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Wage inequality in workers' cooperatives and conventional firms[1]

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Abstract

The author evaluates the effects of democratic worker participation on the income distribution within firms. Wage inequality in French workers' cooperatives (called SCOPs) versus traditional firms is measured using the 2001-2012 panel DADS dataset which includes all French firms. The author finds significantly lower inequality in SCOPs, in line with the previous empirical literature. Going into more detail, it appears that inequality is reduced at the top of the distribution and specifically regarding qualification-based inequalities; the gender gap and the advantage of senior workers are not lower in SCOPs. These findings contribute to the literature on Labor-Managed Firms, as well as to the broader debate on rising wage inequality in developed countries.

JEL: J54, D21, J31, P13

Key words: Worker cooperatives, inequality, wage equation.

1. Introduction

Explaining the increase of wage inequality has been a challenge for economists since the 1980s. At the level of the firm, there is no consensus to explain the deviations from marginal productivity remuneration. At a macro level, large inequalities are recognized as having a detrimental effect on growth and economic stability, specifically since the 2008 crisis (Dabla-Norris et al. 2015). A micro approach sheds light on the dynamics of wage inequality and cooperatives are a very good natural laboratory as democracy's effect on income distribution can be observed. Furthermore, the consequences of workers' participation on wage distribution can be studied with relation to effort incentive, worker selection and turn-over. There are many reasons to think that worker participation in decision making in firms should lead to lower wage inequality. Theoretically the median voter theory leads to the conclusion that, in cooperatives where workers vote democratically, there will be a redistribution of wealth whenever the median income is lower than the mean (Kremer 1997). Another point of view considers ex ante selection: agents who choose to work in a cooperative are likely to have a strong aversion to inequality. On the other hand, if cooperatives are operating side by side with conventional firms in a competitive market, they might not be able to have a significantly different wage structure in the long term. An empirical answer is thus required to the question of whether or not the wage structure actually differs between cooperatives and conventional firms, and more specifically whether inequality is lower in cooperatives. If it is, a second question will be raised: how much of the observed gap

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is due to the workers' characteristics and how much is due to a different remuneration of these characteristics?

In empirical literature there is a consensus that inequalities are much lower in cooperatives. Pencavel (2001) proves this in the case of American plywood cooperatives and highlights the fact it can be partially explained by the small number of supervisors[3]. Based on an extensive dataset of Uruguayan firms, Burdin (2016) shows strong evidence of redistribution in favor of low wage workers in cooperatives and of a higher exit rate for high-ability members. The paper offers precise measures of these two phenomena. The case of Mondragon cooperatives has also been investigated but shows a very different pattern from French cooperatives since statutory regulations exist regarding wage differentials (Dow 2003). The fact that there are no such rules in French cooperatives[4] leads to a large diversity of individual firms. It is therefore entirely relevant to measure the impact of workers' democratic participation on wage determiners. For Northern Italy, Bartlett et al. (1992) show a much lower wage differential in cooperatives since the ratio of managerial to unskilled manual workers' wages is 75% lower, mainly because of lower managerial salaries. More recently, Abramitzky (2008) explores the equality schemes and distribution patterns of Israeli Kibbutzim. He shows that the level of equality has diminished since the 1980s but the kibbutzim which have remained egalitarian are the richest. Finally, Clemente et al. (2012) measure lower inequality in Spanish cooperatives, with industry variations. With the exception of Burdin (2016), all these papers have databases concentrated on one industry or one region: Pencavel (2001) focuses on Northwest American plywood cooperatives and Bartlett et al. (1992) use a matched sample of 85 firms in Tuscany and Emilia-Romagna, all in light manufacturing with around 100 workers. While offering a unique field for systematic comparison since the chosen cooperatives and conventional firms develop in the same environment, these databases do not allow for variations in industry and region. The DADS[5] dataset allows us to take into account all French cooperatives which are distributed among all industries and French regions. It is also unprecedented in its size since it includes 23 million jobs, 45000 of which are in cooperatives. Panel data is available for years 2001 to 2012 for $1/12^{th}$ of all French jobs. French SCOPs also present the double advantage of a long history and a recent dynamism: they have been numerous and active in a wide range of industries since the end of the 19^{th} century and they have created an estimated 15,000 net jobs between 2000 and 2015. France is the third European country in terms of workers cooperatives after Spain and Italy.

Some of the mentioned articles analyze the causes of reduced inequality (size of the firm, statutory rules, median voter theory or political convictions) while others focus on the consequences (brain drain, lower productivity). They do not go into detail about the distribution of wages according to categories of workers beyond the simple distinction between high-ability and low-ability workers. Furthermore, there is no measurement of the yield of workers' characteristics, with the notable exception of

[3] Greenberg (1986) counts 1 or 2 managers in cooperatives where 6 or 7 are present in an equivalent conventional firm.

[4] There is a label entitling firms to tax advantages if the mean of the 5 best paid workers does not exceed 5 times the minimum wage and if the firm is not listed on the stock market. However, this label is completely independent from the cooperative status.

[5] "Déclaration annuelle des données sociales" collected by the fiscal administration and made available for researchers by the INSEE (Institut national de la statistique et des études économiques)

Clemente et al. (2012). Using the Oaxaca-Blinder method, the latter pinpoints workers' characteristics as the reason for their lower wages in cooperatives and finds similar returns for these characteristics in both types of firms. At the end of this brief review of the existing empirical literature, we can point out that wage inequality has not been well documented for French SCOPs[6] despite the rich and influential history of French workers' cooperatives, and in all other cases, the wage distribution was not analyzed in detail. This paper will attempt to answer the following: how different is the distribution of wages in French SCOPs compared to conventional firms (CFs) and which categories of workers benefit from it?

Section 2 reviews the theoretical predictions and assesses their relevance in the context of French worker cooperatives. Section 3 presents the empirical strategy to compare levels of inequality and returns to workers' characteristics in both types of organizations. Section 4 describes the extensive dataset we use in our analysis. Section 5 displays the results and relates them to the hypotheses made in section 2. Section 6 presents concluding remarks.

2. Theoretical issues and institutional background

2.1. Wage inequality theory

Although SCOPs still account for a negligible proportion of French firms, they currently have the wind in their sails as they have been found more resistant to economic shocks[7] and are regarded as a popular alternative model of firm.[8] At the end of 2016, there were 2298 SCOPs in France employing 48750 workers. SCOPs are worker cooperatives characterized by a few important statutory rules:

1. **Capitalization**. Workers own at least 51% of the capital. Up to 49% can be owned by outside shareholders but it cannot be listed on the stock market, nor can the shares fluctuate from their nominal price.
2. **One person = one vote**. Members vote democratically in the general assembly[9]. Not all workers are members of the cooperative and the proportion varies strongly between firms. Some SCOPs have clauses in their status making it compulsory for workers to become members within a few years, some strongly encourage it in an informal manner and others do not exert any pressure. On average, according to the CGSCOP[10], 69% of workers with at least 2 years seniority are members.

[6] Defourny, Estrin and Jones (1985) and Fakhfakh, Pérotin and Gago (2012) focus on productivity and capital issues.

[7] See Roelants, Eum, Terrasi (2014), p. 36.

[8] The 2014 social economy law includes a clause that gives priority to workers to form a cooperative when it comes to firm transmission from a former owner.

[9] Each SCOP has specific rules and traditions but the annual vote at the general assembly includes at least important strategic decisions, as well as the election of the manager.

[10] The General Confederation of SCOPs is an organization that gathers almost all French SCOPs, providing financial and managerial services to its members and has a function of communication and lobbying. The Confederation publishes a few key statistics each year: http://www.les-scop.coop/sites/fr/les-chiffres-cles/

3. **Profit distribution**. The profits are shared in three parts: participation (at least 25%) is shared between all workers (including non-members) either on an equal basis or in proportion to wages or hours worked. Dividends (maximum 33%) are distributed to members in proportion to the owned shares. Reserves (minimum 16%) are reinvested in the company and constitute collectively owned capital that may never be paid to the members, even in the case of shutdown.

These characteristics bring SCOPs close to what is referred to in the literature as labor-managed firms (LMF) or employee-owned firms since Ward (1958), although some institutional rules are not always well accounted for (particularly profit-sharing and integration of new members) as highlighted by Kamshad (1997). Theoretically, there are many good reasons to think wage inequality would be lower in such firms. The literature on the subject can be divided into two parts: the theory of labor-managed firms is founded on the median voter model whereas the non-profit literature relies mostly on the intrinsic motivation hypothesis.

According to Kremer's median voter theory (1997), wages are compressed in LMF adopting the principle of one vote per worker, because whenever the median wage is below the mean a majority of workers votes for redistribution. This has two possible consequences. Firstly, minorities or non-members can be oppressed or arbitrarily expropriated. Secondly, workers whose abilities are above the mean are incited to flee to jobs where they have reasons to think they would be paid higher wages[11]. This raises the question of the durability of such a significant difference in the wage structure on a competitive market. Kremer (1997) argues that mobility barriers exist in the form of a non-refundable investment all workers made in the cooperative before they had access to any information on productivity. Empirically, Burdin (2016) shows a higher turn-over for managers in Uruguayan labor-managed firms than in comparable conventional firms, without it calling into question the significantly different wage structure. In the case of SCOPs, the principle of one vote per member-worker applies, if not directly to decide on wages, at least to elect a manager who then decides on wages[12]. There is an initial investment which can be seen as partially non-refundable since the legal status of SCOPs proscribes capital gains workers could benefit from if they invested their capital in CFs' shares. We can therefore expect a certain level of redistribution within firms compared to a situation with no vote, redistribution which will probably not favor minorities.

Another argument in favor of lower inequality in cooperatives comes from Hansmann (1996). He argues that LMF will be most efficient when workers' preferences are homogeneous and therefore the cost of collective decisions is not too

[11] In a perfectly competitive labor market, if all workers outside cooperatives are paid their marginal product, any worker with a marginal productivity above the mean of the cooperative is incited to leave. In a more realistic labor market, we can still assume that high productivity workers would be paid more in an organization where no decision is submitted to vote.

[12] Considering the decision processes in which wages are determined in SCOPs, incidental evidence from interviews with SCOP managers show that they are specific to each firm. In most cases, there is a general desire to minimize the wage differential, but some firms have a philosophy of perfect equality whereas in others wages are at the manager's discretion. In the latter case, since the manager is elected by the cooperative members during the annual general assembly, members still have an indirect impact on wage inequality. In some firms, strict rules regarding pay rises and wage range have been voted for in the general assembly and included in the statutes.

high. In that case, we should observe lower wage inequality in French cooperatives, not because of a redistribution process, rather because of a similarity in the workers' characteristics.

The literature on non-profit organizations insists on another hypothesis that could lead to lower inequality in cooperatives: the intrinsic motivation of highly qualified workers. Workers are said to be intrinsically motivated if they gain utility from their work beside monetary compensation. Following Preston (1989), workers employed in the non-profit sector are ready to "donate" labor, which is to say work for lower wages in exchange for the morality of their job or other non-monetary compensation. Lower average wages (not accompanied by lower satisfaction) should therefore be found in the non-profit sector. The opposite argument is presented by François (2003) who distinguishes two effort extraction technologies: one preferred by CFs that relies on intensive and costly supervision and leads to lower wages and another preferred by non-profit organizations that relies on intrinsic motivation and leads to higher wages. Just like the theory, empirical evidence is mixed: in the US, Leete (2001) concludes that the wage differential is in favor of the non-profit workers only for certain industries and Mocan and Tekin (2000) find a non-profit wage premium in the child care industry whereas Ruhm and Borkoski (2003) find no significant differences. In Europe, Mosca et al. (2007) for Italy and Narcy (2011) for France find lower non-profit wages. Yet the wage gap need not be the same for low and high wages. Intrinsic motivation is not equally distributed among workers and more specifically it is likely to weigh more for high-ability workers. We can suspect the existence of a wealth effect, meaning workers are more likely to consider monetary compensation as secondary once they have secured a certain level of wage. Among others, Narcy (2011) highlights the intrinsic motivation of executives in the French non-profit sector. Regarding SCOPs, this leads us to the hypothesis of lower average wage and most importantly lower levels of inequality due to lower wages at the top of the distribution. This could explain long term differences as intrinsically motivated workers have no reason to quit even though they anticipate higher wages in other firms. Incidental evidence from the field seems to favor the intrinsic motivation hypothesis[13]. In addition to the legal rules of SCOPs, some historical context can also be helpful to formulate hypotheses about wage distribution.

2.2. Some context about French workers cooperatives

Historically, the current cooperative movement in France took off on the initiative of workers in manufacturing and construction industries at the end of the 19th century. Throughout the 20th century more diversification occurred and the general confederation of SCOPs insists that cooperatives are now widely spread across all industries. The 2010 change of name from "production workers' cooperative company" to "participative and cooperative company" was meant to reflect the diversity of SCOPs. According to the SCOP confederation, an average of 220 SCOPs a year were

[13] Field evidence comes from a survey that consisted in 40 interviews with SCOP managers in the Rhône-Alpes region. The wage system and its fairness is at the center of much discussion and managers tend to insist on the wage sacrifice they accepted in exchange for a more fulfilling job and the benefits of participative management or out of aversion to inequality. More details can be found in Charmettant et al. (2016).

created between 2007 and 2012[14]. Many of these newly created firms are in the service industry.

However, SCOPs are still over-represented in the manufacturing and construction industries as shown in table 1.

[14] http://www.les-scop.coop/sites/fr/les-chiffres-cles/

Table1: Industry distribution

Industries	Proportion of firms. 2009-2012		Proportion of jobs. 2001-2012	
	CF	SCOP	CF	SCOP
Manufacturing industry	9.1%	17.0%	19.0%	26.9%
Construction industry	11.3%	23.3%	6.8%	31.9%
Trade, transport, accommodation and catering	39.7%	13.9%	27.4%	10.1%
Other services	33.7%	35.8%	34.6%	24.8%
Education and health	6.2%	10.1%	11.8%	6.3%
Total	100%	100%	100%	100%

Regarding SCOP workers' characteristics, they are also different from CF workers, as shown in table 2. There are notably fewer women working in SCOPs, more blue collars and fewer newly hired workers, which is obviously linked to the industry distribution described in table 1. If minorities are disadvantaged as the median voter theory predicts, we should observe lower wages for women and newly hired workers in SCOPs[15]. Regarding women, there may be a self-sustaining cycle at work: it women anticipate lower wages in SCOPs, their scarce participation will be exacerbated. This will have to be kept in mind as a potential endogeneity source when interpreting the results.

Table 2: Workers' characteristics

Workers' characteristics	CF	SCOP
Women	45%	28%
Age mean	36.7 years	39.5 years
Permanent contract	71.2%	75.9%
Full-time jobs	71.0%	76.9%
Incidental jobs[16]	14.9%	10.8%
Seniority mean	3.6 years	5.2 years
Occupations		
Executive	15%	12%
Intermediate occupation	17%	17%
Semi-skilled white collar	11%	9%
Unskilled white collar	21%	6%
Semi-skilled blue collar	20%	36%
Unskilled blue collar	12%	17%
Intern	4%	2%
Total	100%	100%

[15] Regarding newly hired workers, the fact that they are less likely to be voting members must also be taken into account.

[16] Incidental jobs or "postes annexes" are defined by the INSEE as jobs including fewer than 120 hours or fewer than 30 days or a ratio number of hour/duration inferior to 1.5 and the wage is less than three times the minimum wage. The objective is to eliminate summer jobs or very temporary jobs that are numerous but not representative. Those jobs constitute 14% of all jobs for a given year.

The institutionalization of SCOPs took place in France at the end of the 19th century, with the objective of promoting workers' independence from employers and capitalist exploitation, specifically in the construction and manufacturing industries (Demoustier 1984, Toucas-Truyen 2005). The fight for equality targeted primarily class equality. In the workplace, this materialized in an effort to lower inequality between capitalists and workers and between white collars and blue collars. The strong cohesion of the cooperative movement gives us reason to believe the original preoccupations are still relevant today. More specifically, we can make the hypothesis that SCOPs are primarily trying to lower inequalities due to qualification and occupations. This could also apply to newly created SCOPs, due to the strength and stability of the cooperative network and to the key role of the CGSCOP in most SCOP creations as a financial support, a consultant and later on a training center for members and managers.

It is worth referring to the empirical literature on labor-unions and their impact on wage dispersion. Using different methods, Freeman (1980), Lemieux (1998) and Card et al. (2003) find a reduction of the differential between blue collar and white collar workers and lower returns to skill and experience in the union sector. The literature focusing on the impact of unions on the gender wage-gap is less consensual. Main and Reilly (1992), Card (2003) and Koevets (2007) find that unions tend to raise women's wages more than men's without entirely filling the gap. In France, Leclair and Petit (2004) and Duguet and Petit (2009) find that unions actually increase the gender-gap. The common history of empowerment of workers could lead to the hypothesis of similar wage policies in both SCOPs and labor-unions. This quick overview of the union literature allows us to reinforce our hypothesis that wage distribution in SCOPs might be more compressed, mostly reducing the gap between qualified and unqualified workers. However, distinct objectives and ideological disagreements between the two forms of organization are not to be ignored, as evidenced by the history of conflicts between SCOPs and French unions.

Finally, since profit sharing is an important part of SCOPs workers' income, wages in SCOPs are likely to be higher than in CFs in more profitable firms[17]. As a result, workers in large SCOPs should be more advantaged than workers in large CFs since large firms are shown to be more profitable on average (Josefy, Kuban, Ireland and Hitt 2015). The expected effect of industry is more ambiguous because more profitable industries could be different under SCOP and CF status, due to different capital endowment (Fakhfakh, Perotin and Gago 2012).

From this theoretical and institutional analysis, we draw six hypotheses worth testing empirically when it comes to wage dispersion in SCOPs and CFs:

H1: Wages are less dispersed in SCOPs than in CFs. Within workplace inequality is lower.

H2: Wage inequality is reduced mainly at the top of the distribution.

H3: Wage inequality is reduced mainly between qualified and unqualified positions. Return to skill is lower in SCOPs.

[17] A quick calculation from CGSCOP data allowed us to estimate average profit-sharing at 5% of total payroll in SCOPs for 2012, whereas the results of the PIPA survey for all French CFs (available at this address: http://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/statistiques-de-a-a-z/article/la-participation-l-interessement-et-l-epargne-salariale) estimates profit-sharing at 1% of total payroll.

H4: The gender gap is not lower in SCOPs than in CFs.

H5: Return to seniority is higher in SCOPs than in CFs.

H6: Workplace size gives a larger wage advantage to SCOP workers compared to CF workers.

In order to test these hypotheses, we now have to establish an empirical strategy, which draws from the union literature, as well as from other attempts to measure wage distribution among two distinct categories of workers, namely literature on the gender gap and on the public-private gap. Before going into more detail, we describe our data set.

3. Database and descriptive statistics

The DADS are collected from all French firms every year by the national institute of statistics (INSEE) and made available for researchers via a secure procedure. Its completeness is guaranteed by the fact that it is a compulsory declaration that every employer must make every year. We have two panel datasets that allow us to compare SCOPs and CFs wage distributions. The first includes wage per worker for $1/12^{th}$ of national jobs for years 2001 to 2012 and the second consists of workplace observations, for which we are able to measure average hourly wage and very detailed distribution variables within the workplace for years 2009 to 2012. We are interested in gross wage distribution, which includes all compensation paid to employees, including bonuses, profit sharing, taxable fringe benefits and all employee social security contributions[18]. We obtain hourly wage by dividing annual earnings by annual paid hours[19]. Wages are trimmed to eliminate 0.5% of the lowest and highest values. In addition, we have a number of wage determining variables. For individual level observations, we have: individual characteristics such as age, sex, occupation, place of birth; job characteristics such as full-time employment, nature of the contract, seniority; and firm characteristics such as firm size, industry, localization, collective agreement. In the workplace dataset we have very detailed distribution variables for wages and hours worked by each occupation, gender and type of contract, as well as decile for gross wages.

Some observations are eliminated: industries with no SCOPs such as the agricultural industry or the finance and insurance industry[20], individual employers, the public sector, incidental jobs (see table 2). Once this selection has been made, we have a workplace dataset with 4.2 million observations (including 9500 SCOPs) in 4 years and a job dataset with 10 million observations (including 34000 jobs in SCOPs) in 12 years.

Table 3 shows average wage by subgroup of workers for SCOPs and CFs: the average wage for all workers is 15.6 euro per hour but qualified workers (CEO and executives) have lower wages in SCOPs whereas others have slightly higher wages. This is coherent with hypothesis H1, H2 and H3.

[18] Net wage is also available in the DADS but because of the method used to measure it, it only includes taxable profit-sharing. As a result, it seems less relevant for a comparison between SCOPs and CFs since we expect profit-sharing to be significantly different between the two types of firms.

[19] Positions with zero hours declared are excluded; this may concern, for example, home-workers.

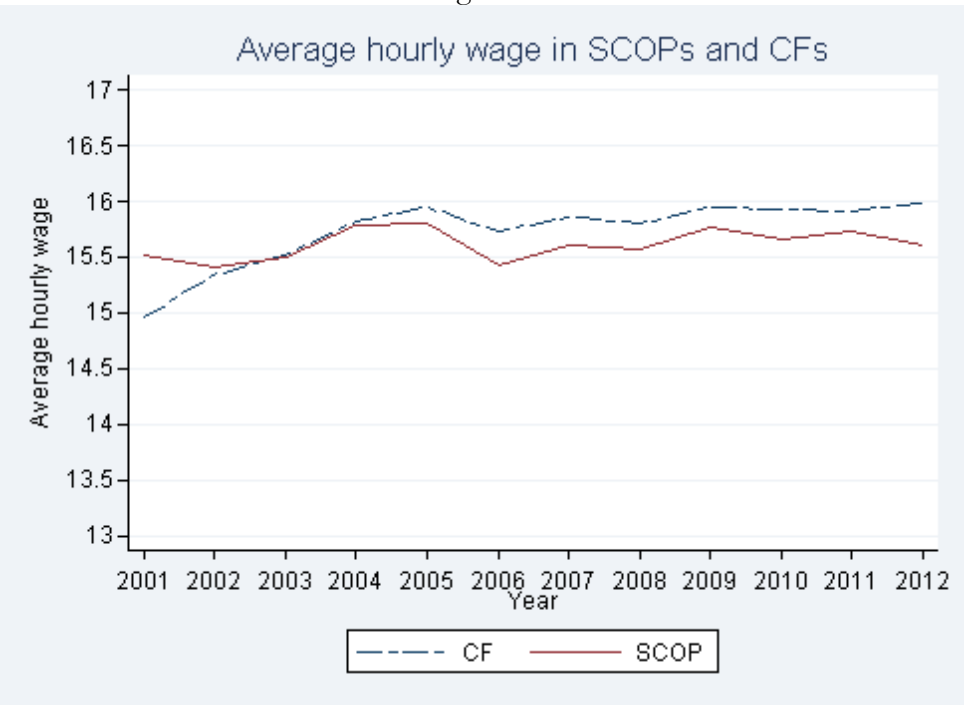
[20] The complete list of eliminated industries can be found in the annex.

Table 3, Average gross hourly wage by socio-professional group and gender in SCOPs and CFs, for years 2001 to 2012. Unit: euro per hour (constant euro at its 2012 level)

	CF	SCOP
Total	15.6	15.6
CEO	43.7	41.2
Executive	30.1	27.2
Intermediate Occupation	17.5	18.1
Semi-skilled white collar	13.3	13.7
Unskilled white collar	11.5	11.6
Semi-skilled blue collar	13.6	13.9
Unskilled blue collar	11.5	11.1
Intern	7.2	6.4
Men	16.8	16.2
Women	14.0	13.9

Figure 1 represents the evolution of individual hourly wage throughout the 2001-2012 period for SCOPs and CFs. SCOP wages are higher in 2001 and 2002 but lower from 2004 on.

Figure 1



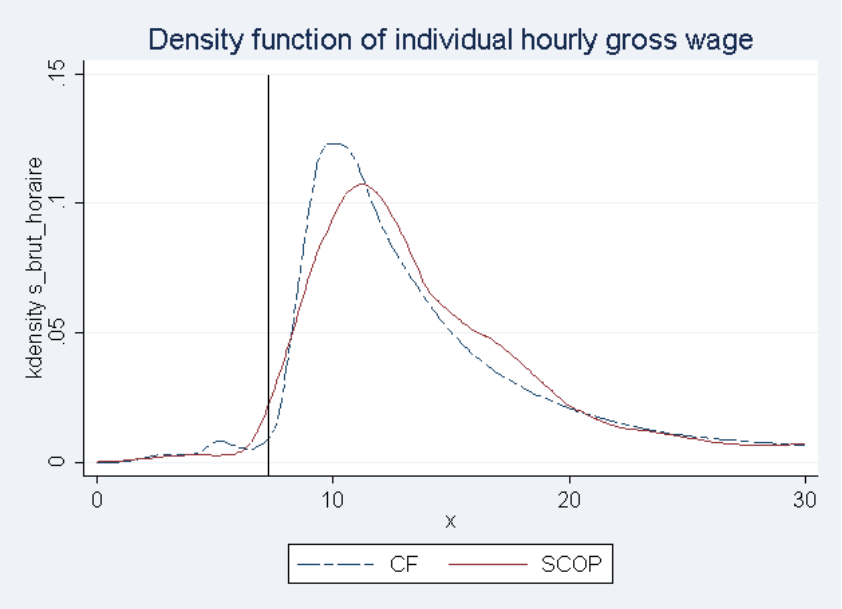
The univariate Kernel density estimation for individual hourly wages in SCOPs and CFs for the year 2003[21] gives a first idea of how different the distribution can be (figure 2). A higher proportion of workers are paid just above minimum wage in CF than in SCOP[22]. The flatter density curve observed for SCOPs indicates that more

[21] 2003 was chosen because average wage is approximately the same in SCOPs and CFs for that year.

[22] The distribution starts below the hourly minimum statutory wage which can be accounted for by a more realistic declaration of hours worked. Moreover, minimum wage does not apply for interns.

workers are paid between 12 and 20 euros an hour than in CFs whereas fewer workers have high wages (above 20 euros an hour). The distributions are significantly different for SCOPs and CFs as proved by a Kolmogorov-Smirnov test.

Figure 2. Density function of individual hourly gross wage in CF and SCOP for year 2003. The given unit is euro per hour. Statutory minimum wage is 7.19



4. Empirical strategy

Before tackling our six hypotheses H1 to H6 on the SCOP impact on the wage distribution, we estimate the SCOP impact on the average wage level, through the following equation:

$$\ln(\text{hourly wage})_{it} = \beta_0 + \beta_1 SCOP_{it} + \beta X + u_i + \varepsilon_{it} \quad (1)$$

with $SCOP_{it}$ a dummy indicating if worker *i* works in a SCOP during year *t*, u_i individual fixed effects and X control variables.

In order to test the six hypotheses outlined in section 2, we proceed in two parts, using firstly the workplace dataset and secondly the job dataset. The method used for the workplace dataset is very straightforward and provides a precise measure of the effect of the SCOP status on wage distribution within the workplace. Quantile analyses are made within workplaces. We run a regression per decile at the level of the workplace, controlling for the size of the workplace, the industry, the proportion of permanent labor contracts, the proportion of each occupation (measured in number of workers and in hours worked), the proportion of women and the localization. The dependent variable is the logarithm of the i^{th} decile of full-time equivalent wage, or in other words the full-time equivalent wage of the worker at the i^{th} decile of the workplace wage distribution. We also carry out the regressions with interdecile ratios as dependent variables (successively D9/D1, D9/D5 and D5/D1). We include a dummy variable

equal to 1 if the firm is a SCOP. We also include year dummy variables in order to capture the variation in wages due to changes in the economic environment or any institutional changes at a national level. This allows us to test hypotheses H1 and H2. The equation is estimated with panel data from 2009 to 2012, with random effects as too few firms switch from classical to SCOP status to be representative[23]. Moreover, there is no reason to suspect unobserved heterogeneity since we control for industry, size and skill composition of the workforce at a very fine level (see annex). In other words, we can safely assume that there is no omitted time invariant characteristic. Any effect of the SCOP variable on the level of wages or wage deciles is indeed what we want to measure. We estimate the following equation:

$$\ln(wage\ i^{th}\ decile)_{jt} = \alpha_j + X_{jt}\beta + \gamma SCOP_j + \varepsilon_{jt} \quad (2)$$

Where X_{jt} includes all control variables detailed in the annex as well as year dummies, $SCOP_j$ is the dummy equal to 1 if the firm is a SCOP and ε_{jt} the error term.

Next, we must go into more detail regarding the impact of the SCOP status on wage distribution within the firm in order to test H3 and H4. To achieve this, the dependent variable is replaced by hourly wage for men and women separately, as well as for each aggregated occupation, and then by ratios between these. All regressions are run with clustered standard errors to allow for intragroup correlation.

The job-level observation dataset allows us to analyze wage distribution more precisely, taking into account individual workers' characteristics and the impact of these on wages. The Oaxaca-Blinder method is used to test hypotheses H3, H4, H5 and H6. This method was first used by Oaxaca (1973) and Blinder (1973) for decomposing the gender wage gap. It has been used more recently to compare the private and public sectors (Melly 2005), different sexual orientation workers (Antecol et al. 2008) as well as cooperative workers and capitalist firm workers (Clemente et al. 2012). The wage gap between SCOPs and CFs can be broken down into two terms: the explained part (or characteristic component) which is accounted for by the different characteristics of both groups of workers and the unexplained part (or return component) which comes from different remunerations of the workers' characteristics and is identified as discrimination by Oaxaca (1973) and Blinder (1973) in the case of gender gap[24]. We are mostly interested in the detailed return component as we are trying to answer the following question: which characteristics are remunerated differently in SCOPs? We estimate equation (3):

$$\bar{W}_{CF} - \bar{W}_{SCOP} = \bar{X}_{SCOP}\left(\hat{\beta}_{CF} - \hat{\beta}_{SCOP}\right) + (\bar{X}_{CF} - \bar{X}_{SCOP})\hat{\beta}_{CF} \quad (3)$$

where $\bar{W}_{CF}$ is the mean wage in log for CFs, $\bar{W}_{SCOP}$ the mean wage in log for SCOPs, $\bar{X}_{CF}$ the mean wage determinant for CFs and $\bar{X}_{SCOP}$ the mean wage determinant for SCOPs. Details about the included variables can be found in the annex. We estimate

[23] From 2009 to 2012, 202 firms have changed status from conventional firm to SCOP or vice versa.

[24] The interpretation in terms of discrimination relies on the hypothesis that there are no unobserved variables that could have a different impact on men's and women's wages.

$(\hat{\beta}_{CF} - \hat{\beta}_{SCOP})$ and $\hat{\beta}_{CF}$. $\hat{\beta}_{CF}$ measures the part of the difference between average wage in SCOP and CF that is due to different characteristics of the workers. $(\hat{\beta}_{CF} - \hat{\beta}_{SCOP})$ measures the return component, or the "discrimination" assuming there is no unobserved variable. We will be able to determine which part of wage gap between SCOPs and CFs is due to different workers' characteristics and which is due to different returns to characteristics. If we find $(\hat{\beta}_{CF} - \hat{\beta}_{SCOP})$ significant and negative for the qualification variables, this will mean that qualified workers are paid less in SCOPs than they are in CFs, therefore proving hypothesis H3 to be true. Clustered standard errors are used in the estimation to allow for intragroup correlation.

However, this estimation technique does not take individual fixed effects into account. Although it was safe to assume that there were no invariant time characteristics at the workplace level, we have every reason to believe there are individual fixed effects. More specifically, SCOP workers' unobserved characteristics are likely to have an impact on their wage on average. We want to control for these characteristics in order to isolate the SCOP effect on wage distribution. There is a technique to take into account fixed effects in the panel data for Oaxaca-Blinder: the regression must be run in two steps. The wage gap can be written as follows.

$$\overline{predictedW_{CF}} - \overline{predictedW_{SCOP}} = \bar{X}_{SCOP}(\hat{\beta}_{CF} - \hat{\beta}_{SCOP}) + (\bar{X}_{CF} - \bar{X}_{SCOP})\hat{\beta}_{CF} \quad (4)$$

$$\ln(wage)_{it} = \beta_0 + X_{jt}\beta + u_i + \varepsilon_{it} \quad (5)$$

Where $\overline{predictedW_{CF}}$ is the predicted mean wage in log for CFs, $\overline{predictedW_{SCOP}}$ the predicted mean wage in log for SCOPs (obtained from equation (5) including fixed effects). All explanatory variables are centered. Standard errors are calculated using the bootstrap option to correct for the two-step estimation procedure. However, as noted by Heitmüller (2005), the omission of time-invariant variables in the fixed-effect model leads to a bias in the decomposition results. This estimation technique will allow us to distinguish between the wage gap due to characteristics on one hand and return to characteristics on the other hand but it does not allow us to test hypothesis H3 to H6 while controlling for individual fixed effects.

As we are primarily interested in the unexplained part of the decomposition, there is a more straightforward method which is not affected by the same bias while taking into account all individual heterogeneity: the use of interaction variables in a fixed-effect regression. We run Mincerian-type wage regressions with interaction variables between each of the independent variables and the SCOP dummy. Unlike in the workplace regression, this variable is not time-invariant as workers can and frequently do change from CFs to SCOPs and vice versa. This does not give us any information about the "characteristic component" of the Oaxaca-Blinder decomposition but allows us to compare the return component for CFs and SCOPs and therefore test hypotheses H3, H4, H5 and H6. We estimate the following equation:

$$\ln(\text{hourly wage})_{it} = \beta_0 + \beta_1 SCOP_{it} + \beta_2 firmsize_{it} + \beta_3 sector_{it} + \beta_4 permanantcontract_{it} + \beta_5 fulltime_{it} + \beta_6 CSP_{it} + \beta_7 localisation_{it} + \beta_8 seniority_{it} + \beta_9 CSP.SCOP_{it} + \beta_{10} gender.SCOP_{it} + \beta_{11} age.SCOP_{it} + \beta_{12} age^2.SCOP_{it} + \beta_{13} firmsize.SCOP_{it} + \cdots + \mu_i + \varepsilon_{it} \quad (6)$$

The equation is estimated with fixed effects and cluster standard errors. A significantly positive β_{10} would mean starting to work in a SCOP is more beneficial (or less detrimental) for men than it is for women, proving H4 to be true. The variable CSP_{it} indicates the qualification and the position occupied in the firm as explained in box 1: therefore coefficient β_9 allows us to test hypothesis H3 (lower return to skill in SCOPs). Finally, year dummies are included in equation (6) and interacted with the SCOP dummy in order to allow for different effects of economic or institutional shocks on SCOP and CF wages[25].

Box 1. Classification of professions and socio-professional categories

It classifies the population by a combination of profession, hierarchical position and status (salaried employee or otherwise). It has been very commonly used in France since the 1950s for national statistics and has been updated by the INSEE in 1982 and 2003. It comprises three embedded levels of aggregation: the socio-professional group (8 items), the socio-professional category (29 items) and the professions (486 items).

We use the second level in the workplace regressions (for precise controls on the decomposition of the workforce) and the first level in the job level regressions. The first level is the one used in table 3 for descriptive statistics and includes 8 categories: CEO, executive, intermediate occupation, semi-skilled white collar, unskilled white collar, semi-skilled blue collar, unskilled blue collar and intern. More precise definitions of each category can be found on the INSEE website: https://www.insee.fr/fr/information/2406153 and in Burnod and Chenu (2001) for the distinctions between semi-skilled and unskilled white and blue collars.

5. Results and robustness checks

Before focusing on the dispersion of wages in SCOPs versus CFs, we measured the impact of the SCOP status on the average hourly wage by estimating equation (1). As shown in table 3, on average and without controlling for any variable, SCOP workers have a slight wage advantage (column 1: hourly gross wage is 1% higher in SCOPs than in CFs). However, as soon as we exclude incidental jobs and add year dummies, the effect stops being significant (column 3 and 4), which is coherent with the statistics reported in table 2. This could be due to the fact that SCOPs rely less on incidental jobs or that they tend to pay incidental jobs better. Moreover, when workplace characteristics are controlled for, the impact becomes negative (column (5): SCOP workers earn on average 1.3% less). The inclusion of individual controls and individual fixed effects

[25] In particular, the empirical literature (Burdin and Dean (2009), Pencavel et al. (2006)) shows more flexible wages in worker cooperatives than in conventional firms.

increases this negative impact (column (6) and (7)): everything else being equal, SCOP workers earn on average 3.5% less than CF workers. On average, wages are slightly higher in SCOPs but this is due to the firms' characteristics (namely, SCOPs are on average larger and more numerous in industries with higher wages) and to the workers' characteristics (as reported in table 2, there are more men, more tenured workers and fewer unskilled workers in SCOPs). When controls are introduced, the sign of the coefficient becomes negative which implies that returns to characteristics are different in CFs and SCOPs, therefore making hypotheses H3 to H6 fully relevant.

Table 4: Impact of being in a SCOP on wages. Results for estimation of coefficient β_1 from equation (1). Number of observations: 14,815,230 (34,416 are SCOP workers)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Estimated coefficient for the SCOP dummy	.010*** (.002)	.009*** (.002)	-.0009 (.003)	-.021*** (.003)	-.013*** (.002)	-.030*** (.002)	-.035*** (.004)
Year dummies	No	Yes	No	Yes	No	No	Yes
Workplace controls	No	No	No	No	Yes	No	Yes
Individual characteristics controls	No	No	No	No	No	Yes	Yes
Individual fixed effects	No	No	No	No	No	No	Yes
Excluding incidental jobs	No	No	Yes	Yes	No	No	Yes
R^2	0	.002	0	.002	.13	.58	.51

We now focus on wage dispersion, through hourly gross wage decile regressions. As shown in table 5, the worker at the 10th percentile of the wage distribution in a firm earns 2% more in a SCOP than in a CF. No significant differences are observable for the 2nd and 3rd deciles, and all deciles above are lower in SCOPs. The negative effect increases up to the worker at the 90th percentile of the wage distribution in a firm, who is seen to earn 12% less in a SCOP than in a CF[26]. Inequalities appear to be lower in SCOPs because low paid workers are slightly better off and because high paid workers are worse off. Interdecile regressions confirm that inequality is mostly reduced at the top of the distribution: the ratio D9/D1 is 14% lower in SCOPs than in CFs, D9/D5 is 9% lower and D5/D1 only 5% lower[27]. Wages are more concentrated in SCOPs and inequality is reduced mostly at the top of the distribution. Hypothesis H1 and H2 are confirmed. An additional question is the evolution of these levels of inequality during

[26] As a robustness test, regressions are also run with a balanced panel, keeping only firms that were in the panel for 4 years. The results are qualitatively the same except for the first decile which is no longer higher in SCOPs. As a whole, all negative impacts of the SCOP variable are stronger and positive impacts weaker with the balanced panel dataset. This could be due to differences between newly created SCOPs and newly created CFs (for example, newly created SCOPs could have higher wages than newly created CFs if they face higher selection from investors and bankers).

[27] The interdecile coefficients are the same with the balanced panel, ruling out the possibility that only newly created SCOPs would have lower inequality and the wage distribution would quickly converge towards the CFs norm.

the 2009-2012 period. To provide an answer, we add interacted year dummies with the SCOP dummy in equation (2). The results show that the gap actually rises between 2009 and 2012: more specifically, the interdecile ratios are smaller in SCOPs during the whole period but even more so in 2012 than in 2009. This could be due to the effect of the crisis which increased inequalities in CFs but not in SCOPs. We now want to know more about the characteristics that yield different wages in SCOPs and CFs.

Table 5 – Quantile and ratio regressions, workplace observations, panel 2009-2012. Estimation results of equation (2): the same equation is estimated with the dependent variable successively equal to D1 to D9, interdecile ratios and aggregated wages for different categories of workers at the workplace level. The reported coefficient measures the SCOP impact on these variables (γ in equation (2)).

Dependent variable	Unbalanced panel	Number of observations and R^2
Decile 1	.021*** (.007)	742,232 .30
Decile 2	.003 (.007)	742,232 .38
Decile 3	-.010 (.007)	742,232 .40
Decile 4	-.022*** (.008)	742,232 .40
Decile 5	-.036*** (.008)	742,232 .41
Decile 6	-.051*** (.008)	742,232 .41
Decile 7	-.070*** (.008)	742,232 .41
Decile 8	-.089*** (.008)	742,232 .40
Decile 9	-.120*** (.009)	742,232 .38
Intedecile D9/D1	-.138*** (.008)	742,232 .20
Intedecile D9/D5	-.087*** (.006)	742,232 .14
Intedecile D5/D1	-.048*** (.006)	742,232 .17
Executive average wage	-.035*** (.008)	1,401,584 .16
Intermediate occupation average wage	.025*** (.006)	2,772,995 .20
White collar average wage	.034*** (.007)	3,061,109 .18
Blue collar average wage	.031*** (.005)	2,260,291 .17
Ratio Intermediate occupation/ executive	-.046*** (.011)	1,007,456 .06

Dependent variable	Unbalanced panel	Number of observations and R^2
Ratio Intermediate occupation/ blue collar	.007 (.007)	1,404,090 .05
Ratio Intermediate occupation / white collar	-.004* (.002)	2,679,014 .04
Ratio executive / blue collar	-.028*** (.010)	794,286 .11
Women average wage	.011** (.005)	3,382,315 .38
Men average wage	.003 (.005)	3,353,863 .46
Ratio men / women	-.023*** (.006)	2,478,640 .18

We now focus on wage gaps between positions and between genders (H3 and H4). The workplace regressions (table 5) display interesting results: average hourly wage within the workplace is higher in SCOPs for women, blue collars, white collars and intermediate occupations, whereas it is lower for executives and not significantly different for men. The ratio of executive hourly wage on manual worker hourly wage and the gender ratio are found to be lower in SCOPs. However, this could be due to different individual characteristics of executives and manual workers, as well as male and female workers in SCOPs since we only control for workplace variables. For example, women could have more qualified jobs in SCOPs. The same is true regarding the reduced gap between qualified and unqualified positions: it could be due to different unobserved skills. The job dataset allows us to overcome these limitations since taking into account individual fixed effects ensures that the observed return differences are in fact due to the SCOP status: this is the purpose of the estimations reported in table 6 and 7.

The Oaxaca-Blinder estimation results show that, overall, there is no significant difference between average hourly wage in SCOPs and CFs (this is coherent with descriptive statistics reported in table 3). However, the characteristic component is significant and negative and the return component is significant and positive, which implies two conclusions. Firstly, the workers characteristics give SCOPs a wage advantage: for example, there are more men, older workers and more tenured workers in SCOPs which pushes SCOP wages upwards. The industries in which SCOPs are found also have higher average wages (as the negative coefficient for industry characteristics demonstrates). However, some characteristic components have positive signs: for example there are more executives in CFs (table 2) which pushes CF wages upward. Secondly, returns to characteristics give CFs a wage advantage overall and the decomposition in table 6 shows the variables that yield a higher return in CFs: working in a richer region, being an executive, an unskilled white collar or an intern. On the other hand, tenured workers, semi-skilled white collars, unskilled blue collars and workers in larger firms are better paid in SCOPs than in CFs. This is a first validation of hypothesis H3. However, there is one problem with this decomposition, as mentioned in section 4: it does not control for individual fixed effects. We run the two-step regressions (equation 4 and 5) including fixed effects (table 6 column 2) and it shows a

higher predicted hourly wage for SCOP workers, which is in line with the negative characteristic component in column 1: if the observed characteristics and the individual fixed effects (controlled for in equation 5) were paid the same in both firms, SCOP wages would be significantly higher. The characteristic component and its decomposition show the same signs as the one-step estimation but with smaller values, due to the fact that we are now comparing estimated wages, as opposed to observed wages in column (1). The return component however cannot be interpreted directly as the explanatory power of independent variable is already embedded in the predicted wages. In order to test hypothesis H3 to H6 while taking into account individual fixed effects, we have to estimate a model with interaction variables (equation 6).

Table 6. Oaxaca-Blinder results (estimation of equation 3 in column 1 and estimation of equation 4 in column 2). Return and characteristic components were computed for each explanatory variable of interest. We control for year dummies.

		(1) **Gross hourly wage** **One-step estimation**	**(2)** **Gross hourly wage** **Two-step estimation**
Total	CF	2.64*** (.0003)	2.64*** (.00006)
	SCOP	2.63*** (.006)	2.65*** (.001)
	Difference	.008 (.006)	-.0096*** (.001)
	Characteristic	-.034*** (.001)	-.007*** (.001)
	Return	.042*** (.004)	-.002*** (.00002)
Regions	Characteristic	.008*** (.0006)	.007*** (.0002)
	Return	.004*** (.009)	-.0005*** (.0002)
Size	Characteristic	.0002 (.0003)	.00006 (.00005)
	Return	-.013*** (.012)	-.0005*** (.0001)
CEO	Characteristic	-.0009 (.0008)	-.0004** (.0002)
	Return	.0002 (.0004)	-9.2e-06 (8.1e-06)
Executive	Characteristic	.014*** (.002)	.007*** (.0005)
	Return	.010*** (.002)	-.001*** (.00004)
Intermediate occupation	Characteristic	(ref)	(ref)
	Return	(ref)	(ref)

		(1) **Gross hourly wage** **One-step estimation**	**(2)** **Gross hourly wage** **Two-step estimation**
Semi-skilled white collar	Characteristic	-.004*** (.0007)	-.020*** (.0002)
	Return	-.003*** (.001)	.002*** (.0005)
Unskilled white collar	Characteristic	-.05*** (.0007)	-.001*** (.0001)
	Return	.001** (.0006)	.0006* (.0004)
Semi-skilled blue collar	Characteristic	.045*** (.002)	.015*** (.0003)
	Return	.002 (.004)	-.0002 (.0002)
Unskilled blue collar	Characteristic	.020*** (.002)	.007*** (.0003)
	Return	-.003* (.002)	.00001 (.00006)
Intern	Characteristic	-.010*** (.001)	-.007*** (.0006)
	Return	.003** (.0007)	-.00004** (.00002)
Industry	Characteristic	-.023*** (.0006)	-.009*** (.0001)
	Return	-.005 (.035)	-.0001*** (.00002)
Male	Characteristic	-.014*** (.0005)	-.00002*** (7.7e-06)
	Return	-.003 (.006)	.00005 (.0002)
Age	Characteristic	-.013*** (.001)	.0005*** (.00002)
	Return	.011 (.037)	-.00002 (.00005)
Seniority	Characteristic	-.008*** (.0007)	-.006*** (.0002)
	Return	-.011*** (.004)	.0007*** (.0001)
Part-time	Characteristic	.0002*** (.0003)	.003*** (.0001)
	Return	-.002 (.002)	.00006 (.00005)
Number of observations		9,877,079 23,613 SCOPs 9,853,466 CFs	9,877,079 23,613 SCOPs 9,853,466 CFs

As shown in table 7, some variables have less of an impact on wages in SCOPs than in CFs. The most striking difference is the occupied position (see more information about this variable in box 1), which counts much less as a wage determinant: executives are paid less in SCOPs than in CFs. This effect holds when individual fixed effects are controlled for (column 2). The hausman test was carried out and the hypothesis that the individual-level effects are adequately modeled by a random-effects model is rejected. Therefore our model should imply fixed effects, as written in equation (6). The coefficient of the interaction variable can be interpreted as follows: its negative sign means the effect of higher qualifications on wages is weaker in SCOPs than it is in CFs within individuals. In other words, an executive who switches from a CF to a SCOP will lose more in terms of remuneration than an unqualified worker. All qualification variables are dummies and therefore should be interpreted in relation to the intermediate occupation used as a reference. For instance, switching from a CF to a SCOP for an executive implies a wage loss 5% higher than for an intermediate worker. On the other hand, unskilled workers (white and blue collars) appear to be better paid in SCOPs than CFs. This confirms hypothesis H3, although it is worth noting the exception of interns who are paid less in SCOPs.

Table 7: Estimate of the wage equation for individual jobs, with interaction variables (equation 6) Panel data 2001-2012, excluding incidental jobs.

	(1) **Generalized least square**	**(2)** **With individual fixed effects**
Position		
CEO	.49*** (.001)	.37*** (.003)
Executive	.30*** (.0004)	.20*** (.0007)
Intermediate occupation	(Ref)	(Ref)
Semi-skilled white collar	-.13*** (.0004)	-.09*** (.0005)
Unskilled white collar	-.20*** (.0003)	-.13*** (.0005)
Semi-skilled blue collar	-.17*** (.0003)	-.09*** (.0005)
Unskilled blue collar	-.24*** (.0004)	-.13*** (.0006)
Intern	-.74*** (.0005)	-.63*** (.001)
Contract		
Full-time contract	(Ref)	(Ref)
Part-time contract	.04*** (.0002)	.06*** (.0003)
Seniority	.005*** (.0002)	.004*** (.00004)
Individual characteristics		
Female	(ref)	

	(1) Generalized least square	(2) With individual fixed effects
Male	.09*** (.0004)	
Age	.008*** (.00001)	
Interaction variables		
Position		
CEO	-.06*** (.02)	-.02 (.04)
Executive	-.08*** (.007)	-.05*** (.01)
Intermediate occupation	(Ref)	(Ref)
Semi-skilled white collar	.03*** (.007)	.02** (.01)
Unskilled white collar	.04*** (.01)	.04*** (.01)
Semi-skilled blue collar	.006 (.006)	.006 (.009)
Unskilled blue collar	.02*** (.006)	.02* (.01)
Intern	-.14*** (.01)	-.14*** (.03)
Contract		
Full-time contract	(ref)	(ref)
Part-time contract	.002 (.004)	-.01 (.01)
Seniority	.002*** (.0003)	.003*** (.001)
Individual caracteristics		
Female	(ref)	(ref)
Male	.01*** (.005)	.02* (.01)
Age	-.001*** (.0002)	-.001** (.0004)
Number of observations	10,398,099	10,398,099
R^2	.51	.60

Gender inequality on the other hand is not diminished in SCOPs; it even tends to be higher. The coefficient of the interaction variable between the male dummy and the SCOP dummy can be interpreted as the impact of being a man on the within-individual effect of the SCOP status on wages. The male variable is not included as it is time-invariant: its effect is included in the fixed effect. In all our regressions, this coefficient was found to be positive when significant, which means that women see their wages reduced more than men (or not less) when they switch from CF to SCOP. Hypothesis H4 is therefore validated. However, the gender variable is potentially endogenous since the proportion of men and women working in the firm depends on the hiring strategy

of the firm and possible self-selection by the workers (women could anticipate lower wages and be more reluctant to work in SCOPs[28]). In case of endogeneity, the gender-gap coefficient would be underestimated for SCOPs; in other words, if endogeneity were controlled for, women could come out as even more disadvantaged in SCOPs. This point is an interesting direction for future research on SCOP recruitment strategies. Meanwhile, equation (6) was estimated for the sub-sample of the service industry (where women are less under-represented in SCOPs: 41% for 50% in CFs) and the gender gap was also found to be higher in SCOPs: estimated coefficient β_{10} was .02 (higher than in the whole regression as shown in table 7, which feeds the endogeneity hypothesis) and significant at the 5% level.

Seniority is found to have a stronger impact in SCOPs than in CFs as shown by the positive interaction variables, validating hypothesis H5: one more year of seniority causes a 0.4% wage augmentation in CFs and a 0.7% augmentation in SCOPs. Age however has a weaker impact on wage in SCOPs than in CFs. Whereas the size of the firm has a positive effect on all workers' wages, this effect is stronger in SCOPs for firms above 100 employees. Hypothesis H6 seems to be validated as well. However, we do not control for the seniority of the firm: this effect could be due to bigger firms being older, as we have reason to believe that older SCOPs are likely to be more successful because of their locked assets. Finally, there is no significant difference between SCOPs and CFs regarding the effects of industries, regions or part-time contracts.

Estimation of equation (6) involves many interaction terms and, as such, may lead to an increase in multicollinearity. Multicollinearity was assessed using variance inflation factor (VIF) with simple OLS estimation of equation (6). The mean VIF for all 130 regressors is 8.7, with the age interacted variable as well as 7 interacted industry variable showing a VIF superior to 10 (usually considered as the acceptable threshold). As a robustness test, we run the estimations with more aggregated industries and without the age interacted variable (collinear with seniority). The results on our variables of interest remained unchanged. All regressions were run including and excluding incidental jobs (for the workplace dataset, excluding workplaces with only incidental jobs at the end of the year) as well as with balanced panels (keeping only individuals or workplaces that were present throughout the whole period). Multicollinearity with the balanced panel estimation led us to drop interacted year dummies. Estimations were also carried out with daily wage instead of hourly wage (restricting the sample to full-time employees) to account for any error in declared hours worked. We then restricted the sample to the 2006-2012 period to incorporate the two variables only available for that sub-period: the type of contract and the existence of a collective agreement at the workplace level. Our main results remained unchanged. Finally, potentially endogenous control variables were removed from the workplace regressions (table 5), namely the proportion of permanent labor contracts and the proportion of women. The impact of the SCOP dummy on deciles and interdecile ratios remained unchanged.

Overall, we find strong evidence of lower inequality in SCOPs than in CFs. This reduction does not affect all workers in the same way. SCOPs actually show an increase

[28] It should also be mentioned that the average gender gap (reported in table 3) without any control variable is actually lower in SCOPs (men earn 20% more than women in CFs and only 17% more in SCOPs), which is due to the fact that a higher proportion of women are executives in SCOPs that in CFs. This makes the issue of gender inequality in French SCOPs more complex and worthy of further research.

in seniority and gender inequality and inequality due to the size of the firm. They have no impact on part-time contracts or regional and industry inequalities, whereas they strongly diminish inequality due to qualifications.

6. Conclusion

Our extensive panel database allows us to compare wage distribution in French worker cooperatives (SCOPs) versus conventional firms (CFs) while controlling for a large set of variables. We estimate Mincerian-type wage equations to quantify the wage impact of working in a SCOP and find a slightly negative impact of the SCOP status on wages. We then estimate the same equations using deciles and interdecile ratios as dependent variables and the results show much lower inequalities in SCOPs than in CFs, both within and between firms. More specifically, inequalities are lower mostly at the top of the wage distribution. The Oaxaca-Blinder regression allows us to distinguish between wage differences due to workers' or firms' characteristics and differences due to return to characteristics. It appears that SCOP workers' characteristics would confer them higher wages if they were paid the same as in CFs, but the returns of these characteristics (particularly qualification) are lower in SCOPs. Finally, we introduce interaction variables in order to measure any difference in the return of individuals' or firms' characteristics on wages in CFs and SCOPs, while controlling for individual fixed effects. We find that qualification-based inequalities are those most significantly lowered in SCOPs. Inequalities between regions and industries are not significantly different, whereas gender and seniority inequalities, as well as inequality due to the size of the firm are raised.

These findings contribute to the empirical debate about LMF objectives, showing a maximization of the median income more than the average wage. Our results support Kremer's median voter theory since the gap between high and low wages is reduced in SCOPs and minorities (namely women and new workers) are not favored. However, it does not sufficiently explain the durability of the reduced wage gap since there is no strict mobility barrier preventing highly qualified workers from leaving SCOPs (although higher return on seniority could be a indirect barrier). A precise measurement of qualified workers' turn-over is an interesting direction for future research. We can make the hypothesis that intrinsic motivation and more specifically aversion to inequality plays an important role in qualified workers' decision to work in SCOPs. More generally, a thorough analysis of SCOPs recruitment and dismissal strategies promises to be highly instructive.

The larger wage advantage in SCOPs for senior workers raises the question of a possible difference within SCOPs between members and hired workers. We are not able to differentiate between the two in our dataset but it is an interesting direction for further research. Higher wages in larger or older SCOPs could be linked to productivity differentials throughout cooperatives' life cycle, which could be explored by matching the DADS with financial data. Finally, the remaining gender inequality sheds light on the inequality SCOPs focus on: qualification inequality. Beyond the specific case of workers' cooperatives and in the political context of fast rising inequalities in developed countries, these findings also give some insight into the consequences of workers' democratic participation in terms of income distribution.

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Appendices

Table 8. Variables from individual dataset

Job characteristics	
Wage	Total wage (net and gross)
Hours	Total number of hours worked
Duration of the contract	In days
Type of contract	Permanent contract (CDI), temporary contract (CDD), "incidental job" (shorter than 30 days and 120 hours, paid less than 3 month minimum wage) or apprenticeship. This variable is only available for the period 2006-2012. Robustness tests were carried out for this sub-period and did not change our main results.
Working hours	Full-time or part-time
Seniority	In years
Occupation	Head manager, executive, intermediate occupation, semi-skilled white-collar, unskilled white-collar, semi-skilled blue-collar, unskilled blue-collar.
Individual characteristics	
Age and age2	Workers' age in years and age²
Man	Dummy variable equal to 1 if the worker is a man
Seniority	Seniority within the firm in years
Workplace characteristics	
SIRET	Workplace identifier
Size	11 dummies for the number of employees in the workplace (non-incidental jobs on the 31st of December) 1: from 1 to 4 2: from 5 to 9 3: from 10 to 19 4: from 20 to 49 5: from 50 to 99 6: from 100 to 249 7: from 250 to 499 8: from 500 to 999 9: from 1000 to 1999 10: from 2000 to 4999 11: 5000 and above
Industry	13 industries corresponding to the A17 national classification (4 industries have been removed because they do not include any SCOPs: agriculture, finance and insurance, real estate and public administration) 1: Manufacture of food products, beverages and tobacco products 2: Manufacture of electrical, computer and electronic equipment; Manufacture of machinery 3: Manufacture of transport equipment 4: Other manufacturing 5: Energy, water supply, sewerage, waste management and remediation activities 6: Construction 7: Wholesale and retail trade; repair of motor vehicles and motorcycles 8: Transportation and storage 9: Accommodation and food service activities 10: Information and communication 11: Professional, scientific, technical, administrative and support service activities 12: Education, human health and social work activities 13: Other service activities
Collective agreement	Dummy equal to 1 if the workplace is submitted to a collective agreement (95%). This variable is only available for the sub-period 2006-2012
Region	23 regional dummies: Ile-de-France, Champagne-Ardenne, Picardie, Haute-Normandie, Centre, Basse-Normandie, Bourgogne, Nord-Pas-de-Calais, Lorraine, Alsace, Franche-Comté, Pays de la Loire, Bretagne, Poitou-Charentes, Aquitaine, Midi-Pyrénées, Limousin, Rhône-Alpes, Auvergne, Languedoc-Roussillon, Provence-Alpes-Côte d'Azur, Corse, Dom

Table 9. Additional variables from workplace dataset

Workplace characteristics	
SIRET	Workplace identifier
Wage	Total payroll for the year (net and gross)
Hours	Total number of hours worked by all employees
Industry	28 industries corresponding to the A38 national classification (10 industries have been removed because they do not include any SCOPs: agriculture, mining and quarrying, electricity, coke and refined petroleum products, pharmaceutical products, finance and insurance, real estate, public administration, activities of households as employers and extraterritorial activities) 1: Manufacture of food products, beverages and tobacco products 2: Manufacture of textile, wearing apparel, leather and related products 3: Manufacture of wood and paper products; printing and reproduction of recorded media 4: Manufacture of chemicals and chemical products 5: Manufacture of rubber and plastics products and other non-metallic mineral products 6: Manufacture of basic metals and fabricated metal products, except machinery and equipment 7: Manufacture of computer, electronic and optical products 8: Manufacture of electrical equipment 9: Manufacture of machinery and equipment 10: Manufacture of transport equipment 11: Other manufacturing; repair and installation of machinery and equipment 12: Water supply; sewerage, waste management and remediation 13: Construction 14: Wholesale and retail trade; repair of motor vehicles and motorcycles 15: Transportation and storage 16: Accommodation and food service activities 17: Publishing, audiovisual and broadcasting activities 18: Telecommunication 19: IT and other information services 20: Legal, accounting, management, architecture, engineering, technical testing and analysis activities 21: Scientific research and development 22: Other professional, scientific and technical activities 23: Administrative and support service activities 24: Education 25: Human health activities 26: Residential care and social work activities 27: Arts, entertainment and recreation 28: Other service activities
Distribution of the workforce	
Proportion of types of contracts	Permanent contract (CDI), temporary contract (CDD), "incidental job" (shorter than 30 days and 120 hours, paid less than 3 months minimum wage) or apprenticeship
Proportion of hours per gender	Proportion of hours worked by men/ women
Proportion of wage per gender	Total payroll for men/women
Proportion of hours per occupation	Proportion of hours worked by head manager, executive, intermediate occupation, semi-skilled white-collar, unskilled white-collar, semi-skilled blue-collar, unskilled blue-collar.
Proportion of wage per occupation	Total payroll for: head manager, executive, intermediate occupation, semi-skilled white-collar, unskilled white-collar, semi-skilled blue-collar, unskilled blue-collar.
Decile	Decile of full-time-equivalent net and gross wages (only for years 2009-2010)