How do internships improve student major choices and early labor market outcomes?*

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Abstract

We study the role of internships in students orientation and career beginning. On-the-job experiences accumulated during schooling and before specialization, via internships, give to students some information they may exploit to choose their majors, and to employers some insights on the skills of potential future co-workers. In recent years, more and more French "Grandes Ecoles" students have chosen to undertake an optional full year of internships between the two years of their Master degree. We use this selection process to assess empirically the causal effects of internships on subsequent major choices and labor market outcomes. Internships improve student specialization choices and fasten labor market integration. When a student undertakes several internships in different areas, he/she is likely to refine his/her final major choices. Employers value internship experience but less than professional experience. Employers are indeed more likely to perceive internships as a signal of ability than as a gain in experience and human capital.

Keywords: Internships, Human capital, Returns to education, Discrete choice models.
JEL Codes: I21, I23, J24.

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1 Introduction

Internships have always represented one of the main foundations of vocational and professional formations, e.g. apprenticeship, in contrast with traditional higher education programs. However, internships have recently become more and more frequent in general higher education in France, far above what is required to graduate. In particular, more and more French "Grandes Ecoles" students choose to undertake a full year of internships between the two years of a Master degree, which is not a requirement of the Master program. Beyond formal education, on-the-job experiences accumulated during schooling, via internships, increase the student operational and practical skills in a professional setting. These are also privileged periods during which students gather information about the characteristics of a given job, firm, industry, and about their preferences for them. In parallel, employers gather information about a potential future co-worker that they may employ at the end of his/her studies. So, internships are likely to help students to make their own decisions about their future field of specialization and about their future career, and internships are also likely to have an impact on wages and job conditions.

However, labor market outcomes of students who undertook a full year of internships do not apparently differ from those of students who did not. In forty-five engineering schools for which this year of internship is common but not compulsory, we found no effect on satisfaction at work and only a small increase of wage with a 3% premium, which is far below the returns to the first years of experience in such schools.[1] Only 2% more students who did a full year of internships find a job before graduating (50% versus 48%). These apparently low benefits are unlikely to justify to postpone labor market entry of one later with a financial loss. Hence, these aggregated comparisons do not enable us to understand the huge increase in one-year internships. Using detailed data on labor market outcomes of new graduates of one "Grande Ecole" matched with their schooling attainment during the master program, we study the effect of internships undertaken during general higher education studies, on student choices about their specialization, and on their employability and wages after graduation. While many political debates were held on internships in France, little is known about their potential effects. In the French engineering schools, students can make the choice to undertake an optional full year of internship between the two years of the Master. This possibility teaches us about how this first work experience is perceived by firms, as a signal of student quality or as a gain of human capital, which is a sensitive issue in economics.

Internships were largely studied in sciences of education and psychology. Taylor (1988) underlines that internships improve employment opportunities, and in a more partial way, knowledge of interest and work values. Some management studies (Gerken et al. (2010), Narayanan et al. (2010) and Gault et al. (2000)) focus on internships in business schools, but are mainly based on qualitative and descriptive analysis. Firms, universities and students can gain from effective internships. For firms, internships may be help for special projects and a signal on future employees. Universities get better connected to the corporate world and may improve their reputation. Students may reduce job search duration and increase their knowledge of interest, work values and potentially wages. Gault et al. (2000) survey 223 students graduating during 1994-1996 and find positive effects on wages (9% higher) and satisfaction at work, and negative effect on job search duration (less of more than 2 months). In economics, Saniter and Sandler (2014) find a positive effect on wages in the German labor market, using IV analysis with the introduction of mandatory internships in some programs.

[1] These figures come from surveys "integration of graduates" described below.

Using an experiment with CVs including internships as one feature, Nunley *et al.* (2014) find too a positive effect on the interview rate, which may be explained by signaling. However most of the literature on youth training in the workplace focuses on apprenticeship, that is, fully designed programs alternating workplace based training and formal education periods,[2] see Wolter-Ryan (2011) for a complete recent review and the seminal work of Becker (1962).[3] The main concern of these studies is to account for the endogenous selection of individuals between apprenticeship and full-time formal vocational education. Our approach is close, as we consider the optional full year and the major choice as an endogenous selection process too.

A closely related literature concerns the determinants of college majors and associated returns (see Altonji et al. (2012) for a complete review and a general but mainly theoretical approach of sequential-decision schooling models). Education decisions are made sequentially and outcomes are uncertain, see Altonji (1993), Heckman et al. (2003). Preferences, beliefs, abilities, expected earnings and non-pecuniary employment conditions revealed along the schooling process, are expected to affect student choices at the next step of the schooling process, and especially when they choose their specialization majors. Arcidiacono (2004) analyzes the role of ability in major choices, distinguishing verbal and maths abilities. Stinebrickner (2003) shows that students change majors after observing their grade performance in the first years. For France, Beffy et al. (2012) find very low, though significant, elasticity of college major choice to expected earnings and conclude that non-pecuniary factors are the key determinants. For the U.S., Arcidiacono et al. (2012) show that uncertainty about wage expectations generate inefficient decisions. Optional internships may provide the occasion for students to revise their beliefs about their preferences, their occupation-specific abilities, their expected earnings and some non-pecuniary employment conditions. They consequently help to reduce the uncertainty of related decisions.

We analyze the effect of a full year of internships[4] in a French Grande Ecole on student subsequent choice of specialization and labor market outcomes after graduation, *i.e.* job search duration, wages, satisfaction at work. Our data come from an original survey about the labor market integration of graduates matched with the students' attainments during their schooling. This enables us to account for students abilities. We consider that schooling decisions are sequential. The decision of undertaking an optional full year of internships is indeed done before the major choice one. During their first years of schooling (or other experience), students receive information about their abilities and preferences. At the end of the first year of the Master degree, they decide whether or not they would do an optional year of internships between the two years of their Master degree. At the beginning of the second year, they choose a major after having or not done a year of internships the year before. Graduates finally enter the labor market or decide to go on their studies (Ph.D

[2]Wolter-Ryan (2011) define "apprenticeship as programs that comprise both work-based training and formal education, in most countries at upper-secondary level, and lead to a qualification in an intermediate skill, not just to semiskilled labor."

[3]The questions addressed include where to develop specific-occupation skills in the workplace or at school, the firm behavior in entering and financing an apprenticeship system, the outcomes for apprentices. Answers greatly depend on the country-level institutional context. Some other papers compare secondary education apprenticeship to full-time formal vocational high school in terms of labor market outcomes, especially risk of unemployment. In France, Bonnal el al. (2003) show a positive impact of apprenticeship versus full-formal vocational high school on getting rapidly a first job, and Alet and Bonnal (2011), a positive impact on subsequent schooling outcomes. Studies are more numerous in German speaking countries, in which the system of apprenticeship is widespread. Developing a full structural approach, Adda et al. (2010) find an increase in wages and an accelerated experience gain profile in Germany. Exploiting small firms closures and consequent exogenous variations in apprenticeship durations, Fersterer el al. (2008) find a 5% pay increase of apprenticeship. A parallel literature focuses on the advantages of developing some occupation-specific skills, through some vocational courses, in general high school, to increase students' cognition and motivation, see, e.g., Altonji (1995), Mane (1999) and Bishop and Mane (2004).

[4]In the article, the terms "full year of internships" refer to one or more internships for a duration of one year and three months ("long internship"), which replace a mandatory 3 months internship.

or other).

The sequential schooling decisions framework highlights several potential causal effects of internships, which we test using reduced-forms models. Students who undertook a full year of internships between the 2nd and the 3rd year of their program may have higher wages or reduce their job search duration at their labor market entry for several reasons.1) It may be a signal to employers. With similar characteristics and in the absence of other available information, employers are likely to choose graduates who completed internships in their firms since they have information on student individual ability, which is usually unobserved. 2) The experience accumulated as an intern may be valued by employers, which can be compared to the return to the first years of experience. 3) Doing a full year of internships may improve opportunity of careers (a first job effect), the professional network and the returns to experience. Hence, we can compare the return to experience with and without doing a full year of internship. 4) Students may have improved their orientation, and may have chosen their major specialization more accurately according to their preferences and abilities. The matching quality between graduates and first jobs may be improved. Students who did a full year of internships are likely to be more satisfied of their job. 5) Students may have delayed their entry into the labor market in times of economic slowdowns. This effect is nevertheless expected to be weak (Gaini et al., 2013).

Empirical results indicate that the gross wage return of a full year of internships values is smaller than 75% of the return of one of the first years of work experience. Hence, this is lower than the return of a real year of professional experience. The effect is mainly determined by the revelation of abilities. Internships are perceived as a signal of ability by employers more than as a return to experience and a gain in human capital. The econometric analysis takes into account the ability bias and the endogeneity of the choice of making a full year of internship. With IV analysis, the wage return of a full year of internships appears higher than a real year of professional experience, but this result has only a local interpretation. This year of internship improves the ability to find a job faster. When a student undertakes several internships in different areas, he/she is likely to refine his/her final major choices. The effects on job satisfaction remain ambiguous, positive but small and not significant. Public policies implemented, which ban unpaid internships or more than six months, appear consistent with our results. Compensation for internships of one third of potential wage output seems necessary to financially equalize the loss. Perform a full year internship should help to refine these major choices. It therefore seems logical to ban internships more than 6 months, which can be considered as a real job and not as an internship.

The layout of the paper is as follows. Section 2 contains contextual elements about the French higher education system with Grandes Ecoles and universities and the place of internships therein. Section 2 also describes the schooling program of the Grande Ecole studied. Section 3 presents the data used. Descriptive statistics are reported in section 4. Section 5 presents the reduced-form estimation strategy and results. Section 6 concludes.

2 Institutional context

2.1 Overview of French higher education system

Universities and Grandes Ecoles. (cf. figure 1) In France, two types of higher education institutions can deliver graduate degrees: universities, which are large state-financed structures, and "Grandes Ecoles", which may be state-financed or private and are of smaller size. The "Grandes Ecoles" contain "engineering schools" and "business schools". Their particularity is that they are generally selective contrary to universities. To get admitted, students prepare for competitive examination ("concours") during two years. This competitive entry and the ranks of admitted students contribute a lot to the reputation of the Grande Ecole and to the delivered degrees. French Grandes Ecoles students represent about 15% of students in higher education in 2010 (about 8% in 1980). Some of the "Grandes Ecoles" are quite generalists, others are more specialized. Their schooling programs usually last three years, leading to a master degree.[5] Even though there is a lot of variability between Grandes Ecoles (and universities), labor market outcomes of Grandes Ecoles students are on average better than those of university students. In 2010, six months after graduation, 84% of students from "Grandes Ecoles" are employed and earn on average 35.800 euros (bonus included). The selection at the entrance is one argument in favor of these higher labor market outcomes, the fact that Grandes Ecoles programs contain on-the-job training periods is another. A Grande Ecole curriculum is usually composed of periods of formal education and compulsory periods of internships. The load of each, and the sequence in which they intervene, depend on the program. Even though curriculum contains some work-place experience periods, Grandes Ecole schooling programs cannot be considered as vocational training, nor apprenticeship. The latter correspond most often to certifications below the bachelor degree. [6]

Internships in the French higher education system. Internships are compulsory part of many training programs, but their duration and content really depend on the program, and the type of program. Internships are constitutive and widespread in Grandes Ecoles programs. Programs in these schools are labeled by external commissions, which check and insure that the program fits certain requirements, including a certain number of weeks of internships. Those labels are very important for schools as they entail the real recognition of a certain level of education and degree equivalences. So all schools do their best in order to get their programs to satisfy those requirements. Most Grandes Ecoles contain an "internships office", which is composed of administrative staff who receive, find, check, and screen internship offers sent by firms and transmit them to the students. In 2010, while almost all students from "Grandes Ecoles" undertook at least one internship (there is usually a compulsory 6-months internship at the end of the last year of the program), university students were only 61% to undertake an internship in the last year of the Master. 97% of students in "Grandes Ecoles" were paid for their last year internships versus 76% for university students of equivalent education level. 57% earned more than 600 euros a month versus 29% for university ones.

In the recent years, a policy debate in France has accompanied a change in regulation about internship minimum remuneration and internship duration. The drawbacks of unpaid internships were discussed. First, as stated by Richmond (2010) for the UK, students with lower financial resources would have fewer opportunities to undertake unpaid internships than their counterparts, which may in turn deteriorate their entry

[5] The grade of Engineer is in France equivalent to a master degree.

[6] The apprenticeship system has been greatly developed in France in recent years, although it remains low in the higher education: apprentices accounted for 0.9% of students in higher education in 1995, 2.4% in 2000 and 4.8% in 2010. The majority of these apprentices are under the bachelor degree level (90% in 1995, 75% in 2010).

conditions on the labor market. Second, unpaid internships may also be viewed as unfair competition with older workers for whom minimum wage regulation applies. The Law for equality of opportunity of March 2006, implemented in February 2008, forbids unpaid internships longer than three months. This regulation has been extended in November 2009 to forbid unpaid internships lasting longer than two months. Internships have to be paid at least 400 euros per month, which represents a third of the minimum wage. The Cherpion Law (2011) and the Fioraso Law (2014) prohibit (paid) internships, which last more than six months and strengthen intern rights but these laws are not yet implemented. In contrast, in the U.K. or in the U.S., there is no legal obligation for firms to pay an internship that lasts less than one year if the latter is required as part of study curriculum. However, if interns satisfy the legal definition of 'workers' in the United Kingdom (i.e. they do work for which other employees are paid) or some equivalent requirements defined from the Fair Labor Standards Act in the U.S., they should normally be paid at least the minimum wage.

2.2 French Grande Ecole schooling program

We now describe more precisely the Grande Ecole (ENSAE-ParisTech, Paris Graduate School on Economics, Statistics and Finance), on which the data rely, and the schooling program. The school is a relatively small Grande Ecole. Around 150 students graduate each year. Students who succeed the examination entrance enter the first year of the curriculum. This first year differs slightly between students upon their previous studies. Those who have studied economics before are taught more maths and those who have studied maths before, more economics. Some other students, selected on records, directly enter the second year of the program. The second year of the program is composed of compulsory common general courses in Economics, Statistics, and Humanities and students choose a minor in Economics or Applied Mathematics. The minor choice is made by the student upon his/her preferences and expected abilities. There are no quota in registration in a minor, neither restrictions based upon previous specialization. At the end of the 2nd year, students choose either to undertake a compulsory 3-month internship and to enter the 3rd year of the program, or to undertake internships for a complete year and three months. If so, they come back one year later in the 3rd year of the program, and graduate one year later. There are seven majors in 3rd year, which, due to the small number of students per major, we will gather in two main fields, Finance/Actuarial Sciences and Economics/Statistics/Social sciences. Those are equitably distributed with 54% of students in the Finance-oriented majors and 46% in the other ones. Students choose the 3rd-year major at the beginning of the 3rd year. Again, there is no quota, whatever her previous curriculum is, a student enters the major he chooses.

3 Data

We use five "integration of ENSAE graduates" surveys (2009 to 2013), which we match with the administrative data on student schooling attainments.[7] The survey " integration of graduates" is organized every year in all French "Grandes Ecoles", so approximately 200 schools (including both "engineering schools" and "business schools") and 40,000 students. The survey focuses on the labor market integration and job conditions at the

[7]The survey has been declared to the French "Commission nationale de l'informatique et des libertés" (declaration number 1604776) with the precision that the survey data can be matched with data coming from the administrative education software ("pamplemousse"). All data are anonymous.

date of the survey, *i.e.* wage and job satisfaction. The survey questions exhaustively the two (for surveys 2009 and 2010) or three (for surveys 2011, 2012, and 2013) promotions who graduated during the year, the year before or two years before. A student is then interviewed 6 months, 18 months, and 30 months after graduation. Each year, the questions are identical and use the same definitions to allow time comparisons.

The survey data are matched to schooling attainment records that come from the education management software used. These administrative data also contain student 3rd-year-major specialization choices, 2nd-year-minor choices; and some basic information on student previous studies and on their social-demographic characteristics: parental background and location, social scholarships, age, gender, etc..

The sample contains students admitted in the first year or in the second year of the program as they are the one for whom the full year of internship option is opened. We exclude all students for whom the full year of internships option was not opened, *i.e.* students who joined the program directly for the third year (around 23% of a graduating promotion); civil servants (14%); students who were registered in double degree programs in convention with other institutions (around 12%); the very few students who repeated the first or the second grade (less than 4%).

Finally, the dataset is composed of 452 students who graduated between 2007 and 2012. 39% are women. 65% were admitted in the first year, 35% directly in the second year (i.e. the first year of a Master degree). The overall response rate is around 71%, lowering with the time after graduation: 82% for the more recent graduating promotions, versus 65% for the others. This overall response rate is between 74% and 78% for surveys 2009 to 2012, but only 57% in 2013. The comparison between the survey response rate and the numbers of students per 3rd-year major confirms that the sample of respondents is representative. Student who majored in Economics/Statistics/Social Sciences respond more frequently than those who majored in Finance (81% versus 64%). We construct weights to correct for non-response, and estimate both weighted and non-weighted regressions.[8] Results from weighted and non-weighted regressions are close. Partial non-response is very low, and individual responses between surveys are quite consistent.[9] Job satisfaction was not surveyed in 2009.

Variables of interest. Using administrative schooling management software data, we construct a dummy variable indicating whether a student undertook or not a full year of internships. We also construct 3rd-year major variables. In contrast, labor market outcome variables come from survey data.

As wage variable, we use the annual total of wages including bonuses in real terms, deflated using price consumption index. On average, 62% of people report bonuses, which consists of 12% of their annual remuneration. Bonuses increase with experience. Further, we construct proxies for job satisfaction ranging from 1 (worst) to 5 (best): satisfaction regarding relations with colleagues (working environment), level of

[8] We construct unequal weights, obtained as inverses of probability response estimates of a Logit, and stratified weights, based on the year of graduation, the major and the duration the survey year and the year of graduation.

[9] Partial non-response is equal for example to 6% for duration of the first job search and to 10% for wages. Students are surveyed about their current job. However, there are additional questions for those for whom this is not the first job. So, depending on the fact that he/she changes or not of job, we either have repetitive information on the same job or information up to 4 different jobs he/she held. 78 students (17%) did not give any information, 157 (35%) one response, 83 (18%) two responses, 99 (22%) three responses and 35 (8%) four responses. So some of them answered several times at the same questions. We analyzed the consistency of responses and memory bias. Concerning the first job search duration, answers between surveys are consistent. They differ in less than 10% of the cases and in such cases for minimal differences: answering "between 2 and 4 months" instead of "between 4 and 6 months", for example.

autonomy in work, working conditions, and salary level. We consider a worker satisfied if he chooses the response item 4 or 5 (the scale ranges from 1 to 5)[10].

We have included job characteristics in the analysis, such as working abroad (without distinguishing between countries), working in the public sector, or working with a fixed-term contract. We do not include the firm size nor business industries because the data upon obtained in the survey were of poor quality. The firm size is often misinformed because of confusion between responding at the firm or the local unit level. However, we think that this omitted variable has little impact on the results since the majority of graduates work in very big firms (banks and assurances). 18% of graduates finally work in another industry than the one they majored in (a student majoring in economics who works in the banking sector for example). However, we cannot control precisely for the industry as the survey do not manage to differentiate close professional industries.

Moreover, we do not observe how employers define their wage proposal. The bargaining power of graduates may be reduced if employers use fixed pay scales based on the name of the university or the "Grande Ecole" followed, independently of whether the graduate did or not a full year of internships. This may explain a lower effect of internships. We do not know whether the graduate works in the firm where he/she did an internship because the name of the firm is misinformed. We cannot therefore exclude the hypothesis that the effect of internships differs regarding to the fact that graduates work in the same company as the one they did an internship in or not.

Because of majors, students do not take the same courses during the 3rd year of the program. Hence, their scores are not comparable. In order to construct proxies for abilities, we rather rely on 2nd year achievements. We compute inverse ranking scores based only on the schooling attainments upon common courses. The best student is ranked 100 and the last one 0. We construct a global ranking based on the average score during the year (all courses including group projects, and after the catch-up examinations), and specific scores based on written individual evaluation in mathematics (statistics and time series), and economics (micro- and macro-economics). Courses to be included in the specific rankings have been selected using a principal component analysis.

4 Descriptive statistics

4.1 The choice of doing an optional full year of internships

Figure 2 reports the increasing share of students choosing to undertake an optional full year of internships between the 2nd and the 3rd year of the curriculum. 23% of those who graduated in 2007 used this option and 62% of those who graduated in 2011. 52% of students admitted in the first year completed a full year of internships (32% in 2007 and 76% in 2011) whereas only 17% of those admitted in the second year did so (almost none before 2010 and 38% in 2011). Furthermore, 56% of students who opted for the full year

[10]Responses 1 or 2 are rare. There are 3% of responses 1 for wages, and 1% for the non-monetary variables. There are 9% of responses 2 for wages, 6% for autonomy and the working conditions, and 2% for the working environment. The response item 4 seems the more stable, with 36% of response for wage, autonomy and the working conditions, and 31% for the working environment. The highest satisfaction (5) is obtained for the working environment (57%), then the working conditions (44%), autonomy (38%) and finally wages (28%).

of internships option undertook two internships, compared to 37% just one and 8% three. Internships in Finance are more frequent. Generally, internship topics are related to minor and major choices.

4.2 Minor, major choices and schooling attainments

Table 1 compares student rankings and major choices depending on the fact that students did or not a full year of internships. As noted before, 54% of the students major in Finance and 46% in Economics/Statistics/Social Sciences. More students who did a full year of internships chose to major in Finance during the 3rd year of the program (61% of cases vs. 49%) whereas there are no apparent relation between 2nd-year minors and the choice of undertaking or not a full year of internships.

Students who chose to undertake a full year of internships seem to have lower 2nd year schooling attainments on average than others. Their average inverse ranking is 46.1 versus 53.0 for those who did not. Note that we report an inverse ranking to make rankings comparable to GPA. This holds regardless of the 2nd-year minors (5.7 ranks for mathematics; 9.6 ranks for economics) and of the compulsory courses considered. Students choose their specialization in line with their skills. Those who minor in economics have better ranking in economics courses than in mathematics courses (54.4 versus 41.5), and *vice versa* for those who minor in mathematics (56.9 average ranking for mathematics courses versus 51.9 for economic courses).

4.3 Early labor market outcomes

Table 2 reports average labor market outcomes of graduates according to whether or not they undertook a full-year of internships. This option apparently fasten labor market integration: six months after graduating, only 2% of graduates who did a full year of internships were looking for a job compared to 9% of those who did not. The employment rate is higher 73% including volunteering versus 55%. Graduates usually end their studies more rapidly: only 11% of them continued their studies after graduation against 19% for those who did not the full year of internships. On average over the three promotions interviewed in each survey, students who did a full year of internships earn 13% more than those who did not (53.300 euros bonuses included versus 47.100 euros). Wages rose sharply in the early years of the career. They increase of 13% on average between the first and second year, and of 7% between the second and third year after graduation. This evolution differs nevertheless according to whether or not graduates undertook a full-year of internships. The increases are 28% (between the first and second year) and null (between the second year and the third year) for graduates who did a full year of internships while they are 7% and 13% for others. This may be due to a later entry into professional life. Students majoring in Finance earn on average 12% more. There is no correlation (or only a small one) between a full year of internships and the wage differential by specialization fields six months after graduation. These figures suggest that the on-the-job experience acquired during the year of internships is valued by the employers. Concerning satisfaction at work, the results are less obvious. Internships seem to be associated to a better satisfaction (for all components) but the difference is small. There is more satisfaction for non-monetary components (72% for autonomy, 80% for working conditions, and 88% for working environment) than for wages (63%). However, when defining satisfaction for non-monetary components with a score higher or equal than 4 for each component, the overall rate of non-monetary satisfaction is only 60%. If we compare satisfaction between responses of students with and without a full year internship, we do not find a significant effect at 10%. The difference is however around

10% for autonomy in work, and for overall non-monetary satisfaction (i.e. for 100 workers, 10 would answer 4 or 5 instead of 3 for example). For wages, working environment, and working conditions, differences are less than 3%.

Table 2 reports the distribution of the first job search duration. 63% of the graduates who did a full year of internships found a job before graduating compared to 53% of those who did not. They are also less likely to have a search period lasting more than 6 months, 4% versus 10%. 28% of the students declare that internships - including full-year, part-time and other compulsory ones - helped them to find a job. Full-year of internships are also associated to longer job periods after graduation. The first job - when ended - was also on average longer - of 3 months- for the graduates who did a full year of internships. These figures suggest a better matching between the graduates who chose to undertake a full year of internships and the employers occurred. 18% of students studying in a major work finally in an other employment sector (a student majoring in economics who works in the banking sector for example). As this figure is low and the distinction between close professional sectors difficult, we assume the major choice is associated to a choice of employment sector.

5 Internships, major choice, and early labor market outcomes: results

5.1 Estimation strategy

Our goal is to test the potential causal effects of internships. There are two endogenous variables in the analysis, undertaking or not a full year of internships and majoring in Finance. We consider indeed that schooling decisions are sequential. The decision of undertaking an optional full year of internships is done before the major choice one, depending both on future expectations on wages and non-monetary benefits. As the labor market can be considered as an absorbing state (you cannot return to school after entering in the labor market), the effects of undertaking an optional complete year of internships on labor market outcomes after graduation can then be tested using a Mincer type model for wages (and close models for duration of job search and satisfaction at work) and controlling for the endogenous selection with IV analysis and 2SLS. The subsequent schooling decision of the major choice is estimated with a classical probit model. To be valid, Rust (1987) assumptions are the conditional independence (the unobserved factors at t have no effects one period later if you control by the decision variable at $t+1$) and that unobserved heterogeneity is a random effect. It means that there is no omitted variable and no serial correlation of unobserved preferences. In order to have weaker assumptions, we estimate a biprobit model of the both subsequent schooling decisions (major and full year internship).

5.2 Internships and major choice

We examine the determinants of the 3rd-year major choice and the decision to do a full year of internship. We assume that individuals choose their majors to maximize a value function V_m, which is the sum of the non-monetary benefits and the present value of expected earnings, $m^\star = \underset{m}{\text{argmax}} V_m$. These both terms are unknown by the student and approximated when learning of his own ability and preferences. The non-

monetary benefits are assumed to be a linear function of observable individual covariates (such as ability for a special topic, gender...). The present value of expected earnings may depend of the economic conditions.

There are 7 different majors in 3rd year of the program but due to the small number of students per major, we group them in those related to Finance/Acturial Sciences and those related to Economics/Social Sciences/Statistics. We explain the 3rd year major by students schooling attainments in 2nd year (inverse ranking i.e. 100 for the best student, 0 for the worst), minor choices in 2nd year, a dummy identifying those who chose to undertake the optional full year of internships, and the topics of the internships undertaken. Demographic characteristics (sex, place of birth) are used as control variables. The constant of the probit model for majoring in Finance can be interpreted as a wage differential, and so on an estimation of expected earnings. We add the year of graduation, which can measure the economic conditions[11]. The major choice and the decision to do a full year of internships may be explained by identical unobserved factors. Furthermore, there may be serial correlation between unobserved preferences of these two endogenous variables. We so estimate a biprobit model of these both subsequent schooling decisions. The student admission type and his/her age in the first year of master are used as instruments to explain the decision to do a full year of internships. The choice of instruments is discussed in the IV analysis of the wages regressions.

Table 3 reports the average marginal effects of a probit model for a major choice in Finance. Second year minor choice is naturally correlated with the 3rd year major one. Students who chose a minor in applied maths are more likely to major in Finance in 3rd year with an average marginal effect of 29-53%. The minor choice is a first expression of students' preferences and expected abilities. As seen previously in the descriptive statistics, students who undertook a full year of internships are more likely to major in Finance with an average marginal effect of 14%. However, when a student undertakes several internships in different areas, he/she is likely to refine his/her final major choices. Doing several internships both in economics and finance reduces the probability of majoring in Finance around 13%. 2nd year general ranking is positively correlated with majoring in Finance, but the results are not significantly different from 0. In contrast, the mathematics ability is highly correlated with majoring in Finance. The decision to do a full year of internship is not correlated with the second year minor choice (column 6). The admission in 2nd year, the age in 2nd year, and the rank have a significant and negative effect. Increase its ranking of one decile decreases the probability of 2%. Concerning economic conditions, we observe that graduating after 2010 increases the decision of doing a full year of internships. We do not observe such cyclical choices (or only weakly) for the major choices. When the decisions are estimated simultaneously with a biprobit (column 5 and 6), the effect of the full year of internship on the major choice is reduced despite the fact that the correlation between the error terms of the two equations is not statistically significant. This could be because the causal effect of internships in students orientation is mainly observed for students with internships in different areas.

5.3 Labor market outcomes: duration and wages

The choice of the number of years of schooling has already been done by the student at the entry of the "Grande Ecole" (more than 5 years depending on whether the student goes on with a Ph.D or not). The

[11]To help them to make these decisions, the administrative staff informs students on the labor market outcomes of former graduates by communicating about the results of the last Integration of Graduates survey. But results are published two years after graduation and are not known over a long period (in particular before 2007).

failure rate is very low in French "Grandes Ecoles" and the degree is obtained 5 years after high school graduation. The wage of a graduate on the labor market is defined with a Mincer type analysis[12]

$$\log(W_{mt}) = \alpha_{0mt} + \alpha_{1mt} \cdot d + \alpha_{2m} A^m + \alpha_{3m} \cdot d \cdot A^m + \alpha_{4m} \exp_t + \alpha_{5m} \cdot d \cdot exp_t + X_t\beta + \varepsilon_{mt}$$

with t, the year, m, the third year major, $\log(W_{mt})$ the log of total wages - bonuses included, d, a dummy equal to one if the student did a full year of internships, A, the student ability, which is major specific (a student may choose a major where his/her ability is higher) and can be split into a general and a specific ability, exp the experience in the labor market (a squared term is not necessary for the first years), and X a vector of other characteristics (job characteristics (working abroad, second job since graduation, whether it is in the public sector, whether the job contract is fixed-term or long-term), and student characteristics (gender, nationality, year of graduation). Experience (in years 0, 1 or 2) accounts for the sum of the duration of each job reported in the survey. The year of graduation accounts for effects of economic conditions. Students ability is measured by their ranking in the second year (the courses are partly common unlike the third year), or their ranking on specific courses (economics and mathematics), which has been defined using a principal component analysis. As robustness check, we also used a potential experience variable.[13] X is assumed to have the same returns for each major and whether or not the student has done a full year of internships. The other variables are major- and internship- specific. The constant term measures the structural differences of wage returns between majors and the gain associated with a full year of internships (to be compared to an additional year of experience).

This reduced-form model entails some predictions that can be tested.

- Signaling to employers: with similar characteristics and in the absence of other available information, firms are likely to choose graduates who completed internships. The ability of the student A is largely unknown by the firm. Doing an internship so reveals a part of the student ability to the employer, with $\alpha_{2m} = 0$ and $\alpha_{3m} > 0$ in an extreme case where the ability is completely unknown without internship and revealed with internship;
- A cost-benefit analysis between the opportunity cost of entering the labor market one year later, and the wage gain associated with the experience accumulated as an intern: there would be a wage return to a full year of internships. We can so compare the return to experience α_1 and the return to a full year of internship α_4.

[12] A huge literature has focused on the returns to education, with estimates based on the traditional Mincer equation, which explains wages by years of schooling, experience and other control factors. Due to the potential endogeneity of the schooling decision (as the student ability is not observed), IV estimators have been proposed with instruments mainly based on compulsory schooling laws. This approach has been debated (see Björklund and Kjellström (2002), Dickson and Harmon (2011) for a brief review). Heckman et al. (2003) analyze the assumptions of the classical Mincer model and conclude that derived returns to schooling estimates are not valid. Indeed, this static model neglects the major determinants of schooling decision such as the uncertainty about the future wages, the cost of schooling, or the variation of these returns over the life cycle. Furthermore, the use of IV estimators to address the problem of the omitted ability bias is not powerful, and quite different results occur depending on which instruments are used and which assumptions are made (Heckman and Urzua, 2010). Blundell et al. (2005) compare several methods linked with the evaluation literature: matching, IV, and control function approach. They emphasize the importance of the detailed test score and the family background differences to explain (heterogeneous) schooling returns. Non-monetary benefits of education are generally not taken into account, despite the fact that health and well-being can be improved with a higher education (Heveman and Wolfe, 1984).

[13] The Pearson correlation between the two experience variables is very high, 90%.

- A better return of experience: doing a full year of internships may improve opportunity of careers (a first job effect), the professional network and the returns to experience. The returns to experience also depend on first job opportunities, which may differ depending on internships done and majors chosen. Hence, we can compare the return to experience α_5 with and without doing a full year of internship.

It is also possible that students wait for good economic conditions. They could delay their entry into the labor market if they think the economy is not favorable. We so add the year of graduation as a control variable for the duration of job search after graduating.

A similar analysis can be done for the duration of job search after graduating. Table 4 reports the average marginal effects of a probit model for finding a job before graduation (column 1) and shows that a full year internship reduces this duration but not by revealing the ability of students (interaction effects are not included but are close to 0 and non significant). With an interval regression (column 5), this reduction of job search is estimated less than 2 months. In column 2, IV analysis with a linear probability model shows that the effect may be underestimated but becomes not significant (the choice of instruments are discussed thereafter). The economic conditions (measured by the year of graduation) have effects on duration of job search.

Table 5 reports wages determinants. In column 1, we compare the effect of a full year of internships to the returns of the first years of experience. In column 2, we add education characteristics (3rd year major chosen, inverse ranking). In such analyzes, there may be an omitted ability bias. Students have different skills, often unobserved. We add student achievements in the program. We use the inverse ranking of student in 2nd year i.e. 100 for the best student, 0 for the worst, as proxy for ability. In column 3, we use a LAD estimator (median regression) to take into account extreme wages. In column 4, we separate the overall ability in two specific skills, mathematics and economics. In column 8, we cross the full year internship dummy with each year of professional experience (0, 1 or 2) in order to check if the effect could disappear with experience. A full year of internships has a positive and significant effect around 8% on wages, which is reduced by half when we control for extreme wages. A rank increase of general ability by one decile corresponds to a pay increase of 0.5% more, due to the economics skills (as the mathematics skills have an unexpected negative value) with a 1.3% premia. Experience has a positive and significant effect higher than 10% on wages, reduced around 9% when we control for extreme wages. Consequently, with a static vision, one may infer that the wage cost-benefit trade-off of undertaking a full year of internships is negative; it would be rewarded less than the year of labor market experience it replaces, smaller than 75% and even 43% when controlling for extreme wages. The students' enthusiasm for it would remain a puzzle. The effect of a full year internship does not disappear with experience (column 8). Choosing to major in Finance is associated to 9-10% premia. Finally, over 2007-2012, the year of graduation has no effect and has not been included.

The effect of a full year of internship or to major in Finance could differ following ability of students. Furthermore, returns to experience could not be the same. We test those assumptions by including interaction effects in our analysis. Results are reported in table 5. Columns 5, 6 and 7 report the OLS estimates. Column 1 adds interaction effects between education characteristics (full year of internship), experience and a third year major in Finance. In column 5, the effect of a full year internship would be the same for students majoring in Finance and in other major. Choosing to major in Finance is associated to a non-significant premia. Concerning returns to experience, we note that returns are higher for students majoring in Finance

(around 6%), and small and non significant for a full year of internship. Concerning returns to ability, a full year of internship would have a positive effect to reveal abilities. In column 6, the effect of general ability is null for students who have not made a full year internship but highly positive and significant for others. A rank increase of general ability by one decile corresponds to a pay increase of 2% more. In column 8, concerning specific abilities, we note that it reveals mainly the mathematics abilities (there could be an adverse selection effect for students who have not made a full year internship).

In our sequential decision framework, the internship take-up depends on future expectations on wages and non-monetary benefits. Those gains can be explained by several factors, such as heterogeneous preferences, beliefs, risk aversion, or individual abilities. We control our econometrics analysis with schooling attainments, which can be interpreted as a measure of individual ability. However, there may be an omitted part of individual ability, and there may also be some error measurements. Ability for theoretical courses does not say anything about communication skills for example. If the omitted ability is positively correlated with the schooling attainments (i.e. students with better schooling attainments have also a better ability to communicate) and as students who take-up a full year internship have lower schooling results, there would be a downward bias. However as the sign of this correlation is unknown, the direction of the bias is uncertain. Furthermore, if students who did a full year internship were those who have preferences for professional settings and lower preferences for non-monetary benefits, it would interact with monetary and non-monetary benefits. Those students may engage in jobs with better wages and lower working conditions, which may create an upward bias in the wage equation. All in all, the bias may exist but the direction of the bias is largely uncertain.

There are two endogenous variables in the analysis, undertaking or not a full year of internships and majoring in Finance. They depend both on future expectations on wages and non monetary benefits, which can be explained by several factors, such as heterogeneous preferences, beliefs, risk aversion, or individual abilities. In an attempt to control endogeneity for the full year of internships and a major in finance, we conduct an IV analysis. There are two main identifying assumptions behind the IV equations.

The first one is that the instruments do not have to be correlated with the dependent variable (i.e. the exogeneity condition), such as wage, the probability to find a job before graduating or satisfaction at work. Our set of instruments is the student age at the end of the 2nd year of the program, the year of admission, a year of graduation higher than 2010 and the minor choice in 2nd year. Our assumption is these variables are not correlated with wage, the probability to find a job before graduating (except for the year of graduation) or satisfaction at work. In France, each "Grande Ecole" is similar to a brand valuated by firms, for which a shadow "ranking" is obtained according to the difficulties to be admitted. We may assume that, as this school is highly selective, that employability and wages do not depend of past experience such as being graduate from an other university for example. The student age and the year of admission would be thus valid instruments for undertaking a full year of internship. Similarly one may think that firms consider mainly major choices and the "Grande Ecole" standing to fix wages or to hire an employee. The minor choice would be thus uncorrelated with wages and be a valid instrument to explain the major choice. Finally we may think that the economic situation primarily affects employability but not wages which are considered rigid even in a recession. A year of graduation higher than 2010 would be then a valid instrument for wages but not for the probability to find a job before graduating. These assumptions are questionable. If violated, there will be no endogeneity correction with an IV analysis. However, if there are as many instruments

as endogenous variables, this exogeneity condition cannot be tested. If there are more instruments than endogenous variables, a Sargan-Hansen test of overidentifying restrictions can be performed, whose the joint null hypothesis is that the instruments are consistent instruments (i.e. the choice of instruments is not invalidated).

The second condition is that the instruments have to explain the endogenous variables (i.e. the rank condition), which is tested in the first stages regressions of 2SLS. The student age at the end of the 2nd year of the program or the year of admission is likely to be negatively correlated with the full year of internships. It will be more expensive for older students to postpone their entry into the labor market. Due to the implementation of laws banning unpaid internships starting in 2008, a year of graduation higher than 2010 (i.e. two years after the law) can be a possible instrument too. The minor choice in 2nd year is a natural instrument for the choice of major. All F-stat are higher than 10. As there are two endogenous variables, a global F-stat is computed who gives the same conclusions. However, we exclude potential instruments because they were found to be weak instruments, such as having a social scholarship or the value index for French banking and insurance equities. With weak instruments, results can be indeed misleading. Due do financial constraints and the fact that undertaking a full year of internships implies postponing labor market entry of one year, having a social scholarship could have been negatively correlated with the full year of internships dummy but not correlated with wages. Furthermore, the choice of undertaking internships during a full year or majoring in finance may depend on the conjuncture in the banking and insurance sector. The value index (base 1 in December 2011) in June for French banking and insurance equities (AXA, Societe Generale, Credit Agricole SA, BNP Paribas) could have been used as alternative instruments.

For IV analysis on wages, we perform an iterative choice of instruments. We begin with the student age and the minor choice, then we add the year of admission, and at last a year of graduation higher than 2010. All tests conclude to the consistency of instruments.

Results are reported in table 6 with different instruments, using 2SLS (GMM estimators give consistent results). Columns 1, 2 and 3 are for the model with a dummy for the full year internship and IV analysis. The full year of internships IV estimates are higher than the OLS ones, around 13-16% but standard errors are often much higher too. Without taking into account the year of admission (column 1), the effect is not significant. The column (2) with all instruments except year of graduation seems to be the best estimate (no over identification, higher KP F-stat for weak identification). With IV analysis, the wage return of a full year of internships appears higher than a real year of professional experience, but this result has only a local interpretation. All instruments (except for the student age) and endogenous variables are indeed dummies variables. The interpretation will be similar to a Local Average Treatment Effect (LATE), i.e. restricted to a subpopulation. All first stages and the corresponding F-tests are reported in table 7. Results are consistent. To be older of one year is associated with a decrease of taking-up a full year internship around 5-7%. Minoring in mathematics is associated with an increase of majoring in finance around 45%. To be admitted in 2nd year decreases the probability of a full year internship around 31-36% and the probability of majoring in finance around 14%. A year of graduation higher than 2010 increases the take-up of internship of 31%.

5.4 Internships satisfaction at work outcomes

If internships enable students to learn about their preferences for a job, an industry, and to adapt in consequence their orientation, one would expect that optional internships would be associated with higher satisfaction once at work. The surveys we use contain several questions on the degree of general satisfaction at work, and satisfaction degrees regarding relations with colleagues (working environment), autonomy in work, work conditions and salary level. Each satisfaction variable ranges from 1 (worst) to 5 (best). We note that the response item 4 corresponds to a median response. What is important is that workers are more satisfied than this median. We so consider a worker satisfied if he chooses the response item 4 or 5. We define satisfaction for non monetary components with a score higher or equal than 4 for each component (working environment, autonomy in work, and work conditions).

Tables 8 and 9 report OLS results of wages and non-pecuniary satisfaction on similar characteristics as previously. Experience has a negative effect on satisfaction, which shows that expectations are not fulfilled. Wages are highly correlated with wage satisfaction but not with non-pecuniary satisfaction. Having undertaken a full year of internships is positively related to non-pecuniary satisfaction and to wages satisfaction, but the effects are not significant. Choosing a major in Finance is negatively correlated with wages satisfaction. An interesting point is that the non-pecuniary satisfaction is very difficult to explain. Unobserved factors play an important role.

An absence of a link between internship and satisfaction may be possible if increasing the satisfaction at work is not a selection criterion for doing an internship as the potential gains in non-monetary utility may have other sources (prestige, altruism or social utility of a job). We may argue that satisfaction at work may be badly anticipated by workers, which is consistent with the negative correlation between experience and satisfaction. However, three critics arise regarding these results. First, tests lack of power. The non-significance may also be due to the sample size. Second, questions are measured with a Likert scale, i.e. an ordered opinion on a subject, which may create a measurement issue. Aggregating the three components of non-monetary satisfaction is valid only if these three components are highly correlated, which is only partly the case with a correlation between 0.34-0.40. In order to check these assumptions, we performed a disaggregated analysis by estimating a model for each of the three components (autonomy, working conditions and environment). We estimated probit models of a response item of 5 versus lower or equal than 4. We constructed an alternative index of non-pecuniary satisfaction by summing the 3 satisfaction variables regarding relations with colleague, autonomy in work, and work conditions (with several choices of points for rare responses). In all cases, the effect of a full year of internship remains non-significant and low. The third critic is that, as for wages, heterogeneous preferences can explain satisfaction at work, but also the choice of doing a full year internship or majoring in finance. If students who did a full year internship or choose a major in finance are those who have preferences for professional settings and lower preferences for non monetary benefits, those students could engage in jobs with better wage and lower working conditions, which may create an downward in the satisfaction equations. Hence, we performed an IV analysis similar to the one conducted for wages (first stage regressions are close to the ones for wages). With this analysis, we find indeed higher effects, but they remain not significant with high variability.

6 Conclusion

This article tests different predictions of internships effects using the endogenous selection process of an optional one year internship. Perform a full year of internship is less valued by employers as a real year of professional experience. Internships are perceived as a signal of ability by employers more than a return to experience and a gain in human capital. This year of internship improves the ability to find a job faster. The effects on job satisfaction remain ambiguous, positive but small and not significant. When a student undertakes several internships in different areas, he/she is likely to refine his/her final major choices. These questions are to be related to public policies. It opens the debate on compensation of internships, analyzing returns to education for early career professionals. It also provides evidence on the time students need to make effective major choices, and improve the social gain associated. Public policies implemented, which ban unpaid internships or more than six months, appear consistent with our results.

Internships may reduce the uncertainty about the wage expectations for a given major and may reveal the student preferences. But understanding the complete learning process of preferences associated with doing a full year of internship (or shorter internships) is a tricky issue. The short and long internships may have different effects. Furthermore, the role of non-market benefits such as working and learning in a high level academic or professional environment or with international experts is difficult to assess quantitatively. At last we do not model complete careers even if internships may generate better matching on the labor market and better long-term opportunities.

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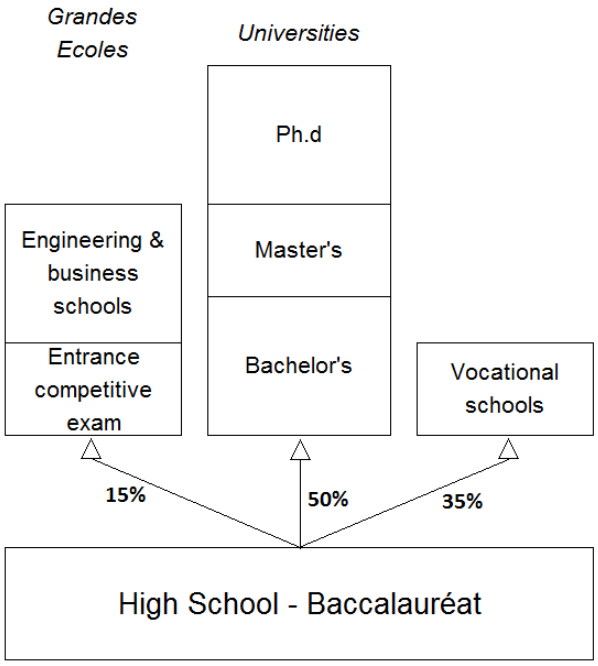
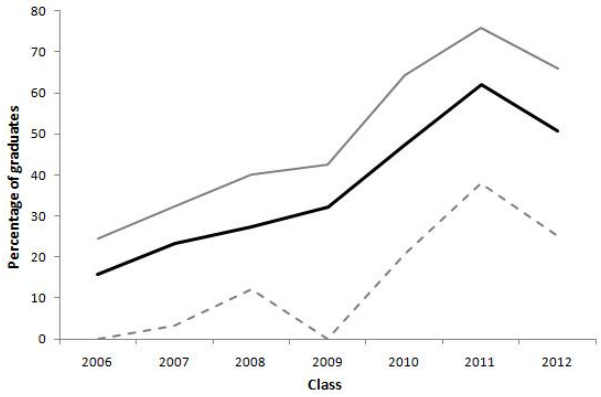
8 Tables and graphics



Note: figures from Analyse de l'orientation et des poursuites d'études des lycéens à partir de la procédure admission post-bac, Rapport n° 2012-123, Inspection générale de l'éducation nationale, p.53

Figure 1: French higher education system



Note: full grey line for students admitted in first year, dash grey line for students admitted in second year, full black line for all students.

Figure 2: Share of students undertaking a full year of internships.

		Total	Full year internship	No full year internship	Mean Diff. p-value
Minor and major choices (%)					
Minor choice					
(First year of master)	Mathematics	69.0	68.3	69.5	0.796
	Economics	31.0	31.7	30.5	
Major choice					
(Second year of master)	Finance	53.8	61.1	48.9	0.011
	Other	46.2	38.9	51.1	
Ability of students (average inverse ranking)					
First year of master		50.3	46.1	53.0	0.012
Minor choice	Mathematics	50.2	46.8	52.5	0.088
	Economics	50.3	44.6	54.2	0.055
Courses in Mathematics		52.2	49.9	53.7	0.111
Minor choice	Mathematics	56.9	54.3	58.7	0.099
	Economics	41.5	40.5	42.2	0.680
Courses in Economics		52.7	50.8	53.9	0.168
Minor choice	Mathematics	51.9	52.1	51.7	0.889
	Economics	54.4	47.9	58.9	0.007
# Obs.		452	180	272	

Note: data from the administrative education software. For each first year of master (from 2004 to 2009), the best student obtained the rank of 100, the worst gets 0. The global ranking is based on the average score during the year. Specific rankings are based on the written individual evaluation. Courses included for the specific rankings have been defined using a principal component analysis.

Table 1: Minor, major choices (%) and schooling attainments

		Total	Full year internship	No full year internship	Mean Diff. p-value
Labor market status 6 months after graduation (%)					
	Employment	63.2	73.4	55.3	0.002
	Job search	6.0	2.4	8.7	0.027
	Further studies	15.8	11.3	19.3	0.068
	Ph.d	14.0	12.1	15.5	0.410
	No activity	1.0	0.8	1.2	0.722
	# Obs.	285	124	161	
Duration of first job search (%)					
	Before graduating	56.8	62.9	52.7	0.086
	Less than 2 months	24.2	20.7	26.6	0.252
	Between 2 and 4 months	6.3	6.9	5.9	0.740
	Between 4 and 6 months	4.9	5.2	4.7	0.867
	More than 6 months	7.7	4.3	10.1	0.074
	# Obs.	285	116	169	
Average annual wages bonus included (in euros)					
Total		49.400	53.300	47.100	0.015
Months after graduation	6 months	45.400	46.800	44.100	0.275
	18 months	51.500	60.000	47.000	0.003
	30 months	55.200	60.200	53.100	0.138
3rd-year major field 6 months after graduation	Finance	47.300	48.700	45.900	0.435
	Other	42.200	43.100	41.500	0.433
	# Obs.	444	167	277	
Satisfaction at work (% of satisfied)					
Total					
	Autonomy	72.5	77.9	68.9	0.113
	Working conditions	79.8	80.2	79.6	0.917
	Working environment	88.1	89.3	87.2	0.612
	Non monetary components	59.9	65.7	56.1	0.137
	Wages	63.3	64.9	62.2	0.679
	# Obs.	327	131	196	

Note: data from the survey "integration of graduates" from 2007 to 2012 (2007 excluded for satisfaction variables). For each satisfaction variable (working conditions, working environment, autonomy in work, and the wages level), the scale ranges from 1 (worst) to 5 (best). A worker is considered satisfied if the score is higher or equal than 4.

Table 2: Labor market outcomes after graduation

	(1) 3rd year Major Finance Probit	(2) 3rd year Major Finance Probit	(3) 3rd year Major Finance Probit	(4) 3rd year Major Finance Probit	(5) 3rd year Major Finance Biprobit	(6) Full year Intern. Biprobit
Full year intern.		0.140***	0.049	0.052	0.047	
		(0.039)	(0.038)	(0.038)	(0.089)	
Full year intern. Economics			-0.454***	-0.435***		
(Ref. Full year intern. Finance)			(0.049)	(0.049)		
Full year intern. Economics and Finance			-0.135*	-0.128*		
			(0.069)	(0.068)		
2rd year minor: applied maths	0.523***	0.525***	0.340***	0.292***	0.530***	0.060
	(0.044)	(0.043)	(0.051)	(0.052)	(0.044)	(0.045)
2nd year inverse rank	0.002	0.034	0.110*		0.013	-0.184***
	(0.067)	(0.067)	(0.059)		(0.070)	(0.070)
Inverse rank - economics				-0.080		
				(0.080)		
Inverse rank - mathematics				0.285***		
				(0.078)		
Graduating in 2008	-0.100	-0.101	-0.049	-0.036	-0.101	0.067
(Ref. Grad. in 2007)	(0.068)	(0.067)	(0.059)	(0.059)	(0.068)	(0.077)
Graduating in 2009	-0.089	-0.098	0.042	0.028	-0.091	0.053
	(0.062)	(0.061)	(0.053)	(0.053)	(0.062)	(0.067)
Graduating in 2010	-0.111*	-0.142**	0.009	0.006	-0.121*	0.257***
	(0.063)	(0.063)	(0.055)	(0.054)	(0.066)	(0.061)
Graduating in 2011	0.019	-0.030	0.041	0.035	0.004	0.360***
	(0.061)	(0.062)	(0.056)	(0.055)	(0.069)	(0.058)
Graduating in 2012	-0.113*	-0.147**	-0.047	-0.058	-0.122*	0.268***
	(0.069)	(0.068)	(0.060)	(0.060)	(0.073)	(0.064)
Age in 2nd year						-0.072***
						(0.021)
Admitted in 2nd year						-0.288***
						(0.048)
Constant	10.654***	10.554***	10.584***	10.539***	10.584***	10.596***
	(0.024)	(0.042)	(0.027)	(0.046)	(0.036)	(0.046)
Observations	452	452	452	452	452	452
Pseudo R^2	0.269	0.288	0.437	0.453	-	-
Baseline probability	0.537	0.537	0.537	0.537	0.537	0.398
$\hat{\rho}$					0.236	
					(0.194)	

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Columns 1, 2, 3 and 4 are the average marginal effects of a probit model for a third year major in Finance. Columns 5 and 6 are the average marginal effects of a biprobit model for a third year major in Finance and a full year of internship. Demographic characteristics (sex, place of birth) are used as control variables.

Table 3: Major determinants - probit and biprobit average marginal effects

	(1) Before graduation Probit	(2) Before graduation IV 2SLS	(3) Full year intern. OLS	(4) 3rd year Major: Finance OLS	(5) Duration Int. Reg.
Full year intern.	0.132**	0.202			-1.334*
	(0.059)	(0.142)			(0.684)
3rd year Major: Finance	0.103*	-0.177			-0.510
	(0.062)	(0.117)			(0.603)
2nd year inverse rank	0.230**	0.265**	-0.184*	0.075	-1.887*
	(0.097)	(0.105)	(0.098)	(0.093)	(1.041)
Graduating in 2008	-0.212**	-0.214**	0.089	-0.099	2.527***
(Ref. Grad. in 2007)	(0.093)	(0.099)	(0.088)	(0.094)	(0.950)
Graduating in 2009	-0.077	-0.053	0.043	-0.030	1.498
	(0.090)	(0.089)	(0.078)	(0.079)	(0.967)
Graduating in 2010	-0.130	-0.158	0.217**	-0.118	1.422
	(0.090)	(0.096)	(0.085)	(0.085)	(0.900)
Graduating in 2011	-0.150	-0.139	0.399***	0.021	1.813*
	(0.092)	(0.103)	(0.083)	(0.085)	(0.944)
Graduating in 2012	-0.272**	-0.322**	0.420***	-0.056	2.861***
	(0.104)	(0.129)	(0.089)	(0.106)	(1.096)
Age in 2nd year			-0.069***	0.013	
			(0.023)	(0.020)	
2nd year minor: applied maths			0.016	0.569***	
			(0.062)	(0.055)	
Admitted in 2nd year			-0.335***	-0.063	0.338
			(0.053)	(0.054)	(0.636)
Constant		0.614***	2.051***	-0.054	-1.012
		(0.127)	(0.536)	(0.460)	(0.950)
Observations	285	285	285	285	285
Pseudo R^2 / Adjusted R^2	0.067	-	0.216	0.321	.-
Baseline probability	0.569	0.569	0.407	0.607	
KP stat. for rank condition		54.898	27.08	36.42	
(p-value)		0.000	0.000	0.000	
Sargan-Hansen stat. for overid.		0.119			
(p-value)		0.730			
KP stat. for weak ident.		26.644			

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Column 1 is the average marginal effects of a probit model for finding a job before graduation. Column 2 reports the 2SLS estimates with full year of internship and 3rd year Major in Finance as endogenous variables and age in 2nd year, 2nd year minor-applied maths and admitted in 2nd year as instruments. Columns 3 and 4 report the 2SLS first-stages estimates for full year of internship and 3rd year Major in Finance. Column 5 is the estimates of an interval regression of the duration of job search. KP for Kleibergen-Paap. Demographic characteristics (sex, place of birth) are used as control variables.

Table 4: Duration of job search

	(1)	(2)	(3)
	Log wage	Log wage	Log wage
	IV 2SLS	IV 2SLS	IV 2LS
Full year intern.	0.151	0.160**	0.130**
	(0.108)	(0.076)	(0.053)
Experience	0.109***	0.110***	0.108***
	(0.015)	(0.015)	(0.015)
3rd year Major: Finance	0.080	0.085	0.085
	(0.082)	(0.072)	(0.071)
2nd year inverse rank	0.092	0.093	0.088
	(0.061)	(0.059)	(0.056)
Constant	10.515***	10.507***	10.525***
	(0.099)	(0.063)	(0.057)
Observations	444	444	444
Adjusted R^2	0.354	0.350	0.361
KP stat. for rank condition	20.642	36.673	27.443
(p-value)	(0.000)	(0.000)	(0.000)
Sargan-Hansen stat. for overid.	.	0.016	0.487
(p-value)	.	(0.900)	(0.784)
KP stat. for weak ident.	10.283	16.951	15.018
Instruments			
Age in 2nd year	X	X	X
2nd year minor: applied maths	X	X	X
Admitted in 2nd year		X	X
Year of graduation > 2010			X

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Columns report the 2SLS estimates with full year of internship and 3rd year Major in Finance as endogenous variables. Wages are deflated using price consumption index. The variance-covariance matrix is clustered with the student identifier. KP for Kleibergen-Paap. Job characteristics (working abroad, second job, public sector, and fixed term contract) and demographic characteristics (sex, place of birth) are used as control variables.

Table 6: Wage determinants - IV 2SLS

	(1) Log wage OLS	(2) Log wage OLS	(3) Log wage LAD	(4) Log wage OLS	(5) Log wage OLS	(6) Log wage OLS	(7) Log wage OLS	(8) Log wage OLS
Full year intern.	0.080***	0.077***	0.039**	0.075**	0.067	-0.017	-0.080	
	(0.029)	(0.030)	(0.018)	(0.029)	(0.049)	(0.057)	(0.079)	
Experience	0.105***	0.106***	0.090***	0.103***	0.066***	0.108***	0.105***	
	(0.015)	(0.015)	(0.012)	(0.015)	(0.019)	(0.015)	(0.015)	
Full year intern. - No experience								0.053
								(0.034)
No full year intern. - 1 year experience								0.079***
								(0.027)
Full year intern. - 1 year experience								0.185***
								(0.040)
No full year intern. - 2 years experience								0.201***
								(0.032)
Full year intern. - 2 years experience								0.290***
								(0.060)
3rd year Major: Finance		0.089***	0.069***	0.096***	0.051	0.094***	0.104***	0.090***
		(0.030)	(0.021)	(0.031)	(0.039)	(0.031)	(0.032)	(0.030)
Full year intern. x Finance					-0.003			
					(0.063)			
Finance x Experience					0.057**			
					(0.028)			
Full year intern. x Experience					0.015			
					(0.032)			
2nd year inverse rank		0.078	0.052*		0.074	-0.004		0.080
		(0.052)	(0.031)		(0.054)	(0.067)		(0.053)
Inverse rank - economics				0.127**			0.072	
				(0.062)			(0.070)	
Inverse rank - mathematics				-0.028			-0.130*	
				(0.058)			(0.077)	
2nd year inverse rank x Full year intern.						0.196*		
						(0.102)		
Inverse rank - economics x Full year intern.							0.052	
							(0.141)	
Inverse rank - mathematics x Full year intern.							0.249**	
							(0.125)	
Constant	10.654***	10.554***	10.584***	10.539***	10.584***	10.596***	10.621***	10.564***
	(0.024)	(0.042)	(0.027)	(0.046)	(0.036)	(0.046)	(0.057)	(0.041)
Observations	444	444	444	444	444	444	444	444
Adjusted R^2	0.348	0.368		0.369	0.369	0.375	0.377	0.365
Full year intern./Experience	76%	73%	43%	73%				

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Columns 1, 2, and 4 report the OLS estimates without interraction effects, columns 5, 6, 7, and 8 the OLS estimates with interaction effects, column 3 the LAD estimates. Wages are deflated using price consumption index. The variance-covariance matrix is clustered with the student identifier (except for the LAD estimator). Job characteristics (working abroad, second job, public sector, and fixed term contract) and demographic characteristics (sex, place of birth) are used as control variables.

Table 5: Wages determinants and interaction effects - OLS and LAD

	(1) Full year intern.	(2) Full year intern.	(3) Full year intern.	(4) 3rd year Major Finance	(5) 3rd year Major Finance	(6) 3rd year Major Finance
	OLS	OLS	OLS	OLS	OLS	OLS
Age in 2nd year	-0.119***	-0.069***	-0.053**	0.014	0.037*	0.037*
	(0.023)	(0.024)	(0.023)	(0.018)	(0.020)	(0.020)
2nd year minor: applied maths	-0.032	-0.035	-0.039	0.451***	0.449***	0.449***
	(0.078)	(0.069)	(0.065)	(0.069)	(0.067)	(0.067)
Admitted in 2nd year		-0.308***	-0.363***		-0.142**	-0.142**
		(0.063)	(0.057)		(0.059)	(0.059)
Year of graduation $>$ 2010			0.314***			0.001
			(0.055)			(0.052)
Constant	3.392***	2.344***	1.834***	-0.033	-0.518	-0.519
	(0.536)	(0.545)	(0.552)	(0.419)	(0.451)	(0.462)
Observations	444	444	444	444	444	444
Adjusted R^2	0.147	0.222	0.313	0.430	0.444	0.443
F-Stat	13.98	19.63	33.78	22.63	19.57	14.95

Note: Standard errors in parentheses data, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Columns report the 2SLS first-stages estimates for full year of internship and 3rd year Major in Finance. Wages are deflated using price consumption index. The variance-covariance matrix is clustered with the student identifier.

Table 7: Wage determinants - IV 2SLS first-stages

	Satisfaction Wage	Satisfaction Wage	Satisfaction Wage	Satisfaction Wage	Full year intern.	3rd year Major Finance
	Probit	Probit	IV 2SLS	IV 2SLS	OLS	OLS
Full year intern.	0.041	0.003	0.142	0.078		
	(0.062)	(0.060)	(0.101)	(0.107)		
3rd year Major: Finance	-0.145**	-0.174**	-0.421***	-0.452***		
	(0.073)	(0.070)	(0.132)	(0.125)		
Experience	-0.033	-0.093**	-0.028	-0.081**	0.021	-0.015
	(0.034)	(0.036)	(0.037)	(0.040)	(0.026)	(0.022)
2nd year inverse rank	0.183*	0.124	0.222**	0.108	-0.068	0.191*
	(0.104)	(0.100)	(0.113)	(0.188)	(0.121)	(0.098)
Log wage		0.568***		0.501***		
		(0.169)		(0.135)		
Age in 2nd year					-0.054**	0.026
					(0.025)	(0.021)
2nd year minor: applied maths					0.019	0.515***
					(0.069)	(0.072)
Admitted in 2nd year					-0.428***	-0.144**
					(0.064)	(0.061)
Year of graduation > 2010					0.335***	0.028
					(0.061)	(0.054)
Constant			0.774***	-4.506***	1.786***	-0.347
			(0.121)	(1.415)	(0.585)	(0.493)
Observations	327	327	327	327	327	327
Pseudo R^2 / Adjusted R^2	0.079	0.121	0.018	0.059	0.364	0.512
Baseline probability	0.633	0.633	0.633	0.633	0.376	0.597
KP stat. for rank condition			23.134	22.846	36.56	17.23
(p-value)			(0.000)	(0.000)	(0.000)	(0.000)
Sargan-Hansen stat for overid.			0.743	0.945		
(p-value)			(0.690)	(0.623)		
KP stat. for weak ident.			13.142	12.757		

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Columns 1 and 2 report the average marginal effects of a probit model for beeing satisfied with wages (i.e. a score higher than 4). Columns 3 and 4 report the 2SLS estimates with full year of internship and 3rd year Major in Finance as endogenous variables and age in 2nd year, 2nd year minor-applied maths, admitted in 2nd year, and year of graduation as instruments. Columns 5 and 6 report the 2SLS first-stages estimates (without wage) for full year of internship and 3rd year Major in Finance. Wages are deflated using price consumption index. The variance-covariance matrix is clustered with the student identifier. KP for Kleibergen-Paap. Job characteristics (working abroad, second job, public sector, and fixed term contract) and demographic characteristics (sex, place of birth) are used as control variables.

Table 8: Job satisfaction - Wage

	Satisfaction Non mon.	Satisfaction Non mon.	Satisfaction Non mon.	Satisfaction Non mon.	Full year intern.	3rd year Major Finance
	Probit	Probit	IV 2SLS	IV 2SLS	OLS	OLS
Full year intern.	0.084	0.071	0.112	0.092		
	(0.064)	(0.064)	(0.113)	(0.115)		
3rd year Major: Finance	-0.007	-0.015	-0.052	-0.062		
	(0.080)	(0.083)	(0.172)	(0.176)		
Experience	-0.078**	-0.094**	-0.075**	-0.091**	0.002	-0.028
	(0.035)	(0.037)	(0.036)	(0.038)	(0.028)	(0.024)
2nd year inverse rank	0.016	-0.001	0.026	0.011	-0.086	0.179*
	(0.114)	(0.115)	(0.116)	(0.116)	(0.123)	(0.101)
Log wage		0.155		0.156	0.184	0.121
		(0.161)		(0.163)	(0.112)	(0.100)
Age in 2nd year					-0.052**	0.027
					(0.024)	(0.021)
2nd year minor: applied maths					0.012	0.511***
					(0.068)	(0.074)
Admitted in 2nd year					-0.415***	-0.136**
					(0.064)	(0.062)
Year of graduation > 2010					0.330***	0.024
					(0.061)	(0.054)
Constant			0.631***	-1.016	-0.206	-1.654
			(0.147)	(1.694)	(1.326)	(1.239)
Observations	327	327	327	327	327	327
Pseudo R^2 / Adjusted R^2	0.041	0.045	0.021	0.023	0.369	0.514
Baseline probability	0.599	0.599	0.599	0.599	0.376	0.597
KP stat. for rank condition			23.134	22.846	33.37	15.57
(p-value)			(0.000)	(0.000)	(0.000)	(0.000)
Sargan-Hansen stat for overid.			2.297	2.471		
(p-value)			(0.317)	(0.291)		
KP stat. for weak ident.			13.142	12.757		

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Columns 1 and 2 report the average marginal effects of a probit model for beeing satisfied with all non monetary components (i.e. a score higher than 4 for autonomy in work, working conditions and environment). Columns 3 and 4 report the 2SLS estimates with full year of internship and 3rd year Major in Finance as endogenous variables and age in 2nd year, 2nd year minor-applied maths, admitted in 2nd year, and year of graduation as instruments. Columns 5 and 6 report the 2SLS first-stages estimates (with wage) for full year of internship and 3rd year Major in Finance. Wages are deflated using price consumption index. The variance-covariance matrix is clustered with the student identifier. KP for Kleibergen-Paap. Job characteristics (working abroad, second job, public sector, and fixed term contract) and demographic characteristics (sex, place of birth) are used as control variables.

Table 9: Job satisfaction - Non monetary components