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Firm-Level Agreements and Wage Inequality in France

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Abstract

This article examines wage inequalities induced by firm-level collective agreements. While European literature on firm-level collective bargaining often identifies a wage premium associated with firm-level agreements, we seek to go beyond this finding by studying the effects on the distribution of wages within and between firms. To do so, we use the AKM (Abowd-Kramarz-Margolis) estimation method, previously applied by Song et al. (2018) and Babet, Godechot, and Palladino (2025), who studied the variance of individual log hourly wages. Our indicator for firm-level agreement presence carries no direct explanatory power in the year the agreement is signed. However, wage inequalities are systematically higher in firms that have signed a wage agreement over the full sample period, reaching 0.0195 for firms with 50–99 employees, 0.0284 for firms with 100–249 employees, and 0.0487 for firms with 500 or more employees. This difference is driven primarily by the within-firm component of wage inequality, which is higher in firms signing FLAs (Firm-Level-Agreements) and increases further with firm size. These findings suggest that the culture of negotiation within companies, rather than the act of signing an agreement itself, can contribute to a raise of wage inequalities in companies signing FLAs.

Keywords: labour market, collective bargaining, wage inequalities

JEL Codes: D30, D33, J31, J52

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1 Introduction

Over the past four decades, collective bargaining has been substantially restructured across most high-income economies, shifting from a centralized model in which agreements were negotiated at the sectorial or national level, towards a more decentralized one, in which firm-level agreements have gained more importance. Beginning in the 1980s, most developed countries initiated this transition, driven by the idea that giving the possibility to the companies to determine the wages would allow them to better remunerate higher productivity. These changes were incited as well by the policy recommendations of international institutions such as the OECD and the European Commission (OECD, 2019). This has translated into varying degrees of bargaining decentralization across EU member states. While some countries see the large majority of their private sector covered by firm-level agreements (FLAs), such as the United Kingdom (88%), Poland (92%), or Hungary (82%), others rely on them only marginally, as is the case in Austria (10%), Sweden (under 10%), or Portugal (7%) (Visser, 2013).

In this context, France is representative of the two-tier bargaining system. Historically dominated by sectorial agreements, the French model has progressively shifted toward the decentralization of negotiations, with firm-level agreements being made easier to negotiate and having precedence on subjects. This evolution was set in motion by the *loi Auroux* (1982), which introduced a yearly mandatory obligation to negotiate at the firm level (Eyraud and Tchobanian, 1985). The minimum threshold for mandatory yearly negotiations has since been lowered to 50 employees, and the scope of the "Négociations Annuelles Obligatoires (NAOs)" has been broadened to cover wage negotiation, gender equality, and working conditions.

Decentralization of collective bargaining was subsequently accelerated by a series of legislative reforms, from the *loi El-Khomri* (in 2015) to the *ordonnances Macron* (in 2017). This last reform was particularly significant in the sense that it facilitated firm-level negotiations even in companies without union representatives. It established as well a new hierarchical structure in which firm-level agreements now take precedence over sectorial agreements for most negotiation topics (Hablot-Murolo, 2018), wages being a notable exception. As seen in Table 1, the number of texts signed at the firm level rose sharply in the years that followed, from 84,318 in 2014 to 109,190 in 2020, an increase of almost 30% within just six years.

Table 1: List of agreements, disagreements, denunciations and others at the establishment level between 2014 and 2020 (in percentage).

Year	Total	Agreements (%)	Disagreements (%)	Denunciations (%)	Others (%)
2014	84,318	75.9	4.7	3.1	16.3
2015	82,551	76.1	5.3	3.7	14.9
2016	92,737	79.8	4.1	3.0	13.1
2017	84,036	80.2	4.1	2.7	13.0
2018	91,783	79.7	3.6	2.2	14.5
2019	116,863	77.2	2.6	1.5	18.7
2020	109,190	78.4	2.9	1.5	17.2

Note: The figures described here are obtained from the D@ccord database, which contains information on FLAs signed in France and officially filed online by firms.

This configuration, in which sector-level and firm-level agreements coexist and interact, is commonly referred to in the literature as a two-tier bargaining system. In such systems, a first tier of sectorial or national agreements sets minimum standards applicable to all firms within a given industry, while a second tier of firm-level negotiations allows individual companies to deviate upward from these standards ; both systems then coexist with a confusing hierarchy of norms. Calmfors and Driffill (1988) famously argued that intermediate bargaining structures, neither fully centralized nor fully decentralized, tend to produce the worst macroeconomic outcomes on employment specifically. Boeri (2014) showed that two-tier bargaining systems tend to inherit the disadvantages of both levels ; "the rigidity of centralized floors combined with the fragmentation of decentralized negotiations." In France, this rigidity is illustrated by the fact that sectorial agreements retain their precedence over wage determination, such that a firm-level agreement cannot set salaries below the floor established by the sectorial agreement.

Finally, the sectorial part has itself undergone significant restructuring in recent years. As of 2023, the French Ministry of Labour reported only 250 sectorial agreements in effect in France, down from approximately 700 before the restructuring initiative launched in 2015 (Ministère du Travail, 2020). This consolidation was designed to rationalize the branches, so that the remaining sectorial agreements would be more representative and better enforced across their respective industries.

Parallel to these institutional changes, we have seen significant attention in the litterature to wage inequalities in high-income countries. In the United States, wage inequality has risen continuously since the late 1970s (Autor et al., 2008). Similar trends have been documented in Czechia, Norway, and South Korea (Tomaskovic-Devey et al., 2020). In France, however, the picture is more nuanced. Net wage inequality has in fact declined over the long run, largely due to the redistributive effects of payroll taxation and successive minimum wage increases (Guillot et al., 2020). More recent work by Babet, Godechot, and Palladino (2025) corroborates this analysis by focusing on between and within-firm inequalities.

Indeed, when analyzing wage inequalities, it is common to distinguish between two components: within-firm wage inequalities and between-firm wage inequalities. In the last fifty years, the primary driver of wage inequality has been within-firm differences in pay based on employees' skills, job roles,

and levels of education. However, more recent evidence suggests that between-firm wage differences have become a more important driver of rising wage inequality (OECD, 2021). Tomaskovic-Devey et al. (2020) found that in 12 out of the 14 high-income countries studied between 1993 and 2013, between-firm wage inequalities had increased substantially. Song et al. (2018) attribute part of this global effect to a growing segregation of workers, whereby employees are increasingly concentrated in firms with others who share the same wage characteristics. In France specifically, Babet et al. (2025) highlight a distinctive pattern : despite the rise of in between-firm wage inequalities, overall French wage inequality has remained roughly stable, thanks to the decline of within-firm wage disparities driven by the minimum wage (SMIC, or Salaire Minimum Interprofessionnel de Croissance) in the last decade.

Whereas these two bodies of literature developed independently, we think that FLAs may play a role in the increase in wage inequalities. Indeed, since firm-level agreements are legally, in France, constrained to set wages at least at the level guaranteed by sectorial agreements, the signature of an FLA on the topic of salary increase implies a raise from the wage floor defined by the sector. In other words, firms that negotiate a firm-level agreement should systematically pay more than others who do not in the same sector. This distinction is all the more significant given that over 98% of French workers are covered by a sectorial agreement. Moreover, firms can decide over the magnitude of these wage increases, meaning that the most productive or profitable firms can negotiate larger wage premiums, further distancing themselves from the rest. As the share of firms covered by firm-level agreements has grown substantially over the past decade, this mechanism could plausibly have contributed to the widening of between-firm wage disparities documented in the wage inequality literature. Finally, since firm-level agreements can discriminate the raises given to employees depending on their role in the company, we think that within-firm inequalities could rise as well.

Thus, in this article, we aim to extend the analysis of Babet et al. (2025) by incorporating a new variable into their AKM decomposition ; the presence of a firm-level agreement, to better understand its role in shaping between and within-firm wage inequalities.

Our next section focuses on the existing literature on collective bargaining and the impact of firm-level bargaining on wage inequalities. We then describe the data at our disposal in Section 3, before presenting our statistical approach in Section 4. Section 5 presents our main results, and finally, we conclude in Section 6.

2 Literature Review

2.1 The wage premium associated with firm-level agreements

A large body of empirical literature has documented a positive wage premium associated with FLAs relative to sectorial agreements or no coverage at all. This finding is consistent across a wide range of European countries. In Spain, Card and de la Rica (2006) estimated a wage premium of 5 to 10% associated with the presence of a firm-level agreement. In Greece, Daouli et al. (2013) defended as well the existence of such a premium using matched employer-employee data, to an average of 6.82%. In Belgium, Garnero et al. (2020) found positive productivity and wage effects associated with firm-level agreements using linked panel data, specifying that wage effects are stronger than productivity effects.

In Sweden, Andreasson (2014) documented similar patterns for decentralized bargaining. In Germany, Gürtzgen (2012) found evidence of a wage premium for firms transitioning from no collective agreement to firm-level bargaining, though not for those moving from a sectorial agreement to a firm-level one. When looking at the scope of sectorial agreements only, Zwysen and Drahokoupil (2023) show that, at the level of the European Union, sectorial bargained agreements are associated with larger pay premia when union density is higher, while the erosion of bargaining power over time has been accompanied by a decline in these premia.

The distributional implications of this wage premium have also been studied. Using quantile regression methods, Ramos, Sanromá, and Simón (2022) find for Spain that the premium associated with firm-level agreements is more pronounced for workers in the middle and upper segments of the wage distribution, contributing to greater inequality compared to workers covered only by sectorial agreements. They underline as well that low-paid workers are paid more with FLAs than without them. Daouli et al. (2013) reached a slightly different conclusion for Greece : they confirmed a raise of wage inequalities around the median of the wage distribution, following a reversed U shape, before declining at the upper tail. Administrative reports from the OECD (2018, 2019) have further highlighted at the macroeconomic level that greater decentralization of bargaining systems tends to be associated with rising wage inequality.

2.2 The rise of wage inequalities

The second literature we are mobilizing is focusing on the evolution of wages inequalities in the developed countries. They differentiate between-firm inequalities, and within-firm inequalities, and observe through these lenses the evolution of wage inequalities in the last fourty years. One of the foundations for this literature is initiated by Abowd, Kramarz and Margolis (1999), who decomposed wages into worker and firm fixed effects using French data. Their work shows that both person effects and firm effects contribute meaningfully to wage variation, with person effects being the dominant component.

This framework was then mobilized to study the evolution of wage inequality. Card, Heining and Kline (2013) applied it to West Germany and showed that the rise of wage inequalities in Germany between their two furthest intervals (1985-1991 and 2002-2009) can be explained by a combination of unexplained facts between workers and that both between-firm inequalities and within-firms inequalities are rising during the period. Song et al. (2018) realized a similar analysis in the United States using a matched database covering 1978 to 2013, and found that two-thirds of the rise in earnings inequality occurred between firms (rather than within them). They attribute this between-firm rise to a growing segregation of workers, where high-wage workers have become increasingly likely to work in high-wage firms. This sorting and segregation dynamic also has been documented at a global scale by Tomaskovic-Devey et al. (2020), who analyzed administrative records for 14 high-income countries and found that the between-workplace share of wage inequality is growing notably in Czechia, Norway and South Korea.

In Germany, Bossler and Schank (2023) analyze the evolution of monthly wage inequality between 2000 and 2017, with a particular focus on the introduction of the national minimum wage in 2015. They show that the variance in log wages has decreased by 14,7% thanks to the introduction of the minimum wage, while their diff-and-diff analysis showed that it would have decreased by only 8,7% without its introduction. The minimum wage seems to play a similar role than the one in France for reducing wage inequality, and probably more specifically within-firm inequalities.

Finally, in Brazil, Engbom and Moser (2022) use the AKM methodology between 1996 and 2018, and show that wage inequalities have considerably reduced between both periods (1994-1998, 2014-2018). Indeed, the variance of log wages have fallen from 0.709 to 0.444, for a total difference of -0.265. Messina and Silva (2019) broaden the view by looking at Latin America as a whole, and underline similar decrease in wage inequalities.

2.3 The AKM methodology and its application to France

Finally, the model we are using was introduced by Abowd, Kramarz and Margolis (1999), and has become a standard tool for decomposing individual wages in matched employer-employee data. The model introduces the log wage of worker i employed at firm j at time t as the sum of a worker fixed effect, a firm fixed effect, a vector of time-varying observable characteristics, and a residual term. The variance of log wages can then be decomposed into contributions from the variance of worker effects, the variance of firm effects, the variance of the error term and all the covariances, which allow to capture the part of wage inequalities that comes from within the companies and between them, as described above.

Song et al. (2018) extended this decomposition by proving the existence of a segregation effect. This extension has proven particularly useful for studying the respective dynamics of sorting, segregation, and firm-level pay policies. Babet, Godechot and Palladino (2025) applied this full framework to France using a quasi-exhaustive matched employer-employee database covering the period 2002 to 2019. Their results reveal a significant increase in between-firm wage inequalities, driven in part by the segregation of workers (highly paid workers working with highly paid workers in highly paying firms), a phenomenon described by Song et al. (2018). At the same time, within-firm inequalities declined over the period, largely due to the compressing effect of successive minimum wage increases, compensating for the rise of the in-between component. Our paper builds directly on this methodology and these findings, by introducing the presence of a firm-level wage agreement as an additional explanatory variable in the AKM framework, in order to assess whether the expansion of firm-level bargaining in France has contributed to wage inequalities.

3 Data Description

Our objective is to construct a comprehensive matched employer-employee panel dataset spanning the period 2014 to 2020, which enables us to study the relationship between firm-level agreements and wage inequality in France. For this purpose, we use two administrative databases : the individual-level base named "BTS-Postes" and the database including the topics of FLAs signed by the companies named "D@ccord".

The individual-level database was constructed by INSEE from the *Déclaration Sociale Nominative* (DSN), an administrative source providing exhaustive information on employees in France. We retain a set of key individual characteristics: hourly net wages, place of residence, years of education, age, gender, date and place of birth, nature of the employment contract (full-time or part-time), and the ID of the firm (represented by the SIREN).¹

Table 2 reports average wages and selected wage quantiles for firms in our full sample (whether they signed a FLA or not). Here, the salary is represented as the hourly net wage received by a worker in a company, and take into account every individual job occupied by a worker even if the latter has occupied several jobs during a given year. We first present results for the overall sample and then split them by firm size. Firm size is a reconstructed value, in which employees are weighted proportionally to both their time spent within the firm during the year and their workload (part-time or full time). This approach is adopted to address missing or incomplete employment information in the years 2015 and 2016.

Table 2: Distribution of wages by firm size category (hourly salary per worker).

SIREN size category	Q10	Q25	Q50	Q75	Q90
Total	10.4	11.9	14.4	19.8	29.0
10–49	10.1	11.3	13.3	18.0	26.4
50–99	10.4	11.7	14.0	19.1	27.3
100–249	10.5	11.9	14.1	19.3	28.2
250–499	10.5	12.0	14.8	20.4	29.9
500+	10.7	12.3	15.1	21.0	30.8

We see two main tendencies ; 1/ the 90th percentile (Q90), corresponding to the top 10% of earners, is centered around an hourly wage of approximately 30 euros, and 2/ wages increase slightly with firm size, with this effect being particularly pronounced at the 75th and 90th percentiles, while the raise is almost inexistent in our 10th percentile.

Our second database provides information related to firm level bargaining. For each text, we retain the subject (salary adjustments, working conditions, and so forth), the date of signature, and

¹The individual-level database is structured as multiple two-year datasets. While individual IDs remain consistent within each dataset, they are not harmonized across periods. Following the methodology recommended by Babet, Godechot and Palladino (2025), we use the dataset of year T (comprising data from T and $T - 1$) and the dataset of year $T - 1$ (comprising data from $T - 1$ and $T - 2$), and match the individual characteristics of $T - 1$ workers across both files using variables such as age, place of residence, and occupation, allowing us to construct a single dataset spanning from $T - 2$ to T . We repeat this process across all yearly files to cover the period 2014–2020.

the nature of the text, distinguishing between agreements, disagreements, and denunciations. This database has been created by the French Ministry of Labour and covers firm-level texts registered in France over the past two decades. Due to inconsistencies² in the recording of texts prior to 2014, we restrict our analysis to the period 2014-2020.

The database categorizes firm-level texts into 57 themes, ranging from wage negotiation to working conditions. Several adjustments were necessary to ensure the usability of this classification. Since the texts are self-deposited by employers, the quality of administrative reporting varies significantly across firms. To address this, the French Ministry of Labour identified the relevant subject(s) matter of each text through keywords, and regrouped texts that could not be assigned to any substantive theme into a residual miscellaneous category.

Key adjustments include categorizing the natures of texts for the firm-level negotiations (most notably agreements, amendments, denunciations, disagreements), and studying the combination matrix of our variables. In the category ‘others’, we find an important part of specific cases that are not relevant to our subject, such as agreements signed only by the head of a company in small companies, that we chose to exclude. We thus regroup agreements and amendments in one category named ”agreement” which is our primary focus for this analysis.

At this stage, our dataset comprises the total number of firm-level agreements and amendments signed between 2014 and 2020. Since a single agreement can address one or several subjects within a single text, the number of subjects covered exceeds the number of agreements signed. In 2014, for instance, 64,025 agreements were recorded, covering a total of 78,111 subjects (122%). In order to analyze negotiation themes effectively, we constructed eight variables that categorize agreements based on their overall subject. We show some information about these variables in Table 3.

Table 3: Breakdown of agreements by category at the establishment level between 2014 and 2022 (in percentage).

Year	Total	Wage	$\pi_sharing$	Formation	Gender Equality	Working Duration	Methodology	Working Conditions	Others
2014	64,025	15.8	44.6	1.0	6.5	15.5	0.6	2.1	35.9
2015	62,794	21.1	44.8	1.0	8.0	16.3	0.7	2.0	28.9
2016	73,968	18.1	52.9	0.8	6.5	15.2	0.6	1.8	24.9
2017	67,417	21.3	45.3	0.9	8.3	18.0	0.7	3.8	28.0
2018	73,156	19.5	42.7	0.9	9.2	20.6	0.7	4.9	29.1
2019	90,273	20.8	39.4	0.8	7.4	18.6	0.5	4.5	32.4
2020	85,602	19.0	42.9	1.0	6.6	24.3	0.7	5.8	31.8

Table 3 presents the repartition of the agreements depending on their category. Among these eight variables, ”Wage” and ” $\pi_sharing$ ” are our primary focus. ”Wage” covers agreements and amendments directly related to wage increases, while ” $\pi_sharing$ ” covers those related to profit-sharing. The ”others” category encompasses all negotiation themes not addressed in this paper, and is retained here for assiduity (since a FLA can have multiple subjects, withdrawing ”others” would lead to a loss of some FLAs on the subject of ” $\pi_sharing$ ” or ”Wage”).

Rent-sharing agreements ($\pi_sharing$) dominate collective bargaining texts throughout the period, consistently accounting for 40 to 50% of agreements. FLAs on the topic of wage increase (Wage) and

²The methodology behind the categorization of the themes changed in 2014, thus, to avoid issues in consolidation, we focus the 2014-2020 period.

working duration are the next most prevalent themes, with the latter showing a notable upward trend in 2020 due to the COVID. All other themes, including gender equality, working conditions, formation, and methodology, remain comparatively marginal across the entire period.

Table 4 presents a general agreement combination matrix, in which we show the likelihood of negotiating a subject alongside another one.

Table 4: Combination matrix depending on the type of agreement (in percentage).

	Wage	$\pi_sharing$	Formation	Gender Equality	Working Duration	Methodology	Working Conditions	Others
Wage	100	2	49	39	29	4	24	28
$\pi_sharing$	5	100	7	7	5	1	4	4
Pro.For	2	≤ 1	100	5	2	3	4	2
Gen.Equ	15	1	36	100	10	2	18	13
Wor.Dur	29	2	41	25	100	4	32	17
Mtd	≤ 1	≤ 1	2	≤ 1	≤ 1	100	≤ 1	1
Wor.Con	5	≤ 1	19	10	7	2	100	6
Others	43	3	70	50	27	36	39	100

We retain several key insights. First, salary agreements ("Wage") are often negotiated alongside working time and gender equality agreements. Second, profit-sharing agreements (" $\pi_sharing$ ") are mostly negotiated independently of the other agreements, with little overlap. This pattern aligns with French labour law, which mandates annual 1/ salary negotiations, 2/ discussions on gender pay equality and 3/ discussions on working time. Additionally, companies with over 250 employees must sit at the table once a year to discuss professional training.

Finally, the table is not symmetric : agreements on the topic of professional formation often go together with "Wage" agreement, but the converse is not true. In contrast, 29% of the "Working Duration" agreements are related to "Wage" agreements, and 29% of "Wage" agreements are signed along the topic of "Working Duration"

A key limitation of the D@ccord database is that agreements are recorded at the establishment level (SIRET) rather than at the firm level (SIREN). For single-establishment firms, this distinction is of no importance, as the firm and the establishment are one and the same. For multi-establishment firms, however, it is common practice for the main establishment to deposit agreements on behalf of the entire firm. We therefore aggregate agreements at the firm level by grouping all SIRET numbers sharing the same SIREN, under the assumption that an agreement deposited by any establishment applies to the whole company.

Our final sample is restricted to firms that employ at least ten workers at least once over the 2014-2020 period. This threshold is motivated by institutional considerations: the legal framework governing firm-level bargaining differs substantially for firms below this size (the owner being able to sign FLAs on his own), making comparisons across the two groups difficult. We then merge the D@ccord database with the BTS-Postes database at the firm level (SIREN), retaining all workers employed by firms present in both sources over the study period.

Table 5: Number of firms (SIREN) that signed a FLA before and after merging.

	2014	2015	2016	2017	2018	2019	2020
Number of SIREN in D@ccord	7 858	10 135	10 260	10 821	10 713	13 762	11 345
Number of SIREN in our merged sample (10+ employees)	7 626	9 935	10 041	10 697	10 509	12 811	10 875
Matching rate (%)	97.05	98.03	97.86	98.85	98.10	93.09	95.86

Table 5 shows that this restriction leads to only a limited reduction in the number of firms observed (lower than 3% for most years and 7% at most during 2019). Across all years, the number of SIREN retained in the merged sample remains very close to the total number observed in D@ccord (which represents only companies signing an agreement), indicating that the exclusion of very small firms does not materially affect the coverage of firms engaging in firm-level bargaining. The database resulting from this merge initially includes all jobs held by active workers in France between 2014 and 2020. As a consequence, a given individual, identified by a unique ID, may hold multiple jobs within the same year and therefore appear in multiple observations (close to 1.4 jobs a year per ID in average).

Table 6: Firm-level coverage by at least one FLA between 2014 and 2020, depending on firm size category.

Firm size category	Number of firms	Covered at least once (Wage)	Mean Wage	Covered at least once (π_{sharing})	Mean π_{sharing}
10-49	309 076	6 264	0.0203	31 262	0.101
50-99	47 502	6 435	0.1350	10 796	0.227
100-249	25 362	7 886	0.3110	8 474	0.334
250-499	8 407	3 867	0.4600	3 428	0.408
500+	5 902	3 096	0.5250	2 529	0.428

Table 6 examines the share of firms in our merged dataset that signed at least one FLA over the 2014-2020 period. First, we can see that the sample mean of signing an agreement increases with firm size, which is consistent with the existing literature. Second, " π_{sharing} " agreements are more widespread than "Wage" agreements in small companies. However, the higher prevalence of " π_{sharing} " mainly reflects that many firms sign a " π_{sharing} " agreement once and do not renew it in subsequent years.

The size factor in coverage is striking. Among firms with 10-49 employees, only 2% sign at least one "Wage" agreement over the entire seven-year period, compared to 13.5% for firms with 50-99 employees, 31.1% for firms with 100-249 employees, 46% for firms with 250-499 employees, and 52.5% for firms with 500 or more employees. This suggests that firm-level wage bargaining remains a practice largely concentrated in medium and large firms, while the vast majority of small firms rely exclusively on the sectorial wage floor.

For " π_{sharing} ", the size factor is not as strong, with coverage ranging from 10.1% among the smallest firms to 42.8% among the largest. Taken together, these figures imply that any aggregate effect of firm-level agreements on wage inequality is likely to be driven disproportionately by medium and large firms, which both negotiate more frequently and employ a substantial share of the total workforce.

Table 7: Share of firms continuously covered by a FLA on our time period, by firm size category.

Firm size	Wage	π_{sharing}
10–49	0.0079	0.0327
50–99	0.0774	0.1040
100–249	0.1900	0.1690
250–499	0.3110	0.2430
500+	0.3430	0.2660

Table 7 shows that, when focusing on the share of firms covered every successive year by "Wage" or " π_{sharing} " agreements, coverage levels are markedly lower than the cumulative figures reported in Table 6, and the gap between the two types of agreements narrows considerably. For instance, among firms employing 10–49 workers, 2.03% signed at least one FLA related to "Wage" between 2014 and 2020 (included), while only 0.79% did so on an annual basis throughout the entire period.

For "Wage", annual coverage ranges from only 0.8% among firms with 10-49 employees to 34.3% among firms with 500 or more employees. This is consistent with the literature, since wage negotiations at the firm level are a recurring practice almost exclusively in large firms, while small firms sign at most sporadically over the period. For " π_{sharing} ", the pattern is similar, with annual coverage ranging from 3.3% among the smallest firms to 26.6% among the largest. Notably, for firms with fewer than 100 employees, " π_{sharing} " coverage exceeds "Wage" coverage on an annual basis, suggesting that profit-sharing agreements are signed more regularly than direct wage agreements in this size category. This pattern reverses for firms with 100 employees or more, where "Wage" annual coverage consistently exceeds " π_{sharing} ". This likely reflects the fact that larger firms, subject to the mandatory annual wage negotiation obligation (NAO), are more systematically engaged in salary discussions, whereas profit-sharing agreements tend to be signed less frequently and conditional on the financial performance of the firm.

Overall, the comparison between Tables 6 and 7 highlights that a significant share of small firms sign agreements only once or twice over the seven-year period, rather than engaging in sustained and repeated bargaining.

Finally, for computational reasons, our merged database was too large for our regression. We draw a random sample of 5 million individuals observed in 2014 and follow them over the 2014–2020 period. This procedure resulted in approximately 8 million individual–year observations. When an individual exits the sample during the period (for example due to retirement), we replace them with a randomly selected individual entering the labour market in the corresponding year. This sampling strategy allows us to preserve a representative sample while keeping the dataset small enough for our regressions.

4 Statistical analysis

We study the structure of wage determination using a two-way fixed effects model, building on the AKM (1999) framework. The baseline model is given by :

$$y_{i,t} = x_{i,t}\beta + \theta_i + \psi_{j(i,t)} + u_{i,t}. \quad (1)$$

Here, $y_{i,t}$ is the log wage of individual i at time t , $x_{i,t}$ are observed worker characteristics, θ_i denotes the worker fixed effect, $\psi_{j(i,t)}$ the firm fixed effect, representing the firm in which an individual is working at a given time, and $u_{i,t}$ the random term not correlated to the explanatory variables. For given $x_{i,t}$, we decompose the variance of wages:

$$V(y_{i,t}) = V(\theta_i) + V(\psi_j) + 2 \text{Cov}(\theta_i, \psi_j) + V(u_{i,t}). \quad (2)$$

We then express the worker effect as the sum of its deviation from and average within firm j , following the methodology of Babet et al. (2023):

$$\theta_i = \theta_i - \bar{\theta}_j + \bar{\theta}_j. \quad (3)$$

Substituting the identity into the variance equation, we obtain the following.

$$V(y_{i,t}) = V(\theta_i - \bar{\theta}_j + \bar{\theta}_j) + V(\psi_j) + V(u_{i,t}) + 2 \text{Cov}(\theta_i - \bar{\theta}_j + \bar{\theta}_j, \psi_j). \quad (4)$$

Where V and Cov represent respectively the variance and co-variances. Highlighting the decomposition into between- and within-firm inequality, Babet et al. (2023) explicitly rewrite the equation as :

$$V(y_{i,t}) = \underbrace{V(\psi_j) + 2 \text{Cov}(\bar{\theta}_j, \psi_j) + V(\bar{\theta}_j)}_{\text{Between-firm component}} + \underbrace{V(\theta_i - \bar{\theta}_j) + V(u_{i,t})}_{\text{Within-firm component}}. \quad (5)$$

Instead of assuming that $\text{cov}(\theta_i, u_{i,t}) = \text{cov}(\psi_{j(i,t)}, u_{i,t}) = 0$, we enrich specification (1) and include FLA as an additional explanatory variable in the wage determination model

$$y_{i,t} = \beta x_{i,t} + \beta FLA_{j,t} + \psi_j + \theta_i + v_{i,t} \quad (6)$$

with :

$$u_{i,t} = \beta FLA_{j,t} + v_{i,t} \quad (7)$$

Our model rests on several hypotheses ; first, the fixed effects ψ_j and θ_i are additive and do not interact. Second, the mobility of the workers is exogenous, meaning that we consider firm-level agreements do not have an impact on the resignation and the arrival of employees. These hypotheses have been tested by Babet et al. (2022) with similar data as ours, and they show that they provide reasonable approximations. However, we choose to not account for the low bias of mobility, since we are interested in the salary tendency of employees staying in firms that sign FLAs or do not sign FLAs over the time period.

Then, We make the hypothesis $v_{i,t}$ not correlated with $x_{i,t}$, and the individual fixed effects. is not correlated with $v_{i,t}$. We argue that FLAs are negotiated for regulatory compliance in

²Here, we have $x_{i,t} = \text{AGE} + \text{AGE}^2$

regards to yearly obligatory negotiations. By decomposing the variance of wages following the example given by AKM, and taking into account our new variable we obtain for given value of x :

$$V(y_{i,t}) = V(\theta_i - \bar{\theta}_j + \bar{\theta}_j) + \beta^2 V(FLA_{j,t}) + V(\psi_j) + 2 \text{Cov}(\theta_i - \bar{\theta}_j + \bar{\theta}_j, \psi_j) + 2\beta \text{Cov}(\theta_i - \bar{\theta}_j + \bar{\theta}_j, FLA_{j,t}) + 2\beta \text{Cov}(\psi_j, FLA_{j,t}) + V(u_{i,t}). \quad (8)$$

By definition of $\bar{\theta}_j$, it follows that

$$\frac{1}{N_j} \sum_{i \in j} (\theta_i - \bar{\theta}_j) = 0.$$

Consequently, our covariances following that pattern are null. We then rearrange the equation as presented in equation (5), leading us to :

$$V(y_{i,t}) = \underbrace{V(\psi_j) + V(\bar{\theta}_j) + 2 \text{Cov}(\bar{\theta}_j, \psi_j) + \beta^2 V(FLA_{j,t}) + 2\beta \text{Cov}(\psi_j, FLA_{j,t}) + 2\beta \text{Cov}(\bar{\theta}_j, FLA_{j,t})}_{\text{Between-firm component}} + \underbrace{V(\theta_i - \bar{\theta}_j) + V(u_{i,t})}_{\text{Within-firm component}}. \quad (9)$$

5 Estimation results

Table 8 presents our main results. The overall level of wage variance, as well as its decomposition into between-firm and within-firm components, are in line with the results found for France. However, the relative importance of the different components shows some differences. In particular, the residual term represents a substantially larger share of total variance than typically observed. Part of this discrepancy may be related to sample composition or a lower number of identified controls, particularly driven by less controls at the individual level.

Table 8: AKM decomposition of log wage variance.

	Baseline AKM (1)		AKM + FLA (2)	
	Component	Share (%)	Component	Share (%)
Total variance				
$\text{Var}(y)$	0.2106	100.00	0.2106	100.00
$\text{Var}(\theta)$	0.1351	64.17	0.1351	64.17
$\text{Var}(\psi)$	0.0219	10.41	0.0218	10.40
$\text{Var}(x\beta)$	0.0080	3.78	0.0080	3.78
$\text{Var}(u)$	0.0462	21.96	0.0462	21.96
$2 \text{Cov}(\theta, \psi)$	-0.0069	-3.28	-0.0070	-3.31
$2 \text{Cov}(\theta, x\beta)$	0.0059	2.81	0.0060	2.83
$2 \text{Cov}(\psi, x\beta)$	0.0004	0.20	0.0004	0.20
Between-firm variance				
$\text{Var}(\bar{y})$	0.0906	43.01	0.0906	43.01
$\text{Var}(\bar{\theta})$	0.0657	31.22	0.0657	31.22
$\text{Var}(\bar{\psi})$	0.0380	18.03	0.0380	18.03
$\text{Var}(\bar{x}\beta)$	0.0053	2.51	0.0053	2.51
$2 \text{Cov}(\bar{\theta}, \bar{\psi})$	-0.0207	-9.82	-0.0207	-9.82
$2 \text{Cov}(\bar{\theta}, \bar{x}\beta)$	0.0005	0.25	0.0005	0.25
$2 \text{Cov}(\bar{\psi}, \bar{x}\beta)$	0.0018	0.84	0.0018	0.84
Within-firm variance				
$\text{Var}(y_i - \bar{y}_j)$	0.1200	56.99	0.1200	56.99
Segregation				
$\text{Var}(\bar{\theta})/\text{Var}(\theta)$	0.4860		0.4860	

Notes: Shares are computed relative to total wage variance $\text{Var}(y)$. θ denotes worker effects, ψ firm effects, and $x\beta$ observable characteristics.

Introducing the presence of a firm-level agreement (FLA) as an additional explanatory variable shows no effect on the variance decomposition. One potential explanation for this result lies in the fixed-effects. As documented in Tables 6 and 7, firms that sign firm-level agreements tend to do so repeatedly over the study period, while firms that do not sign often never will. This persistence in bargaining behavior means that the presence of a firm-level agreement is, for most firms, a relatively stable characteristic over time rather than a discrete shock (52,5% of companies above 500 employees sign at least one FLA on the topic of "Wage" in the time period, and 34,30% sign every year on the subject). As a consequence, we think that the firm fixed effect ψ_j is likely to absorb a large share of the variation associated with FLA presence.

In light of this issue, we wish to further our descriptive approach. Rather than relying solely on the variance decomposition, we divide our sample into two distinct groups following the regression (firms that have signed at least one firm-level agreement over the study period, and those that have not) and compare their respective wage variance structures. This grouping allows us to examine whether firms with an established bargaining practice differ systematically from non-signatory firms in terms of both the level and composition of wage inequality. In particular, we seek to assess whether what we assess to be a "culture of negotiation" is associated with different patterns of wage dispersion, both between and within firms.

Before turning to this decomposition, I present in Table 9 the aggregate AKM variance decomposition by firm size category. This table serves as a robustness test, allowing us to compare them to the patterns we will observe later.

Table 9: AKM total log wage variance decomposition by firm size category.

Firm size category	Obs.	Firms	Var(y)	Var(θ)	Var(ψ)	Var($x\beta$)	Var(u)	2Cov(θ, ψ)	2Cov($\theta, x\beta$)	2Cov($\psi, x\beta$)
10-49	10 365 068	306 418	0.2041	0.1232	0.0317	0.0092	0.0466	-0.0114	0.0045	0.0012
50-99	4 559 337	47 495	0.1930	0.1163	0.0176	0.0079	0.0434	0.0036	0.0038	0.0003
100-249	6 115 251	25 362	0.1983	0.1223	0.0165	0.0078	0.0443	0.0033	0.0041	0.0005
250-499	4 102 318	8 407	0.2154	0.1364	0.0174	0.0073	0.0460	0.0022	0.0049	0.0006
500+	19 656 483	5 902	0.2171	0.1473	0.0201	0.0075	0.0474	-0.0131	0.0076	-0.0002

First, we note that $\text{Var}(y)$ increases with firm size, from 0.193 (with a notable slightly higher number in the 10-49 employees category than the following category) to 0.217 among firms with 500 or more employees. Second, $\text{Var}(\theta)$ follows the same upward gradient, rising from 0.123 to 0.147 (and the same distinction at the 10-49 employees category), which we explain by the different profiles present in bigger companies. Third, $\text{Var}(\psi)$ is not monotone ; it is highest among the smallest firms (0.032) and among the largest (0.020), and reaches its minimum among firms with 100-249 employees (0.016). While in the smallest companies, we can explain it by the very high number of companies and very different productivity of the sectors they evolve in, we interpret this number for the bigger companies by making the assumption that 1/ some companies in this bracket outsource more than smaller companies and 2/ these firms tend to align salaries more closely in order to better retain employees.

Table 10: AKM total log wage variance decomposition by firm size and agreement status.

Component	Wage = 0	Wage = 1	$\pi_{\text{sharing}} = 0$	$\pi_{\text{sharing}} = 1$
10-49 employees				
Number of Firms:	305,580	6,162	304,972	30,515
Var(y)	0.2037	0.2241	0.2008	0.2597
Var(θ)	0.1230	0.1450	0.1209	0.1720
Var(ψ)	0.0317	0.0283	0.0314	0.0363
Var($x\beta$)	0.0092	0.0062	0.0093	0.0073
Var(u)	0.0465	0.0512	0.0465	0.0485
2 Cov(θ, ψ)	-0.0115	-0.0150	-0.0115	-0.0192
2 Cov($\theta, x\beta$)	0.0045	0.0038	0.0042	0.0103
2 Cov($\psi, x\beta$)	0.0012	0.0016	0.0012	0.0016
50-99 employees				
Number of Firms:	46,021	6,434	45,815	10,796
Var(y)	0.1906	0.2101	0.1861	0.2450
Var(θ)	0.1145	0.1367	0.1119	0.1556
Var(ψ)	0.0173	0.0178	0.0172	0.0190
Var($x\beta$)	0.0080	0.0060	0.0080	0.0069
Var(u)	0.0431	0.0471	0.0430	0.0476
2 Cov(θ, ψ)	0.0040	-0.0050	0.0029	0.0039
2 Cov($\theta, x\beta$)	0.0038	0.0027	0.0033	0.0078
2 Cov($\psi, x\beta$)	0.0001	0.0011	0.0001	0.0014
100-249 employees				
Number of Firms:	23,552	7,886	23,887	8,474
Var(y)	0.1912	0.2197	0.1875	0.2420
Var(θ)	0.1183	0.1385	0.1160	0.1519
Var(ψ)	0.0160	0.0167	0.0157	0.0189
Var($x\beta$)	0.0081	0.0060	0.0079	0.0067
Var(u)	0.0433	0.0492	0.0433	0.0500
2 Cov(θ, ψ)	0.0030	0.0004	0.0022	0.0021
2 Cov($\theta, x\beta$)	0.0040	0.0036	0.0033	0.0075
2 Cov($\psi, x\beta$)	0.0000	0.0011	0.0002	0.0013
250-499 employees				
Number of Firms:	7,247	3,867	7,505	3,428
Var(y)	0.2032	0.2365	0.1999	0.2480
Var(θ)	0.1299	0.1500	0.1273	0.1593
Var(ψ)	0.0185	0.0135	0.0178	0.0141
Var($x\beta$)	0.0076	0.0064	0.0075	0.0065
Var(u)	0.0444	0.0498	0.0446	0.0509
2 Cov(θ, ψ)	-0.0001	0.0043	-0.0001	0.0013
2 Cov($\theta, x\beta$)	0.0039	0.0065	0.0031	0.0099
2 Cov($\psi, x\beta$)	0.0002	0.0011	0.0004	0.0007
500+ employees				
Number of Firms:	5,190	3,096	5,245	2,529
Var(y)	0.1985	0.2472	0.1953	0.2552
Var(θ)	0.1371	0.1664	0.1349	0.1743
Var(ψ)	0.0244	0.0089	0.0226	0.0092
Var($x\beta$)	0.0075	0.0075	0.0075	0.0074
Var(u)	0.0470	0.0481	0.0466	0.0497
2 Cov(θ, ψ)	-0.0217	0.0019	-0.0196	-0.0057
2 Cov($\theta, x\beta$)	0.0064	0.0097	0.0050	0.0143
2 Cov($\psi, x\beta$)	-0.0007	0.0004	-0.0005	0.0002

Table 10 presents the full AKM variance decomposition by firm size and FLA status. Several patterns emerge consistently across all size categories. First, for "Wage", total wage variance $\text{Var}(y)$ is systematically higher among signatory firms than among non-signatory firms of equivalent size. This gap widens with firm size, from a difference of 0.020 among firms with 10-49 employees (0.224 against 0.204) to a difference of 0.049 among firms with 500 or more employees (0.247 against 0.199). Interestingly, total wage variance remains relatively stable across size categories for non-signatory firms, hovering around 0.190/0.203 regardless of firm size, whereas signatory firms exhibit strong differences, with $\text{Var}(y)$ rising from 0.210 to 0.247 among the largest.

Second, the variance of worker fixed effects $\text{Var}(\theta)$ is consistently higher among signatory firms across all size groups. This suggests that firms with an established bargaining culture could tend to discriminate more in terms of salary increases through the FLAs.

Third, the behavior of the firm fixed effect $\text{Var}(\psi)$ is nuanced and varies across size categories. Among smaller firms (10-49 employees), $\text{Var}(\psi)$ is slightly lower among signatories than non-signatories. This gap widens and reverses for the largest firms: among firms with 500 or more employees, $\text{Var}(\psi)$ is substantially lower among signatories (0.009 against 0.024).

Finally, the same logic emerges when examining " π _sharing" agreements, with a stronger variation of total wage variance. Total wage variance $\text{Var}(y)$ is again systematically higher among signatory firms across all size categories, with the gap reaching 0.060 among the largest (0.255 against 0.195), compared to 0.049 respectively for "Wage". However, we can see that the difference in variance between signing companies related to their size category is negligible for total wage inequalities.

Table 11: Between-firm and within-firm variance by firm size and FLA status (WAGE).

Firm size category	Wage	$\text{Var}(y)$	Between-firm	Within-firm
10-49	0	0.2037	0.0949	0.1088
10-49	1	0.2241	0.1139	0.1102
50-99	0	0.1906	0.0800	0.1106
50-99	1	0.2101	0.0733	0.1368
100-249	0	0.1912	0.0803	0.1109
100-249	1	0.2197	0.0711	0.1486
250-499	0	0.2032	0.0828	0.1204
250-499	1	0.2365	0.0789	0.1576
500+	0	0.1985	0.0730	0.1255
500+	1	0.2472	0.0869	0.1603

Table 11 represents the total wage variance, split into its between-firm and within-firm components by firm size and "Wage" status. Across all size categories, total wage variance $\text{Var}(y)$ is higher among firms that signed an FLA, and this gap is almost entirely driven by the within-firm component, except for the smallest companies. For non-signatory firms, within-firm variance remains relatively stable across size categories, ranging from 0.109 to 0.126.

Among signatory firms, by contrast, within-firm variance increases with firm size, rising from 0.110 among firms with 10-49 employees to 0.160 among firms with 500 or more employees. This finding points to a mechanism operating primarily within firms, which is consistent with the hypothesis that

firm-level wage agreements tend to increase the logic for differentiated wage increases across employee categories, widening the internal wage distribution rather than shifting it up equally.

Table 12: Between-firm and within-firm variance by firm size and FLA status ($\pi_sharing$).

Firm size category	$\pi_sharing$	$Var(y)$	Between-firm	Within-firm
10-49	0	0.2008	0.0946	0.1062
10-49	1	0.2597	0.1278	0.1319
50-99	0	0.1861	0.0782	0.1078
50-99	1	0.2450	0.0920	0.1529
100-249	0	0.1875	0.0776	0.1098
100-249	1	0.2420	0.0839	0.1580
250-499	0	0.1999	0.0801	0.1198
250-499	1	0.2480	0.0813	0.1666
500+	0	0.1953	0.0693	0.1259
500+	1	0.2552	0.0801	0.1751

Note: Here, the within-firm variance is equal to $V(y_{i,t}) - V(\bar{y}_j)$.

Table 12 replicates this analysis for " $\pi_sharing$ " agreements, and the results show a similar but stronger pattern. The gap in total variance $Var(y)$ between signatory and non-signatory firms is larger for " $\pi_sharing$ " than for "Wage" across all size categories. Among firms with 10-49 employees, the difference reaches 0.059 (0.260 against 0.201), compared to 0.020 for "Wage" in the same size group. Among firms with 500 or more employees, the gap reaches 0.060 (0.255 against 0.195), compared to 0.049 for "Wage".

As with "Wage", this excess variance is concentrated in the within-firm component, which is substantially higher among " $\pi_sharing$ " signatories across all size groups, reaching 0.175 among the largest firms compared to 0.126 among non-signatories. The stronger magnitude of the " $\pi_sharing$ " results relative to "Wage" show that profit-sharing agreements, by their nature, condition wage supplements on firm performance and may distribute them unequally across the workforce depending on employees' seniority, position, or contract type, potentially generating greater within-firm dispersion than standard salary increase agreements. Taken together, both tables converge to the same conclusion : firms with an established culture of firm-level bargaining, whether through direct salary agreements or profit-sharing agreements, exhibit systematically higher within-firm wage inequality, and this pattern intensifies with firm size.

6 Conclusion

In this paper, we examine whether the increase of firm-level collective bargaining in France has contributed to the rise in wage inequalities, both between and within firms. To do so, we extended the AKM framework of Babet, Godechot and Palladino (2025) by incorporating the presence of firm-level agreements as an additional explanatory variable, using a matched employer-employee panel covering the period 2014 to 2020.

Our results yield two distinct findings. At the aggregate level, introducing firm-level agreements as a time-varying binary variable in the wage equation has only a marginal effect on the variance decomposition. The shifts in the allocation of variance across components (worker effects, firm effects, or observable characteristics) are negligible. We argue that this null result does not imply the absence of an effect, but rather reflects firms' signing behavior : companies tend to sign continuously or never sign at all. We think that this effect might be absorbed by the fixed effects in our analysis.

The heterogeneity of wage increases negotiated through FLAs may also matter: wage increases depend on firm size and employee bargaining power, which tends to be stronger in larger firms. As a result, FLAs signed in larger companies are likely to generate higher wage increases for the better paid workers, and thus raising wage inequalities as a whole.

This interpretation motivates our second approach, in which we split the sample by FLA status and compare the wage variance structures of signatory and non-signatory firms within each size category. Total wage variance $\text{Var}(y)$ is systematically higher among signatory firms across all size categories, with the gap widening markedly with firm size (reaching 0.0487 for "Wage" and 0.0600 for " π_{sharing} " among firms with 500 or more employees). This bigger dispersion is mostly by the within-firm component : within-firm variance is higher among signatory firms and increases with firm size, while the between-firm component remains broadly the same between the two groups. This pattern holds for both types of agreements studied (SAL 1 and " π_{sharing} ").

The empirical results suggest that the mechanism through which firm-level bargaining affects wage inequality operates primarily within firms rather than between them. Firm-level agreements appear to facilitate differentiated wage increases across employee categories, increasing wage differences between most paid employees and least paid employees. The persistence of bargaining behavior (called "culture of negotiation") appears to be a more meaningful indicator of wage dispersion than the act of signing any individual agreement.

Several limitations of this study leads us to potential future research. Our analysis remains descriptive and does not establish a causal relationship between firm-level agreements and wage inequality. Exploiting exogenous variation in bargaining reforms could provide a better identification. Additionally, distinguishing between the first signature of an agreement and subsequent renewals could show the dynamic effects of bargaining culture over time. Finally, extending the analysis to cover the post-2020 period could help to find a causality effect to the presence of the FLAs.

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