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## Employee-Owned Firms and the Careers of Young Workers

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## ABSTRACT

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# Employee-Owned Firms and the Careers of Young Workers\*

Using detailed administrative data from Spain, we investigate the impact of having an initial work experience in an employee-owned firm (EOF) versus a conventional business on subsequent earnings. We find that young workers' exposure to EOFs at the time of labour market entry reduces earnings by about 8% during the first 15 years in the labour market. The selection of individuals with low initial ability in EOFs does not appear to be a relevant channel. Our results seem to be rather related to differences in job mobility and wage returns to experience. On the one hand, we document lower wage returns to experience acquired in EOFs, although no differences in subsequent career progression in terms of promotions. On the other hand, we find that workers who had their first job in EOFs show a strong attachment to such a business model and are less likely to voluntarily leave their employers. Taken together, our findings suggest the existence of non-pecuniary job attributes offered by EOFs that might compensate for lower lifetime earnings.

**JEL Classification:** J31, J50, J62

**Keywords:** employee-owned firms, careers, wages, job mobility

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# 1 Introduction

Growing evidence of firms' power to set wages has renewed interest in institutional arrangements aimed at strengthening the position of workers in the labour market (Ashenfelter et al., 2022; Card, 2022). While certain labour institutions, such as unions, collective bargaining, or minority workers' representation on company boards, have been extensively studied, important gaps remain in the understanding of how more extensive forms of worker participation affect individual and firm outcomes.

Employee-owned firms (EOFs) represent a limiting case of such arrangements, as the workforce exerts control over corporate decisions and shares profits. EOFs are typically highlighted for their potential to benefit workers and the economy as a whole (Kruse, 2022). For instance, numerous studies have documented how EOFs contribute to protecting workers against adverse shocks (Pencavel et al., 2006; Burdin and Dean, 2009; Kurtulus and Kruse, 2018; Garcia-Louzao, 2021) and, in certain production environments, raise productivity and reduce income inequality (Burdin, 2016; Montero, 2022; Young-Hyman et al., 2022). However, little is known about how this type of company, compared to conventional firms, may affect the careers of young workers.

Most of the existing literature on post-schooling wage growth highlights the role of skill accumulation, job search, and learning (Rubinstein and Weiss, 2006), as well as the economic conditions prevailing at the time of entry into the labour market (von Wachter, 2020). Recent work has also emphasized the importance of firms' characteristics for understanding wage determination (Card et al., 2018) and career outcomes (e.g., von Wachter and Bender, 2006; Arellano-Bover, 2022). In this paper, we investigate the role of the ownership structure of the first employer in shaping the labour market trajectories of young workers.

EOFs may offer greater opportunities for human capital development, which in turn may exert positive effects on young workers' long-term labour market outcomes. EOFs may create better incentives for both workers and firms to invest in training by mitigating poaching problems and monopsony power (Askildsen and Ireland, 1993; Naidu and Posner, 2022). Moreover, the democratic structure of certain types of worker-owned organizations may provide unique opportunities for young workers to accumulate social (general-purpose) skills, such as empathy, communication and interpersonal skills.<sup>1</sup> Similarly, EOFs may exploit organizational comparative advantages

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<sup>1</sup>Existing evidence suggests that these types of skills are hard to automate and are increasingly re-

in innovative activities which stress the production knowledge of ordinary workers (Putterman, 1982; Estrin et al., 1987; Smith, 1994).<sup>2</sup> To facilitate this process, EOFs may rotate workers into different tasks and implement multi-skilling strategies, training young workers in a wide variety of skills (Carmichael and MacLeod, 1993). Therefore, cooperatives may contribute to career success by allowing workers to perform a diverse range of tasks and broadening the scope of their human capital (Frederiksen and Kato, 2018).<sup>3</sup>

However, several alternative mechanisms might imply a negative relationship between the EOF status of the individuals' first employer and wage trajectories. Firstly, some of the skills developed in an EOF may be too specific, having limited value once workers switch to a conventional business. This may lead to lock-in effects and reduce job mobility. Secondly, EOFs may be poorly managed, rely on outdated technologies, and have low productivity. For instance, pay compression may affect the ability of EOFs to recruit and retain high-ability workers (Abramitzky, 2008; Burdin, 2016), restricting young workers' opportunities to learn from talented managers and coworkers.<sup>4</sup> Thirdly, young workers' expectations of more job security in a cooperative may hold back the acquisition of alternative skills, i.e., skills that are not useful in the current job but would be useful elsewhere (Kuhn and Sweetman, 1999). Finally, if asymmetric information prevents employers from determining the productivity levels of potential employees, they may use the information about past employment in an EOF as a noisy signal of a worker's productive potential. Conventional employers may engage in statistical discrimination, taking workers' previous job experience as an indication of low productivity.<sup>5</sup>

Finally, it is worth emphasizing that individuals' career choices are not exclusively  
warded in the labour market (Deming, 2017). Bó et al. (2010) report results from laboratory experiments showing that democratic procedures positively affect the extent of cooperative behaviour.

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<sup>2</sup>The combination of long-term job security and profit sharing in cooperatives may provide incentives to reveal valuable information about incremental improvements in the production process, ensuring that workers will reap the benefits (Levine, 1992; Che and Yoo, 2001).

<sup>3</sup>By contrast, due to incentive considerations, conventional employers may find it optimal to reduce task variety and structure bundles of tasks according to their ease of monitoring (Milgrom and Roberts, 1992). EOFs may also use job rotation to avoid conflicts between members regarding the allocation of unpleasant tasks, reducing collective decision costs (Hansmann, 1988; Pencavel, 2002).

<sup>4</sup>The literature on the productivity effect of worker cooperatives vis-à-vis conventional firms offers mixed conclusions (Craig and Pencavel, 1995; Fakhfakh et al., 2012; Monteiro and Straume, 2018; Montero, 2022).

<sup>5</sup>Individuals' past experience in a participatory workplace may contribute to developing critical attitudes to authority, signalling to conventional employers a lack of discipline (Wu and Paluck, 2020).

driven by income maximisation but also non-monetary compensation, i.e., job amenities (Bonhomme and Jolivet, 2009; Adda and Dustmann, 2022). Therefore, workers may value the non-pecuniary work attributes offered by worker-owned companies (e.g., job security, equal pay, workplace democracy, social mission, friendly ties, or low intensity of supervision) and remain employed in such firms, despite lower wages.<sup>6</sup> From a dynamic perspective, wage differentials of individuals who had an initial job experience in a worker-owned firm may just reflect their willingness to pay for other work amenities and do not necessarily imply that they are worse off relative to young workers in conventional enterprises.

In light of existing research, it is not clear whether having an initial job experience in employee-owned organizations should affect young workers' careers positively or negatively. This paper draws on rich Spanish administrative data to shed light on how a first job experience in EOFs affects the labour market outcomes of young workers during their first 15 years in the labour market. Our analysis focuses on a particular type of EOF scheme: worker cooperatives, which are enterprises in which worker-members have ultimate control rights (Dow, 2003). In practice, worker cooperatives combine both employee financial participation and voice, i.e., worker-members own the company, share the net profit, and control strategic management decisions on a "one-person, one-vote" basis, regardless of their capital contribution. Hence, in our setting, we compare two types of firm ownership regimes: worker-owned enterprises organised as worker cooperatives and conventional investor-controlled companies.

The Spanish context offers a unique setting to investigate the impact of alternative firm ownership and organisation arrangements on the labour market career of young workers, for several reasons. Firstly, the available data set is particularly suitable for our purposes as it allows us to follow workers' trajectories since their entry into the labour market and to identify, along with other demographic and firm characteristics, the legal ownership form of their first employer unambiguously. Importantly, we can also control for crucial determinants of wage growth, such as education and the skill content implicit in individuals' professional classifications, information that is usually missing in previous studies on cooperative firms using administrative data. Secondly, Spain is an international case study for the historical development of its co-

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<sup>6</sup>For instance, Cassar (2019) shows, in the context of a laboratory experiment, that a prosocial mission allows employers to economize on monetary incentives. For a general discussion about the relevance of non-monetary aspects of work, see Cassar and Meier (2018).

operative sector, including the famous example of the Mondragon Cooperative group in the Basque Country. Thirdly, the Spanish government has systematically promoted the cooperative sector or, more generally, the Social Economy, as highlighted by the 2015 law for the Social Economy and the Social Economy Strategy 2017-2020. The Social Economy accounts for around 10% of GDP and 12.5% of employment in Spain. Cooperatives are the main business model within the Social Economy, representing approximately 45% of all Social Economy enterprises. Finally, during the period of our analysis, 1985-2018, the country experienced substantial economic growth as well as a large variation in macroeconomic conditions, which allows us to isolate the effect of the first job experience from nationwide economic developments.

Our empirical strategy consists of comparing the careers of young Spanish workers whose first labour market experience was in a worker cooperative with those who started in a conventional firm. More specifically, we exploit variation in education-specific graduation years to predict when a worker *should* start her career, thus addressing endogeneity problems related to selective graduation decisions. Based on imputed labour market entry, we follow workers through their first 15 years in the labour market and analyse the role of the ownership status of their first employer in shaping their career path.

According to our preferred estimates, the cooperative status of individuals' first employer is associated with a lifetime labour income penalty of 8%. This negative effect remains even after controlling for province-specific unemployment rates at the moment of entry. This is important considering the well-documented effect of initial labour market conditions on workers' outcomes (Kahn, 2010; Oreopoulos et al., 2012; von Wachter, 2020) and the counter-cyclical role of worker cooperatives in terms of job creation and employment stabilisation (Pencavel et al., 2006; Perotin, 2006; Burdin and Dean, 2009; Díaz-Foncea and Marcuello, 2015; Garcia-Louzao, 2021). Moreover, the penalty is explained neither by individual traits, such as gender or education nor by the characteristics of the first job. Importantly, differences in firm size between the cooperative and conventionally owned enterprises (Arellano-Bover, 2022) or issues associated with the income reporting behaviour of cooperative members who decide to contribute to different Social Security regimes (salaried workers vs. self-employed workers) play little role in explaining our results.

To rationalize our results, we examine possible mechanisms that may underlie the

negative effect of employee ownership on workers' wage trajectories. Firstly, we document that the first work experience, despite being transitory, has long-term effects. Individuals who started their careers in a cooperative are more likely to remain in the cooperative sector even after 15 years of labour market experience. Taking into account the existence of a wage penalty for workers in Spanish cooperatives (Clemente et al., 2012; Garcia-Louzao, 2021), this observed attachment would be indicative that these workers might be willing to forgo wages in exchange for other job amenities. Secondly, we investigate the mediating role of firm ownership of the first job in workers' mobility patterns during their first 15 years in the labour market. Our analysis reveals that workers whose first job after entering the labour market was in a cooperative are significantly less likely to voluntarily separate from their first job, as well as from their future employers. Similarly, these individuals are less likely to be fired from their current company, compared to workers who started their careers in a conventional company. Given their attachment to the cooperative sector, these results indicate that these workers may have greater job satisfaction in cooperatives, as revealed by their lower voluntary turnover rates (Böckerman and Ilmakunnas, 2009; Cottini et al., 2011; Harju et al., 2021), as well as that cooperatives offer greater job security to their workers (Pencavel et al., 2006; Burdin and Dean, 2009; Garcia-Louzao, 2021).

As an additional, albeit complementary, mechanism, we investigate whether individuals learn less valuable skills at worker cooperatives. To test for the human capital channel, we look at the effect of total accumulated experience at cooperative firms on wages and promotions. We find inconclusive evidence with respect to the human capital mechanism. Our results indicate that wage returns to cooperative-employer experience are lower compared to the experience accumulated in conventional firms and that this lower return declines over tenure with the current employer. However, the catch-up rate is too slow to be fully consistent with any plausible employer's learning process about the true productivity of workers. The gap in returns would thus be more consistent with differences in human capital accumulation rather than with statistical discrimination by employers or related reasons (e.g., Arellano-Bover, 2022; Garcia-Louzao et al., 2023). However, greater experience accumulated at cooperatives does not significantly reduce future career progression, as suggested by the dynamics of promotions along the professional category ladder. Interestingly, cooperative-employer experience does not restrict access to top-level professional po-

sitions, which is usually considered an indicator of career success (Frederiksen and Kato, 2018). This may suggest that workers in cooperatives do not necessarily acquire less valuable skills, but are remunerated differently for their experience, which may be explained by differences in wage-setting policies and equality concerns between cooperative and conventional enterprises (Kremer, 1997; Montero, 2022).

Finally, we explore to what extent the non-random selection of workers might affect our estimates. In particular, we assess whether workers with different innate ability sort into firms with different ownership structures at the time of labour market entry. To this end, we follow de la Roca and Puga (2017) and compare the estimated worker fixed effects among individuals who started their careers in cooperatives relative to conventional firms. This exercise suggests that our results are unlikely to be explained by ex-ante productivity differences across workers. In particular, we show that the distribution of innate ability, as measured by worker fixed effects, is almost identical between individuals who entered the labour market in a cooperative and those who entered the labour market in a conventional enterprise, once the dynamic impact of working in different firm types and its interaction with worker heterogeneity is taken into account. Importantly, the results of a bounding exercise in the spirit of Oster (2019) indicate that other unobserved confounding factors not captured by worker-fixed effects are unlikely to explain our results.

The paper contributes to several strands of the literature. Firstly, we add to an extensive literature that documents the long-lasting effect of initial labour market conditions on workers' careers. Most of these studies have focused on the role of macroeconomic conditions at labour market entry (e.g., Kahn, 2010; Oreopoulos et al., 2012; Altonji et al., 2016; Leombruni et al., 2019; Schwandt and von Wachter, 2019; von Wachter, 2020; Bentolila et al., 2021; Rothstein, 2021). Using similar administrative data from Spanish workers, recent work by Arellano-Bover (2022) has shown that the characteristics of the first employer also matter. In particular, he finds that young workers whose first job was in a large firm have better labour market trajectories compared to workers who initially matched with smaller firms. We add to this line of work by investigating the role played by another organizational dimension, i.e., first-employer ownership form, along which individuals' initial job experiences differ. In this regard, we show that even when possible differences in firm size are taken into account, individuals whose first work experience was in a worker cooperative have

flatter wage profiles, but this does not necessarily mean that they are worse off, given the mobility patterns we uncovered.

Secondly, our analysis contributes to the literature on cooperative firms and employee ownership. A number of papers examine pay differentials between individuals employed in worker cooperatives and conventional firms (Blasi et al., 1996; Pencavel et al., 2006; Kruse et al., 2010; Clemente et al., 2012; Magne, 2017; Burdin, 2016; Garcia-Louzao, 2021; Montero, 2022). Scholarly work has emphasized the advantages of employee ownership in terms of job stability (sometimes in exchange for lower and more volatile wages), particularly in the case of tenured workers endowed with sector- and firm-specific human capital and affected by macroeconomic shocks and corporate restructuring. All these studies focus on contemporaneous worker-firm relationships. By contrast, our paper adds a dynamic perspective to the analysis of wage differentials between cooperatives and conventional firms by investigating the career effects of employee ownership from the perspective of young workers. Our results suggest that young workers initially employed in a worker cooperative exhibit a strong attachment to the cooperative sector and are less likely to quit their jobs, plausibly revealing their job satisfaction.

The paper also relates to the literature on codetermination and worker voice (Jäger et al., 2021). Recent quasi-experimental evidence suggests that these institutions have no or small positive wage effects, no effect on voluntary separations, and some reduction in involuntary separations (Kim et al., 2018; Jäger et al., 2022). While these studies focus on arrangements that convey limited power to workers, such as minority or quasi-parity representation, our paper analyses the limiting case of such mechanisms: labour-managed firms where worker-members exert ultimate control over firm governance and appropriate the net profit.

Finally, our analysis connects with the literature on the role of firms in shaping the wage distribution (e.g., Abowd et al., 1999; Card et al., 2018; Song et al., 2018; Bonhomme et al., 2019; Engbom et al., 2022) and, more specifically, with recent work on the career consequences of past job experiences in heterogeneous firms (Gregory, 2020; Arellano-Bover and Saltiel, 2021; Sorenson et al., 2021; Di Addario et al., 2022; García-Trujillo et al., 2022; Arellano-Bover, 2022). We add to this line of work by analysing the impact on labour market trajectories of an underexplored dimension: the ownership structure of the firm. Our results indicate that heterogeneous firm ownership regimes

may also have a first-order effect on the career of young workers.

The remainder of the document is organised as follows. In Section 2, we describe the institutional set-up governing the operation of worker cooperatives in Spain. In Section 3, we present our main source of data and estimation sample. In Section 4, we introduce our empirical approach, while in Section 5 we discuss our main findings. Section 6 concludes.

## 2 Institutional background

**Employee-owned firms.** Two types of employee-owned firms exist in Spain: cooperatives (*sociedades cooperativas*) and labour societies (*sociedades laborales*).<sup>7</sup> Cooperatives are enterprises that meet the international principles of worker-owned enterprises: “an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise” They are organized according to cooperative principles: voluntary and open membership; democratic member control (one member, one vote); member economic participation; autonomy and independence; education, training and information; cooperation among cooperatives; and concern for the community (Levin, 2002). Labour societies are subject to exactly the same conditions as conventional, capital-owned, enterprises in terms of capital requirements, taxes, and the transmission of property rights. The key difference lies in the ownership schemes, as in labour societies at least 51% of the capital must be held by working partners and limitations on hiring non-partner workers. Given the similarities between labour societies and conventional firms, in our analysis, we focus on cooperatives as worker-owned enterprises, and leave labour societies as part of traditional capital-owned organizations, as is usually done in official statistics.<sup>8</sup>

**Cooperatives.** In order to create a cooperative, two fundamental requirements must be met: (i) the company must have at least three working partners, and (ii) each partner is entitled to only one vote in the governing bodies, regardless of capital con-

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<sup>7</sup>See Appendix B for a more detailed comparison between cooperatives and labour societies.

<sup>8</sup>In the rest of the paper, we will use the terms employee-owned firms (EOFs) and cooperatives interchangeably.

tributions.<sup>9</sup> It is important to note that cooperative partners can choose their Social Security contribution regime: self-employed or General Regime.<sup>10</sup> In either of these two regimes, the partners decide on the labour income they declare as Social Security contributions. In practice, the difference between the Social Security schemes is only related to future social benefits, as partners tend to declare the legal minimum contribution.

Cooperatives are allowed to hire external labour under the same conditions as mainstream capitalist enterprises.<sup>11</sup> Wage-earners in cooperatives are thus covered by the same Labor Code and collective agreements that apply to workers in conventional enterprises. However, labour legislation restricts the number of hours worked by salaried employees to a maximum of 30% of the total hours worked in a year by partners but does not set any limit on the proportion of salaried employees to working members.

Finally, cooperatives must allocate at least 20% of their net revenues to a reserve fund and 5% to an education and training fund. Profits paid into these funds are exempt from corporate income tax.<sup>12</sup> Net revenues in excess of the amount contributed to the funds may be distributed to the working partners in proportion to their work and dividends may be paid on the capital contributed, within the limits imposed by Spanish law.

### 3 Data

**Social Security records.** The main data source is the Spanish Continuous Sample of Employment Histories (*Muestra Continua de Vidas Laborales* or MCVL), an administrative dataset collected annually by the Spanish Social Security administration and linked to Tax Records from 2005 up to 2018.<sup>13</sup> The MCVL is a representative 4% random sample of individuals who had any relationship with the Social Security system

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<sup>9</sup>The incorporation of new partners requires the approval of the organization's governing bodies, and new members must subscribe to the minimum capital required and, in some cases, pay an admission fee. If a member decides to leave, the value of the capital contributed is reimbursed.

<sup>10</sup>Recent data from aggregate statistics indicate that about one-third of cooperative partners contribute to the self-employed regime.

<sup>11</sup>Aggregate figures indicate that 20-30% of cooperatives' employment corresponds to wage-earners.

<sup>12</sup>The corporate tax rate for cooperatives is 20%, compared to 25% for conventional corporations.

<sup>13</sup>The first version of the MCVL corresponds to 2004, but the information structure differs from that available for subsequent years.

at any time in the reference year.<sup>14</sup> The MCVL has a longitudinal design since an individual present in a year who subsequently remains registered with the Social Security administration stays as a sample member.<sup>15</sup>

For each member of the sample, the MCVL includes information on all Social Security relationships from the date of first employment, or from 1967 for workers who were employed before then, allowing us to track individuals over time from their entry into the labour market. For each of these relationships, we observe start and end dates along with part-time status, occupation category, workplace location and sector of activity, type of contract (with reliable information only as of 1997), and labour income.<sup>16</sup> Demographic information such as age, gender, education, and nationality is also observed.

Importantly for the purposes of this analysis, the dataset provides information on the legal setting of the firm, which is determined by firm-specific tax IDs. The first element of these IDs stipulates the legal status of the company in terms of corporate taxation and makes it possible to unequivocally differentiate the employees of cooperatives from those of conventional companies.<sup>17</sup> Unfortunately, the data does not allow us to identify self-employed individuals who are partners of a cooperative as compared to other more standard forms of self-employment. Therefore, in our analysis, we focus on individuals whose first job was in the General Regime of Social Security and compare the careers of those individuals who entered the labour market in a cooperative versus a conventional firm. However, we do not limit their career to being exclusively in the General Regime, but allow them to become self-employed at any time after their first job.

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<sup>14</sup>This includes employed and self-employed workers, recipients of unemployment benefits and pension earners, but excludes individuals registered only as medical care recipients, or those with a different social assistance system (civil servants, such as the armed forces or the judicial power).

<sup>15</sup>Individuals who stop working remain in the sample while they receive unemployment benefits or other welfare benefits (e.g. retirement pension). Individuals leave the sample when they die or leave the country permanently. Moreover, each wave adds individuals who enter the labour market for the first time.

<sup>16</sup>Labor income from standard wage-employment relationships is bottom- and top-coded. In our main analysis, we use the censored corrected earnings using a cell-by-cell Tobit model to impute censored observations (see Appendix D for more details on the correction method). However, we show our results are robust to using original (censored) earnings or excluding the top-coded observations.

<sup>17</sup>See Appendix C for a more detailed description of the definition of the two employer categories and additional variables.

**Analysis sample.** We exploit all the 2005-2018 MCVL files to select individuals born in Spain and reconstruct their labour market histories, as we cannot track the complete history of those born abroad. For this group of people, we follow [Arellano-Bover \(2022\)](#) and rely on the information on educational attainment to calculate each individual's expected graduation year in order to define labour market entry.<sup>18</sup> Specifically, education-specific graduation years are assigned as the years when high-school dropouts turn 16, when high-school graduates turn 18, and when college graduates turn 23. Using the predicted graduation year, we define the first job as the first six months after the year of graduation when individuals worked for more than 100 days. We then classify workers according to the ownership structure of the first employer to differentiate between those whose first job was in a cooperative versus a conventional firm.<sup>19</sup> Finally, to avoid the inclusion of individuals whose first employment is likely to have taken place outside Spain, in the informal sector, or occurred abnormally late, we eliminate those workers whose first employment is observed more than five years after their predicted year of graduation.

From this sample, we focus on cohorts of graduates between 1984 and 2003 to ensure that we follow each cohort for 15 years and have reliable information on earnings from the first year after graduation.<sup>20</sup> Next, we construct a monthly panel of individuals to study the career effects of having a first job in a cooperative compared to a conventional business form. Our final sample consists of 214,024 individuals observed in a total of 24,659,247 employment (worker-month-year) observations between January 1985 and December 2018. Table [A1](#) reports descriptive statistics for this sample.

## 4 Empirical strategy

To investigate the impact of entering the labour market in a worker cooperative relative to a conventional firm, we closely follow the literature on the effects of aggregate conditions at the time of labour market entry on workers' careers (e.g., [Kahn, 2010](#);

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<sup>18</sup>We use this approach to define an exogenous moment for labour market entry since we only observe workers from the first relationship with Social Security, which is ultimately an endogenous decision.

<sup>19</sup>If during the first six months, a worker has more than one job, we consider as the main employer the one in which she worked most of the time.

<sup>20</sup>Information on labour income prior to 1985 exhibits several missing values and inconsistencies and, hence, is not reliable.

Oreopoulos et al., 2012).<sup>21</sup> Specifically, we estimate models of the following form

$$y_{icpt} = \alpha + \beta \text{Coop}_{it_0} + \theta_p + \lambda_c + \delta_e + \gamma_t + X_{it_0}\Omega + \epsilon_{icpt} \quad (1)$$

where  $y_{icpt}$  refers to the (log) real daily income in month-year  $t$  of individual  $i$  categorized by graduation cohort  $c$  and province of birth  $p$ .  $\text{Coop}_{it_0}$  is the main independent variable which identifies individuals whose first job after labour market entry,  $t_0$ , was in a cooperative. Thus,  $\beta$  quantifies the effect on earnings of having the first labour market experience in a cooperative over the first 15 years in the labour market.

To purge our main coefficient of interest from confounding factors, we include unrestricted fixed effects for graduation cohort ( $\lambda_c$ ) and the province of birth ( $\theta_p$ ), as well as years of potential experience ( $\delta_e$ ) and current calendar time ( $\gamma_t$ ).<sup>22</sup> This set of fixed effects is intended to account for unobserved heterogeneity related to non-linear experience profiles, different economic conditions at the current time as well as the time of graduation and among cohorts, respectively. To the extent that province-cohort specific variations in the likelihood of having a first work experience in a worker cooperative are uncorrelated with entrants' traits that are not loaded into our set of fixed effects, the estimated coefficient would produce the long-term earnings effect of having a first job in a cooperative during the first 15 years in the labour market.

Despite the fact that in our empirical strategy, we take into account several potential sources of heterogeneity via the broad set of fixed effects, there could still be other determinants of long-run earnings that are arguably correlated with the ownership of the first employer (e.g., differences in risk aversion). To mitigate these concerns, we include three different sets of entry-level controls, which are summarized in  $X_{it_0}$ .<sup>23</sup> Firstly, to account for predetermined differences in earnings potential, we add indicators for gender and educational attainment. Secondly, we include a cubic polynomial of the provincial unemployment rate at the time of entry to take into account heterogeneous hiring rates for young workers over the business cycle (Forsythe, 2021), as

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<sup>21</sup>See von Wachter (2020) for a recent review of the literature.

<sup>22</sup>Recall that cohort, time, and experience effects cannot be identified separately in our framework without any additional assumptions. Given our interest in the effect of having a first job in a cooperative, we adopt a modelling strategy similar to that of Oreopoulos et al. (2012) and simply estimate  $C - 2$  cohort effects.

<sup>23</sup>We do not include contemporaneous controls to avoid a *bad* controls problem, i.e., conditioning on post-treatment outcomes that ultimately affect current earnings (Angrist and Pischke, 2009; Cinelli et al., 2022). Therefore, we allow the indicator variable of having a first work experience in a cooperative to capture all the (potentially) different career paths of workers whose first employer was a cooperative relative to a conventional firm.

well as the differential role of worker cooperatives over the business cycle in terms of employment stabilisation (Pencavel et al., 2006; Perotin, 2006; Burdin and Dean, 2009; Garcia-Louzao, 2021). Thirdly, we control for the characteristics of the first job (e.g., skill level, full-time status, sector, and firm age) aimed at isolating the effect of ownership from other factors that are plausibly accounted for by the observed characteristics of the first labour relationship.<sup>24</sup>

Finally,  $\epsilon_{icpt}$  represents the error term and we allow for group-specific error components at the graduation cohort  $\times$  province birth level by means of clustered standard errors (Abadie et al., 2022).

## 5 Career effects of first employment in a cooperative

### 5.1 Wage trajectories

**Benchmark results.** In Figure 1, we plot experience-wage profiles by ownership status of their first employer. We use raw daily wages (Panel A) and residualized daily wages (Panel B), removing year and demographic effects (gender and education). Individuals' wage curves have the usual concave shape: wages increase with labour market experience at a decreasing rate. Wage growth is especially strong during the first 10 years of workers' careers, but is flatter for individuals who had their first work experience in a worker cooperative. However, these differences only start to appear after two years of labour market experience, which already points to some dynamic consequences of the type of first job. Moreover, the difference between groups becomes larger when residual earnings are considered, suggesting a role played by the composition of the workforce.

We formally investigate these differences in a regression framework in which we take into account broader dimensions of heterogeneity. In Table 1, we report our baseline pooled estimates. Column (1) reports estimates from a regression that only includes our basic set controls (calendar month-year, potential experience, graduation cohort, and province of birth). In Columns (2)-(4), we sequentially add controls to assess changes in the coefficient of interest and the role of the observed factors on it. In Column (2), we account for gender and education differences. To account for differences in initial macroeconomic conditions, in Column (3) we include a cubic poly-

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<sup>24</sup>For example, workers may have a preference for greater job stability and therefore search for jobs in less volatile sectors.

nomial of the province-specific unemployment rate at the time of labour market entry. Finally, in our preferred specification reported in Column (4), we add controls for first-employer and job attributes, such as skill level (professional category), full-time status, sector, and firm age.

According to the estimates reported in Column (4), young workers' exposure to worker cooperatives at the time of labour market entry reduces earnings by about 8% during the first 15 years in the labour market. Importantly, the wage gap increases when controlling for education and gender, as well as for the characteristics of the first employer and the job, highlighting the importance of taking into account differences between individuals. Based on an estimation of an augmented version of equation (1), Figure 2 plots the coefficients associated with the interaction of the cooperative dummy variable with indicators for each year of labour market experience. Namely, we unfold the dynamics of the wage penalty reported in Table 1, Column (4). The wage penalty suffered by individuals initially employed at a worker cooperative reaches a maximum of eight years of labour market experience, remaining stable or slightly reversing beyond that point.

Finally, we follow the empirical approach of [Arellano-Bover \(2022\)](#) to break down earnings differences in terms of differences in average daily wage and working time (days worked) over the first 15 years in the labour market. More specifically, we collapse the database into a single observation per individual and use a measure of lifetime earnings (and its components) as the dependent variables. Therefore, we are now looking at the value of the entire stream of labour income accrued by a worker during her first 15 years of career. Table 2 presents the results from this complementary empirical framework. The point estimates in Panel A indicate that roughly three-quarters of the difference in lifetime earnings between individuals initially employed in worker cooperatives and conventional firms can be attributed to differences in average daily wages. The remaining gap is explained by the fact that these individuals work fewer days. In Panel B, we extend the regression to account also for first-employer and job attributes, as in our benchmark specification in Table 1, Column (4). The results in Column (3) indicate an average daily wage penalty equal to 7.2%, in line with the point estimate from our benchmark model. However, when accounting for first-employer and job attributes, the contribution of days to the total earning losses become slightly

larger, i.e., they account for about 32% of the lifetime earning gap.<sup>25</sup>

**Robustness checks.** To validate our main results, we perform an extensive set of sensitivity checks. Firstly, we assess the robustness of our results to alternative definitions of individuals' first job after graduation. The estimates presented in Table 3 indicate that the different definitions produce virtually the same results. Similarly, our results are not affected by our definition of earnings, as the results remain qualitatively the same when we use censored earnings or uncorrected earnings, or drop such observations (see Table 4).<sup>26</sup>

Secondly, we assess the sensitivity of our results to the impact of the incidence of self-employment on workers' careers. This is particularly relevant in the Spanish context, as cooperative partners can decide to contribute either to the General Regime of the Social Security for salaried workers or to the Special Regime for self-employed workers. In the latter case, individuals' Social Security contributions are based on a notional income statement rather than on actual earnings. This suggests that the previously documented wage penalty could partly be an artefact of income reporting issues.<sup>27</sup> To rule out this possibility, in Table 5 we implement different sample constraints to mitigate the incidence of self-employment. For instance, in Column (1) we restrict the sample to individuals who contributed to the General Regime for wage-employment relationships at least 60% of the time over their first 15 years in the labour market. The wage penalty experienced by individuals who kicked off their careers at a worker cooperative remains negative and statistically significant, albeit smaller in comparison to our baseline estimate. Similar results are obtained when alternative sampling restrictions are introduced, suggesting that the penalty is not due to workers becoming self-employed and under-reporting their earnings.

Thirdly, we check the robustness of the results with respect to adjustments in the definition of employee ownership. Our benchmark analysis excludes Labour Societies,

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<sup>25</sup>This higher relative contribution of working days to the total earnings penalty when controlling for firm and job characteristics could be an indication that, for example, cooperatives could operate in less volatile industries, which in turn translates into more stable employment.

<sup>26</sup>The smaller penalty observed when censored observations are not corrected, or not used at all, is due to the maximum earnings gap and a higher incidence of censored observations at the top among workers who started their careers in conventional firms.

<sup>27</sup>Unfortunately, we cannot track the link between individuals and cooperative firms if individuals contribute to the self-employed regime. In other words, we cannot distinguish between genuine self-employed individuals and worker-partners employed in a worker cooperative who contribute to the regime for self-employed workers.

another form of employee-owned enterprise in Spain, and identifies worker cooperatives simply by looking at the legal cooperative status of individuals' first employer. Column (1) of Table 6 shows that including Labour Societies as part of cooperatives does not affect the estimated penalty. Similarly, by defining cooperatives based exclusively on their legal status as determined by their relationship with the Tax Authority, our cooperative dummy may be picking up the effect of other types of cooperative firms that do not involve substantial levels of employee ownership (e.g., credit cooperatives, consumer cooperatives). In Column (2), we restrict the definition of cooperatives to firms specifically coded as worker cooperatives by the Spanish Security Administration. In Column (3), we restrict the analysis to individuals who had an initial job in Manufacturing, a sector in which the cooperative firm legal status unambiguously identifies worker cooperatives. These alternative definitions yield a larger wage penalty, but the interpretation of the results holds. Finally, in Column (4) we distinguish salaried employees and partners among individuals who had an initial job experience in a cooperative. The point estimates in this specification suggest that partners have a larger wage penalty. However, this may just be a reflection of the fact that wages are the only source of income for partners or that these workers are more likely to become self-employed.

Finally, recent work by [Arellano-Bover \(2022\)](#) shows that firm size can be considered a sufficient statistic for several earnings-enhancing firm characteristics that are difficult to observe (e.g., management quality). Indeed, using similar data from Spain, he shows that firm size is associated with higher lifetime earnings. Therefore, one could argue that the documented wage penalty may simply reflect that cooperative firms are smaller than their conventional counterparts. Unfortunately, in our dataset, information on firm size is only available between 2005 and 2018. This implies that we have to restrict the analysis to workers whose first job is observed when firm size is available, but also to a subset of years in order to be able to observe wage developments over time. In Table 7, we report estimates of our benchmark model using graduation cohorts whose first job occurred between 2005 and 2009 and including first-employer size as an additional control. In line with [Arellano-Bover \(2022\)](#), firm size is positively correlated with individual earnings. However, the wage penalty associated with having an initial cooperative job remains virtually unchanged, implying

that firm size is not an important factor underlying our results.<sup>28</sup>

**Heterogeneity.** We explore different dimensions of heterogeneity based on worker demographics as well as time in the first job. In Table 8, we look at the heterogeneous effects of having an initial experience at a cooperative employer by gender and education. The wage penalty appears to be higher for men, as well as for individuals with a college degree. One possible explanation for a higher wage penalty for this group of workers, who tend to be the ones with wage premiums, may be associated with concerns about inequality within cooperatives. For example, provided that individuals who had an initial job in a worker cooperative develop a career in the cooperative sector, this heterogeneous pattern is consistent with the existing evidence on wage compression in employee-owned organisations (Kremer, 1997; Burdin, 2016; Magne, 2017; Montero, 2022). In the next section, we show that the attachment of these individuals to the cooperative sector is highly persistent, thus lending support to this interpretation.

In Figure 3, we look at the wage penalty associated with having a first job at a worker cooperative by the duration of the first job. Our findings indicate that this penalty is increasing over the duration of the first job, though non-monotonically. This suggests a potential role for insufficient skill development in worker cooperatives as an explanatory channel. However, the wage penalty is roughly 6% even for individuals who spent less than one year at their first cooperative employer. Given the short amount of time those individuals spent at their first employer, it would be implausible to attribute the results exclusively to lower human capital accumulation during the first work experience. In the next sub-section, we investigate potential mechanisms that can contribute to explaining our findings.

## 5.2 Mechanisms

Having documented a negative correlation between the cooperative status of the first employer and earnings, we move on to explore the possible underlying mechanisms.

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<sup>28</sup>The fact that firm size plays little role in explaining the cooperative wage penalty is not surprising. Using aggregate data from the Spanish Statistical Office, Figure A2 shows no clear differences in the size distribution of the two types of firms.

**Persistence.** We start by looking at the duration of the first job by the ownership status of the first employer. Figure 4 reveals that the first job is not usually of long duration: more than 40% of the individuals spend no more than 12 months at their first job. However, there are some nuanced differences between workers initially employed in cooperatives and those employed in conventional enterprises. In particular, we find that individuals who are initially matched with a worker cooperative have slightly lengthier job spells, as suggested by both the higher mass of these workers with jobs lasting 2 or more years (Panel A) and the distribution of (log) days in the first job (Panel B). Interestingly, individuals whose first job after labour market entry was in a worker cooperative are substantially less likely to voluntarily leave their job relative to those who started their career in a conventional firm (see Table 9).<sup>29</sup> The lower voluntary mobility might be explained by the fact that common ownership of assets in cooperatives increases individuals' exit costs, serving as a lock-in device (Abramitzky, 2008), or simply reflect job satisfaction with the workplace amenities offered by cooperatives (Harju et al., 2021). Given that only 9% of those initially employed in a cooperative joined the enterprise as members, the latter explanation seems more plausible.

We also document how relevant is the first job relative to individuals' overall career outcomes. In Figure 5, we plot the distribution of days worked (Panel A) and labour income (Panel B) earned in the first job relative to such outcomes over the first 15 years in the labour market. For more than 60% of individuals in the sample, the first job represents 25% or less of total career outcomes, both in terms of working days and labour income. If anything, the first job appears to be slightly more relevant for individuals who had an initial job experience at worker cooperatives, in line with the fact they spent more time employed in the first job.

We now turn to assess the attachment of individuals to the cooperative sector. In other words, we investigate whether individuals initially employed at cooperatives are more likely to remain in the cooperative sector even several years after joining the labour market. In Panel A of Figure 6, we plot linear probability model estimates of the coefficients associated with the interaction between a dummy variable identifying individuals who had a career start in a cooperative with indicators for each year of

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<sup>29</sup>To investigate the underlying reasons for separation from the first job, we estimate a discrete-time duration model with a competing risk for each type of separation in relation to not leaving the first job (about 3% of workers are still employed in the first job after 15 years in the labour market). The empirical hazard rates underlying the duration model are depicted in Figure A3 in Appendix A.

experience, holding constant a wide range of personal and first-job characteristics.

The results reveal that, even after 15 years of labour market experience, individuals who started at a worker cooperative are still 20% more likely to remain employed in the cooperative sector. However, this does not necessarily mean that all remaining workers leave the cooperative sector. As mentioned above, cooperative partners can register as self-employed in Social Security, even when they belong to a cooperative group. In Panel B, we document that having a first job at a worker cooperative is also positively correlated with the probability of becoming self-employed. The probability of being self-employed is roughly 5% higher for individuals with more than 8 years of experience initially employed at a worker cooperative. Although we cannot directly determine that these individuals remain in the cooperative sector as self-employed, the parallel evolution of both figures may be suggestive of this.

Therefore, our results point to a high degree of career persistence in cooperative jobs for individuals, which may indicate the relevance of job search behaviour and the existence of a cooperative career ladder. Given that the existing evidence for Spain suggests that wage levels are typically lower in cooperatives relative to conventional firms (e.g., Clemente et al., 2012; Garcia-Louzao, 2021), the observed attachment of workers to the cooperative sector is a possible explanation for the flatter wage profiles associated with individuals who had an initial experience in a cooperative.

**Job mobility.** A large literature identifies voluntary job mobility as a critical driver of young workers' wage progression due to the search for a better job (e.g., Topel and Ward, 1992; Light and McGarry, 1998; Keith and McWilliams, 1999; Davia, 2010).<sup>30</sup> Given the plausible existence of a cooperative career ladder and the fact that workers who started their career in a cooperative were less likely to voluntarily leave their first employer, one possible mechanism that may underlie our results is differences in the intensity of job mobility and its ultimate relationship with wage growth.

We investigate whether an initial work experience in a cooperative affects the probability of separating from a given employer along the career path. In Table 10, Columns (1) and (2), we report the estimates from a linear probability model and discrete-time duration model specification for the likelihood of separating from the current job.<sup>31</sup>

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<sup>30</sup>Involuntary job mobility (job displacement) is typically associated with wage losses (e.g., Jacobson et al., 1993; Bertheau et al., 2022).

<sup>31</sup>In both models, we use the same set of controls as in our benchmark wage regression in Column

The results indicate that an initial job experience at a worker cooperative reduces a worker's lifetime likelihood of separating from her employer. In other words, workers who started their careers in a cooperative enjoy higher job stability during the first 15 years in the labour market. In Columns (3)-(5), we investigate these differences further by estimating a competing-risk duration model where we consider different types of separations (voluntary, involuntary, and other types). The results indicate that having an initial experience at a worker cooperative reduces the probability of both employee-initiated and employer-initiated separations. This suggests that higher stability during the first 15 years in the labour market for these workers is driven by both labour supply and labour demand dimensions.

Our previous results pointed to a considerable degree of attachment to the cooperative sector for workers initially employed in a cooperative after labour market entry. Therefore, the specific labour supply and demand conditions prevailing in this sector are of particular relevance to understanding the relevance of our findings on mobility patterns. On the one hand, the reduction in voluntary turnover could be interpreted as a preference-revealed indicator of job satisfaction with workplace amenities provided by cooperatives (Böckerman and Ilmakunnas, 2009; Cottini et al., 2011; Harju et al., 2021). On the other hand, the somewhat lower probability of involuntary terminations may reflect the well-documented propensity of cooperative enterprises to avoid layoffs and to provide employment insurance for their employees (Pencavel et al., 2006; Burdin and Dean, 2009; Garcia-Louzao, 2021).<sup>32</sup>

Taken together, our results indicate that individuals who started their career in a worker cooperative change jobs less frequently compared to those who were initially employed in a conventional firm. Therefore, the observed life-cycle wage gap for the former group of workers may be partly a consequence of foregone wage gains associated with job mobility. However, less intense job mobility may reflect the transformative experience of working in a cooperative. In other words, individuals may develop preferences for certain (cooperative-specific) non-pecuniary job attributes that may compensate for lower wages. This hypothesis would be consistent with the substantially lower quitting probabilities observed for these workers, assuming that voluntary

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(4) of Table 1 and assess the impact of the first job in a cooperative on the overall separation probability during the first 15 years in the labour market.

<sup>32</sup>Recent studies on board-level employee representation have shown that worker's voice is also associated with higher employment stability (Kim et al., 2018; Gregorič and Rapp, 2019; Jäger et al., 2022).

resignations reveal information about their job satisfaction, along with the attachment to the cooperative sector documented above.

**Human capital.** Another potential channel through which the cooperative nature of individuals' first employer may affect lifetime earnings is skill development. For instance, cooperatives may rely on outdated technologies and hire less talented managers, providing limited learning opportunities for young workers (Abramitzky, 2008; Burdin, 2016). Alternatively, the participatory nature of cooperative firms may create better incentives for investing in training and allow workers to accumulate a wider range of skills (Carmichael and MacLeod, 1993; Frederiksen and Kato, 2018).

We investigate the empirical plausibility of this mechanism in different ways. In Table 11, we report estimates from our baseline regression model but restrict the sample to individuals exhibiting a non-employment gap between their first and second job of at least 6 months. As suggested by Arellano-Bover (2022), an unemployed worker looking for a new job does not have a current employer as a benchmark to compare new job offers. In other words, a person in this situation is presumed to be restarting her career, so the job ladder mechanism would be shut down for this sample of individuals. Therefore, evidence of persistent negative effects of having an initial cooperative job would be more consistent with a human capital mechanism. In Columns (2) and (3) of Table 11, we report estimates considering all movers and involuntary movers, separately. For individuals who experienced an unemployment spell, having an initial job experience in a worker cooperative is also associated with a wage penalty. However, the estimated coefficient is smaller, representing between 51% and 73% of our baseline estimate reported in Column (1), thereby suggesting that human capital could plausibly explain about half of the wage penalty.

To gain a better understanding of the role of human capital underlying our results, we estimate the differential returns to accumulated experience in worker cooperatives versus conventional firms, as a proxy for human capital differences (e.g., Arellano-Bover and Saltiel, 2021; Arellano-Bover, 2022; Garcia-Louzao et al., 2023). For this purpose, we estimate a Mincer-type of wage equation, including as main explanatory variables the *actual* experience accumulated in each type of firm since labour market entry and compare individuals who acquired this experience either in cooperatives

or conventional enterprises.<sup>33</sup> We further control for the characteristics of the current job, including the contemporary cooperative status of the current employer as well as worker fixed effects to account for time-invariant characteristics that may affect both wages and experiences with the different types of employers.

Our estimates indicate that cooperative-employer experience has lower returns than experience at conventional employers and that the differential decreases over time (see Table 12). Therefore, provided that accumulated experience reflects past human capital acquisition, the estimated lower returns to the cooperative experience might be indicative of differences in skill acquisition across firms, which would be in line with recent evidence pointing to the existence of substantial heterogeneity across firms in the learning opportunities they offer to their workers (Arellano-Bover and Saltiel, 2021). However, we do not find evidence that negative returns of cooperative experience can be attributed to slower career progression, as measured by promotions to more skilled professional categories (see Table 13).<sup>34</sup>

The dynamic of promotions is usually considered the result of a skill acquisition process and a strong indicator of career success (Gibbons and Waldman, 2006; Waldman, 2012; Frederiksen and Kato, 2018). The fact that we do not observe significant differences along this dimension may suggest that workers in cooperatives do not necessarily acquire less valuable skills.<sup>35</sup> The lower return on accumulated experience in worker cooperatives compared to conventional enterprises may in part reflect well-documented differences in wage-setting policies between cooperatives and conventional enterprises and the degree of wage compression in cooperatives due to concerns about equality among their members (Kremer, 1997; Abramitzky, 2008; Burdin, 2016; Montero, 2022).<sup>36</sup> Consistently with this interpretation, Columns (2) and (4) of Table 12 indicate that the gap in returns to experience is smaller when we control for the cooperative status of the current employer. Therefore, attributing differences in returns to experience to differences in human capital may not be entirely appropriate

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<sup>33</sup>In this exercise, we rely exclusively on wage-employment observations.

<sup>34</sup>Figure A6 in the Appendix shows a heatmap of transition matrices of professional categories between the first and last observed job for workers who started in conventional firms (Panel A) and cooperatives (Panel B).

<sup>35</sup>Promotions to high-level positions within the cooperative sector may be driven by political considerations rather than by meritocratic factors. However, as shown in Column (6) of Table 13, results remain unchanged when we control for the cooperative status of the current employer.

<sup>36</sup>Empirical evidence also suggests that most conventional, capital-owned firms are primarily focused on profit maximisation, while worker-managed firms are concerned with both the income and employment or, more generally, the welfare of their members (e.g., Burdin and Dean, 2012).

when dealing with firms with widely different objective functions.

**Statistical discrimination.** Could the observed negative returns to accumulated experience in cooperatives be consistent with other theoretical mechanisms? For example, conventional employers may use the past experience of individuals in a worker cooperative as a signal of low productivity. According to this interpretation, negative returns should disappear over time as employers learn the true productivity of workers (Altonji and Pierret, 2001). Figure 7 shows that the (negative) differential return to cooperative is decreasing with tenure at the current employer. This is consistent with a certain degree of ex-ante discrimination and employers learning about the true productivity of workers over time. However, our results indicate that it would take 10 years of tenure for this gap in the returns to experience to disappear (while the median tenure in the sample is 4 years). Such a slow catch-up process would therefore be difficult to reconcile with any plausible specification of the employer’s learning process (Lange, 2007), making it has to consider statistical discrimination as the sole (or main) underlying source of the observed differences in returns to experience.

**Sorting.** Endogenous selection of workers into firm types at the moment of labour market entry might potentially explain our findings. For example, if, due to their socially inclusive nature (Perotin, 2013), cooperatives hire less productive workers compared to conventional enterprises and such workers have lower earnings potential (Neal and Rosen, 2000), this would have an impact on career paths regardless of the ownership status of the first employer.

To directly shed light on the role of sorting, we compare the distribution of workers’ ability, based both on observed and unobserved measures, according to the ownership structure of the first job. Table 14 shows that 25% of the workers who started their career in a cooperative have some type of tertiary education, but only 21% in conventional enterprises. Similarly, the share of workers at the top of the skill categories is higher in cooperatives.<sup>37</sup> More precisely, 3.9% and 7.8% of workers held either a very-high- or a high-skilled job at the moment of labour market entry in cooperatives, relative to 3.5% and 4.4% in conventional enterprises. Therefore, worker cooperatives

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<sup>37</sup>We use the professional category of the first job as a measure of observed pre-labour market skills. However, using the first observed skill group or exploiting the longitudinal dimension does not affect the comparison, as there is a sizable correlation between the skill group of the first job and the skill group of the last job observed in the sample (see Figure A6 in Appendix A).

do not seem to recruit individuals with lower education or skill levels.

The comparison between the observed ability of workers in cooperatives relative to conventional enterprises suggests that workers are more educated and occupy more skilled positions, but there remains the possibility that they may not be the “best” individuals within these categories. In other words, sorting into unobservables might be more salient. To delve into this issue, we closely follow [de la Roca and Puga \(2017\)](#) and compare the distribution of unobserved ability, as measured by estimates of worker fixed effects, across firm types.<sup>38</sup> In Figure 8, we plot estimates of unobserved ability based on alternative regressions where we allow returns to experience to be common across firms (Panel B), to vary based on whether the experience was acquired in a cooperative or conventional firm (Panel C), or to be heterogeneous across worker types and vary by the type of firm when it was accumulated (Panel D).<sup>39</sup> For comparison, we also show the distribution of lifetime earnings in Panel A.

As expected, when comparing the lifetime earnings distribution of workers whose first job was in a cooperative compared to those who started their career in conventional firms, the distribution of workers in cooperatives shows a lower mean. In addition, it also shows greater dispersion and a higher degree of negative skewness. However, when comparing the unobserved ability of workers across firm types, the two distributions become very similar, although the distribution of cooperatives still has a slightly heavier left tail: there is a slightly larger mass of low-ability workers. Interestingly, the distribution of worker fixed effects becomes nearly identical when we allow for firm-specific returns to experience to be heterogeneous across workers (Panel D). These differences across ability distributions arise because the worker-fixed effects in Panel B and Panel C not only capture the time-invariant heterogeneity across individuals but also embed the time-varying effect of working for a given type of firm (returns to firm-specific experience), as well as the interaction of that effect with workers’ innate abilities.

Taken together, these results suggest that the initial ability of workers whose first job was in a cooperative rather does not differ significantly from the initial ability of

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<sup>38</sup>We estimate worker fixed effects from Mincer-type regressions that include, among others, controls for time-varying skill categories to account for observed ability.

<sup>39</sup>The estimates are based on variations from the regression results in Table 12 Column (4). In particular, we modify the regression by either forcing the returns to experience to be common across firms or heterogeneous across workers by interacting firm-specific returns to experience with worker fixed effects as in [de la Roca and Puga \(2017\)](#).

those whose first job was in a conventional firm. Instead, it is the dynamic consequences of such first experience that have an impact on their careers.

**Beyond worker fixed-effects: a bounding exercise.** Despite the apparently limited relevance of the sorting channel in terms of individual ability, the lack of exogenous variation in the probability of having an initial job in a worker cooperative raises concerns about the potential role of selection on unobserved personality traits and economic preferences. For example, if young workers who join cooperatives are more risk averse and therefore change jobs less frequently (Argaw et al., 2017; van Huizen and Alessie, 2019), this would shape life-cycle wage growth regardless of the characteristics of the first employer.

To assess the extent to which selection of workers into employer types based on factors other than the traits embedded in the worker fixed effects may affect our results, we follow the procedure proposed by Oster (2019) to bound the possible selection bias under the assumption that selection on unobservables is proportional to selection on observable characteristics.<sup>40</sup> The exercise consists of quantifying the magnitude of the selection bias by comparing the coefficient of interest and the R-squared between regressions with and without control variables. More precisely, we calculate the ratio, called  $\delta$ , of the effect of unobservables to the effect of observed characteristics that would drive the coefficient of interest to zero. The parameter  $\delta$  thus captures the relevance of unobservables relative to the observables affecting  $Coop_{it_0}$  in Equation 1.<sup>41</sup>

The comparison between baseline and controlled estimates of our coefficient of interest reported in Columns (1) and (4) of Table 1 reveals that the wage penalty becomes stronger when we control for an extensive set of observable characteristics, increasing in absolute value from -0.056 to -0.080. At the same time, the R-squared increases from 0.113 to 0.322. Following Oster (2019), we assume that the value of the R-squared in a hypothetical regression including unobserved confounding factors ( $R_{max}$ ) would be  $1.3\tilde{R}$ , where  $\tilde{R}$  is the R-squared from the controlled regression reported in Column (4) of Table 1. We obtain a value of  $\delta=-11.3$ , implying that to wipe out the career impact of having an initial experience in a worker cooperative the remaining selection on unob-

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<sup>40</sup>See also Altonji et al. (2005) for a similar discussion.

<sup>41</sup>When  $\delta=1$ , unobserved and observed factors are equally relevant and their impact on the coefficient of interest goes in the same direction; if  $0 < \delta < 1$ , unobservables are less important than observables. The opposite holds if  $\delta > 1$ . A negative ratio,  $\delta < 0$ , indicates a negative correlation between observables and unobservables.

servables would have to be 11 times larger than the selection on observables (and the coefficient would be changed to the opposite direction). This ratio seems implausibly high given the extensive set of controls included in our analysis. In relation to the robustness of our magnitude conclusions, the corresponding bias-adjusted  $\beta$ , with  $\delta=1$  (i.e. equal relative degree of selection on observable and unobservable variables) and  $R_{max}=1.3\tilde{R}$ , is -0.09, falling within the 95% confidence intervals of  $\beta$  in the controlled regression. This suggests that controlling for unobservable factors is unlikely to overturn our main result. In other words, the uncovered wage gap is presumably not due to ex-ante differences between workers who started their careers in a cooperative and those initially assigned to a conventional firm.

## 6 Conclusions

This paper investigates the role of the firm’s ownership structure of the first job in shaping the careers of young workers. Our analysis reveals that individuals who had their initial job experience at an employee-owned firm (EOF) experience an 8% reduction in earnings over the first 15 years in the labour market relative to similar individuals initially employed at conventional, capital-owned firms.

We rule out the self-selection of individuals with low unobserved initial ability into EOFs as a relevant explanatory channel. Instead, differences in returns to experience and job mobility patterns seem to account for our findings. On the one hand, we find evidence of negative wage returns to accumulated experience in EOFs versus conventional firms, but no significant differences in the dynamic of promotions. This calls into question the interpretation of differential returns to experience as an indicator of lower skill acquisition in EOFs and may instead indicate differences in pay policies. On the other hand, we document that individuals who started their career in an EOF tend to stay in that type of organization, even several years after their entry into the labour market, and are less likely to voluntarily leave their company. This is indicative of the existence of non-pecuniary job attributes offered by EOFs that might compensate for lower lifetime earnings.

Our results suggest that, contrary to studies that find a minor impact of institutions that confer limited power to workers (Jäger et al., 2022), organisations with broader forms of worker participation in corporate governance and profit-sharing can exert large and persistent effects on workers’ labour market outcomes. Importantly, our

findings also have implications for policy initiatives aimed at strengthening the role of EOFs in facilitating school-to-work transitions and improving the employment conditions of young people. These initiatives generally focus on addressing informational barriers and cultural factors that supposedly prevent young workers from joining these organisations. Our analysis indicates that it is equally important to understand the long-term cost and benefits of working in such firms and to assess whether they offer individuals sufficient incentives to join them in the first place and to stay in them.

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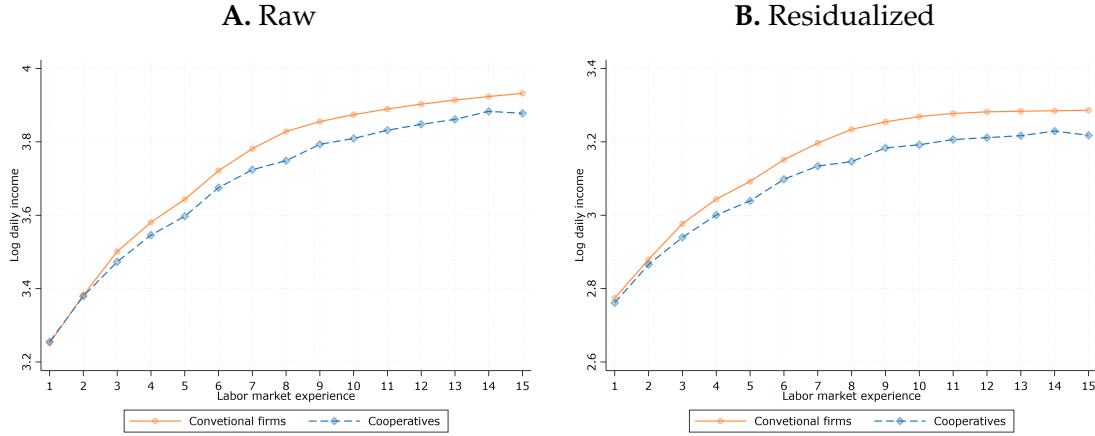
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# Figures and tables

**Figure 1: Experience-wage profile by firm ownership of first job**



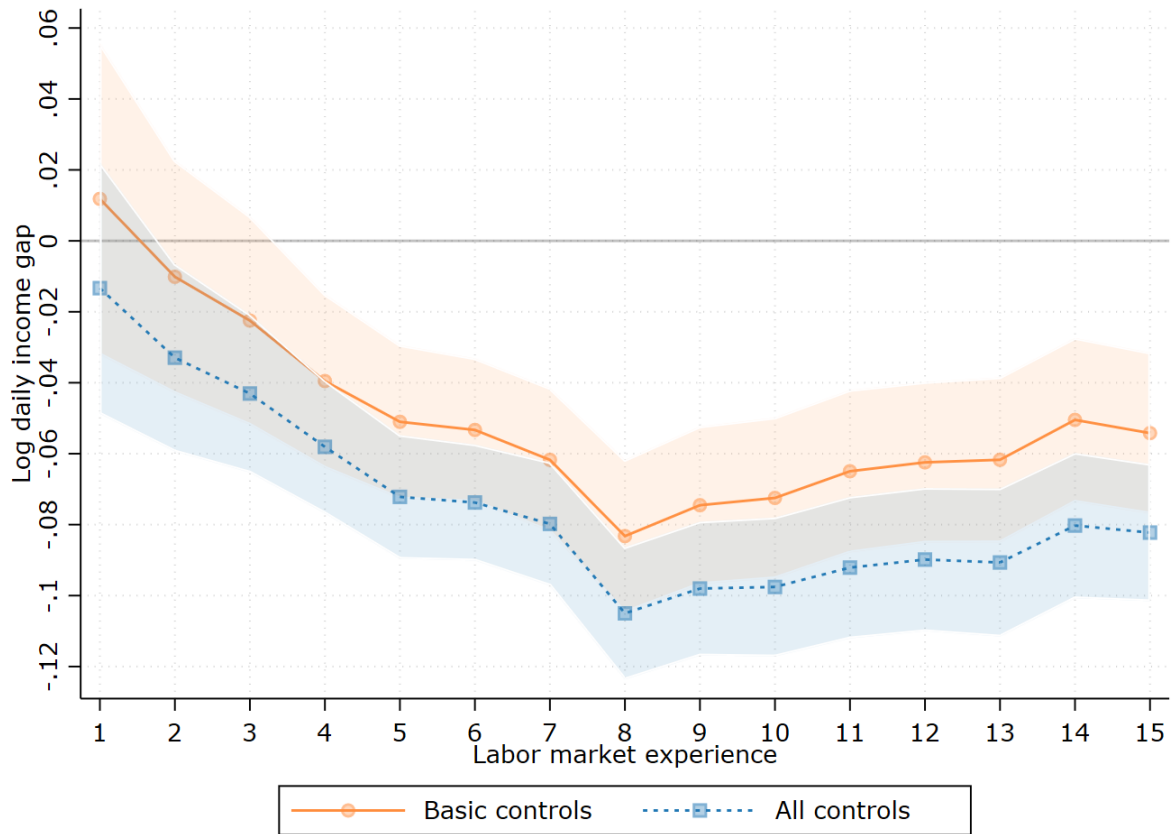
Notes: The figure shows raw (Panel A) and residualized (Panel B) experience-wage profiles by ownership of the firm of first employment. Residualized stands for daily wages after removing year and demographic (education and gender) effects. Wage refers to total labour income (traditional wage employment as well as income from self-employment and other forms of dependent employment) divided by days worked each year. Wages are expressed in 2018 euros deflated using the Spanish consumer price index.

**Table 1: Impact of first job in a cooperative: Benchmark regression**

	(1)	(2)	(3)	(4)
First job at cooperative	-0.056*** (0.009)	-0.071*** (0.007)	-0.071*** (0.007)	-0.080*** (0.007)
Observations	24,659,247	24,659,247	24,659,247	24,659,247
R-squared	0.113	0.265	0.266	0.322
Basic controls	Yes	Yes	Yes	Yes
Gender/Education	No	Yes	Yes	Yes
Unemployment rate at entry	No	No	Yes	Yes
Job-firm characteristics of first employer	No	No	No	Yes

Notes: Columns (1)-(4) show estimates of Equation 1. The dependent variable is the log of daily labour income (traditional wage employment as well as income from self-employment and other forms of dependent employment) after the first job. All regressions include basic controls (calendar month-year, potential experience, graduation cohort and province of birth). In column (2), we add controls for gender and education. In column (3), we control for the province-specific unemployment rate at the time of labour market entry (cubic polynomial). In column (4), we include additional controls for first-job-employer characteristics (skill level, full-time status, sector, firm age). Standard errors clustered at the level of the province of birth  $\times$  graduation year. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Figure 2: Impact of first job in a cooperative: Experience-wage gap**



Notes: The figure shows the experience-specific wage differential for first job experience in a cooperative relative to a conventional firm, estimated from an augmented version of Equation 1 in which the cooperative dummy variable interacts with the indicators for each year of experience. Basic controls refer to calendar month-year, potential experience, graduation cohort, and the province of birth. All controls include basic controls plus province-specific unemployment rate at the time of labour market entry (cubic polynomial) along with variables to account for gender, education, entry-level skill, full-time status, sector, and firm age differences. 95% confidence bands based on standard errors clustered at the level of the province of birth  $\times$  graduation year.

**Table 2: Impact of first job in a cooperative: Lifetime regression**

Panel A.	(1)	(2)	(3)	(4)
	All income	Earnings	Avg. daily wage	Days worked
First job at cooperative	-0.098*** (0.013)	-0.091*** (0.013)	-0.067*** (0.007)	-0.024** (0.009)
Observations	214,024	214,024	214,024	214,024
R-squared	0.212	0.216	0.338	0.076
Panel B.	(1)	(2)	(3)	(4)
	All income	Earnings	Avg. daily wage	Days worked
First job at cooperative	-0.111*** (0.012)	-0.106*** (0.012)	-0.072*** (0.006)	-0.034*** (0.009)
Observations	214,024	214,024	214,024	214,024
R-squared	0.255	0.257	0.417	0.087

Notes: Results based on worker-level regressions the outcomes during the first 15 years in the labour market are summarized in a single observation in the spirit of Arellano-Bover (2022). Column (1) uses as the dependent variable total income during the first 15 years, including both total labour earnings and unemployment benefits. Column (2) excludes unemployment benefits from the measure of income. Columns (3) and (4) examine the daily wages and working days, respectively. All variables are in logs. Panel A includes as controls graduation cohort and province of birth fixed effects, a cubic polynomial in the unemployment rate at the time of labour market entry, gender, and education. Panel B extends the set of controls to incorporate first-job-employer characteristics (skill level, full-time status, sector, firm age). Standard errors clustered at the level of the province of birth  $\times$  graduation year. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 3: Impact of first job in a cooperative: Robustness to the definition of first employment after graduation**

	(1)	(2)	(3)	(4)
	Benchmark	Job spell of 100 days	180 days worked in 12 months	1st job within 3 years
First job at cooperative	-0.080*** (0.007)	-0.078*** (0.007)	-0.086*** (0.008)	-0.072***
Observations	24,659,247	25,700,745	22,442,022	17,656,608
R-squared	0.322	0.317	0.342	0.333

Notes: Column (1) is our benchmark definition of the first job, referring to the first 6 consecutive months after the year of graduation when individuals work at least 100 days. Column (2) defines first employment as the first job spell after the year of graduation lasting at least 100 days. Column (3) specifies first employment the first 12 consecutive months after the year of graduation when individuals work at least 180 days. Column (4) considers only workers whose first job, defined as the first 6 months after graduation when individuals worked more than 100 days, occurs no later than 3 years after the year of graduation. All specifications include the same set of controls as Table 1 Column (4). Standard errors clustered at the level of the province of birth  $\times$  graduation year. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 4: Impact of first job in a cooperative: Robustness to top-coded income**

	(1)	(2)	(3)
	Corrected	Censored	No censored
First job at cooperative	-0.080*** (0.007)	-0.067*** (0.006)	-0.054*** (0.006)
Observations	24,659,247	24,659,247	23,395,870
R-squared	0.322	0.298	0.236

Notes: Column (1) uses censoring-corrected observations following the imputation method described in Appendix D. Column (2) uses uncorrected earnings. Column (3) removes censored observations from the sample. All specifications include the same set of controls as Table 1 Column (4). Standard errors clustered at the level of the province of birth  $\times$  graduation year. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 5:** Impact of first job in a cooperative: Robustness to the type of labour relationships

	(1) Mainly General Regime	(2) Strong LM Attachment	(3) LLC	(4) Only WE Income
First job at cooperative	-0.064*** (0.007)	-0.081*** (0.007)	-0.083*** (0.008)	-0.060*** (0.007)
Observations	22,929,433	22,806,452	18,280,594	23,086,331
R-squared	0.348	0.330	0.371	0.359

Notes: Column (1) specification includes only workers who spend at least 60% of the first 15 years in the labour market employed in standard wage-employment relationships (General Regime of the Social Security). Column (2) specification considers only workers who during the first 15 years in the labour market (LM) were employed more than 50% of the time. Column (3) specification uses only employment relationships with limited liability companies (LLC), i.e., excludes employment relationships with individual enterprises as well as other special forms of businesses. Column (4) considers only income coming from wage-employment relationships. All specifications include the same set of controls as Table 1 Column (4). Standard errors clustered at the level of the province of birth  $\times$  graduation year. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 6:** Impact of first job in a cooperative: Robustness to the definition of cooperatives and inclusion of labour societies

	(1) Including LSs	(2) Only WCs	(3) Only Manufacturing	(4) Partners/employees
First job at cooperative	-0.079*** (0.006)	-0.137*** (0.013)	-0.113*** (0.011)	
First job at cooperative - Employee				-0.071*** (0.007)
First job at cooperative - Partner				-0.176*** (0.030)
Observations	24,659,247	24,659,247	5,279,850	24,659,247
R-squared	0.322	0.322	0.355	0.322

Notes: In Column (1) specification, the first job at a cooperative is a dummy variable, equal to one if the individual had an initial job experience either in a cooperative or a labour society, and zero otherwise. Column (2) specification restricts the definition of cooperative to firms coded as worker cooperatives by the Spanish social security agency. Column (3) specification restricts the analysis to individuals who had an initial job experience in Manufacturing, where the cooperative status unambiguously identifies employee-owned firms (worker cooperatives). In Column (4), we report estimates distinguishing salaried employees and partners among individuals who had an initial job experience in a cooperative as employees or partners (the omitted category refers to individuals who held their first job in a conventional business). All specifications include the same set of controls as Table 1 Column (4). Standard errors clustered at the level of the province of birth  $\times$  graduation year. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 7: Impact of first job in a cooperative: Robustness to the size of the first employer**

	Graduation year: 1999-2003		
	(1) All workers	(2) First job after 2004	(3) (2) + Firm size
First job at cooperative	-0.064*** (0.011)	-0.112*** (0.027)	-0.114*** (0.026)
(log) Firm Size			0.035*** (0.001)
Observations	6,570,628	1,847,141	1,847,141
R-squared	0.305	0.299	0.309

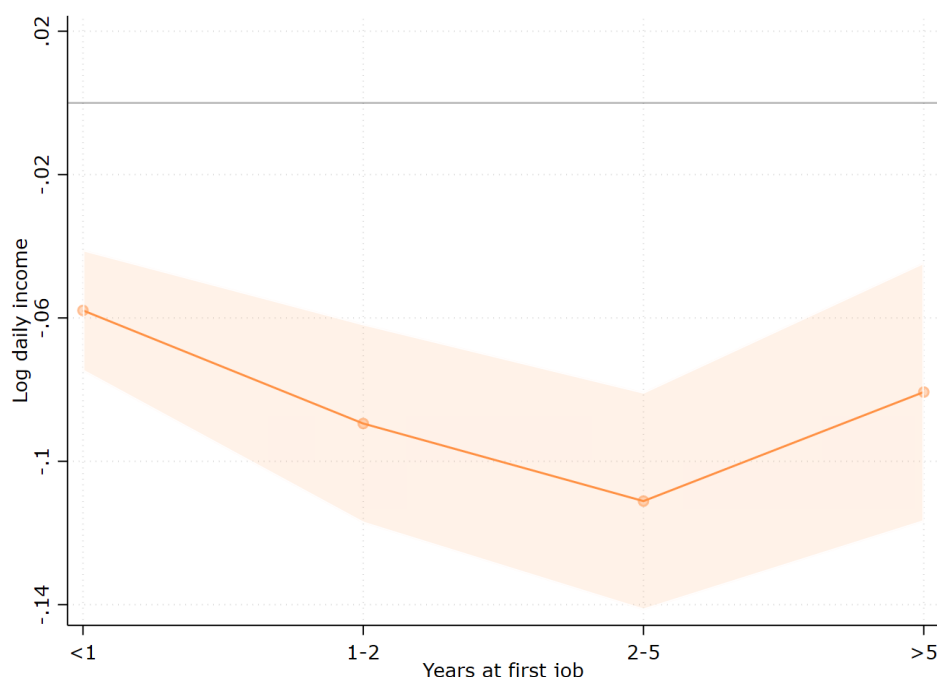
Notes: Column (1) includes all workers whose year of graduation is between 1999 and 2003. Column (2) considers only workers from Column (1) whose first job occurs between 2005 and 2009. Column (3) adds to Column (2) (log) the firm size of the first employer as an additional control. All specifications include the same set of controls as Table 1 Column (4). Standard errors clustered at the level of the province of birth  $\times$  graduation year. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 8: Impact of first job in a cooperative: Heterogeneity by worker demographics**

	(1) Men	(2) Women	(3) Non-College	(4) College
First job at cooperative	-0.097*** (0.009)	-0.058*** (0.009)	-0.073*** (0.008)	-0.103*** (0.014)
Observations	14,356,008	10,303,239	18,811,330	5,847,917
R-squared	0.318	0.301	0.202	0.268

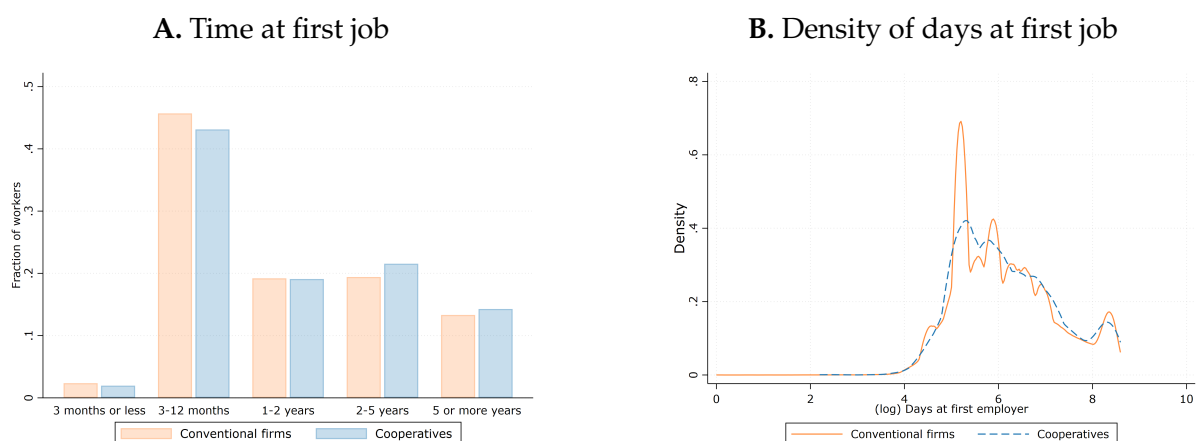
Notes: All specifications include the same set of controls as Column (4) in Table 1 when appropriate. Standard errors clustered at the level of the province of birth  $\times$  graduation year. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Figure 3:** Impact of first job in a cooperative: Heterogeneity by the duration of the first job



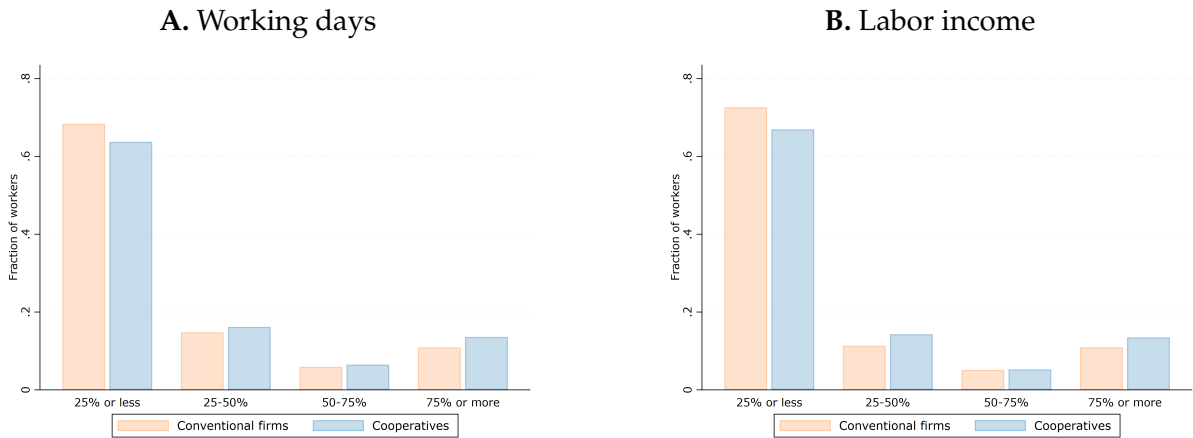
Notes: The figure shows the wage differential for first job experience in a cooperative relative to a conventional firm, estimated from an augmented version of Equation 1 in which the cooperative dummy variable interacts with the indicators for each first job length category: less than a year, between 1 and 2 years, 2 to 5 years, and 5 years or more. The regression includes the same set of controls as Column (4) in Table 1. 95% confidence bands based on standard errors clustered at the level of the province of birth  $\times$  graduation year.

**Figure 4:** Duration of first job



Notes: Panel A shows the share of workers by time spent in the first job. Panel B reports the distribution of (log) days worked in the first job.

**Figure 5: First job outcomes relative to career outcomes**



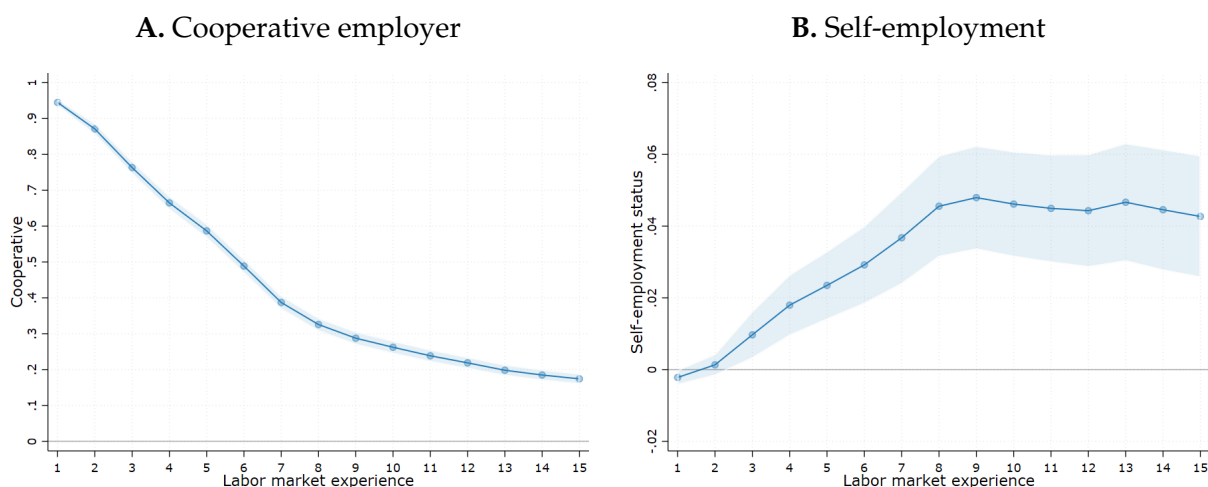
Notes: Figures show the distribution of total days worked (Panel A) and income earned (Panel B) in the first job relative to overall days worked and income earned during the first 15 years in the labour market by firm ownership of the first job.

**Table 9: Impact of first job in a cooperative: Reason for separation from the first job**

	Competing-risk		
	(1) Voluntary	(2) Involuntary	(3) Other
First job at cooperative	-0.141** (0.059)	0.017 (0.032)	-0.194 (0.128)
Observations	2,198,595	2,198,595	2,198,595

Notes: The table reports the results from a discrete-time duration model with competing risks (multinomial logit) using three types of separations: voluntary, involuntary, and other. Voluntary and involuntary movers stand for workers whose separation from their first job was initiated by the employee or the employer, respectively. Other types of separation is a residual category including among others sickness or parental leave, but mostly refers to undefined/administrative causes. Controls include a firm-type specific quadratic polynomial on job duration, province of birth and graduation cohort fixed effects, province-specific unemployment rate at the time of labour market entry (cubic polynomial), seasonal effects, gender, education level, and first-job-employer variables such as skill category, full-time status, sector, and firm age. Standard errors clustered at the level of the province of birth  $\times$  graduation year. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Figure 6:** Impact of fist job in a cooperative: Differential probability of being in a cooperative or self-employment by labour market experience



Notes: The figure shows the impact of having a first job in a cooperative relative to a conventional enterprise on the probability of working for a cooperative (Panel A) or being self-employed (Panel B) by labour market experience. Results are obtained from separated linear probability models where the first job in a cooperative dummy is interacted with the indicators for each year of experience. Both linear probability models include the same set of controls as Column (4) in Table 1. 95% confidence bands based on standard errors clustered at the level of the province of birth  $\times$  graduation year.

**Table 10:** Impact of first job in a cooperative: Job mobility over the career

	(1) OLS	(2) Logit	Multinomial Logit		
			(3) Voluntary	(4) Involuntary	(5) Other
First job at cooperative	-0.002*** (0.001)	-0.050*** (0.015)	-0.085*** (0.021)	-0.038** (0.017)	-0.073* (0.042)
Observations	24,659,247	24,659,247	24,659,247	24,659,247	24,659,247
R-squared	0.015	0.035	0.036	0.036	0.036

Notes: Dependent variable is an indicator for the probability that a worker separates from her current employer. Column (1) estimates a linear probability of the model for the likelihood of separating. Column (2) estimates the separation probability by maximum likelihood using a Logit link for the hazard function. Columns (3) to (5) extend Column (2) to a competing risk setting (multinomial logit) using three types of separations: voluntary, involuntary, and other. Voluntary and involuntary movers stand for workers whose separation from their first job was initiated by the employee or the employer, respectively. Other types of separation is a residual category including among others sickness or parental leave, but mostly refers to undefined/administrative causes. All specifications include the same set of controls as Column (4) in Table 1. The R-squared reported in Columns (2) to (5) refers to McFadden's R-squared. Standard errors clustered at the level of the province of birth  $\times$  graduation year. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 11:** Impact of first job in a cooperative: Workers with a non-employment gap between first and second job

	(1) All workers	(2) Movers	(3) Involuntary movers
First job at cooperative	-0.080*** (0.007)	-0.059*** (0.009)	-0.042*** (0.009)
Observations	24,659,247	11,873,895	9,006,751
R-squared	0.322	0.241	0.227

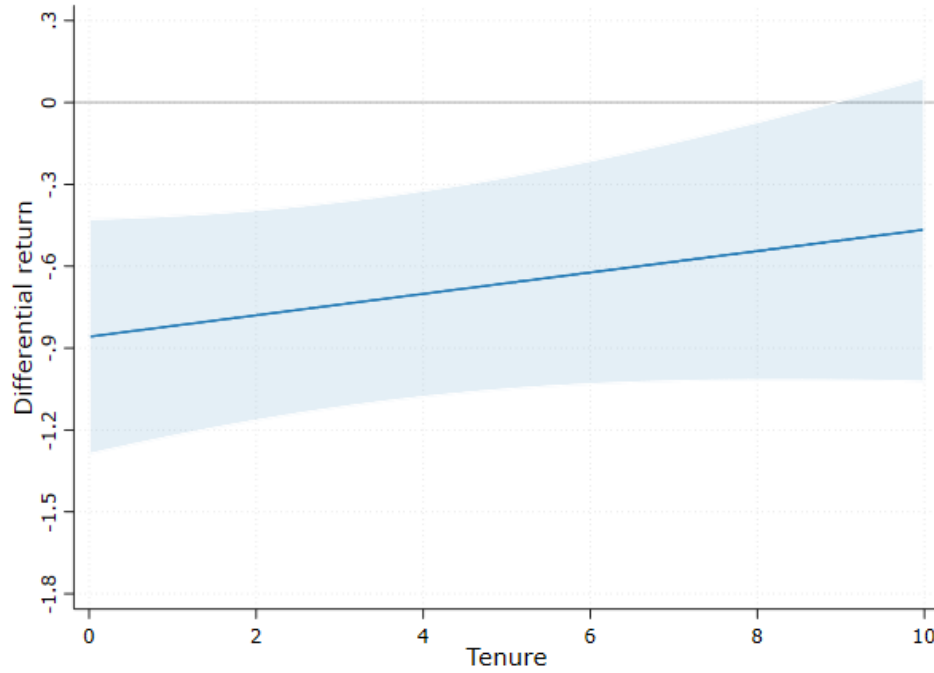
Notes: Column (1) is the benchmark specification in Table 1 Column (4). Columns (2) and (3) estimate the regression model in Equation 1 in the sample of individuals who had a non-employment gap between the first and second jobs of at least 6 months (36% of the baseline sample). Column (3) considers only *involuntary* movers, i.e., workers who were laid off (29% of the baseline sample). All specifications include the same set of controls as Table 1 Column (4). Standard errors clustered at the level of the province of birth  $\times$  graduation year. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 12:** Returns to experience at cooperatives

	(1)	(2)	(3)	(4)
CoopExp	-54.653*** (8.151)	-28.715*** (8.437)	-52.832*** (8.223)	-28.264*** (8.462)
CoopExp $\times$ Exp	0.011*** (0.002)	0.006*** (0.002)	0.007*** (0.002)	0.003 (0.002)
CoopExp $\times$ Tenure			0.005*** (0.002)	0.004** (0.002)
Exp	217.622*** (1.935)	217.360*** (1.935)	217.597*** (1.935)	217.350*** (1.935)
Exp <sup>2</sup>	-0.024*** (0.000)	-0.024*** (0.000)	-0.024*** (0.000)	-0.024*** (0.000)
Tenure	38.228*** (1.058)	38.027*** (1.057)	38.249*** (1.058)	38.052*** (1.058)
Tenure <sup>2</sup>	-0.008*** (0.000)	-0.008*** (0.000)	-0.008*** (0.000)	-0.008*** (0.000)
Observations	23,086,331	23,086,331	23,086,331	23,086,331
R-squared	0.683	0.683	0.683	0.683
Current coop status	No	Yes	No	Yes

Notes: Dependent variable is log daily labour earnings from wage-employment. Experience and tenure are measured in days. Exp is overall *actual* experience. CoopExp is experience accumulated at cooperative firms. Tenure equals days worked for the current employer. Estimated coefficients and standard errors multiplied by  $10^6$  for readability. All specifications include fixed effects for workers, skill-level, full-time, firm age, sector, location, and time. Columns (2) and (4) include a dummy variable equal to one if the current employer is a cooperative firm, and zero otherwise. Standard errors clustered at the worker level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Figure 7:** Catch-up rate: Wage return to one year of experience in a cooperative relative to a conventional firm, by current employer tenure



Notes: The figure shows the differential return (in percent) to one additional year of experience acquired in a cooperative (CoopExp = 360 days) relative to a conventional enterprise by current employer tenure. The differential return is calculated using point estimates, CoopExp, Coop×Exp, and CoopExp×Tenure, from Table 12 Column (4). Experience is fixed at its median value of the actual experience distribution in the baseline sample, 1465 days (~4 years). Tenure is measured in days but expressed in years for readability. 95% confidence bands are computed using the delta method.

**Table 13:** Returns to experience at cooperatives: Professional mobility

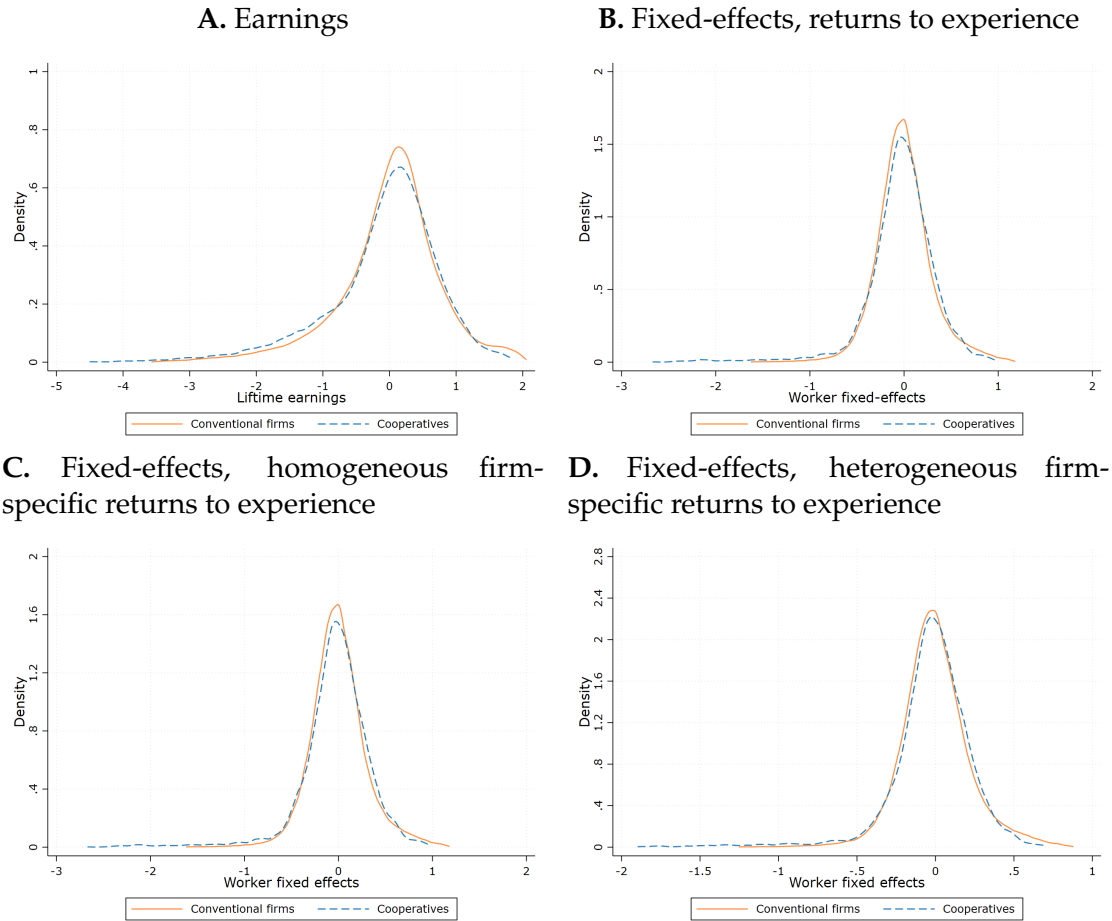
	Promotions		Promotion, w/o demotions		High-level promotion	
	(1)	(2)	(3)	(4)	(5)	(6)
CoopExp	-0.983** (0.497)	-0.562 (0.533)	-0.722 (0.484)	-0.544 (0.503)	-0.233 (0.216)	-0.348 (0.235)
CoopExp×Exp	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
CoopExp × Tenure	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Observations	23,086,331	23,086,331	14,534,828	14,534,828	14,534,828	14,534,828
R-squared	0.030	0.030	0.023	0.023	0.020	0.020
Current coop status	No	Yes	No	Yes	No	Yes

Notes: Dependent variable is an indicator variable equal to one if the individual moves up in the professional category ladder in  $t + 1$  and zero otherwise. Columns (1) and (2) include all upward movements on the occupation ladder. Columns (3) and (5) restrict the sample to individuals who have never experienced a downward career move. Columns (4) and (6) define only movements to the highest level of occupational categories as promotions. Experience and tenure are measured in days. Exp is overall *actual* experience. CoopExp is experience accumulated at cooperative firms. Tenure equals days worked in the current employer. Estimated coefficients and standard errors multiplied by  $10^6$  for readability. All specifications include the same set of controls as Table 12 Column (4), referring to period  $t$ . Standard errors clustered at the worker level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 14: Worker observed heterogeneity by firm ownership of first job**

	Education			Skill				
	Tertiary	Secondary	Primary	Very-high-skill	High-skill	Med-high-skill	Med-low-skill	Low-skill
Conventional firms	.213	.303	.484	.035	.044	.018	.281	.622
Cooperatives	.254	.266	.479	.039	.078	.018	.250	.617

Notes: The table shows the distribution of observed ability of workers in each firm ownership category. Skill groups are based on Social Security contribution groups and we rely on the category of the first job.

**Figure 8: Worker unobserved heterogeneity by firm ownership of first job**

Notes: Panel A shows the distribution of total labour income earned during the first 15 years in the labour market by firm ownership of the first job. Panel B shows the distribution of worker-fixed effects from a wage equation controlling for actual experience, tenure, skill-level, full-time status, current cooperative employer, workplace location, sector of activity and time-fixed effects. Panel C plots the distribution of worker fixed-effects, extending the wage equation of Panel B to allow returns to experience to vary by firm-ownership, whereas Panel D further extends such wage equation to allow the returns to experience to vary by firm-ownership *and* worker fixed-effects using the algorithm proposed by [de la Roca and Puga \(2017\)](#). Distributions are centred at the average value of workers who had their first job in a conventional enterprise.

# Appendix (not intended for publication)

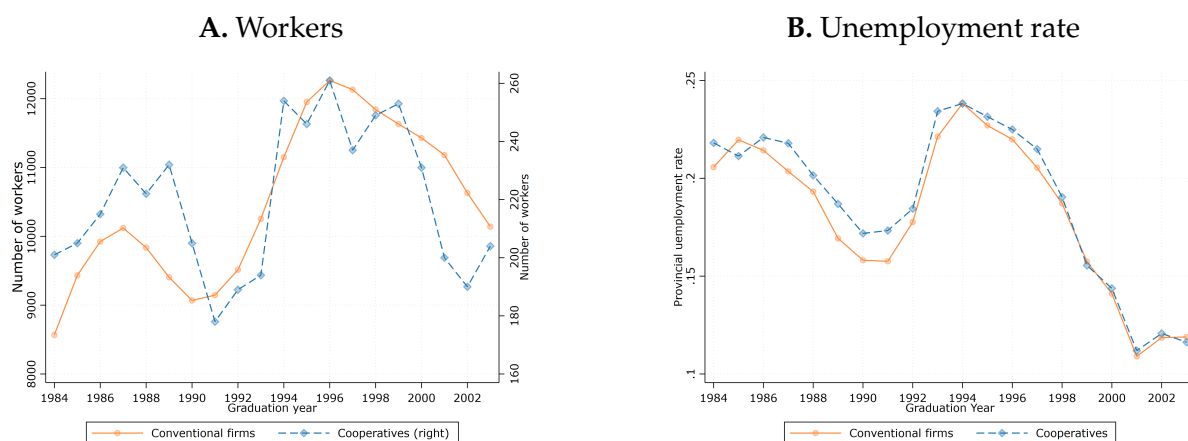
## A Supplementary tables and figures

**Table A1:** Descriptive statistics by firm ownership of first job

	Conventional firms	Cooperatives
<b>Demographics</b>		
Female	0.43	0.47
Age	20.83	21.03
High-school	0.30	0.27
College	0.21	0.25
<b>First labor market experience</b>		
Time to first job (yr)	1.74	1.72
First job in province of birth	0.83	0.85
Unemployment rate	0.18	0.19
Earnings first 6 months	5,557.70	5,732.15
Days worked first 6 months	163.82	163.80
No. employers first 6 months	1.21	1.19
Total earnings in first job	43,018.94	44,703.85
Total days worked in first job	843.65	909.51
First job in a new firm	0.18	0.15
Entry partner	-	0.09
Mid-skill occupation	0.30	0.27
High-skill occupation	0.08	0.12
Full-time job	0.77	0.74
Firm age	9.06	10.86
Manufacturing	0.21	0.31
Construction	0.13	0.10
Big city	0.43	0.29
<b>Lifetime outcomes</b>		
Wage-employment income	175,593.41	157,182.23
Self-employment income	6,133.74	10,650.69
Unemployment benefits	9,868.97	8,687.70
Wage-employment days	3,118.58	2,921.34
Self-employment days	191.06	314.76
Days registered as unemployed	218.22	196.69
No. employers	4.10	3.72
No. cooperatives	0.04	1.20
Always same firm type	0.40	0.16
<b>Workers</b>	<b>209,627</b>	<b>4,397</b>

Notes: Time to first job refers to the years between graduation year and the year of the first employment. The first job in a new firm stands for individuals who were hired within the year the firm was founded. Big city refers to metropolitan areas with over 1 million inhabitants (Madrid, Barcelona, Sevilla, and Valencia). Lifetime outcomes refer to labour market outcomes aggregate over workers' first 15 years in the labour market. Income is expressed in 2018 euros deflated using the Spanish consumer price index.

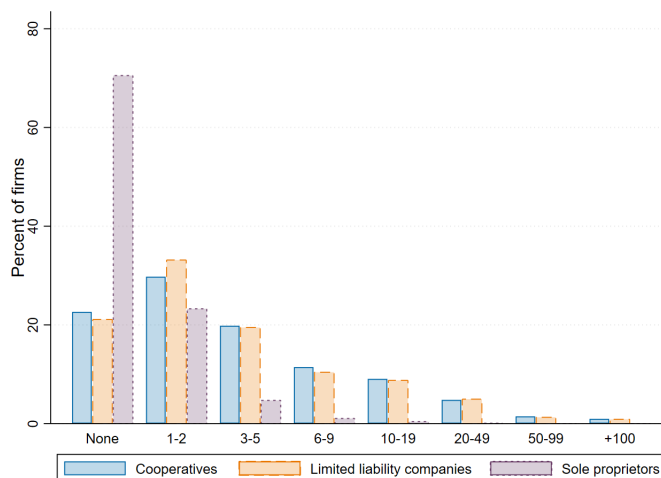
**Figure A1: Graduation cohorts by firm ownership of first job**



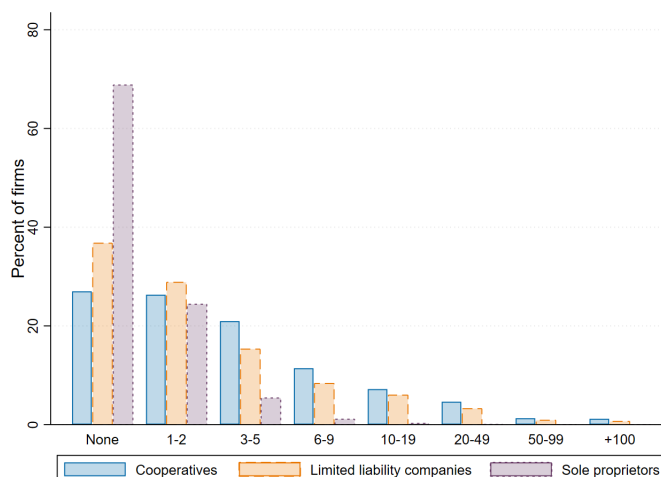
Notes: Panel A shows the number of workers by graduation cohort and ownership of the firm of the first job. Panel B displays the prevalent unemployment rate in the year of graduation in the province of workers' birth.

**Figure A2: Firm size distribution by firm ownership in selected years**

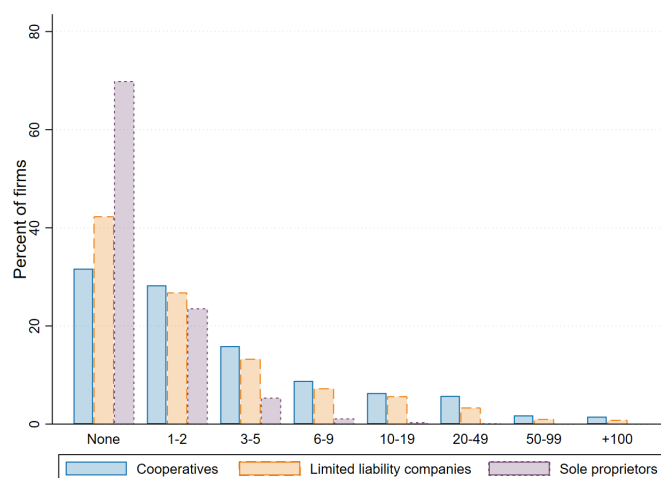
**A. 2000**



**B. 2010**

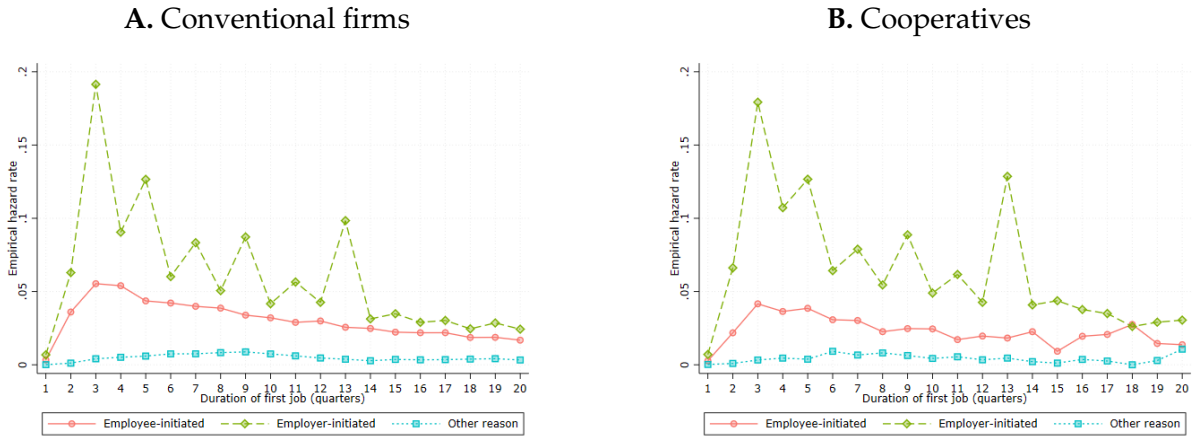


**C. 2020**



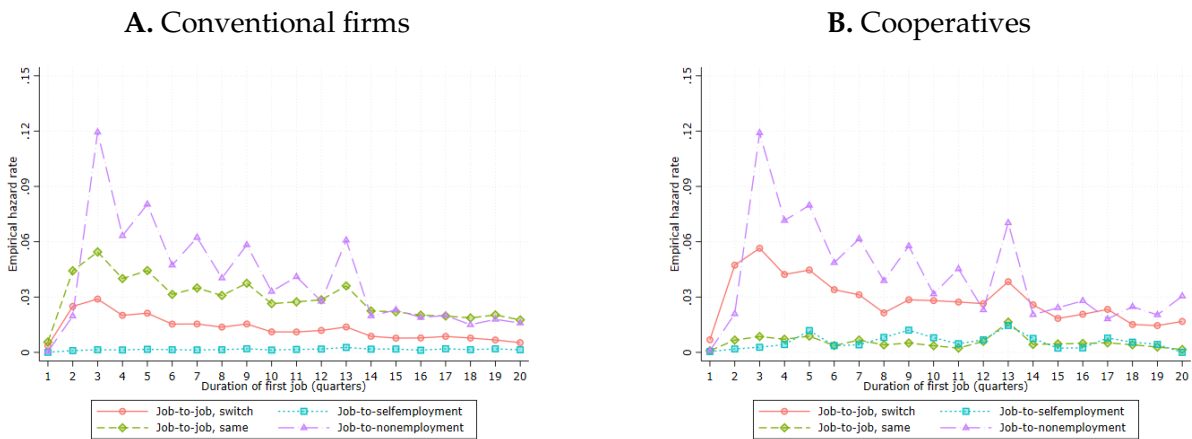
Notes: The figure shows the firm size (average number of employees in a year) distribution for selected years when there is available data from the *DIRCE* database of the Spanish Statistical Office. Firms with no employees (the *none* category) correspond to organisations in which the owner is the only worker.

**Figure A3: Exit from first job by type of separation**



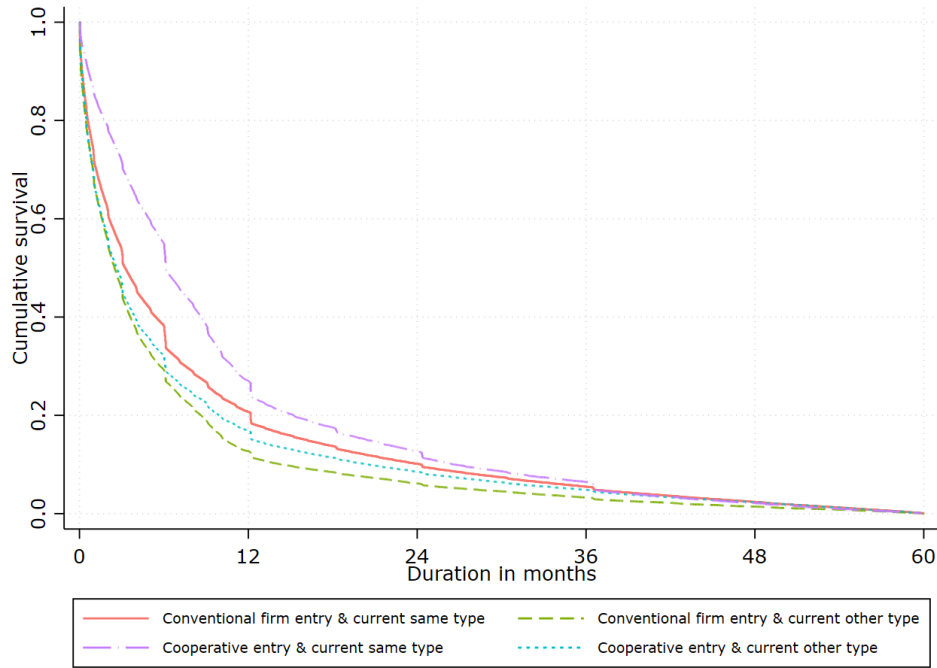
Notes: The figure shows the empirical rates of exit from the first job by the type of separation and ownership of the first employer, i.e., conventional firms (Panel A) and cooperatives (Panel B). "Other reason" is a residual category including among others sickness or parental leave, but mostly refers to undefined/administrative causes.

**Figure A4: Exit from first job by destination state**



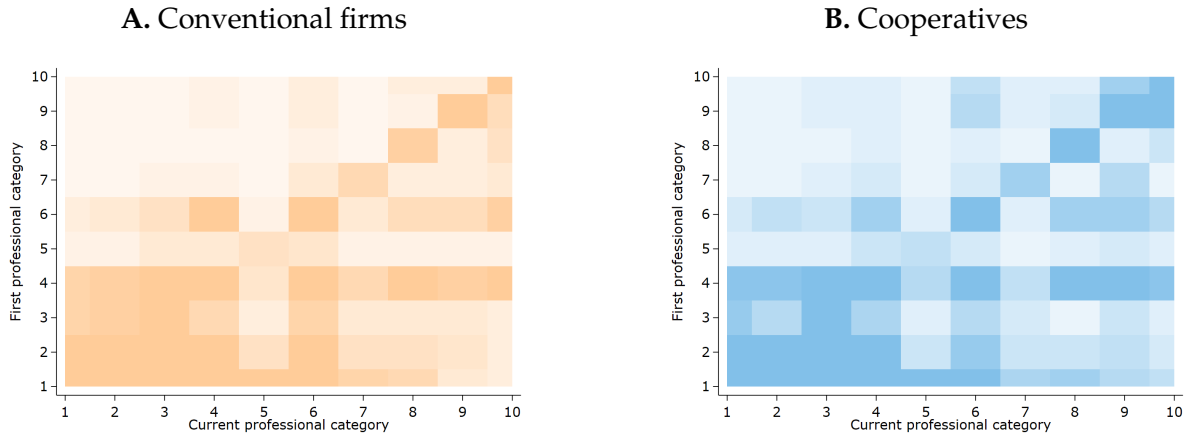
Notes: The figure shows the empirical rates of exit from the first job by destination state and ownership of the first employer, i.e., conventional firms (Panel A) and cooperatives (Panel B). "Switch" refers to workers who changed employer type, while "same" refers to those who remained with the same employer type as in the first job. "Non-employment" means transitions with 6 or more months between the end of the first job and the beginning of the next job.

**Figure A5:** Kaplan-Meier survival estimates of job duration



Notes: The figure shows the survival functions of the duration of the labour relationship separating spells by workers' firm ownership of their first job and the type of current labour relationship. "Current other type" refers to wage-employment spells in an organization with an ownership structure different from that of the first job, as well as periods of self-employment.

**Figure A6:** Professional mobility: Transitions between first and last observed job



Notes: The figure shows a heatmap of transition matrices of professional categories between the first and last observed job for workers who started in conventional firms (Panel A) and cooperatives (Panel B). Professional categories are constructed using Social Security contribution groups. The MCVL contains 10 different contribution groups that are aggregated based on similarities in skill requirements. Group 10 (engineers, college, senior managers—in Spanish *ingenieros, licenciados y alta direccion*), Group 9 (technicians—in *ingenieros tecnicos, peritos y ayudantes*), Group 8 (administrative managers—in *jefes administrativos y de taller*), Group 7 (assistants—in *ayudantes no titulados*), Group 6-4 (administrative workers—in *oficiales administrativos* (6), *subalternos* (5) and *auxiliares administrativos* (4)), Group 3-1: (manual workers—in *oficiales de primera y segunda* (3), *oficiales de tercera y especialistas* (2) and *mayores de 18 años no cualificados* (1))

## B Cooperatives versus labour societies

Spanish law distinguishes two types of worker-owned firms: cooperatives and labour societies. These business forms share the common characteristic of being majority-owned by their workers, i.e., they control more than 51% of the capital. However, there are key elements that differentiate them:

- i. *Restrictions on hiring non-partner workers.* In cooperatives, wage-earners cannot work more than 30% of the total hours worked by cooperative members during a year, while for labour societies this limit is set at 49%.
- ii. *Minimum capital requirement.* Labour societies are regulated by the same legislation as conventional corporations: firms must deposit a minimum level of capital to set up the organization, 3,000 euros in case of limited liability labour societies, and 60,000 euros for limited liability companies that are publicly traded. For cooperative businesses, there is no legal capital minimum requirement, but partners must stipulate the amount of the initial capital in the company bylaws.
- iii. *Capital ownership.* In cooperatives, the owners of the firm are the working partners but the firm bylaws may establish the possibility of accepting collaborative partners whose total contributions cannot exceed 45% of the social capital. In the case of labour societies, there are two types of partners: working partners who own at least 51% of the capital, and capitalist partners who can have a share in the firm that cannot exceed 49% of the capital.
- iv. *Voting power of partners.* The voting power in labour societies depends on the amount of capital provided by each member, while in cooperatives each member has the same voting power. If there are collaborative partners in the cooperative, they cannot represent more than 30% of the votes in the company governing bodies.
- v. *Corporate taxation.* Labour societies are taxed as any other type of for-profit business in Spain (25% of the profits). In the case of cooperatives, the corporate tax rate is lower (20%).<sup>42</sup>

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<sup>42</sup>Prior to 2016, the corporate income tax rate for conventional companies was 30%. In the case of cooperatives, the tax rate was not changed, but a distinction was made between the tax rate for cooperative and non-cooperative profits. Cooperative profits were taxed at 20%, while non-cooperative profits

## C Variables definition

**Gender.** Obtained from the Spanish Residence registry. We select this information from the most recent wave and, if there is any inconsistency, we choose the mode over the waves in which it is available.

**Birth date.** Obtained from personal files coming from the Spanish Residents registry. We select this information from the most recent wave and, if there is any inconsistency, we choose the most common value over the waves for which it is available.

**Nationality.** Obtained from Spanish Residents registry. The variable reports the link between the individual and Spain in terms of legal rights and duties. This variable allows for distinguishing between individuals with Spanish nationality (N00 code) and other worldwide nationalities.

**Education.** Retrieved from the Spanish Residents registry up to 2009, and from 2009 thereafter the Ministry of Education directly reports individuals' educational attainment to the National Statistical Office and this information is used to update the corresponding records in the Residence registry. Therefore, the educational attainment is imputed backwards whenever it is possible, i.e. when a worker is observed in the MCVL post-2009. In the imputation, we assigned 25 years as the minimum age to recover values related to university education.<sup>43</sup>

**Labor income.** Refers to Social Security contribution bases adding up both for traditional wage-employment as well as income from self-employment activities and other forms of dependent employment. Wage-employment income captures gross monthly labour earnings plus one-twelfth of year bonuses and is bottom and top-coded. The minimum and maximum caps vary by Social Security regime and contribution group, and they are adjusted each year according to the evolution of the minimum wage and inflation rate. In our main analysis, we use censored earnings due to the low incidence

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—those obtained from business activities that do not correspond to the purpose of the organization—were taxed at the general rate (30%).

<sup>43</sup>The age threshold is the average graduation age for a Bachelor's degree in Spain: <https://www.oecd.org/education/education-at-a-glance-19991487.htm>

in our sample, as it is mainly composed of young workers. However, we test the sensitivity of our results using censored corrected earnings, where we correct the upper tail of the wage distribution by fitting cell-by-cell Tobit models to (log) daily wages.<sup>44</sup> Self-employment income corresponds to the Social Security contribution declared by individuals carrying out their own activity and is based on their expected stream of labour income for a given period, typically quarters. We express labour income in 2018 euros, deflated using the Spanish consumer price index.

**Skill category.** Refers to Social Security contribution groups. These groups indicate a level in a ranking determined by the worker's contribution to the Social Security system, which is determined by both the level of education required for the specific job and the complexity of the task. The MCVL contains 10 different contribution groups that are aggregated based on similarities in skill requirements. High-Skill: Group 1 (engineers, college, senior managers—in Spanish *ingenieros, licenciados y alta direccion*), Group 2 (technicians—*ingenieros tecnicos, peritos y ayudantes*), and Group 3 (administrative managers—*jefes administrativos y de taller*). Medium-Skill: Group 4 (assistants—*ayudantes no titulados*) and Group 5-7 (administrative workers—*oficiales administrativos* (5), *subalternos* (6) and *auxiliares administrativos* (7)). Low-Skill: Group 8-10: (manual workers—*oficiales de primera y segunda* (8), *oficiales de tercera y especialistas* (9) y *mayores de 18 años no cualificados* (10)).

**Reason for termination.** Declared by the employer to the Social Security Administration. This variable is relevant for determining entitlement to severance pay and unemployment benefits. Using this information, we create three broad categories based on the following codes: code 51 refers to voluntary resignations or separations, 52, 54, 69, 77, 91, 92, 93, and 94 to dismissals or involuntary separations; and the remaining codes are considered other reasons for dismissal, including among others sickness or parental leave, but mostly referring to undefined/administrative causes.

**Plant.** A plant is defined by its Social Security contribution account (*codigo de cuenta de cotizacion*). Each firm is mandated to have as many accounts as regimes, provinces, and relation types with which it operates. According to the Social Security Adminis-

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<sup>44</sup>See Appendix D for a detailed discussion of the correction method and a comparison between the original and corrected wage distributions.

tration, around 85% of the firms are single-unit organizations, i.e. they have just one contribution account per firm. Each firm has one account for each treble province-Social Security regime-type of the employment relation. Thus, the Social Security Administration identifies different groups of employees of a given firm within a province.

**Conventional firms.** We rely on the information on the legal structure coming from tax IDs to select limited liability, joint-stock companies, and foreign entities (first digit of the tax ID: A, B, N and W) as well as sole proprietor enterprises. Conventional enterprises and labour societies are under the same regulation for corporate taxation, implying the tax IDs do not allow to distinguish between them. Then, we use the type of the plant to separate capitalist firms (code 9999) from labour societies (5180).

**Cooperatives.** We use tax IDs to select cooperatives (first digit F), which are the type of organization fulfilling all the international standards to qualify under the cooperatives' class of enterprises. Additionally, we hinge on the type of labour relationship between worker and employer to isolate partners (code 930) from wage-earner employees in cooperatives.

**Plant creation date.** Date when the first employee was registered in the contribution account.

**Plant size.** Number of employees in the contribution account at the data extraction moment. In the case of inactive plants, this variable takes the value zero. This variable is available from 2005.

**Industry.** The MCVL provides information on the main sector of activity at a three-digit level (*actividad economica de la cuenta de cotizacion*, CNAE). Due to a change in the classification in 2009, the MCVL contains CNAE93 and CNAE09 for all plants observed in business from 2009 onwards, but only CNAE93 for those which stop their activity before. We rely on the CNAE09 classification when available, and CNAE93 otherwise, exploiting the correspondence table provided by the Spanish National Statistical Office.<sup>45</sup> Then, we aggregate the three-digit industry information in 14 categories: primary sector (1 to 99), manufacturing and utilities (100 to 399); construction

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<sup>45</sup>[http://www.ine.es/daco/daco42/clasificaciones/rev.1/cnae2009\\_cnae93rev1.pdf](http://www.ine.es/daco/daco42/clasificaciones/rev.1/cnae2009_cnae93rev1.pdf)

(411 to 439); wholesale and retail trade (451 to 479); transportation and storage (491 to 532); accommodation and food services (551 to 563); information and communication technologies (581 to 639); financial, insurance and real estate activities (641 to 683); professional, scientific and technical activities (691 to 750); administrative, support and other services (771 to 829 and 950 to 970); education, health and social work (851 to 889); entertainment (900 to 949); public administration and international organizations (840 to 849 and 990 to 999).

**Unemployment rate.** Refers to the provincial annual unemployment rate downloaded from the National Statistical Office: <http://ine.es/>

## D Censoring correction

In the MCVL, the labour income concept referring to wage-employment relationships is either bottom or top-coded. In our estimation sample, 5.5% of the real daily wages of worker-month wage-employment observations are coded at the maximum. Following other studies that face censored earnings in administrative data (Dustmann et al., 2009; Card et al., 2013; Bonhomme and Hospido, 2017), we fit cell-by-cell Tobit models to log real daily wages to correct the upper tail of the wage distribution.<sup>46</sup>

Each cell,  $c$ , is defined based on gender, occupational groups (3 categories), 7-year length age groups (3), and 5-year interval time groups (7) for a total of 126 cells. Within each cell, we assume log daily wages follow a Gaussian distribution, as it is common in the literature, with cell-specific mean and variance, i.e.,  $\log w \sim N(X\beta_c, \sigma_c^2)$ .<sup>47</sup> Denoting  $\Phi$  the standard normal cdf, the cell-specific maximum likelihood is (up to an additive constant)

$$\sum_{cens_{it}=0} \left[ -\frac{1}{2} \ln \sigma_c^2 - \frac{1}{2\sigma_c^2} (\ln(w_{ijt}) - X_{it}\beta_c)^2 \right] + \sum_{cens_{ijt}=1} \ln \left( 1 - \Phi \left( \frac{\ln(\bar{w}) - X_{ijt}\beta_c}{\sigma_c} \right) \right)$$

where  $w_{it}$  refers to log real daily wages of individual  $i$  in plant  $j$  in moment  $t$  (a worker-month pair),  $\bar{w}$  is the maximum cap,  $cens_{ijt} = 1$  if the observation is top-coded.  $X_{ijt}$  is a set of controls including age and categorical variables, for full-time jobs, sector of activity, workplace location, and time dummies. We follow Card et al. (2013) to also include individual-specific components of the wages using the mean log daily wages in other months and the fraction of censored wages in other months.

After the estimation, we replace each censored observation with the sum of the predicted wages and a random component drawn from a normal distribution with mean zero and cell-specific variance. The imputation rule is

$$\ln w_{ijt} = X_{ijt}\hat{\beta}_c + \hat{\sigma}_c \Phi^{-1} \left[ \Phi \left( \frac{\ln \bar{w} - X_{ijt}\hat{\beta}_c}{\hat{\sigma}_c} \right) + u_{ijt} \times \left( 1 - \Phi \left( \frac{\ln \bar{w} - X_{ijt}\hat{\beta}_c}{\hat{\sigma}_c} \right) \right) \right]$$

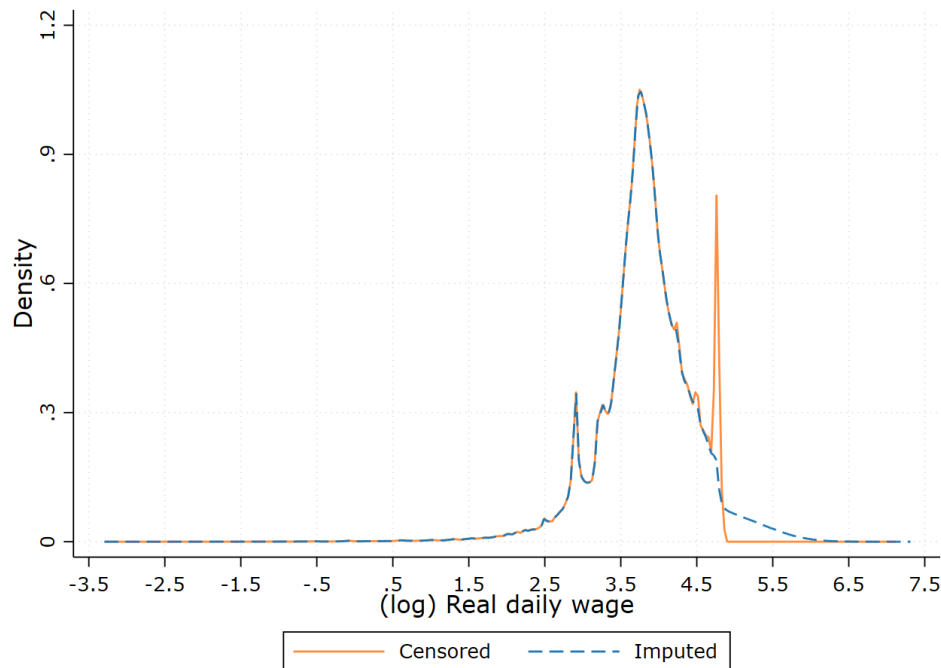
where  $(\hat{\beta}_c, \hat{\sigma}_c)$  are the maximum likelihood estimates of each cell,  $\Phi$  denotes the standard normal cdf, and  $u$  represents a random draw from the uniform distribution.

<sup>46</sup>We do not correct the lower tail due to the existence of a national minimum wage.

<sup>47</sup>Dustmann et al. (2009) provide a systematic comparison across four different distributional assumptions, and conclude that the results are similar across different specifications. Bonhomme and Hospido (2017) use the same data set as we do to evaluate the performance of the cell-by-cell Tobit model compared to a quantile censoring correction method with respect to uncensored income from tax records, and find that the fit is superior with the Tobit model.

Figure C.1 and Table C.1 compare the original (censored) distribution with the imputed distribution resulting from the correction method.

**Figure C.1:** Censored and imputed wage distributions



Notes: Figure shows the distributions of censored and imputed distributions of (log) real daily wages based on month-worker-firm observations (23,086,331). Censored refers to the top-coded original wage distribution. Imputed stands for the imputed distribution based on the cell-by-cell Tobit model. Wages are expressed in 2018:12 euros deflated using the Spanish monthly consumer price index.

**Table C.1:** Moments of censored and imputed wage distributions

Percentiles	Censored	Imputed
5th	2.85	2.85
10th	3.12	3.12
25th	3.55	3.55
50th	3.82	3.82
75th	4.16	4.16
90th	4.54	4.55
95th	4.74	4.78
99th	4.79	5.47

Notes: Censored refers to the top-coded original wage distribution. Imputed stands for the imputed distribution based on the cell-by-cell Tobit model. Moments of the log daily wage distribution are computed over month-worker-firm observations (23,086,331). Wages are expressed in 2018:12 euros deflated using the Spanish monthly consumer price index.