.152**	0.055	0.175***	0.161***
contract	(0.045)	(0.032)	(0.070)	(0.039)	(0.051)	(0.043)
R^2	0.441	0.411	0.392	0.21	0.40	0.27
Observations	189	347	124	259	157	277
Life Sciences						
Constant	6.88***	7.10***	7.06***	6.93***	7.14***	7.11***
	(0.032)	(0.070)	(0.040)	(0.055)	(0.061)	(0.042)
Master:	-0.003	-0.149*	0.049	0.141**	0.017	0.089
1 year	(0.049)	(0.077)	(0.057)	(0.070)	(0.078)	(0.063)
2 years	0.173***	0.053	0.156***	0.324***	0.230***	0.198***
	(0.053)	(0.075)	(0.046)	(0.054)	(0.087)	(0.061)
Ph.D.	0.374***	0.262***	0.362***	0.490***	0.384**	0.421***
	(0.053)	(0.086)	(0.043)	(0.056)	(0.063)	(0.045)
Regular	0.203***	0.135***	0.136***	0.207***	0.08	0.247***
contract	(0.043)	(0.044)	(0.039)	(0.045)	(0.079)	(0.064)
R^2	0.341	0.268	0.304	0.19	0.19	0.36
Observations	252	211	227	173	322	226

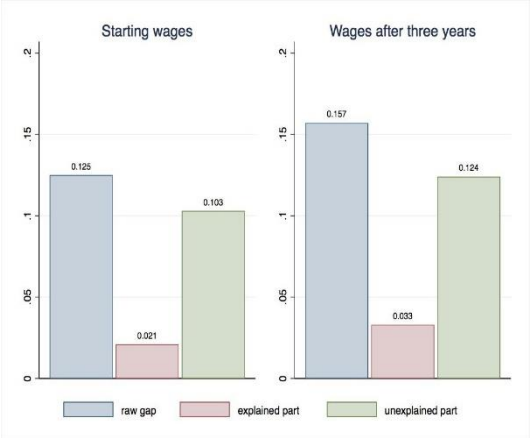
Notes: The table reports results from WLS regressions. The dependent variable is the logarithm of the net monthly starting pay. Robust standard errors in brackets. *, ** and *** indicate statistical significance at 10%, 5% and 1% level, respectively. Source: Enquête Generation.

Table A5 Earnings regressions three years after graduating: separately by gender, Physics-Chemistry and Life Sciences

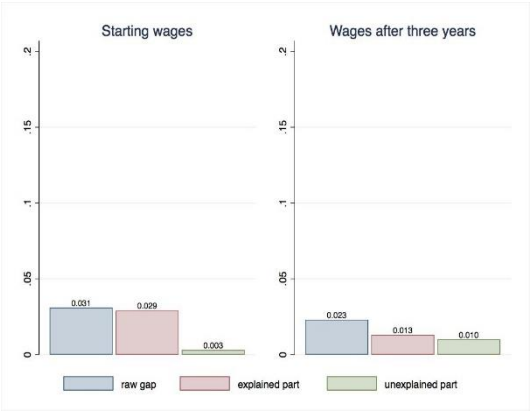
Cohort	1998		2004		2010	
	Females	Males	Females	Males	Females	Males
Physics-Chemistry						
Constant	6.90***	6.99***	7.03***	7.17***	6.91***	7.06***
	(0.085)	(0.073)	(0.100)	(0.072)	(0.110)	(0.170)
Master:	-0.132*	0.169***	0.123	0.271***	0.326***	-0.12
1 year	(0.078)	(0.068)	(0.180)	(0.066)	(0.105)	(0.160)
2 years	0.145***	0.292***	0.147**	0.194***	0.336***	0.336
	(0.055)	(0.060)	(0.072)	(0.058)	(0.090)	(0.222)
Ph.D.	0.245***	0.369***	0.229***	0.237***	0.553***	0.252
	(0.048)	(0.054)	(0.056)	(0.028)	(0.087)	(0.155)
Regular	0.214***	0.237***	0.167**	0.106***	0.085**	0.160**
contract	(0.047)	(0.039)	(0.080)	(0.039)	(0.042)	(0.077)
Actual	0.092***	0.036***	0.090*	0.059**	0.090***	0.123**
experience	(0.033)	(0.022)	(0.051)	(0.027)	(0.029)	(0.048)
R^2	0.452	0.378	0.226	0.20	0.42	0.29
Observations	213	361	137	275	159	281
Life Sciences						
Constant	6.81***	6.86***	6.84***	6.96***	7.02***	7.04***
	(0.112)	(0.079)	(0.069)	(0.085)	(0.103)	(0.085)
Master:	0.099	-0.000	0.079	0.114	-0.030	0.306***
1 year	(0.079)	(0.061)	(0.078)	(0.075)	(0.082)	(0.088)
2 years	0.191***	0.152***	0.133***	0.286***	0.064	0.205***
	(0.059)	(0.050)	(0.037)	(0.052)	(0.084)	(0.060)
Ph.D.	0.344***	0.248***	0.355***	0.430***	0.254***	0.393***
	(0.050)	(0.060)	(0.035)	(0.049)	(0.074)	(0.051)
Regular	0.186***	0.317***	0.141***	0.204***	0.089	0.203***
contract	(0.049)	(0.037)	(0.036)	(0.051)	(0.058)	(0.036)
Actual	0.066	0.069**	0.135***	0.056*	0.145***	0.065**
experience	(0.049)	(0.034)	(0.026)	(0.031)	(0.038)	(0.029)
R^2	0.254	0.457	0.450	0.334	0.31	0.37
Observations	272	251	238	204	327	240

Notes: The table reports results from WLS regressions. The dependent variable is the logarithm of the net monthly pay after three years. All specifications include highest diploma obtained, type of employment contract, actual experience. Robust standard errors in brackets. *, ** and *** indicate statistical significance at 10%, 5% and 1% level, respectively. Source: Enquête Generation.

Figure A1 An Oaxaca decomposition of the gender differential in starting pay and subsequent earnings among physics and chemistry and life sciences graduates

Physics-Chemistry	Life Sciences
1998 Cohort	
	
2004 Cohort	
	

2010 Cohort



Notes: Following Blau and Kahn (2017), the decomposition uses as the counterfactual the predicted log earnings of an average woman using estimated male returns ($\overline{x_f}\hat{\beta}_m$). *Source*: Enquête Génération.