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*Career paths of young workers and size  
of the first firm*

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# Career paths of young workers and size of the first firm <sup>\*</sup>

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## Abstract

This study explores how the size of the first firm affects the long-term career outcomes of young workers in France. Using French administrative data, I investigate the impact of the first firm size, measured by the number of employees on lifetime income. Firm size is a relevant parameter, correlating with training, productivity, and management quality. I use an instrumental variable approach that accounts for non-random sorting by using regional labor demand variations. Results show that starting a career in a firm with a large number of employees is associated with a higher long-term income. A 10% increase of the first firm size is associated with a 0.975% increase of lifetime income. More precisely, less educated workers benefit the most from this effect. The positive effect on hourly wages is less pronounced for women than for men, although large firms mitigate the negative impact of having children on long-term income. This study contributes to the literature by documenting dynamic effects of initial job matches, highlighting variations by gender, education, and family composition, and establishing a causal link between first employer characteristics and career outcomes.

**Keywords:** first job, firm size, firm heterogeneity, young workers, lifetime income

**JEL Codes:** E24, J23, J24, J31, J62

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# 1 Introduction

Nowadays, firms face with major recruitment difficulties. In particular, they point to the mismatch between candidates' profiles, noting a lack of professional experience, education and skills, as well as an insufficient number of job candidates. For their part, applicants may be discouraged by working conditions, terms and conditions of employment (nature of the contract, work-life balance), the level of remuneration or the distance between work and home. This situation is particularly critical for young people entering the labour market. According to INSEE<sup>1</sup>, in 2021, at the age of 24 or 25, one in six young people was neither in employment, education, nor training. The first job is a decisive step in the career path of young workers. The quality of the first firm can significantly influence the search for subsequent jobs, and the opportunities for learning relevant skills differ across firms according to their individual characteristics. For a young worker at the beginning of their career, these differences can have long-term effects on their working life. It is essential to understand these dynamics, not only for policy-makers and employers, but also for the workers themselves.

Many studies focus on wage inequalities generated by firms, focusing principally on the current relationship between workers and their employers. However, few studies have looked at the impact of past work experience, particularly within firms of different sizes. This dissertation aims to address this gap by exploring how the diversity of first firms affects the careers of young workers in France.

To do this, I use French administrative data to examine the impact of the size of the first firm (number of employees) on long-term labour market outcomes. Firm size is a relevant parameter because it correlates with various characteristics which are difficult to observe, such as training, productivity and management quality. In addition, thanks to my data, I can define a firm as "the smallest combination of legal units constituting an organisational unit for the production of goods and services, with a certain degree of decision-making autonomy, in particular for the allocation of its current resources"<sup>2</sup>. This definition of a firm, based on the INSEE one, allows me to better consider the internal opportunities for development and career within firms, particularly large firms. In this way, firm size can be seen as an indicator of the quality of the first employer. To address the issue of non-random sorting of labour market entrants and firms, I develop an instrumental variable (IV) approach, inspired by the work of [Arellano-Bover \(2024\)](#). This approach uses variations in the composition of regional labour demand. The empirical strategy used is based on the idiosyncratic shocks experienced by large firms when young workers enter the labour market, depending on their year of entry into the labour market, their gender, education, geographical location and sector of activity. This method provides an exogenous variation that allows to determine the probability of joining a large or small firm for an individual's first job according to their personal characteristics.

My results show that starting a career at a large firm can shape workers' long-term career paths. The raw data reveal a positive correlation between lifetime income (measured as the sum of annual

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<sup>1</sup>Vuillier-Devillers, Barhouni, Klipfel (2023), *At age 24-25, young people situation remained linked to their lower secondary test results and to their social background*, INSEE. [Link](#)

<sup>2</sup>Article 51 of the implementing decree to the law 2008-776 on the modernization of the economy (LME)

income over 10 years from labour market entry) and the size of the first firm of employment. The main result is that adding controls and using the instrumental variable (IV) approach to account for unobservable worker characteristics confirms the trends in the raw data. I estimate a positive IV elasticity of lifetime earnings with respect to the size of the first employer, equal to 0.0975. The IV estimate shows that the elasticity between lifetime income and the size of the first firm is approximately eight times higher than that obtained using ordinary least squares (OLS). This comparison may seem contradictory, since one might assume that unobserved capacity is positively correlated with the size of the first employer. Within a framework of heterogeneous effects, the difference in results can be attributed by the characteristics of compliers - whose match with the first employer is most influenced by the IV - who benefit most from starting their career in large firm. Given the nature of the IV, compliers are likely those who stay in their birth region to find work, and those with lower wage earning potential.

In addition, I study the variation of the effect of the size of the first firm on lifetime income by gender, level of education and number of children. The results show that the less educated benefit most from the effect of the size of the first firm on long-term income: The effect of first firm size is around 1.6 times greater for workers with a Pre-Bac level of education than for those with a higher level of education. This can be explained by the fact that young workers with low degrees may develop skills that are more highly appreciated in large firms, where there is higher levels of workforce training, peer learning, more competent managers, and a more productive work environment than in small firms. Furthermore, the results show that women benefit less from the effect of the size of the first firm on their long-term hourly wage than men, while the effect on lifetime income is not significant. The effect of the size of the first firm size on average hourly wages is around 1.15 times greater for men than for women. In addition, I find that the larger the firm, the more the negative effect of the number of children on long-term income is mitigated. This highlights the ability of large firms to support their employees when they have children through initiatives such as teleworking, childcare facilities and better remuneration for parental leave.

This dissertation is part of a large literature showing how the characteristics of the first employer influence the career of a young graduate. This includes work related to the two-way fixed effects model (Abowd et al., 1999), the firm size wage premium (Garen, 1985; Brown and Medoff, 1989; Idson and Feaster, 1990; Sorenson et al., 2021), and the effects of labour market entry during recessions (Brunner and Kuhn, 2014; Wachter and Bender, 2006). The major contribution of this dissertation to this literature is to provide evidence of the dynamic effects of employer-employee first job matches, while examining variations by gender, education and family composition of workers. I contribute to this literature by establishing a causal link between the characteristics of the first employer and career outcomes, with implications for long-term inequalities.

The rest of the paper is organized as follows. Section II presents the literature review. Section III describes the data, measurement, and context. Section IV presents my identification strategy. Section V presents the causal effects of first firm size on long-term outcomes. Section VI studies persistence. Section VII concludes.

## 2 Related literature

In the 80s and 90s, the effect of firm size on workers' wages and worker-firm matches has been a major field of economic research. These studies have shown a significant positive correlation between contemporary firm size and wage levels. The hypotheses explaining why large firms pay better than small ones focus on different aspects of wage formation: the quality of work, efficiency wages, the organisation of work by industry and the role of trade unions.

For a long time, many studies have used OLS to estimate the effect of firm size on wages by ignoring the non-random assignment of workers. Studies have focused on reducing the effect of size on wages by controlling for employees and employers, but the effect of unobserved characteristics has been neglected (Garen, 1985; Abraham and Farber, 1987; Rebeck, 1993; Lallemant et al., 2005). One of the major works on this subject is that of Brown and Medoff (1989). They reported a positive and significant effect of employer size on wages in the United States. Their results show that *ceteris paribus* working for a large firm (i.e. a firm that is double the size of another) provides a wage premium of between 1.5 and 3.8%. They propose several explanations such as the ability of large firms to attract better quality workers, to offer better working conditions or to pay higher wages to avoid unionisation. Morissette (1993) proposed a different interpretation: large firms might pay higher wages because they employ workers with more unobserved skills. On the other hand, studies of the German labour market highlight a positive and persistent gap between salaries according to size, even after controlling for the quality of the workforce, seniority, innovative activity and monitoring costs (Schmidt and Zimmermann, 1991; Gerlach and Hübler, 1998). Abowd et al. (1999) used a large matched worker-firm panel date set for France and found that individual heterogeneity rather than firm heterogeneity accounts for most of the wage gap between size categories. To do so, they isolated fixed individual and fixed firm effects from workers moving between employers.

These articles often overlook the non-random distribution of workers in firms of different sizes, which leads to sample selection bias and endogeneity problems. This bias can occur because workers self-select into firms of varying sizes or because different-sized firms have distinct recruitment strategies. Studies investigate both observable and un-observable worker characteristics in explaining the wage premium paid by larger employers, often using methods like Heckman (1979)'s two-step estimation procedures. The possible presence of a worker selection effect in analyses of the effects of firm size on wages was studied by Idson and Feaster (1990) for the US and Main and Reilly (1993) for the UK. They found evidence of higher worker productivity in large firms in the US, while there was no evidence of non-random sorting of workers between different firm sizes in the UK. Idson and Feaster (1990) were the firsts to address the potential selectivity problem. Their study based on the size of five categories of firms shows that controlling for selection effects increases the size of the wage gap associated with firm size. The study of Albaek et al. (1998) is particularly interesting because it is the first to use a continuous measure of the establishment size (i.e. the exact number of employees per establishment) and to compare the size wage elasticity across Scandinavian countries. The authors find large firm-size effects even after controlling for individual and job characteristics as well as for selection effects.

All the studies from the 80s and 90s mentioned above confirm the positive relationship between the size of the employer and wages, and these results are still valid today, as confirmed by many recent studies (Criscuolo, 2000; Fox, 2009; Bassanini et al., 2013). For example, the research of Sorenson et al. (2021) found that employees recruited by start-ups generally earned less than those employed by large established firms.

The articles cited earlier focus on the current effect of firm size on wages. However, the initial characteristics of the firm at entry to the labour market are central to career trajectories, influencing both the characteristics of future employers and long-term wage levels. There is a recent branch of economic literature which has focused on showing the important role of the first year on the labour market of young graduates, particularly in times of crisis (Brunner and Kuhn, 2014; Altonji et al., 2016). The work of Wachter (2020) highlights the importance of young workers' initial work experience for their long-term prospects. The initial effects on wages, labour supply and earnings tend to fade after a period of ten to fifteen years in the labour market, but these early experiences can have persistent consequences for various aspects of professional and personal life, including occupational mobility, job stability and career choices. In addition, the study of Wachter and Bender (2006) highlights that wage losses associated with early job loss can vary according to the size of the firm. Workers who leave very large firms may suffer persistent wage losses, suggesting that the size of the first firm may be a determining factor in the long-term wage trajectory of young graduates, even in times of crisis.

Very few studies focus only on the effect of the size of the first firm on the career path of young graduates. In fact, only two articles have explored this issue: Oyer (2006) and Arellano-Bover (2024).

Oyer (2006) analyzes the relationship between macroeconomic conditions at graduation, initial job placement, and long-term outcomes for PhD economists from seven programs. Using macroeconomic conditions as an instrument for initial recruitment, he shows that the quality and type of the first job have a causal effect on long-term job characteristics: "*Each place higher in rank of initial institution causes an economist to work at an institution ranked 0.6 places higher in the time period from three to 15 years later*". It also shows that a better initial institution increases research productivity, which may explain the effect of initial job matching on long-term employment.

The study conducted by Arellano-Bover (2024) focuses on the long-term consequences of a first job in firms of different sizes, based on Spanish administrative data. It covers the period from 1984 to 2015 and is limited to men aged between 16 and 35. The paper analyses the effect of the size of the first firm on the labour market on lifetime income, defined as the sum of income (wages and unemployment benefit) between the ages of 16 and 35. Although positive and significant results are found with simple OLS, the author recognizes the potential endogeneity in his data, attributable to the fact that workers self-select in firms of different sizes or that firms of different sizes have distinct recruitment strategies. On this particular aspect, Arellano-Bover (2021) has already explored this issue and observed that those who start their careers in large firms are generally positively selected in terms of education and cognitive skills. This

is why, in his 2024 paper, he developed an instrumental variable approach which, by holding business cycle conditions fixed, leverages the variation in the composition of labor demand faced by new entrants to the labor market. His results indicate that starting one's career in a large company significantly improves long-term outcomes, even across subsequent jobs. He explains this phenomenon by the greater development of skills in large firms.

From a more theoretical approach, economists are also exploring the sorting effect between employees and employers. Board et al. (2020) observe that the talent market is affected by imperfect information and that the quality of candidates decreases with the level of wages. Their analysis reveals that wage dispersion and the segregation of talented workers increase with firms' recruitment skills. Firms that are better at recruiting have higher wages, attracting better candidates and recruiting more talent. This dynamic leads to a sorting of workers according to the characteristics of firms, in particular their recruitment skills, which are often linked to their size.

For this article, I drew inspiration from Arellano-Bover (2024), particularly with regard to his empirical strategy, however, my work is distinguished by significant differences. Firstly, I focus on young French graduates entering the job market between 2008 and 2011, and include women in the panel. Secondly, I measure lifetime income over a period of 10 years' experience, excluding income from unemployment benefits, thus following the trajectory of young graduates from their entry at the age of  $X$  to  $X+10$  years. In addition, I determine the size of the firm using organisational contours rather than legal units. My IV also incorporates gender, industry sector and actual graduation year as criteria.

Finally, this paper is part of a large literature that shows that the characteristics of the firm that hires an individual have an impact on their labour market outcomes and that, as a result, the match between employees and employers influences the employees careers. I contribute to this literature by establishing a causal link between first-employer characteristics and long-term career outcomes : Starting jobs at large firms consistently lead to better career outcomes. Another contribution to this literature comes from the perspective I adopt on the firm as an organisational entity, highlighting the capacity of large firms to offer opportunities for internal mobility. Given the lack of attention to gender issues in the existing literature on this subject, this article explores new fields of research, focusing on the importance of considering gender disparities in the effect of firm size on wages.



## 3 Data and Context

### 3.1 Principal Data Source

My principal source of data is the All Employees Panel derived from the Annual Social Data Declarations, enriched with information from the Permanent Demographic Sample (DADS Panel Tous Salariés EDP), a French National Institute for Statistics and Economic Studies (INSEE) sample of 4.5 % of the French population, extracted annually from 1976 to 2020. This panel is composed of the employed population born on the first 4 days of each quarter.

The data is of a panel nature: the workers initially sampled are also selected each following year, provided they are still employed. Each workers has a unique identifier, which follows them every year. The sample is updated annually to maintain its representativeness. The data include the complete labor market histories of the sampled workers. Demographic characteristics include place of birth, date of birth and gender. Information on education, school-leaving age, parents' socio-professional category and education is also provided. In addition, information on marriage, number of children and year of birth of each child is available. Education is a key element in the analysis of young people's entry into the labour market, which I group into four categories: pre-baccalaureate, baccalaureate, higher education and master's or doctorate.

For each employee-employer relationship, I observe starting and ending dates, employer identifier (siren), type of contract (permanent/temporary), occupational category, wages (net and gross) and number of hours worked. For each employer, I observe its location, sector of activity and number of workers. However, I won't be employing the definition of an employer from this database (the employer is associated with a siren number that corresponds to a legal unit) to define the firm and, more specifically, the size of the first firm. Indeed, since 2008, the French legal definition of a firm has been changed by "the smallest combination of legal units that constitutes an organizational unit for the production of goods and services, with a certain degree of decision-making autonomy, in particular for the allocation of its current resources"<sup>3</sup>. In short, for a group of legal units to constitute a firm, it must have the capacity to make its own decisions, it must form an economically coherent entity, and its activity must be primarily market-oriented rather than service-oriented within the group. As a result, analyses based on legal units distort the representation of the production environment in France, which is why I have chosen the 'profiled' INSEE definition established in 2008 to determine the size of the first firm. To do this, I use data from the Longitudinal Company and Employment Database, where legal units are profiled to determine the overall structure of the firm and identify all the legal units that compose it. Longitudinal data includes a firm identifier, the list of legal units (siren) associated with each firm, and the total number of workers in the firm (a variable used to measure the size of the first company). I match these data with my main database by using the employer identifier (SIREN). However, this new firm definition has only been implemented in 2017, with retroactivity back to 2008. Consequently, my sample is limited to the 2008-2020 period.

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<sup>3</sup>Article 51 of the implementing decree to the law 2008-776 on the modernization of the economy (LME)

### 3.2 Sample Selection

I use employment histories to build an annual panel of employment, wages, worker characteristics and firm characteristics. The panel covers the period from 2008 to 2020. I limit the analysis to workers born in Metropolitan France. Focusing on those born in metropolitan France increases the probability of observing the full labor market history of workers in my sample. In addition, including foreign-born workers contradicts my empirical strategy, which is based on a person's region of birth. Since long-term analysis requires observing each worker for a sufficient number of years, the data impose a trade-off between the number of cohorts studied and the number of years each worker is followed. To balance this trade-off, I focus on labor market entry cohorts for the years 2008-2011.

The data requirements for long-term cross-sectional analysis are strict, as each observation is intended to capture information on the entire labor market history for a given worker. For each worker, I need information on their experience of the labor market and sufficient information on employment and earnings over the entire study period (10 years after entry into the labour market). Thus, I impose additional restrictions that reduce the number of workers in the sample. I include those who enter the labor market after graduation between the ages of 16 and 40, and who have at least 7 years recorded in the database between their entry into the labor market and ten years later. I also exclude workers who have their first job in the public sector and those who have their first job very late: after the age of 22 for pre-baccalaureate and baccalaureate graduates, after the age of 25 for higher education graduates and after the age of 30 for master's and doctorate graduates. All these restrictions result in a sample of around 23,000 individuals, i.e. 22% of those initially present in the raw data. *Table 1* shows the summary statistics for this sample *Table 9*.

Table 1: Summary Statistics

	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
<i>Personal characteristics:</i>						
Gender (Men%)	23,061	0.58	0.49	0	1	1
<i>Education:</i>						
Pre-Bac level	23,061	0.04	0.19	0	0	0
Bac level	23,061	0.55	0.50	0	1	1
Higher Education (BAC+2)	23,061	0.19	0.39	0	0	0
Master Degree and PhD	23,061	0.23	0.42	0	0	0
<i>Over the ten first years:</i>						
Number of employers	23,061	4.91	3.93	2	4	6
Hours worked	23,061	14,430	3,803	11,992	15,256	17,376
<i>First year in labor market:</i>						
Age	23,061	20.99	2.54	19	21	23
Hours worked	23,061	1,214	556	806	1,213	1,792
Full time	23,061	0.75	0.43	1	1	1
In region of birth	23,061	0.76	0.42	1	1	1
Unemployment rate of first-firm department	23,061	8.23	1.76	6.90	7.97	9.18
<i>Lifetime income (10 first years):</i>						
Including first experience	23,061	229,347	135,181	146,981	206,543	280,428
Excluding first experience	23,061	216,381	129,848	138,039	195,369	265,158
<i>Size of first-firm:</i>						
First-firm size	23,061	12,304	36,163	9	63	3,619
Log First-firm size	23,061	5.15	3.43	2.20	4.14	8.19
1-9 employees	23,061	0.27	0.44	0	0	1
10-19 employees	23,061	0.11	0.31	0	0	0
20-49 employees	23,061	0.10	0.30	0	0	0
50-249 employees	23,061	0.12	0.33	0	0	0
+250 employees	23,061	0.40	0.49	0	0	1

*Notes: The table shows summary statistics for the cross-sectional lifetime analysis sample. Sample includes workers born in Metropolitan France who enter in labor market between 2008-2011, who enter the labor market after graduation between the ages of 16 and 40, and who have at least 7 years registered in the database between their entry into the labor market and ten years later, who have a first labor market experience as the equivalent of six full-time months worked during the year following their graduation, who have their first job in the private sector and do not enter their first job very late (after the age of 22 for pre-baccalaureate and baccalaureate graduates, after the age of 25 for higher education graduates and after the age of 30 for master's and doctorate graduates). Lifetime income is the sum of all gross annual wages from the year a worker enters the labour market after graduation through to 10 years after. Income is expressed in constant 2020 euros.*

### 3.3 Definitions

*First Labor market experience.* — I define a worker’s first labor market experience as the equivalent of six full-time months worked during the year following their graduation. This definition aims to capture the first relevant job after completing school education while avoiding summer work or very temporary employment.

*First-employer size.* — For each worker, I assign as first firm size the size of his firm during their first labor market experience. As previously explained, I use the number of employees of the profiled firm rather than that of the legal unit to provide a more representative picture of the French production environment. For workers who have more than one employer during the same initial period, I consider the highest number of hours worked among the different firms, and if they are identical, I consider the size of the largest firm.

*Lifetime income.* — I use measures of lifetime income as worker-level long-term outcomes. The aim of this measure is to capture all the income from work that a worker receives between entering the labour market and a decade later. The lifetime income measure takes the following form:

$$Y_i = \sum_{t=t_0}^{t_0+9} w_{it} \quad (1)$$

where  $w_{it}$  are annual gross wages in constant euros <sup>4</sup>,  $t_0$  represents the first year when an individual enters the job market <sup>5</sup>. There is a compromise between the number of cohorts studied and the time required to measure long-term effects: I analyse the cohorts entering the labour market over a four-year period (2008-2011), and I have set a time period of ten years. Ten years after entering the labour market is a significant measure because it covers a large part of working life, a period during which the largest part of wage growth over a career generally occurs (Topel and Ward, 1992).

*Average hourly wage.* — I also use measures of average hourly wage as worker-level long term outcomes. The aim of this measure is to capture the average hourly wage that a worker receives between entering the labour market and a decade later. The average hourly wage measure takes the following form:

$$hourly\_wage_i = \frac{\sum_{t=t_0}^{t_0+9} w_{it}}{\sum_{t=t_0}^{t_0+9} h_{it}} \quad (2)$$

where  $w_{it}$  are annual gross wages in constant euros and  $h_{it}$  are the total amount of hours worked during the year  $t$ . This measure is relevant because it takes into account the disparities in working hours between individuals. Using hourly wages makes it easier to compare individuals, particularly between men and women. Given that women are more frequently employed in part-time jobs than men, this measure allows us to neutralise this disparity and compare the impact of the size of the first firm in the long term on workers’ careers.

<sup>4</sup>I do not incorporate a discount rate in my analysis due to the constant euros measures of wages.

<sup>5</sup>I do not consider the whole year, but only the months from the first work experience identified according to my conditions on the labour market. For example, if an individual starts work in June 2009 after a number of student jobs, I only consider the months worked from June 2009 to calculate the lifetime income.

*Last hourly wage.* — I also use the final hourly wages to estimate long-term results at worker level. The aim of this measure is to identify the last hourly wage on the labour market during the period under consideration. The last hourly wage measure takes the following form:

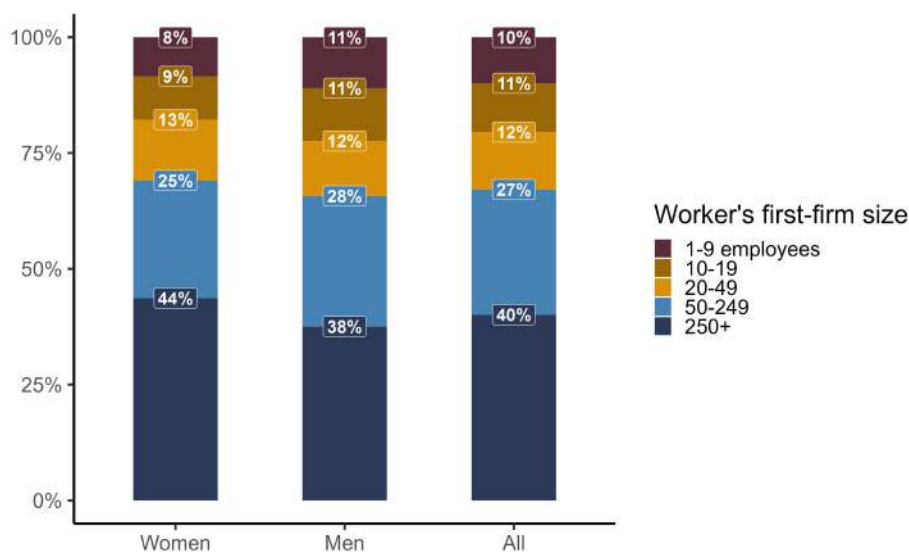
$$last\_hourly\_wage_i = \frac{w_{iT}}{h_{iT}} \quad (3)$$

where  $w_{iT}$  represents gross annual wages in constant euros for work experience ten years after entering the labour market (the last work experience recorded in my sample) and  $h_{iT}$  are the total number of hours worked during this last experience on the labour market  $T$ . This measure offers a more comprehensive comparison between genders and represents a less generalized metric compared to the average hourly wage.

### 3.4 Descriptives facts

*Small and Large Firms in France* — According to INSEE<sup>6</sup>, France has around 6,000 firms with more than 250 employees, representing around 0.18% of all firms. Although their number is relatively small, these firms employ more than 50% of the French workforce on a full-time equivalent basis. In my sample, 27% of workers took their first job with a firm with fewer than 10 employees, while 40% did so with a large firm with more than 250 employees (*Figure 1*).

Figure 1: First-Firm Size by Gender



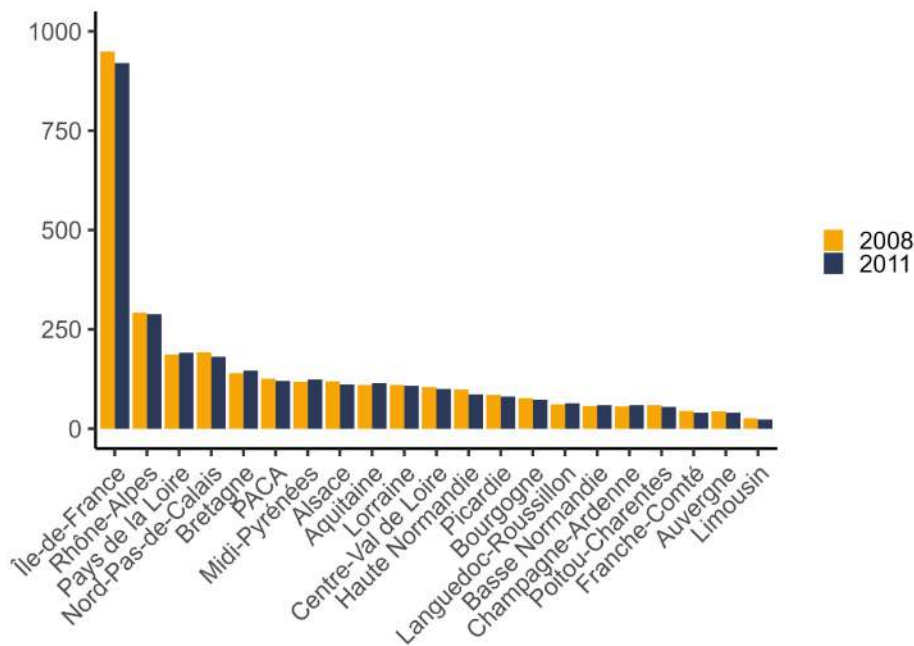
*Note:* The figure shows the firms size where workers start their careers according to their gender in the sample. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.

A closer analysis at regional level reveals a non-uniform distribution of large companies in France (*Figure 2*). Indeed, some regions are characterised by a more important number of large size firms than others: Île-de-France concentrates widely these firms. This pattern is the result of the economic centralisation of France towards the Paris region. Outside the capital, the Rhône-

<sup>6</sup>Tableaux de l'économie française, Édition 2020, INSEE. [Link](#)

Alpes, Pays de la Loire and Nord Pas de Calais regions also have a high concentration of large firms. These regions are known for their strong industrial presence, with the first focusing on the automobile, pharmaceutical and electrical sectors, the second on its maritime and agri-food industries, and the third on automobiles and mass distribution. In the other regions, on the other hand, the number of large firms is quite homogeneous.

Figure 2: Regional Distribution of Large Firms in France in 2008 and 2011



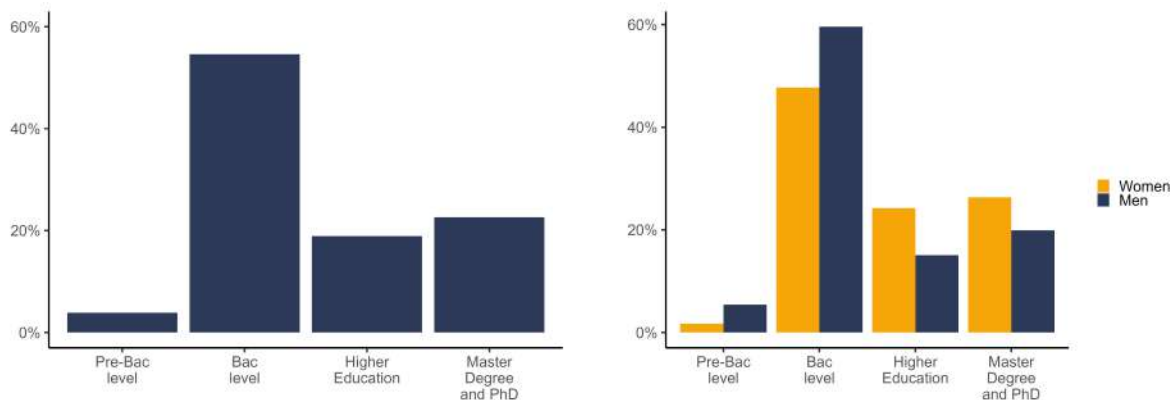
Note: Regional distribution of firms with more than 250 employees in France in 2008 and 2011. The data used are those from FARE (*Statistique structurelle annuelle d'entreprises* issued from the ESANE system) and from the Longitudinal database already described previously in order to use the definition of the firm within the definition of application decree no. 2008-1354 of article 51 of the law on the modernisation of the economy - LME.

*Education* — The distribution of degrees in my sample seems to reflect the general distribution of young individuals who enter the labour market between 2008 and 2011. According to INSEE<sup>7</sup>, in metropolitan France, for the population of young people who finished their initial education between 2005 and 2006, Master's graduates represent 15%, those with a higher education degree account for 26%, baccalaureate graduates represent 41%, while those with less than a baccalaureate account for 18%. In comparison, in my sample there is an over-representation of highly educated individuals, particularly those with a master's or doctorate, and an under-representation of individuals with a level of education below the baccalaureate (*Figure 3*). This disparity could have an impact on my results, as individuals with lower degrees, who start their career in a large firm, may be more sensitive about the long-term impact this might have on their career trajectory (Arellano-Bover, 2024). This is why the consideration of an interaction coefficient between the level of education and the size of the first company is relevant for analysing the heterogeneity effect of the first firm size on career outcomes.

<sup>7</sup>L'état de l'Enseignement supérieur et de la Recherche en France n°10 - Avril 2017, INSEE. [Link](#)

Furthermore, according to the DEPP<sup>8</sup>, women constituted 56.5% of all university students in metropolitan France in 2005-2006. There is a higher proportion of women with high-level degrees, and a lower proportion with lower-level degrees (Baudelot and Establet, 2016; Baker and Drolet, 2010; Blau and Kahn, 2017). In the sample, the distribution of degrees by gender is representative of the INSEE figures (*Figure 3*).

Figure 3: Sample Distribution of Degrees

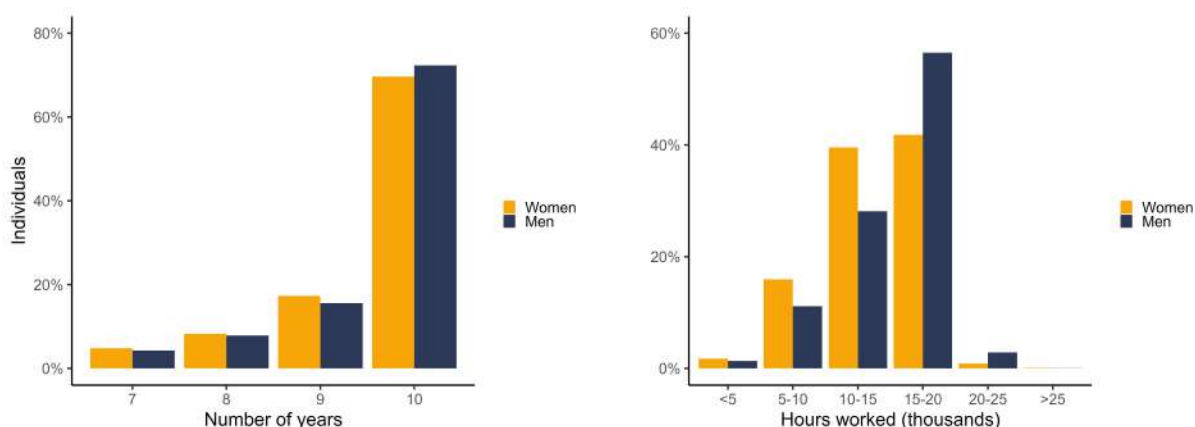


*Note:* The figure shows the distribution of degrees among workers of the studied sample. Sample includes workers born in Metropolitan France who enter in labor market between 2008-2011 and after graduation between the ages of 16 and 40, who have at least 7 years registered in the database between their entry into the labor market and ten years later, who worker's first labor market experience as the equivalent of six full-time months worked during the year following their anticipated graduation, who have their first job in the private sector and do not enter their first job very late (after the age of 22 for pre-baccalaureate and baccalaureate graduates, after the age of 25 for higher education graduates and after the age of 30 for master's and doctorate graduates).

*Years and Hours Worked Reported* — Although the number of years reported by individuals in my sample does not reveal any significant difference between men and women, an in-depth analysis highlights a gender disparity in the number of hours worked over a ten-year period after graduation. On average, women work less hours than men over 10 years, probably as a result of career breaks and more frequent part-time work for women (*Figure 4*). These statistics are consistent with the results of ?, who found that, on average, full-time women aged 25 to 54 work 3 to 4 hours less per week than men. As men working in jobs requiring longer hours also benefit from higher hourly wages (Antonie et al., 2020) and wages are not proportional to hours worked (Goldin, 2014; Erosa et al., 2022), women face career progression challenges in the labour market. Gendered labour market characteristics have a major role in determining wages, employment opportunities and long-term career prospects for women relative to men (van Osch and Schaveling, 2020; Durbin and Tomlinson, 2010; Kleven et al., 2019).

<sup>8</sup>Etudiants inscrits dans les 83 universités publiques françaises en 2005, DEPP. [Link](#)

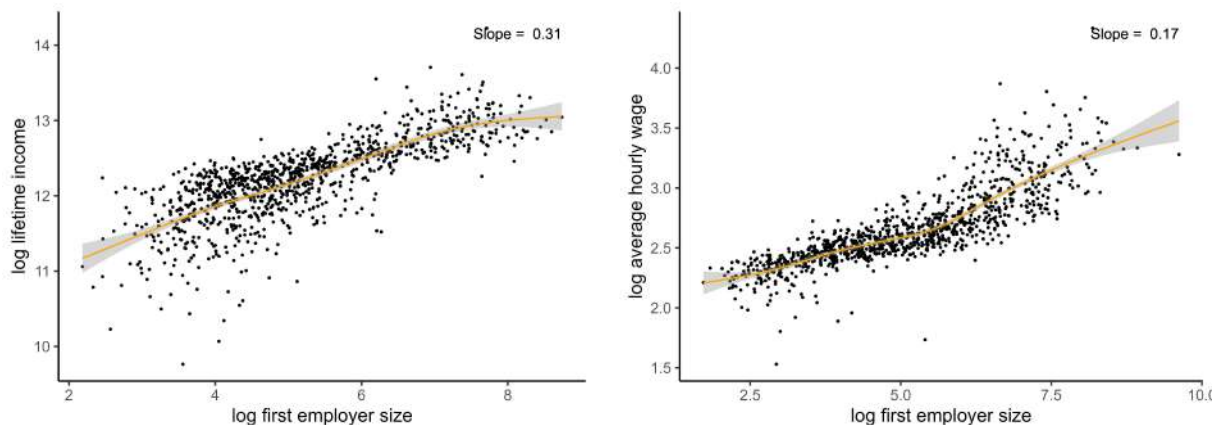
Figure 4: Years/Hours Worked Reported by Gender over 10-Years Post-Graduation



Note: The figure shows the distribution years and hours worked recorded by gender over ten years post-graduation among workers of the studied sample. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.

*First firm size and long term outcomes* — There is an unconditional positive relationship between the size of a worker’s first firm and long-term career outcomes. (Figure 5) plots the unconditional relationship between the lifetime income measure and the first firm size and between the average hourly wage and the first firm size. There are a strong positive relationship between the variables that is linear in logs. The slope coefficient are equal to 0.31 for the lifetime income and around 0.17 for the average hourly wage.

Figure 5: Positive Correlation between Lifetime Income/Average Hourly Wage and First-Firm Size

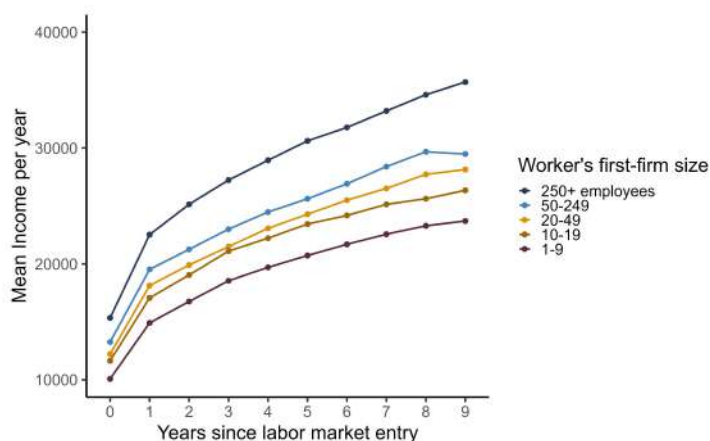


Note: Positive correlation between lifetime income/average hourly wages and first firm size. The figure showed two binned scatter-plot of the conditional expectation of lifetime income/average hourly wage as a function of first firm size. Log lifetime income and log average hourly wage are both on the vertical axis. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.

I also provide evidence on the wages and career paths underlying the lifetime income measure. Figure 6 groups workers into five groups based on the size of their first firm and plots the evolution of average yearly wages since the labor market entry for each of these groups. First-firm size is a good unconditional predictor of subsequent income paths: Incomes profiles for these groups never cross.



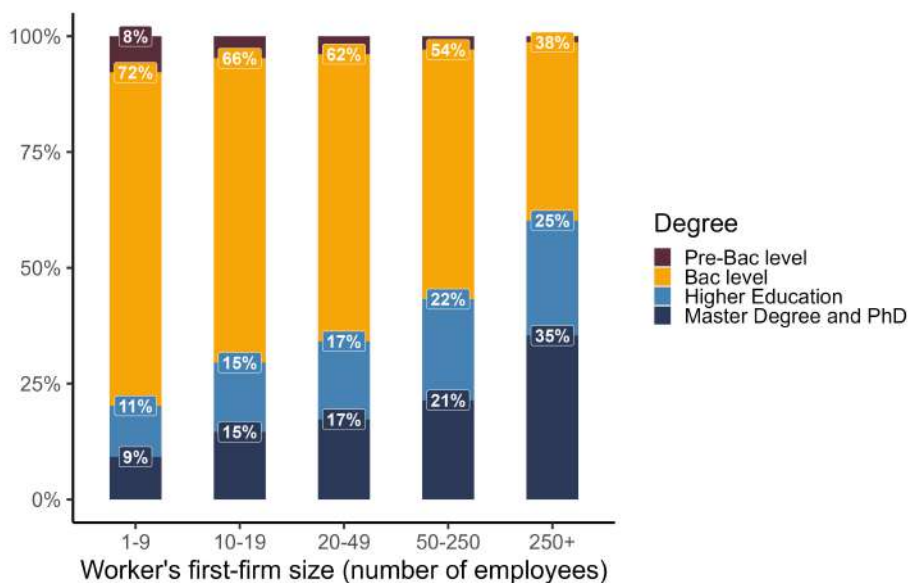
Figure 6: Yearly Income Trajectories by First Firm Size



Note: Yearly income trajectories by first firm size. The figure shows the evolution of average yearly income since labor market entry, categorizing workers on the basis of the size of their first firm. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.

The spread of degrees within firms may explain the large differences in income trajectories according to firm size, as individuals with higher levels of education tend to claim higher wages than those with lower levels of education. Figure 7 illustrates this distribution of degrees for new entrants to the labour market according to firm size. Large firms (more than 250 employees) hire more than 35% of workers with a high level of education (Master or PhD), while this is only 15% for small firms (between 1 and 10 employees).

Figure 7: Education and First-Firm Size



Note: The figure shows the distribution of education levels, categorising workers according to the size of their first firm. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.

## 4 Identification strategy

In this section, I present my empirical strategy and discuss the IV approach that accounts for endogenous sorting of workers and firms.

### 4.1 Estimating Equation

The goal is to estimate the elasticity of a worker’s lifetime income with respect to the size of their first firm. This elasticity is given by  $\beta$  in

$$Y_i = \beta S_{J(i)} + \mu_{educ} + \mu_{birthyear} + \mu_{reg} + \mu_{sex} + \mu_{entry} + \mu_{sect} + u_{dep} + \varepsilon_i \quad (4)$$

where  $Y_i$  is (log) lifetime income for worker  $i$  and  $s_{J(i)}$  is the (log) number of employees of firm  $J$  where  $i$  held their first job. I control for many variables:  $\mu_{educ}$  refers to four educational attainment levels (Pre-Bac level, Bac level, Higher Education, Master and PhD),  $\mu_{sex}$  refers to gender,  $\mu_{birthyear}$  and  $\mu_{reg}$  index respectively birth year and birth region of worker  $i$ . I also control by the year of entering into the firm  $J$  for worker  $i$  ( $\mu_{entry}$ ) and by the sector of activity of the first firm  $J$  of worker  $i$  ( $\mu_{sect}$ ). In order to capture the variation of the business cycle, I additionally include the unemployment rate for the department of firm  $J$ , i.e. the department in which worker  $i$  enters the labour market ( $u_{dep}$ ). I carry out two other similar estimations by substituting lifetime income  $Y_i$  with the average hourly wage  $AH_i$  and the last hourly wage of  $LH_i$  the worker  $i$ . All variation in equation (4) is cross-sectional since each worker has only one first job and one measure of lifetime income.

### 4.2 Endogeneity Issue

OLS estimates of  $\beta$  are likely biased because of unobserved determinants of lifetime income that are plausibly correlated with first firm size. The most important source of endogeneity is the self-selection between young workers and the first firm size. This means that young workers are not randomly sorted into firms of different size (Idson and Feaster, 1990).

Unmeasured skills, such as “ability”, may play an important role in sorting workers into firms of different size as could be seen in *Figure 7*, particularly if worker ability is not equally valued in small and large firms (Garen, 1985). Larger firms may be able to hire more productive young workers who would earn higher wages over their entire career, which means that firms of different sizes adopt different recruitment strategies. Indeed, Arellano-Bover (2021) studies the selection of inexperienced young workers in large firms in 31 countries on the basis of their cognitive skills and formal education. He examines the recruitment practices of large firms to determine whether workers who are more productive from the start are more likely to be hired. His results show that those who get their first job in large firms are generally better educated and more competent. As a result, large firms prefer a more skilled workforce and are better able to pay higher prices for these skills, which increases the lifetime income of young workers in these large firms raising a endogeneity issue.

Similarly, young people who decide to start their career in a large firms may not be a representative sample of all young workers. The distribution of young workers between large and small

firms is influenced by their skills, including their ‘soft skills’, as well as by the remuneration propositions of firms of different sizes. Consequently, those who manage to obtain a position in a large firms may be more active on the labour market, i.e. more active in their job search strategies. The unobserved skills of workers influence the long-term income of young workers; in other words, a worker who is proactive on the labour market can expect, on average, a higher lifetime income raising another endogeneity issue.

Addressing this non-random distribution between young workers and firms of different sizes is essential to understanding the impact of the size of the first firm on the long-term outcomes of young workers. These justify the use of an IV strategy.

### 4.3 **IV motivations and construction**

My IV approach uses variations in the composition of regional labour demand for inexperienced workers across gender, time, and their first sector of activity. The goal of the IV is to aggregate variation resulting from large-firms hiring shocks across years and regions. Although my approach is similar to that of [Arellano-Bover \(2024\)](#), there are some notable differences in methodology. In particular, I incorporate the first sector of activity, the actual year of entry into the labour market and gender to establish the fluctuation in the composition of labour demand faced by young workers. This variation in the composition of labour demand implies that young workers entering the job market at different times, in different locations, and within different sectors, will be exposed to different propensities to join larger or smaller firms. The variation in this index should reflect the extent to which labour demand for inexperienced workers comes from large rather than small firms. This index will function as an IV, used to predict the size of a worker’s first firm.

My instrument incorporates gender into the variation in the composition of regional labour demand because gender segmentation in the labour market exists, is important and is likely to matter. Because men and women tend to cluster in different industries and occupations, labour demand may disproportionately favour men or women depending on which industries are growing fastest ([Olivetti and Petrongolo, 2014](#)). Given that women are less likely than men to move away from their families ([Costa and Kahn, 2000](#)) and more likely to interrupt their careers when they marry and have children ([Goldin et al., 2017](#)), women’s participation in the labour market differs from men’s, which means that the dynamics of the labour market can vary according to gender.

My instrument resolves the endogeneity issue by using the regional average composition variation of workers with similar characteristics. For each group of workers sharing similar characteristics, I assign them a value in the index corresponding to the average firm size in which they enter the labour market. By using this average according to the characteristics of the workers, I can bypass the problem of the importance of soft skills, which I do not observe in my data. I assume that in each group of workers sharing similar characteristics such as gender, years of entry into the labour market, region and sector of activity of entry, some of them will have more developed soft skills enabling them to join a large firm, while others will have a weaker endowment of these soft skills. For the same reasons, this instrument also allows me to solve the endogeneity problem linked to the different strategies used by firms of different sizes to choose their employees. Finally,

by using [Arellano-Bover \(2024\)](#)'s modified instrument in my paper, it allows me to address the endogeneity problem that I experience with a simple OLS analysis.

In practice, I use the information on young workers' hires and their first firms observed in DADS EDP data to construct the IV. Let the IV for worker  $i$  be denoted  $l_i$ . In order to capture the labor demand composition worker  $i$  faces,  $l_i$  is equal to the (log) average first firm size of  $i$ 's relevant peers : workers who have the same gender and educational level as  $i$ , are entering their first job in  $i$ 's region of birth, and are entering in the same sector of activity and the same year in the labor market as  $i$ . More precisely, consider a worker  $i$  with gender  $s_i$ , education  $e_i$ , region of birth  $r_i$ , entering labor market year  $y_i$ , first sector of activity  $sect_i$ . Let  $w_i$  be the region where their first job is located. Subscript  $j = 1, \dots, N$  indexes workers in my sample, and  $\mathbb{1}\{\cdot\}$  is the indicator function. The IV approach predicts workers  $i$ 's (log) first firm size,  $S_{J(i)}$ , with

$$l_i = \ln \left( \frac{\sum_{j \neq i} \exp(S_{J(i)}) \cdot \mathbb{1}\{s_j = s_i, e_j = e_i, w_j = r_i, sect_j = sect_i, y_j = y_i\}}{\sum_{j \neq i} \mathbb{1}\{s_j = s_i, e_j = e_i, w_j = r_i, sect_j = sect_i, y_j = y_i\}} \right) \quad (5)$$

Equation (5) illustrates the fact that I follow a leave-one-out approach ([Arellano-Bover, 2024](#)). That is, if worker  $i$  got their first job in their region of birth, I exclude them from the calculation of  $l_i$ .

#### 4.4 IV discussion

*Instrument Relevance* — My instrument uses variations in the composition of regional labor demand for inexperienced workers across gender, education, time, and their initial sector of activity, with the exception of the leave-one-out component, following the structure of the Bartik approach ([Arellano-Bover, 2024](#); [Goldsmith-Pinkham et al., 2020](#)). I construct a synthetic measure of labor demand size for each group of workers with similar characteristics. Therefore, my instrument is strongly correlated with the size of the first firm (the endogenous variable): The F-statistics of the first stage of my regressions are approximately 172 ([Table 2](#)), indicating a robust and relevant IV. Furthermore, as previously demonstrated, my instrument is not affected by endogeneity because within each group with similar characteristics, there are workers with varying soft skills, and firms may adopt different hiring strategies.

*Instrument Exclusion Assumption* — My instrument affects the lifetime income (dependent variable) only through the first firm size (endogenous variable) when controlling for other factors. The IV exclusion assumption is based on the absence of an unobservable component within each group of workers with similar characteristics, which affects lifetime outcomes ( $Y_i$ ) and is correlated with the large-firm hiring shocks captured by the IV. What would constitute a violation of the IV exclusion assumption ?

A possibility is that I can't observe workers' motivation to pursue education in my sample. In this way, workers could adapt their educational investment according to the composition of labour demand in their future region of employment. A worker who is not inclined to pursue long studies, but who considers that this is the only way to access positions of responsibility

and high wages, could shorten their studies if the setting up of a firm in their sector of activity offers similar career opportunities with a lower level of education. This behaviour could have an impact on the size of the first firm as well as on the worker's long-term income. However, this scenario is rare.

More broadly, to construct and assign instruments to workers, as well as for control aims in my identification strategy, I use variables such as level of education, sector of activity and year of entry into the labour market. Unlike gender or region of birth, these variables are not predetermined. Consequently, there is a risk of potential endogenous responses in educational investment decisions (such as the level of education and chosen sector of activity) to the large-firm demand shocks that the instrumental variables leverage. The risk of endogeneity of the non-predetermined variables in my model gives rise to a justified concern. This concern arises because I employ these variables in constructing my instrument, thereby making the predictor of labour demand specific to each education group, first year of entry in the labor market and initial sector of activity. However, this concern is not evident in the data. No clear link can be observed between changes in worker investment behaviour and my instrument. The paper by [Arellano-Bover \(2024\)](#), on which the construction of my instrument is based, explores this question in more detail and does not reveal any direct link between the changes in investment behaviour in education that the IV could have captured.

Another possibility is that idiosyncratic shocks from large firm, captured by the instrument, could change the economic landscape of a region. A positive would lead to an increase in the total workforce employed in these large firm, as well as higher incomes for the workers employed. For example, the expansion of a plant by a large industrial firm in a given region could change the composition of demand for labour (captured by the IV), as well as the opportunities offered to workers with characteristics compatible with the positions available. This would result in an increase in their income and a change in their career path. To control for the effect of idiosyncratic shocks from large firms on the composition of the labour market, I take into account the unemployment rate in each worker's region of work ([Arellano-Bover, 2024](#)). This allows me to consider possible idiosyncratic shocks from large firms while simultaneously incorporating the economic trend of the region, particularly given the period observed, which is in the post-crisis period.

## 5 Results

### 5.1 Lifetime Income Results

Table 2 shows OLS, first-stage, and IV two-stage least squares (TSLS) results of estimating  $\beta$  in equation (5) using the proposed IV approach. I cluster standard errors at the first hourly wage since this is the level at which workers begin their career in the labor market (Abadie et al., 2023). Column 4 shows first-stage results. The instrument performs well in predicting the size of the first job, as indicated by an F statistic of 172. Columns 1 and 5 show, respectively the OLS and IV elasticities of lifetime income with respect to first firm size. The OLS elasticity estimate is 0.012. The IV-TSLS estimate is significantly larger and equal to 0.098. This elasticity implies that matching with a 10% larger first firm leads to 0.98% higher lifetime income. In columns 2 and 6, I observe the OLS and IV elasticities of the average hourly wage with respect to the size of the first firm. The OLS elasticity estimate remains at 0.012, while the IV-TSLS estimate increases significantly to 0.077. This elasticity implies that matching with a 10% larger first firm leads to 0.77% higher average hourly wage. Columns 3 and 7 present the OLS and IV-TSLS elasticities, respectively, regarding the last hourly wage with respect to the size of the first firm. While the OLS elasticity estimate stands at 0.008, the IV-TSLS estimate significantly rises to 0.051. This elasticity implies that matching with a 10% larger first firm leads to 0.51% higher last hourly wage. The persistence of this effect of the size of the first firm may be explained by the better opportunities for skills development offered by large firms, where young workers can acquire more useful skills, learning from better peers and managers, or working in more productive environment (Arellano-Bover, 2021; Arellano-Bover and Saltiel, 2024).

Furthermore, the IV estimate is about eight times higher than the OLS estimate. Although this disparity may not correspond to what a simple unobserved ability/motivation bias would predict, the difference between IV and OLS is consistent with the idea that the effect of the size of the first employer varies between workers, and is greater for those whose size of first firm is more sensitive to the labour demand instrument. In other words, some workers benefit more than others from having their first job in a large firm, and they represent the group of workers complying with the IV. So, who are these compliers, given the nature of the IV ? The geographical dimension of the instrument, using region of birth, suggests that workers who change region for their first job are less apt to be compliers (the most motivated workers are most likely to move to another region to find a job that matches their requirements). Overall, it seems that those with a lower wage-earning potential are more influenced by the variation in the composition of demand used by the IV, and may therefore benefit more from employment in large firms (Arellano-Bover, 2024). A potential explanation for the larger estimates from IV is that lower-skilled workers benefit more in the long run from a larger first firm (Bonhomme et al., 2019). It is also noted that an unobserved ability bias, whereby the most productive workers tend to work for large firms, could also influence the IV estimates.

Table 2: Career Outcomes and First-Firm Size

	OLS			First Stage First-Firm Size	IV-TSLS		
	Lifetime Income	Average Hourly Wage	Last hourly Wage		Lifetime Income	Average Hourly Wage	Last Hourly Wage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
First-Firm Size	.0119*** (.0013)	.0115*** (.0009)	.0083*** (.0009)		.0975*** (.0216)	.0771*** (.0170)	.0512** (.0207)
Instrument				.0579*** (.0109)			
F-statistic				171.9			
Observations	23,061	23,061	23,061	23,061	23,061	23,061	23,061
R <sup>2</sup>	.44785	.60943	.37825	.33140	.24962	.28342	.29391

Notes: All variables enter regressions in logs. The table shows OLS and IV-TSLS estimates of the elasticity of different long-term outcomes with respect to first-firm size. Columns 1-3 presents OLS estimates, while Column 4 presents the first stage of the instrumental variable. Columns 5-7 depict IV-TSLS estimates, instrumenting for first-firm size using the labor demand composition index. The regressions are conducted at the worker level, controlling for fixed effects related to four levels of educational attainment, birth cohort, birth region, gender, year of entry into the labor market, initial sector of activity, and the unemployment rate in the region of first employment. Standard errors (in parentheses) are clustered at the level of the first hourly wage. Signif. Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

## 5.2 Lifetime Income and Gender Results

The impact of the size of the first firm on the careers of young graduates can be differentiated according to gender. Arora et al. (2021) highlight the differentiated effects of first jobs on the career paths of men and women. To understand how firm size affects the career paths of men and women differently, it is relevant to test the interaction between firm size and gender in the analysis (Table 3).

The results indicate that the impact of gender on firm size on lifetime income is not statistically significant. In this subsection, I look at the results for average hourly wages. More specifically, for women, a 10% increase in the size of the first firm is associated with a significant 0.7% increase in average hourly wages. The coefficient for the interaction term represents the difference in the effect of the size of the first firm on lifetime income between men and women. For men, a 10% increase in the size of the first firm is associated with a 0.8%<sup>9</sup> increase in average hourly wages. In other words, the impact of the size of the first firm on average hourly wages is around 1.15 times greater for men than for women.

This result can be explained by the fact that in my sample I do not observe the job responsibilities of workers. However, whatever the size of the firm, there is a sorting between men and women on the labour market in terms of responsibilities. Men reach positions of responsibility more

<sup>9</sup>0.0704 + 0.0143 = 0.0847



quickly and more frequently than women (Blau and Kahn, 2017; Haegele, 2024), while women are more often in service positions that are not valued in the promotion process (Babcock et al., 2017). As jobs with responsibility are generally associated with higher wages, this leads, in the long term, to higher average hourly wages. The difference in the effect of the size of the first firm on long-term earnings for men and women can be explained by this difference in responsibility, which is stronger in larger firms than in smaller ones (Jones and Kaya, 2023). In addition, large firms tend to pay more for positions of responsibility than small firms (Fox, 2009).

Table 3: Career Outcomes and First-Firm Size by Gender

	IV-TSLS		
	Lifetime Income (1)	Average Hourly Wage (2)	Last Hourly Wage (3)
First-Firm Size	.0984*** (.0246)	.0704*** (.0193)	.0434 (.0268)
Gender (Men = 1)	.2309*** (.0136)	.0244 (.0145)	.0475** (.0182)
First-Firm Size x Gender	-.0019 (.0024)	.0143*** (.0024)	.0166*** (.0030)
Observations	23,061	23,061	23,061
R <sup>2</sup>	.44437	.60135	.37632

*Notes: All variables enter regressions in logs. The reference gender is Women. The table shows IV-TSLS estimates of the elasticity of different long-term outcomes with respect to first-firm size and gender instrumenting for first-firm size using the labor demand composition index. The regressions are conducted at the worker level, controlling for fixed effects related to four levels of educational attainment, birth cohort, birth region, gender, year of entry into the labor market, initial sector of activity, and the unemployment rate in the region of first employment. Standard errors (in parentheses) are clustered at the level of the first hourly wage. Signif. Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1*

### 5.3 Lifetime Income and Education Results

The effect of the size of the first employer on the careers of young graduates can vary according to their level of education. For example, workers with lower levels of education hired by large firms for their first job may experience faster and more significant income growth than those working in smaller firms. This can be explained by the opportunities for internal training and mobility offered by large firms, as well as by their ability to offer diversified career prospects within the firm. Table 4 confirms this argument, for Pre-Bac level graduates, a 10% increase in the size of the first firm is associated with a 1.5% increase in lifetime income. The impact of the size of the first firm on long-term earnings decreases with the level of qualification: a 10% increase in the size of the first firm is associated with an increase of 0.9% for baccalaureate graduates and above (Higher Education, Master and PhD). In other words, the effect of the size of the first firm is around 1.6 times greater for workers with a Pre-Bac level of education than for those with a



higher level of education. This could be because workers with a Pre-Bac level of education have poorer alternative options, find it harder to leave a first job, or make better use of the skills development opportunities offered by larger firms (Finamor, 2022). I also carried out an analysis including the interaction between education, gender and firm size (see Appendix, Table 15).

Table 4: Career Outcomes and First-Firm Size by Education

	IV-TSLS		
	Lifetime Income (1)	Average Hourly Wage (2)	Last Hourly Wage (3)
Bac Level	.4738*** (.0295)	.0702*** (.0184)	.0266 (.0203)
Higher Education	.5498*** (.0473)	.1144*** (.0358)	.1279*** (.0397)
Master and PhD	.6416*** (.0774)	.2115*** (.0606)	.2488*** (.0729)
First-Firm Size	.1520*** (.0266)	.0867*** (.0219)	.0456 (.0268)
First-Firm Size x Bac Level	-.0571*** (.0069)	-.0087 (.0060)	.0076 (.0047)
First-Firm Size x Higher Education	-.0604*** (.0049)	-.0124** (.0055)	0.0054 (.0069)
First-Firm Size x Master and PhD	-.0573*** (.0074)	-.0060 (.0072)	.0154* (.0083)
Observations	23,061	23,061	23,061
R <sup>2</sup>	.44491	.60013	0.37541

*Notes: All variables enter regressions in logs. The reference education degree is Pre-Bac Level. The table shows IV-TSLS estimates of the elasticity of different long-term outcomes with respect to first-firm size and educational degree, instrumenting for first-firm size using the labor demand composition index. The regressions are conducted at the worker level, controlling for fixed effects related to four levels of educational attainment, birth cohort, birth region, gender, year of entry into the labor market, initial sector of activity, and the unemployment rate in the region of first employment. Standard errors (in parentheses) are clustered at the level of the first hourly wage. Signif. Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1*

## 5.4 Lifetime Income, Gender and Number of Children

I have shown that the impact of the size of the first employer on the career path of young graduates varies according to gender. It is also interesting to examine the interaction between the size of the first employer and the number of children during the first 10 years on the labour market in order to assess whether large companies are better at integrating maternity than smaller ones. Indeed, the birth of children plays a crucial role in the careers of young workers, particularly young women workers. Miller (2011) shows that the timing of motherhood can also have a significant impact on women's career paths. She finds that a delay in motherhood leads to a substantial increase in wages and working hours, particularly for women with university degrees and professional or managerial positions. Casarico and Lattanzio (2023) explore the individual-level, firm-level, and cultural factors that influence the size of child penalties and find that the child penalty is larger in small firms with less generous pay and worse peers, and in

more gender-conservative regions.

Table 5 shows that the effect of having children on long-term income varies according to the size of the first firm. The number of children has a negative effect on women's lifetime income (-0.01316), but this effect is mitigated by the size of the first firm (0.0052). Thus, the effect of the number of children on lifetime incomes is mitigated by large firms. This is consistent with the fact that large firms generally offer more flexibility to women after the birth of a child: adapted working hours, teleworking, childcare support, extra days off for sick children, and well-paid maternity leave.

However, it is important to note that the effect of the number of children on lifetime income for men is not negative, but positive. Men are not subject to any penalty associated with children and, on the contrary, are positively affected by the birth of a child on the labour market. This can be explained by the fact that men with children are often perceived as responsible and stable, while women are not. For example, they are less likely to have career breaks to take paternity leave, and the mental pressure associated with children generally falls more on women.

Table 5: Career Outcomes and First-Firm Size by Gender and Number of Children

	Lifetime Income		
	All Sample (1)	Women (2)	Men (3)
Number of Children	-.0211** (.0091)	-.1316*** (.0203)	.0443*** (.0115)
First-Firm Size	.2051*** (.0163)	.2049*** (.0210)	.1928*** (.0163)
First-Firm Size x Number of Children	.0052*** (.0017)	.0115*** (.0032)	.0040* (.0022)
Observations	23,061	9,650	13,411
R <sup>2</sup>	.43574	.45856	.44133

*Notes: All variables enter regressions in logs. The table presents IV-TSLS estimates of the elasticity of lifetime income in relation to the size of the first firm and the number of children during the first 10 years in the labor market, instrumenting for first-firm size using the labor demand composition index. The regressions are conducted at the worker level, controlling for fixed effects related to four levels of educational attainment, birth cohort, birth region, gender, year of entry into the labor market, initial sector of activity, and the unemployment rate in the region of first employment. Standard errors (in parentheses) are clustered at the level of the first hourly wage. Signif. Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1*

## 6 Robustness Checks

The IV elasticity of lifetime income with respect to first-employer size is robust to a variety of alternative specifications.

### 6.1 Adding control variables

To confirm the robustness of my model, I added control variables to confirm the effect of the size of the first firm on lifetime income. I chose to include the number of different employers over the ten-year period, the presence of children, the socio-professional categories of the parents, and the share of permanent contract over 10 years after the labor market entry (*Table 6*).

Changing employers during a career is often correlated with better lifetime income, particularly for young graduates (Neal, 1999). Topel and Ward (1992) used a database of Australian workers between 1957 and 1972 and revealed that, during the first ten years on the labour market, a worker will occupy seven jobs, or about two-thirds of his or her total career. Wage evolution plays a key role in this transition to stable employment, with wage gains from job changes representing at least a third of early career wage growth, and wages being the main determinant of job change decisions among young workers. Thus, changing employer is associated with significant advantages in terms of career and wage growths for young graduates.

In addition, the study conducted by Miller (2011) shows that the timing of motherhood can also have a significant impact on women’s career paths. A delay in motherhood leads to a substantial increase in wages and working hours, particularly for women with university degrees and professional or managerial positions. Consequently, it is also interesting to include the children variable in the robustness analysis to assess how parenthood influences the relationship between firm size and the careers of young graduates.

In my analysis of the impact of the choice of first firm on the lifetime income of young graduates, it is important to recognize that this choice may be influenced by parental employment, introducing a potential bias in our estimates. In his study of inter-generational mobility in the United States among graduates between 2000 and 2013, Staiger (2021) points out that before the age of 30, almost a third of workers work for their parents’ employer, suggesting that family networks have a significant influence on career paths. Moreover, he estimates that this connection with a parent’s employer can increase initial earnings by 19 per cent. This effect could therefore be an obstacle to an precise estimate of the impact of the first firm on long-term earnings. To control for this potential effect, I will take into account the socio-professional category (SPC) of the parents of young graduates in my analysis. By incorporating this variable into our model, I can limit the effect of parental influence on the choice of first firm and isolate more precisely the effect of the first firm on the wage trajectory of young graduates.

Furthermore, fixed-term employment contracts have a significant impact on the career paths of young graduates. Initially, these contracts offer a quick opportunity to enter the labour market and get a first job. However, in the long term, short-term contracts can have a negative impact on wage growth and, more generally, on career path development (García-Pérez et al., 2019).

This is why I choose to include the share of permanent contracts over a period of 10 years after graduation in my regression.

Table 6 shows that with the integration of these relevant control variables into the analysis, the elasticities of lifetime income in relation to the size of the first firm remain significant and decrease very slightly: the IV estimate is 0.0975 for model (1), compared with 0.0758 for model (6), which includes all the control variables mentioned above.

Table 6: Lifetime Income and First-Firm Size : Adding control variables

	Lifetime income					
	(1)	(2)	(3)	(4)	(5)	(6)
First-Firm Size	.0975*** (.0216)	.0975*** (.0216)	.0957*** (.0217)	.0936* (.0345)	.0822** (.0210)	.0758* (.0310)
<i>Control Variables</i>						
Education Degree	x	x	x	x	x	x
Birth Year	x	x	x	x	x	x
Birth Region	x	x	x	x	x	x
Gender	x	x	x	x	x	x
Year of entry in the Labor Market	x	x	x	x	x	x
Initial Sector of activity	x	x	x	x	x	x
Unemployment rate of first-firm region	x	x	x	x	x	x
Number of employers during 10 years		x				x
Children			x			x
Mother's SPC				x		x
Father's SPC				x		x
Permanent Contract					x	x
Observations	23,061	23,061	23,061	12,412	20,906	11,236
R <sup>2</sup>	0.24962	0.24962	0.25928	0.20129	0.41984	0.40502

Notes: All variables enter regressions in logs. The table shows the second stage of the IV-TSLS estimates of the elasticity of lifetime income with respect to first-firm size. Lifetime income is defined as the total sum of labour gross wages accumulated after education over a 10-year period. The regressions are conducted at the worker level, controlling for fixed effects related to four levels of educational attainment, birth cohort, birth region, gender, year of entry into the labor market, initial sector of activity, and the unemployment rate in the region of first employment, number of employers during 10 years, children, mother and father's Socio-Professional Category. Standard errors (in parentheses) are clustered at the level of the first hourly wage. Signif. Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

## 6.2 Considering Net Income

While the main results so far use gross salaries, net wages are more directly relevant for the workers themselves. Net wages represent the amount actually received in the employee's Bank account after social security contributions, such as pension contributions, health insurance, unemployment insurance, etc., have been deducted, but before income tax, which in turn depends on additional dimension in France, such as household composition. I have therefore repeated the main analysis but taking net wages into account instead (Table 7).

The results presented in Table 7 indicate that the effect of the size of the first firm on lifetime income is not statistically significant in the second stage of the regression. However, the results

remain significant and positive for average hourly wages: An increase of 10% of the first firm size is associated with an increase of 0.9% of net average hourly wage. The loss of significance for lifetime income can be explained by considering net wages, which correspond to wages after deduction of social contributions, and by taking into account the fact that the difference between gross and net wages increases with wages (see appendix *Figure 13* and *Figure 14*).

Table 7: Career Outcomes and First-Firm Size : Net Income

	OLS		First stage First-Firm Size (3)	IV-TSLS	
	Net Lifetime Income (1)	Net Average Hourly Wage (2)		Net Lifetime Income (4)	Net Average Hourly Wage (5)
First-Firm Size	.0084* (.0041)	.0189*** (.0023)		.0552 (.0404)	.0881*** (.0256)
Instrument			.0579*** (.0109)		
Observations	23,061	23,061	23,061	23,061	23,061
R <sup>2</sup>	.27169	.40196	.33140	.24498	0.22502

*Notes: All variables enter regressions in logs. The table shows OLS and IV-TSLS estimates of the elasticity of different long-term outcomes with respect to first-firm size. Columns 1-2 presents OLS estimates, while Column 3 presents the first stage of the instrumental variable. Columns 5-6 depict IV-TSLS estimates, instrumenting for first-firm size using the labor demand composition index. In columns 1 and 4, net lifetime income is defined as the total sum of labour net wages accumulated after education over a 10-year period. Columns 2 and 5, net average hourly wage is defined as the mean hourly net wage over a 10-year period following graduation. In Columns 3 and 6, net last hourly wage corresponds to the hourly net wage earned in the final job completed within the sample. The regressions are conducted at the worker level, controlling for fixed effects related to four levels of educational attainment, birth cohort, birth region, gender, year of entry into the labor market, initial sector of activity, and the unemployment rate in the region of first employment. Standard errors (in parentheses) are clustered at the level of the first hourly wage. Signif. Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1*

### 6.3 Considering Legal Unit as Firm

In my analysis, I have adopted an approach in which the firm is considered as a profiled entity. For a set of legal units to constitute a firm, it must have the capacity to make its own decisions, form an economically coherent entity and its activity must be primarily market-oriented rather than service-oriented within the group. I have taken into account the fact that considering the firm as a simple legal unit may distort the economic environment in which the employee works. I conduct an analysis of the size of the first legal unit in which the employee started their career after graduation (*Table 8*).

The use of the legal unit rather than the firm is relevant because of the potential variations in organisational structure. In sectors such as ready-to-wear, firms are often composed of several

legal units, covering aspects such as production and distribution across different establishments. By contrast, in manufacturing industries, a single large legal unit may dominate the organisational structure. These differences in company structure by sector can influence my results. For example, firms with a network of legal units may have greater variety in management practices and career opportunities, which could translate into different results compared to firms with a more centralised structure, such as those in the manufacturing industry. However, since the sector of activity is taken into account as a control variable, differences between firms and legal units are, to some extent, already taken into account. This may explain why the difference in results observed is not as large.

The results show that the effect of the size of the first legal unit on long-term income is positive and significant, thus corroborating the main analysis: An increase of 10% of the first firm size is associated with an increase of 0.8% of lifetime income and average hourly wage.

Table 8: Career Outcomes and First-Legal Unit Size

	OLS			First Stage First-LU Size	IV-TSLS		
	Lifetime Income	Average Hourly Wage	Last hourly Wage		Lifetime Income	Average Hourly Wage	Last Hourly Wage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
First-LU Size	.0121*** (.0016)	.0127*** (.0010)	.0083*** (.0011)		.0763*** (.0248)	.0751*** (.0167)	.0479* (.0246)
Instrument				.0663*** (.0106)			
Observations	23,047	23,047	23,047	23,047	23,047	23,047	23,047
R <sup>2</sup>	.44896	.60934	.37723	.32564	.36928	.40003	.32624

*Notes: All variables enter regressions in logs. The table shows OLS and IV-TSLS estimates of the elasticity of different long-term outcomes with respect to first-legal unit size. Columns 1-3 presents OLS estimates, while Column 4 presents the first stage of the instrumental variable. Columns 5-7 depict IV-TSLS estimates, instrumenting for first-legal unit size using the labor demand composition index. In columns 1 and 5, lifetime income is defined as the total sum of labour gross wages accumulated after education over a 10-year period. Columns 2 and 6, average hourly wage is defined as the mean hourly gross wage over a 10-year period following graduation. In Columns 3 and 7, the last hourly wage corresponds to the hourly gross wage earned in the final job completed within the sample. The regressions are conducted at the worker level, controlling for fixed effects related to four levels of educational attainment, birth cohort, birth region, gender, year of entry into the labor market, initial sector of activity, and the unemployment rate in the region of first employment. Standard errors (in parentheses) are clustered at the level of the first hourly wage. Signif. Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1*

## 7 Conclusion

This paper offers new insights on the interaction between the characteristics of the first firm and the long-term career trajectories of young workers in France.

The results highlight the crucial role of the first firm of employment in determining the career prospects of young workers. Starting one's career in a large firm has a significant positive effect on lifetime income, highlighting the potential benefits of exposure to larger organisational structures associated with higher levels of education and more advanced managerial practices. This suggests that large firms offer unique opportunities for skills development, career progression and long-term economic stability, particularly for lower-skilled workers who could benefit most from these environments. Moreover, the analysis of gender disparities in the effect of firm size on long-term income reveals that women benefit less from the effect of first firm size on average hourly wages over 10 years. Nevertheless, the mitigating effect of large firms on the negative impact of family responsibilities (children) on long-term income sheds light on the policies and organisational practices of large firms to address gender-related inequalities associated with childbirth and to support women's professional careers.

It is important to note the limitations of this paper. One notable limitation is the failure to capture exogenous increases in firm size, notably the development of the first firm in which a worker begins their career. Also, while this study focuses on the impact of the first employer on long-term career outcomes, future research could explore the role of subsequent job transitions in shaping individuals' long-term career trajectories.

In summary, this paper makes a contribution to the existing literature by showing the dynamic effects of first jobs by firm size heterogeneity on career outcomes and highlighting variations by gender, education and family composition.

## A Appendix

### A.1 Sample Selection

Table 9: Sample Selection Filters

	Obs	Gender (Men%)	Pre-Bac Level	Bac Level	Higher Education	Master and PhD
No filter	103706	0.50	0.11	0.51	0.17	0.21
Consistent Gender	103534	0.50	0.11	0.51	0.17	0.21
Labor market entry: 2008-2011	94794	0.49	0.08	0.50	0.19	0.22
Birth dep: Metro. France	92159	0.50	0.11	0.52	0.18	0.20
Age filters	84695	0.50	0.11	0.50	0.18	0.21
Wages and Hours worked reported	84452	0.50	0.11	0.50	0.18	0.21
First-Firm : min. 6 months full-time	39481	0.54	0.05	0.48	0.21	0.27
First-Firm: Private	33711	0.57	0.06	0.51	0.20	0.24
First-Firm's dep: Metro. France	33564	0.57	0.06	0.51	0.20	0.24
First year meets above conditions	33518	0.57	0.06	0.51	0.20	0.24
At least 7 distinct years reported	30175	0.57	0.05	0.51	0.20	0.24
First-Firm size reported	26897	0.57	0.05	0.50	0.20	0.25
The instrument returns a value	23061	0.58	0.04	0.55	0.19	0.23

*Notes: This table shows the different filters used to select the sample. Each filter shows, by order, the number of individuals, the share of men, and the share of individuals with a Pre-Bac level, a Bac level, a Higher Education and Master and PhD.*

### A.2 Descriptive Statistics

#### A.2.1 First Firm Size

Table 10: First-Firm Size Composition of the Sample

	Firms	Total Firms	Share
250+ employees	2509	15721	0.16
50-250 employees	2538	15721	0.16
20-49 employees	2331	15721	0.15
10-19 employees	2237	15721	0.14
1-9 employees	6170	15721	0.39

*Notes: The table shows summary statistics by first-firm size: Number of firms by size, total number of firms and the share of each firm-size in the sample. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.*



Table 11: Education Distribution across First-Firm Size

	Workers	Education Share	Gender Rate (Men%)
<i>1-9 employees</i>			
Pre-Bac level	487	0.08	0.83
Bac level	4485	0.72	0.63
Higher Education	686	0.11	0.44
Master Degree and PhD	573	0.09	0.46
<i>10-19 employees</i>			
Pre-Bac level	109	0.05	0.84
Bac level	1505	0.66	0.70
Higher Education	343	0.15	0.46
Master Degree and PhD	334	0.15	0.49
<i>20-49 employees</i>			
Pre-Bac level	94	0.04	0.83
Bac level	1506	0.66	0.69
Higher Education	410	0.17	0.50
Master Degree and PhD	420	0.17	0.49
<i>50-250 employees</i>			
Pre-Bac level	83	0.03	0.73
Bac level	1541	0.54	0.60
Higher Education	625	0.22	0.48
Master Degree and PhD	613	0.21	0.51
<i>250+ employees</i>			
Pre-Bac level	121	0.01	0.79
Bac level	3558	0.38	0.60
Higher Education	2295	0.25	0.46
Master Degree and PhD	3273	0.35	0.53

*Notes: The table presents summary statistics for the first-firm size by gender and educational degree: Number of workers, share of educational degree and gender rate by first-firm size in the sample. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.*

## A.2.2 First Sector of Activity

Table 12: First-Firm Size Distribution by Sector of Activity

Number of Employees	1-9	10-19	20-49	50-250	250+
Wholesale and retail trade	0.27	0.10	0.09	0.14	0.40
Construction	0.41	0.16	0.16	0.09	0.18
Accommodation and food services	0.37	0.12	0.13	0.17	0.21
Legal, accounting, management, architecture, engineering activities	0.21	0.12	0.13	0.14	0.39
Administrative and support services	0.11	0.06	0.09	0.09	0.65
Manufacture of food products	0.50	0.15	0.10	0.07	0.19
Financial and insurance activities	0.06	0.03	0.02	0.06	0.84
Transportation and storage	0.05	0.04	0.08	0.09	0.75
Other service activities	0.76	0.08	0.05	0.05	0.06

*Notes: The table shows first-firm size distribution by sector of activity. I have only included the 10 most represented sectors in the sample. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.*

Table 13: Educational Degree Distribution by Sector of Activity

	Pre- Bac level	Bac level	Higher Educa- tion	Master Degree and PhD	Gender Rate (Men%)	Sector of Activity Rate
Wholesale and retail trade	0.22	0.30	0.32	0.19	0.51	0.28
Construction	0.38	0.21	0.07	0.05	0.95	0.16
Accommodation and food services	0.19	0.13	0.05	0.02	0.48	0.09
Legal, accounting, management, architecture, engineering activities	0.00	0.01	0.09	0.22	0.50	0.07
Administrative and support services	0.04	0.07	0.10	0.06	0.61	0.07
Manufacture of food products	0.11	0.07	0.02	0.02	0.61	0.05
Financial and insurance activities	0.00	0.01	0.09	0.11	0.30	0.05
Transportation and storage	0.01	0.04	0.04	0.03	0.66	0.04
Other service activities	0.02	0.05	0.01	0.00	0.07	0.03

*Notes: The table shows the share of each educational level and gender by sector of activity. I have only included the 10 most represented sectors in the sample. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.*

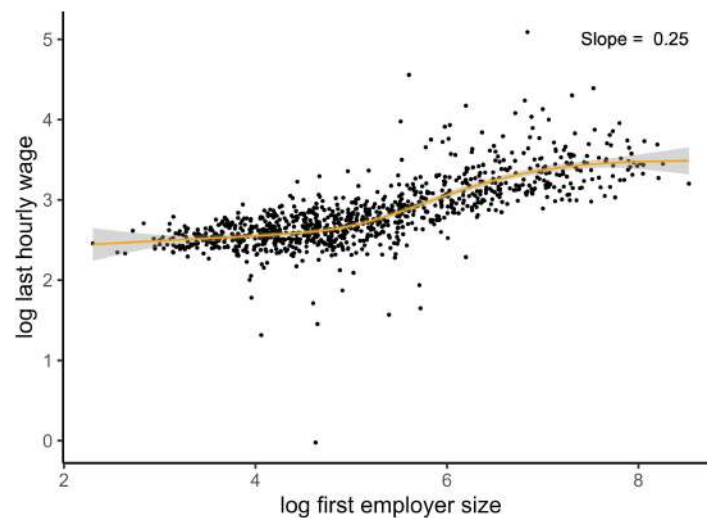
Table 14: Sector of Activity Distribution by Gender

	Men	Women
Wholesale and retail trade	0.24	0.33
Construction	0.25	0.02
Accommodation and food services	0.08	0.12
Legal, accounting, management, architecture, engineering activities	0.06	0.09
Administrative and support services	0.08	0.07
Manufacture of food products	0.05	0.05
Financial and insurance activities	0.02	0.08
Transportation and storage	0.04	0.03
Other service activities	0.00	0.07

*Notes: The table presents the distribution of sector of activity by gender. I have only included the 10 most represented sectors in the sample. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.*

### A.2.3 Last Hourly Wage

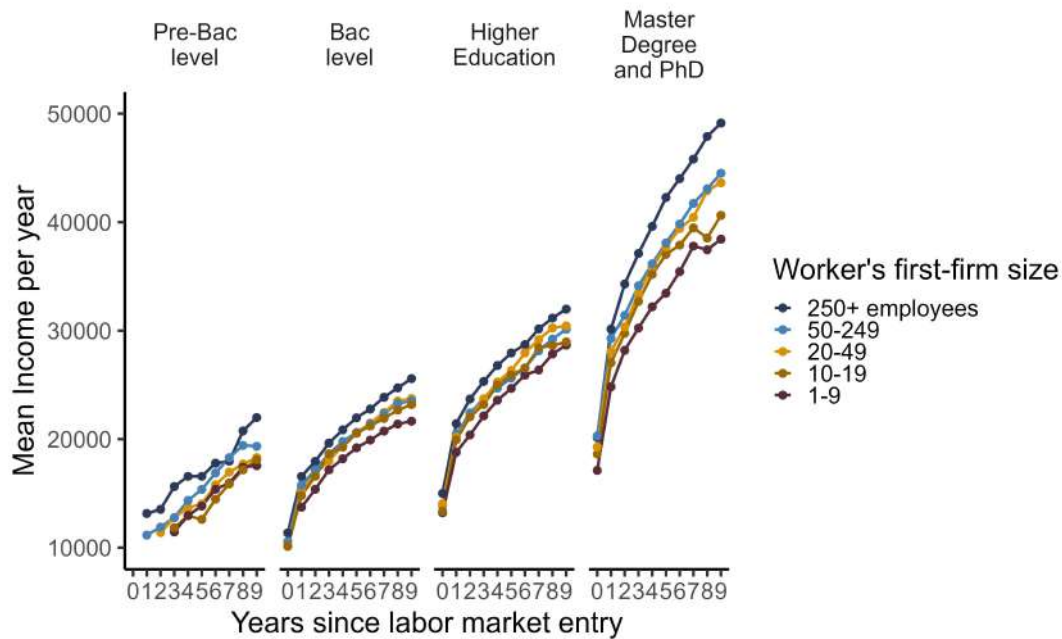
Figure 8: Positive Correlation Between Last Hourly Wage and First Firm size



*Note: Positive correlation between last hourly wage and first firm size. The figure showed two binned scatter-plot of the conditional expectation of last hourly wage as a function of first firm size. Log last hourly wage is on the vertical axis. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.*

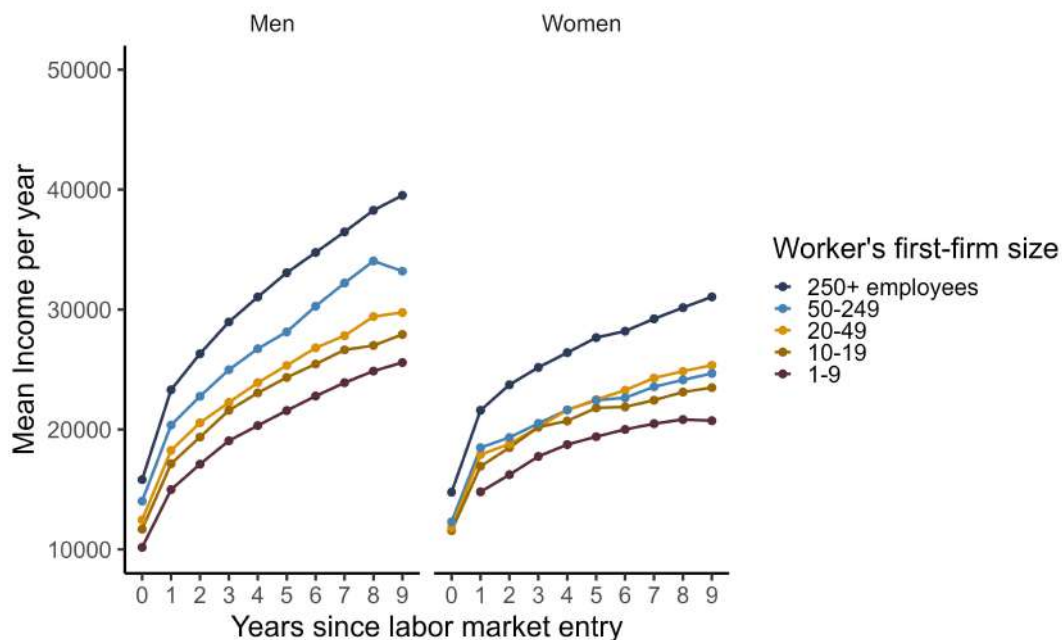
A.2.4 Income Trajectories

Figure 9: Yearly Income Trajectories by First-Firm Size and Educational Degree



Note: The figure shows the evolution of average yearly income since labor market entry, categorizing workers on the basis of the size of their first firm and their educational degree. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.

Figure 10: Yearly Income Trajectories by First-Firm Size and Gender

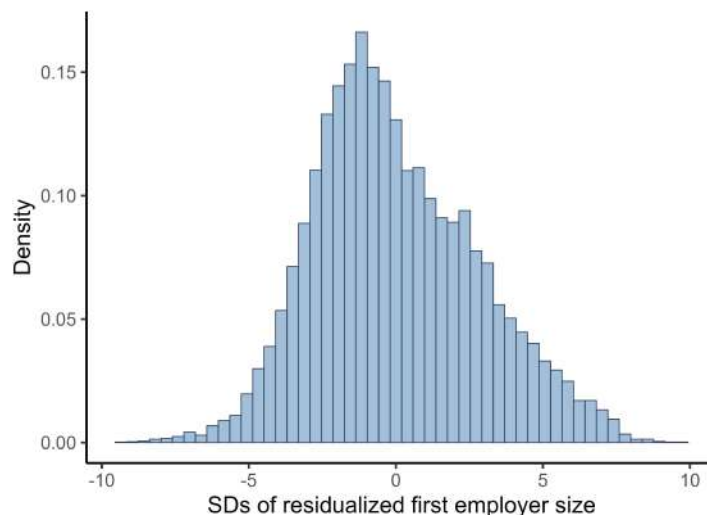


Note: The figure shows the evolution of average yearly income since labor market entry, categorizing workers on the basis of the size of their first firm and their gender. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.

## A.3 Results Extension

### A.3.1 Labor Demand Instrument

Figure 11: Residual Variation



*Note: Histogram of (residualized) labor demand instrument. Expressed in units of standard deviations of (residualized) first firm size from a regression controlling for fixed effects related to four levels of educational attainment, birth cohort, birth region, gender, year of entry into the labor market, initial sector of activity, and the unemployment rate in the department of first employment.*

### A.3.2 Lifetime Income, Gender and Education

The influence of first firm size on lifetime income varies by degree and gender. Analyzing this, I conducted regressions segmented by gender, examining the interaction between education and firm size (*Table 15*). Indeed, as women on average have a higher level of education than men on the labour market, it is possible that women with lower levels of education will experience a more positive effect from starting their careers in large firms than their men peers. The results in *Table 15* indicate that for workers with a pre-baccalaureate degree, a 10% increase in the size of the first firm leads to a 2.1% increase in lifetime income for women and a 1.2% increase for men. In other words, the effect of the size of the first firm for pre-bac graduates is 1.6 times greater for women than for men. This effect holds for all levels of education.

Table 15: Career Outcomes and First-Firm Size by Gender and Education

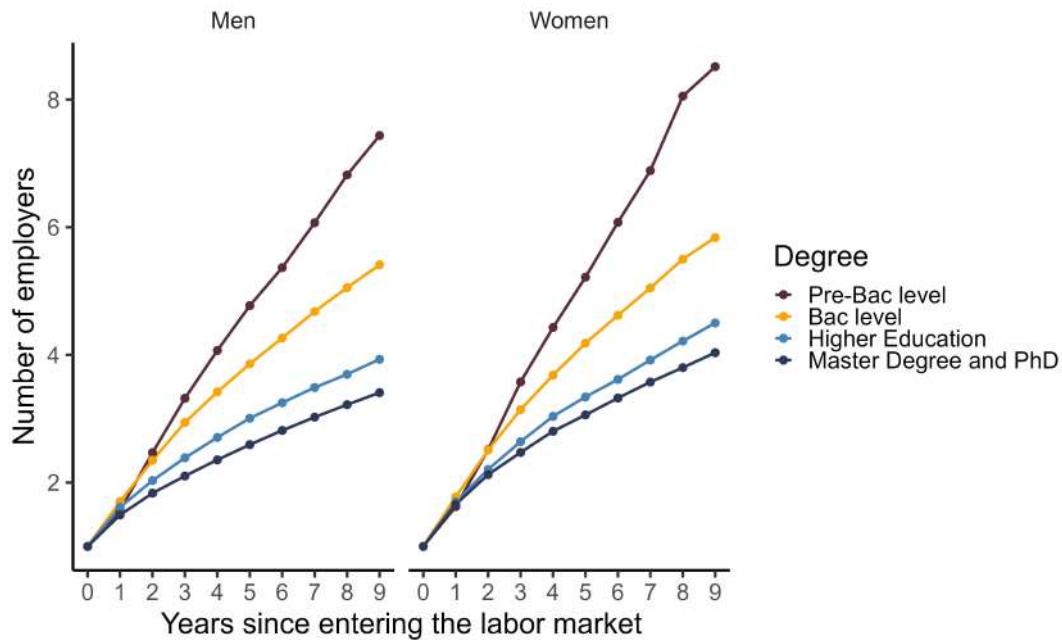
	Lifetime Income		
	All Sample (1)	Women (2)	Men (3)
Bac Level	.4738*** (.0295)	.5695*** (.0961)	.4637*** (.0302)
Higher Education	.5498*** (.0473)	.6036*** (.1121)	0.5865*** (.0498)
Master and PhD	.6416*** (.0774)	.7402*** (.1603)	.6320*** (.0620)
First-Firm Size	.1520*** (.0266)	.2173*** (.0526)	.1285*** (.0240)
First-Firm Size x Bac Level	-.0571*** (.0069)	-.1075*** (.0202)	-.0493*** (.0106)
First-Firm Size x Higher Education	-.0604*** (.0049)	-.1018*** (0.0210)	-0.0614*** (.0078)
First-Firm Size x Master and PhD	-.0573*** (.0074)	-.1062*** (.0252)	-.0509*** (.0085)
Observations	23,061	9,650	13,411
R <sup>2</sup>	.44491	.44881	.44403

*Notes: All variables enter regressions in logs. The reference education degree is Pre-Bac Level. The table shows IV-TSLS estimates of the elasticity of lifetime income with respect to first-firm size and education degree, instrumenting for first-firm size using the labor demand composition index. The regressions are conducted at the worker level, controlling for fixed effects related to four levels of educational attainment, birth cohort, birth region, gender, year of entry into the labor market, initial sector of activity, and the unemployment rate in the region of first employment. Standard errors (in parentheses) are clustered at the level of the first hourly wage. Signif. Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1*

## A.4 Robustness Checks

### A.4.1 Number of Employers

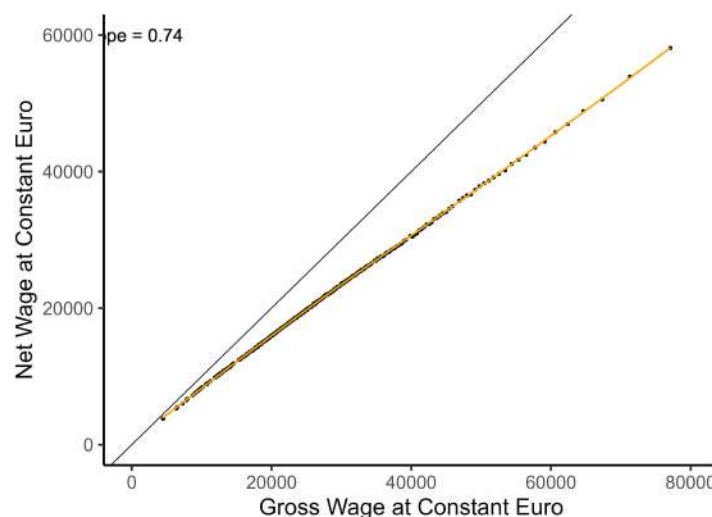
Figure 12: Number of Employers Over 10 Years Post-Labor Market Entry



Note: The figure shows the number of employers over 10 years post-labor market entry, categorizing workers on the basis of their gender and their educational degree. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.

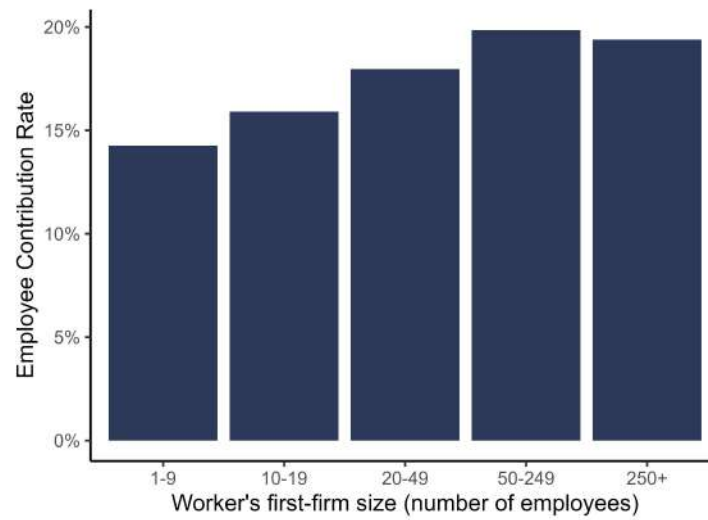
### A.4.2 Gross and Net Wages

Figure 13: Relationship between gross and net wages



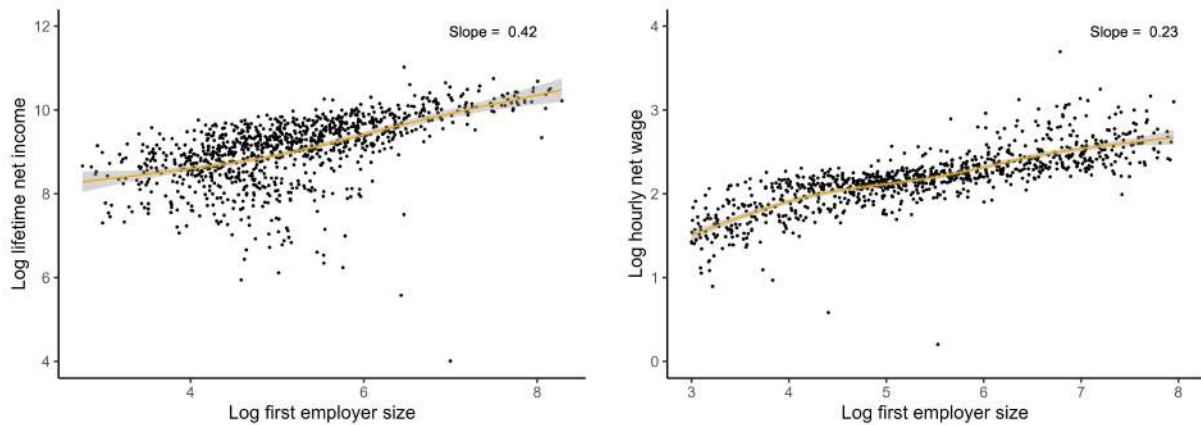
Note: The figure shows the relationship between net and gross wages in the sample from 2008 to 2020. The black line represents the  $x=y$  relationship, while the yellow line depicts the relationship between the gross wage and the net wage. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.

Figure 14: Employee Contribution Rate by Firm-Size



Note: The figure presents the employee contribution rate across worker's first firm size. The employee contribution rate is defined as the variance between the gross and net wage. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.

Figure 15: Positive Correlation between Net Lifetime Income (Net Average Hourly Wage) and First-Firm Size



Note: Positive correlation between net lifetime income/average hourly wages and first firm size. The figure showed two binned scatter-plot of the conditional expectation of net lifetime income/average hourly wage as a function of first firm size. Log net lifetime income and log net average hourly wage are both on the vertical axis. Sample includes workers of all education levels born in Metropolitan France and who enter in the labor market between 2008 and 2011.



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