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The geography of collective bargaining in multi-establishment companies: a strategic choice of employers

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La géographie de la négociation collective dans les entreprises multi-établissements [1]

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Résumé : Malgré l'intérêt croissant pour le processus de négociation en entreprise, peu de recherches ont porté sur la structure de la négociation au sein d'une entreprise multi-établissements. Ce document explore si le fait de mener des négociations au niveau très décentralisé du lieuxde travail et/ou à un niveau multi-établissements est un choix stratégique de l'employeur pour maximiser les profits, en fonction des caractéristiques de l'entreprise. Nous proposons un modèle où le niveau choisi pour la négociation dépend de la géographie de l'entreprise. L'employeur est confronté à un compromis : la négociation dans l'établissement permet de conclure des accords qui répondent aux conditions locales ; mais un niveau plus élevé augmente la distance entre les travailleurs et leurs représentants, ce qui affaiblit leur pouvoir de négociation. En utilisant une enquête représentative des établissements français fusionnée avec des sources administratives, nous testons ce modèle et trouvons une relation significative entre le niveau de négociation au sein d'une entreprise et la distribution spatiale de ses installations.

Mots-clés : négociation collective, décentralisation, géographie de l'entreprise, entreprises multi-établissements, salaires

The geography of collective bargaining in multi-establishment companies: a strategic choice of employers

Abstract : Despite the growing interest in the firm bargaining process, little research has focused on the structure of bargaining within a multi-establishment firm. This paper explores whether running negotiations at the very decentralized level of the workplaces and/or at a multi-establishment level is an employer's strategic choice to maximise profits, according to the characteristics of the firm. We propose a model where the level chosen for bargaining depends on the geography of the firm. The employer faces a trade-off: workplace level bargaining allows deals that meet local conditions; but a higher level increases the distance between workers and their representatives, weakening their bargaining power. Using a representative survey of French establishments merged with administrative sources, we test this model and find a significant relation between the level of bargaining within a firm and the spatial distribution of its facilities.

Keywords : collective bargaining, decentralization, geography of the firm, multi-establishment firms, wages

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1. Introduction

Collective bargaining plays a crucial role in the balance of power between workers and employers. A vast literature in economics and industrial relations explores its consequences for rent sharing, business and macroeconomic performances, and working conditions (e.g. Freeman and Medoff (1984), Flanagan (1999), Garnero et al. (2020)). In geography, according to Lier (2007) "*interest in organised labour as a subject of geographical scrutiny can be traced back to Clark's (1989) study of deunionisation in the USA, as well as a debate set off by Martin et al.'s (1993) article on union decline and local union traditions in the UK (Massey and Painter 1989, see also Massey 1994; Painter 1994).*". The "*geographically informed approach to understanding the workplace*" (Rainnie et al., 2017, p.298-9) also plays a growing part in Labor Process Theory.

Despite the growing interest in the firm bargaining process, the literature on the structure of bargaining within a multi-establishment employer is limited. An obstacle to this endeavor is the lack of large datasets to explore this issue. Swidinski (1981) is one exception: using a sample of 2300 agreements in the Canadian private sector, the author studied whether bargaining "*through employer's association, multi-employer, single (multi-plant) employer or single-plant negotiation units has had an effect on negotiated wage settlements*" (p. 371). However, the paper does not explore what determines the level of bargaining (i.e., if wages are negotiated locally in each plant or centrally for the entire firm).

Some theoretical and qualitative papers provide insights on this issue. Kinnie (1982) stresses that local bargaining allows more flexibility. Block and Berg (2009) propose a model of local-level bargaining in the multi-plant firm, where the parent firm can allocate production differentially across plants; they stress that local unions may help them cooperate with local management to increase profitability rather than wages, in order to maximize plant employment. Zagelmeyer (2005) reviews the literature on the factors of company structure which affect the level of collective bargaining, noting that the geographical concentration of units creates the conditions for a high comparability of working conditions in a homogenous labor market, which favors centralized bargaining. Additionally, he states that "*the more devolved the company structures and the more independent the subunits, the more likely is decentralization of collective bargaining*." (p. 1632), thus echoing a point made decades ago by Livernash (1963) while studying power relations between firm management and staff. Livernash also argued that local (or decentralized) bargaining happened more frequently in companies with many establishments/plants, geographically dispersed, and whose production was not integrated. The size, location, life cycle, productive organization and geographical dispersion of firms are all part of this structure which affects the centralization of negotiations. Furthermore, these elements are interlinked, since functional differentiation in local establishments generally leads to different territorial strategies. For instance, Aarland et al. (2007) point out that firms who choose to have a distinct establishment and location for central administrative offices (CAOs) tend to be the ones which are bigger, more geographically dispersed and more industrially diversified: "Firms that operate in small cities are more likely to have CAOs and to locate them in bigger cities, consistent with functional specialization." (Aarland et al., 2007, p. 493).

In recent years, economic geographers have exploited new financial data sources to analyze the geographical spread and locational strategies of individual firms and multinational groups. At the world level, the commercial ORBIS dataset produced by the Bureau van Dijk provides information about the financial ownership links between firms and their geographical location. This allows to construct the network structure and spatial perimeter of multinational groups, as in Bohan and Gautier (2013), or to derive networks of metropolitan areas from the aggregation of multinational networks, as in Hussain et al. (2019). At the French level, an administrative dataset (LIFI) provides the same information for firms located on national territory. Its exploitation reveals the regional and scalar factors influencing foreign direct investment in French cities, as done by Finance (2016).

Our paper proposes to combine these two lines of research by testing structural hypotheses, in particular related to the geography of firms and financial groups, on strategic choices by employers on the bargaining level, using a large representative sample of workplaces of multi-facility firms. To which extent can the structural organization of firms determine the presence and level of collective bargaining? We hypothesize that several structural aspects of the company, its hierarchical and geographical organization do affect the level of centralization in collective bargaining. We first build a theoretical model which produces testable hypotheses: the employer faces a trade-off: workplace level bargaining allows deals that meet the characteristics of the facility and local market conditions; but a higher level of bargaining increases the distance between workers and their representatives, weakening their bargaining power. In that framework, the spatial – geographical dispersion – and productive structures – variety of sizes and activities of facilities – of the company determine the optimal level of bargaining for the employer. Firstly, we expect collective bargaining to be conducted preferentially at the central level in geographically dispersed companies, and at the local level in geographically compact firms. Secondly, we expect companies composed of similar establishments (in terms of size and specialization) to favor centralized bargaining and companies with an integrated production in heterogeneous establishments to bargain more locally to cater for local specificities more efficiently. Thirdly, we expect that thanks to increasing returns of her bargaining technology, the employer with a larger number of distinct facilities would prefer to run centralized negotiation. Finally, we expect that employers will favor centralized bargaining in establishments located further away from their headquarters (HQ) in order to impede the mobilization of workers. This relationship would hold true both for both the company HQ and the group HQ.

These hypotheses are tested on France where the institutional environment promotes both collective bargaining and a discretionary choice by employers of the level of bargaining within companies. A core survey REPONSE conducted in 2017 by the French Ministry of labor, offering a rich description of labor relations in 2014-2016, is merged with comprehensive administrative sources providing the complete workplace structure of the companies, including their hierarchical inclusion into a wider financial group and the geographical location of their components in France.

The paper is organized as follows. Section 2 presents the model and related hypotheses. We then introduce the French institutions, the data and empirical strategy (section 3) used to test our predictions (section 4). Section 5 concludes.

2. A theoretical model of within-firm level of wage bargaining

2.1 Production and bargaining process

We consider a firm composed of headquarters and $N > 1$ productive establishments across the country. The establishments can operate in different activities. Each establishment benefits from a markup p_i. Let L_i be the number of employees in establishment i and L the total employment. We assume that the more the firm is composed of establishments of different sizes and activities, the greater the dispersion of markups for the same mean.

An establishment enjoys constant returns to labor input. Labor productivity (eg. workers' effort) is driven by a wage mechanism *à la* Solow with decreasing returns[1]: value added is equal to $p_i L_i w_i^{\alpha}$ where $0 < \alpha < 1$, and w_i is the wage level. The operating profit of an establishment i is thus $\boldsymbol{\pi}_i = p_i L_i w_i^{\alpha} - L_i w_i$.

The firm must conduct collective bargaining on wages, either at a multi-facility level or at the decentralized level of each establishment. The employer chooses the level of bargaining. In the case of establishment bargaining, a pay level is set at establishment level. It can therefore be different from one establishment to another, whereas in a multi-establishment agreement the same pay applies to all covered units. Employees' negotiators seek to maximize the negotiated wage whatever the level of bargaining set by the firm, while the employer seeks to maximize net profits.

The bargaining process at one establishment induces a sunk cost $c > 0$ for the firm. At the firm level, the employer enjoys increasing returns in her bargaining technology: the cost $c(N)$ is increasing but concave in the number of covered establishments, and $0 < c(2) < 2c$. In case of failure of the negotiations, we assume, for sake of simplicity (and because of the limitations of our data), a total loss of turnover and wage.

For the same reason, we assume that local workers' negotiators enjoy a relative bargaining power $\boldsymbol{\beta}_i$ which is similar in all establishments. Let $\boldsymbol{\beta}(d)$ the bargaining power of workers' negotiators at the centralized level, where d is the geographical dispersion of establishments. The more the establishments are spatially dispersed – d is large –, the more the workers' negotiators encounter difficulties in coordinating workers' mobilizations across the firm; the employer can also play with the potentially divergent goals of a larger panel of competing unions. The bargaining power of workers' negotiators at the central level is then a decreasing function of d. If $d = 0$, all establishments are in the same location; in this case, the collective bargaining power at the firm is equal to power at the local level: $\boldsymbol{\beta}_i = \boldsymbol{\beta}(0)$.

2.2 Pure employer's choice for bargaining level and main hypotheses

We assume for now that the employer has only one alternative: bargaining locally in all facilities, or bargaining once at a centralized level for all units. Details of the solution are in Appendix A.

1 cf. Schlicht (2016) for the implications and alternatives of this representation.

The outcome of a **bargaining at an establishment** *i* is a Nash equilibrium given by the maximization of

$$\max_{w_i} \left(1-\beta(0)\right)\ln\left(\pi_i\right)+\beta(0)\ln\left(w_i\right),$$

Elementary calculations lead to:

$$w_i=\left[\left(\beta(0)+\alpha-\alpha\beta(0)\right)p_i\right]^{1/(1-\alpha)}.$$

In the case of local bargaining only, the total profit $\boldsymbol{\pi}_e$ is then:

$$\Pi_e=(1-\alpha)\left(1-\beta(0)\right)\left[\beta(0)+\alpha-\alpha\beta(0)\right]^{\alpha/(1-\alpha)}\sum_{i-1}^{N} L_i\, p_i^{1/(1-\alpha)}-Nc$$

Note that if α is equal to 0.5, the profit is proportional to the weighted average of the squared markups of the establishments, i.e. the variance of the markups plus the square of their weighted average.

In the case of bargaining conducted only at the **centralized level**, the aggregated operating profit is p_f L w^{α} - L w, where w is the wage set for all workplaces and p_f is the weighted average of the markups of the establishments covered by the firm-level bargaining. The outcome is thus given by the maximization of

$$\max_{w} \left(1-\beta(d)\right)\ln\left(p_f\, w^{\alpha}-Lw\right)+\beta(d)\ln(w),$$

The firm's total profit is then (see appendix A):

$$\Pi_f=(1-\alpha)\left(1-\beta(d)\right)\left[\beta(d)+\alpha-\alpha\beta(d)\right]^{\alpha/(1-\alpha)}$$

The employer determines its optimal level of bargaining by comparing their profits in the two cases. The ratio $\boldsymbol{\pi}_f$ / $\boldsymbol{\pi}_e$ is a decreasing function of the geographical dispersion of establishments, but increasing with their heterogeneity in terms of size/activities. If $d = 0$ and c small, by convexity, $\boldsymbol{\pi}_e \geq \boldsymbol{\pi}_f$ the employer chooses to bargain in each establishment. Conversely, when the geographical dispersion becomes important, firms will tend to centralize negotiations to optimize profits.

Intuitively, the more establishments are geographically dispersed, the lower bargaining power of the workers' representatives at the company level is and therefore the more significant the rent retained by the firm during a centralized bargaining. If the establishments are very similar – we will hereafter call them "clones" –, a negotiation at the company level makes it possible to preserve the most important share of rents for profits, without significantly deteriorating the incentive mechanisms and thus the size of these rents. Conversely, if markups are very dispersed, setting the same wage in all

establishments makes wage incentives too suboptimal in some establishments, or suboptimal in too many establishments; the employer prefers to promote bargaining in each establishment.
Finally, since the relative cost of running a centralized bargaining is declining with *N*, the propensity to negotiate at the firm level is expected to increase with the number of facilities.

Therefore, our model suggests three testable hypotheses:

H1: The geographic dispersion of establishments favors negotiation at central/company level.

H2: The heterogeneity of size/activity of establishments favors negotiation at the establishment level.

H3: The number of establishments in the multi-establishment firm is positively related its bargaining level.

2.3 Mixed employer's choice for bargaining levels

In practice, the wage packages include a variety of tools: grid by occupation, paid holidays, profit sharing schemes etc. and an employer can initiate negotiations for some elements at the company level and the others at the local level. In the line of H1, we can expect, for a given heterogeneity of markups, that a double level of bargaining (local and central) is run when the geographical dispersion is sufficiently high.

The employer can also implement a two-tiers bargaining: only a part of the establishments is covered by a multi-establishment negotiation while in the remaining ones only local bargaining is implemented. In our framework, the employer should prefer to pool in a unique negotiation, establishments that are far from the head office, in order to magnify the difficulties for employee representatives to coordinate their actions and mobilize workers. The distance of the establishment from its head office is already demonstrated to have an effect on its longevity and revenues (Kanins and Lafountaine, 2013). It would here be a determinant of the probability of being covered by multi-establishment bargaining. This leads to another testable hypothesis:

H4: The distance of an establishment from its HQ may favor its inclusion in a multi-establishment bargaining.

Testing this hypothesis along with H1 and H2 is also useful for preventing a statistical confusion between the mechanisms driven by the global geography of the firm and those driven just by the position of the establishment.

3. Institutions, Data and Methods.

To test the predictions of the model, we merge two main French datasets covering establishments, one describing the collective bargaining from 2014 to 2016 and the second one providing information about the characteristics of French establishments and their parent firms in early 2017. We first

present the main characteristics of the collective bargaining process in France in 2014-2016 and then the data and methods used to test our model's predictions empirically.

3.1 The French bargaining process in 2014-2016

France is often seen as a country of industrial disputes. Actually, in the 2010's according to the Social Dialogue Surveys (ACEMO-DSE), on average less than 2% of companies with 10+ workers experienced a strike on a given year. A majority of these conflicts are driven by external factors, especially public policy reforms; since major reforms affected workers in the transportation sectors, the associated strikes nevertheless had a high visibility. By contrast, on average in the 2010's, in a year, one out of seven companies with 10+ workers experienced negotiations; among them about 80% reached at least one new agreement covering some or all their establishments. These proportions are dramatically rising with the size of the company, therefore a majority of French salaried workers in the private sector are regularly concerned by a bargaining process.

In the past decades, a continuous flow of reforms has modified French labor relations but has not entailed the institutional construction that supports collective bargaining. Basically, employers and unions can bargain at the national level, industry level and firm (in French "*entreprise"*) level. For each level, the labor code defines the bargaining bodies and mandatory negotiations.

We focus here on the *entreprise* level. Actually, this level is broken down into up to five potential levels: establishment, multi-establishment, company (legal unit), multi-company if the companies are controlled by the same shareholders, and group. A key principle is equality within a given level. For example, if an agreement is signed at the company level then its elements should apply equally in all establishments belonging to this company.

When unions are present, only recognized unions can bargain with the employer. The recognition – called representativeness – is based on results at the professional elections organized at least every 4 years. To be recognized in an establishment with 50+ workers, a union should have attracted at least 10% of the votes (compared to e.g. 50% in the US). At a company level, votes from all the local establishments are aggregated to appreciate the 10% threshold. The same principle applies at upper levels. When unions are present, the employers have to open, each year, negotiations on a legal list of topics with all recognized unions, except if an agreement has been reached on the same topic in the past 4 years and is still valid: wages, profit sharing schemes, working time, gender equality and quality of work life. In practice, the variety of topics generates a continuous flow of bargaining in a majority of firms with union delegates. Note that reaching an agreement is not mandatory; and an agreement can be implemented only if it is signed by one or more unions which have attracted cumulatively at least 30% of the votes.

Until the summer of 2016, in multi-establishment companies, the employer could fulfil these mandatory *entreprise* negotiations by opening them either at the establishment or at the company levels. Bargaining topics could be split, some discussed at the establishment level, others at the company level. Companies that have similar activity in the same local area while they are controlled

by the same shareholders, can be considered as a single company – a UES for *Unité Économique et Sociale* in French, or Economic and Social Unit – for collective bargaining.

In addition to the regular negotiations, a bargaining process with recognized unions can be opened by the employer at any time, for example in case of restructuring or for preventing a strike. In this case, it can be conducted at any level.

To wrap up, in the French framework and during the years we study (2014-2016), the level of bargaining – basically local *versus* central/company – can be considered largely a discretionary choice of the employer in multi-establishment firms.

3.2 The REPONSE Survey and interest variables

Our first dataset is the Ministry of Labor's 2017 French Workplace Employment Relations Survey (REPONSE 2017) of 4,364 business establishments with 10+ employees in the non-Agricultural business sector. The sample is stratified by employment size and industries, with a sampling probability proportional to the size. Conducted every 6 years, REPONSE is one of the main sources on industrial relations in France[2]; it is the equivalent of the British WERS (see Amossé et al., 2016).

A management representative completes a long face-to-face interview based on a 70 pages questionnaire in each establishment. [3] She replies to a large number of questions covering in particular the organization of work and industrial relations. These face-to-face interviews have taken place between January and June 2017. REPONSE 2017 was a mandatory survey, meaning that employers had to answer it by law. Eventually, 72% of the contacted workplaces participated. The data are not public but the anonymous version of this survey can be downloaded by academics for research purposes. The non-anonymous version is available within a secure remote environment to link it with other firm-level datasets (see below and appendix B).

REPONSE provides information on unionization but only at the establishment level, so we have no proxy of the bargaining powers at the different levels of the firm. By contrast, REPONSE clarifies the bargaining process at both the local and the central levels.

Our key variables of interest derive from a set of questions on the bargaining process in the years 2014-2015-2016[4] (cf. appendix B). Following our model, we focus on wage bargaining; it is by far the

2 The other major source ACEMO-DSE –a short online annual survey- unfortunately does not include detailed questions on the level of bargaining within the firm,

3 https://dares.travail-emploi.gouv.fr/sites/default/files/pdf/questionnaire_reponse_2017_-_rd.pdf

4 Since the questions cover the 2014-2016 period, we consider that the impact of regulatory changes which occurred in Summer 2016 is negligible for our analysis That was also the view of the REPONSE team that decided to leave the questionnaire unchanged despite a decision of the French civil supreme court (Cour de Cassation) in July 2016 and the *El Khomri* law enacted in August 2016. The decision limits the free choice of employers: a representative union can oppose that mandatory negotiations are run at the establishment level. By contrast, *El Khomri* gives additional choices to the employer in the case of a group of companies controlled by the same head: the mandatory negotiations can be common to two or more companies whatever their locations, or for all companies of the group if the employer and the unions agree on the methodology (topics etc.) of this

most common bargaining topic according to French surveys. The variable WB refers to the wage bargaining between 2014-2016, more precisely on "Salaries, bonuses and other allowances" and takes the value "No"; "Yes only at the establishment level"; "Yes at the company (or UES level)"; "Yes both at the establishment and company (or UES levels)". The questionnaire does not ask if the bargaining holds at the intermediary level of multi-establishments; however, qualitative post-survey investigations suggest that in case of negotiations taking place beyond the level of the establishment, the employer representative likely answers "at the company" (see Didry et al., 2021).

We also explore and compare bargaining on gender equality (GB) and on working time (TB), two additional major topics of bargaining.

3.3 FLORES database: spatial, social and productive variables

The second dataset used in this research design is FLORES 2017 (File of local salaried employment and rewards[5]). This administrative base covers the universe of salaried work in French business establishments, including overseas[6]; it is the core source for local business statistics released by INSEE or Eurostat for France. It contains characteristics of the establishments such as their parent company, creation date, size, industry code, number of employees, wages and municipality of location (except for facilities related to national security and military industry).
Therefore, FLORES draws an almost complete map of companies and establishments operating in France. Merging FLORES and REPONSE can only be made within a secure remote environment, using the unique establishment identifier SIRET. Researchers can apply for this access service (see appendix B for details). We used the geographical information from FLORES to locate REPONSE establishments at the municipality level, as well as to compute the location, geographical dispersion and industrial organization of their parent company (figure 1, left side).

Markups by establishment cannot be computed since key accounting variables are only available at the company level. FLORES does not provide information on the perimeters of the UES either. Therefore, we first ignore workplaces related to a UES[7]. We also ignore single-establishment firms and multi-establishment firms with only one active establishment. Eventually, our core sample covers 2018 observations. Four out of five of these establishments have conducted negotiations at the establishment and/or company level during the 2014-2016 period. Among them an overwhelming majority have at least bargained on salaries, bonuses and other allowances.

process.

5 Fichier Localisé des Rémunérations et de l'Emploi Salarié : https://www.insee.fr/fr/metadonnees/source/serie/s1042

6 i.e. in the districts of Guadeloupe, Martinique, French Guiana, Mayotte and Réunion.

7 The results are replicated for sensibility on the sample including UES in the appendix D.

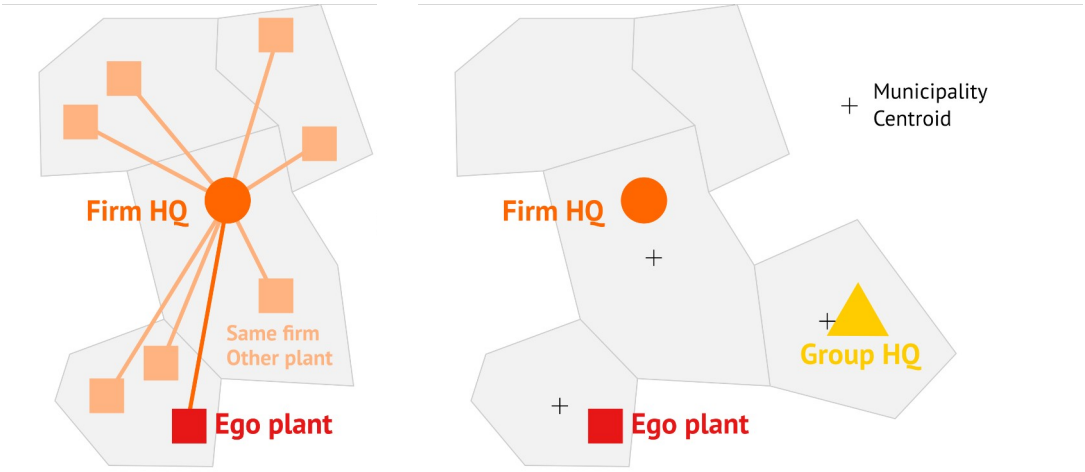

Figure 1. Left: merging REPONSE and FLORES 2017 (locations). Right, merging with LIFI (groups)

3.4 LIFI database: financial information about enterprises and groups

The third and last dataset used in this research is LIFI[8] 2017 (Financial Links). It covers the universe of French companies and their financial links of subsidiarity to other companies in France. It is constructed using fiscal, bank and commercial data about companies' activity. Among other information, this dataset provides for each company the name and unique identifier of its group company (the one who owns the company in last resort, sometimes through a chain of multiple subsidiaries), in France or abroad. When the group company is in France, it has been possible to link it with FLORES through the SIREN unique identifier in order to locate its HQ at the municipality level (figure 1, right side). We have linked this information to REPONSE establishment using the SIREN unique identifier of their parent companies to determine the co-location between the REPONSE establishment and its group HQ.

3.5 Empirical strategy: multinomial model of the presence and level of bargaining topics

The empirical strategy consists in testing the influence of structural characteristics of the establishments as well as their position in the company and financial group to explain and predict the presence and level of three major bargaining topics (wages, professional equality and working times). More specifically, we test the validity of our four hypotheses:

H1: The geographic dispersion of establishments favors negotiation at central level.

H2: The heterogeneity of size/activity of establishments favors negotiation at the establishment level.

H3: The number of establishments belonging to the firm is positively related to a firm level bargaining.

H4: The distance of an establishment from its head office may favor its inclusion in a multi-establishment bargaining.

8 Liaisons Financières : https://www.insee.fr/fr/metadonnees/source/serie/s1038

We do so using a multinomial model of the form:

$$Y_k = \alpha + \beta_{ind}\, I_{industry} + \beta_{size}\, I_{size} + \beta_{age}\, I_{age} + \beta_{e\_clone}\, E_{clone} + \beta_{e\_disp}\, E_{dispersion} + \beta_{e\_n}\, E_n + \beta_{d\_group}\, D_{group} + \beta_{d\_ent}\, D_{enterprise} + \gamma X + \varepsilon$$

$$k \subseteq \{WB, LWG, LGB, LTB\}$$

Where WB is the Boolean variable from REPONSE which indicates the presence of collective bargaining on "Salaries, bonuses and other allowances" between 2014-2016 and LWB the level at which it was conducted, LGB the level at which collective bargaining on gender equality between 2014-2016 was conducted, LTB the level at which collective bargaining on working time between 2014-2016 was conducted.

$I_{industry}$ corresponds to one of 10 NAF industry codes describing the dominant production of the establishment (source: REPONSE 2017); I_{size} is the total number of employees of the establishment at the end of 2016 (source: REPONSE 2017); I_{age} is the age of the establishment, measured as the difference between 2017 and its date of creation (source: REPONSE 2017).

E_{clone} reflects the "cloned" character of the establishments in *entreprise* E and is used to test **H2**. $E_{clone} = 1$ when over 80% of establishments *i* in E share the same dominant industry code (NAF in 88 modalities) and if the coefficient of variation of their size is below 1 (source: FLORES Etablissements 2017). In that case, the majority of establishments *i* are similar in terms of size and activity, and are considered "clones". By contrast, $E_{clone} = 0$ when either of those two conditions are not met (figure 2).

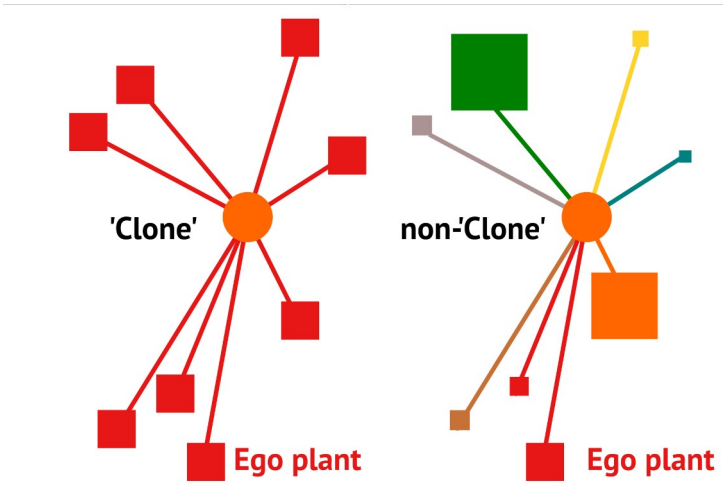

Figure 2. Schematic representation of the differences between clone and non-clone companies

$E_{dispersion}$ reflects the geographical dispersion of the *entreprise* E to which belongs the establishment i (source: FLORES Etablissements 2017). It is used to test **H1** and is measured as the gyration radius of the centroids of the municipalities in which the establishments of E are located:

$$E_{dispersion} = \sqrt{\frac{1}{N}\sum_{mM} n_m (r_m - r_{cm})^2}$$

with n_m the frequency of establishments i of E located in a municipality m, M the total number of municipalities over which E is located, N the sum of all single frequencies n_m, r_m the vector coordinates of municipality *m*'s centroid and r_{cm} the vector coordinates of the center of mass. Frequently used in the geospatial analysis of mobility patterns, the radius of gyration is used here to estimate the spatial spread of the firm. The higher this radius, the more geographically dispersed the firm (figure 3). For the regression model, we have transformed this continuous variable into a discrete one in 4 categories.

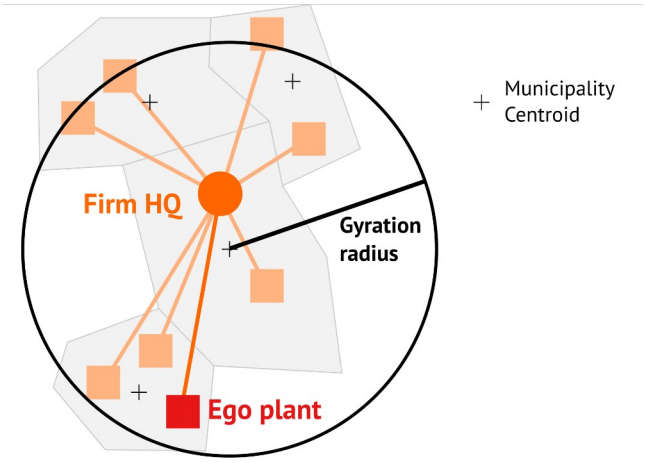

Figure 3. Schematic representation of the construction of the dispersion variable.

E_n is the number of active establishments in E, discretized in 4 categories, and is used to test **H3**.

D_{group} represents the distance between the establishment *i* and the HQ of its financial group company G. It is measured qualitatively as a geographical co-presence of the two organizations (source: LIFI 2017, FLORES Entreprises 2017, FLORES Etablissements 2017) and takes the modalities: "same municipality", "same city"[9], "same country", "foreign-owned group" and "no group". Similarly, $D_{enterprise}$ represents the distance between the establishment *i* and the HQ of its *entreprise* E. It is measured qualitatively as a geographical co-presence of the two organizations (source: FLORES Entreprises 2017, FLORES Etablissements 2017) and takes the modalities: "same municipality", "same city" and "other". These two variables are meant to verify **H4**.

Finally, we have used a series of 6 control variables from REPONSE 2017:
- URC, the presence of a union representative at the central level of the company (Boolean).
- URL, the presence of a union representative at the local level of the establishment (Boolean).
- TEMP, the percentage of employees with temporary contracts in the establishment.
- FEM, the percentage of female employees in the establishment.
- SEX, the sex of the management representative.
- FT, the percentage of full-time employees in the establishment.

The observed distribution of variables is available in Appendix C.

9 The city is defined here as the INSEE 2010 definition of metropolitan areas ("Aires Urbaines"). https://www.insee.fr/fr/information/2115011

4. Results.

This section studies first the determinants of wage bargaining and then explores if similar findings hold for two other major topics, working time and gender equality.

4.1. Determinants of the company structure on wage bargaining (WB).

In 2017, 61.1% of the establishments included in REPONSE reported having bargained on the topic of wages, bonuses and other allowances. This proportion rises to 72.5% among the 2018 establishments of our core sample (i.e. establishments of active multi-establishment firms outside UES). According to interviewed managers, of these 1464 negotiating establishments, 166 conducted the bargain at the local level of the establishment only (11.3%), 982 at the level of the *company* only (67.1%), and 316 at the two levels simultaneously (21.6%).

Model of wage bargaining. The structural characteristics of the establishments and their enterprise account for 40.5% of the variation in wage bargaining (table 1). In this multinomial model with eight variables and five controls, we show that the geography of the company plays as a significant role as the typical characteristics of the establishment to determine the presence of formal bargaining on wages, bonuses and other allowances.

Compared to manufacturing establishments, formal wage bargaining is particularly less prevalent in the services **industries** (for instance commerce and technical, scientific and administrative activities), including public services such as health and education, where salary scales tend to be determined nationally by the government. The coefficients for the **size** and **age** variables confirm basic expectations: large establishments (more than 100 employees) tend to conduct formal bargaining on wages significantly more than smaller establishments and older establishments (6 years and more) bargain more frequently than newly established ones, all things equal, including the presence of a union representative at the central level and the distribution of employment contracts.

Although **clone**-firms do not seem to differ from non-clone and other firms in terms of the presence of wage bargaining in this model, we find that a significant and positive effect associated to wide geographical **dispersion**: establishments whose dispersion goes beyond 150km bargain more systematically than establishments from geographically concentrated companies (<10km), irrespective of the number of establishments in the company. Thus, *in dispersed enterprises, the probability of conducting wage bargaining is higher, regardless of the level at which it is conducted*.

The actual co-location of the establishment with its company and group HQ is not very important: only the co-location with group HQ within the same metropolitan area increases significantly the probability to conduct bargaining on wages, compared to colocation within the same municipality (we can assume that informal bargaining is however likely to be enhanced by such proximity).

Finally, among control variables, we find a significant and strong (positive) effect of the presence of a union representative at the central level, which in practice conditioned the bargaining on any topics in 2014-16, and a slight (positive) effect of the percentage of full-term contracts in the establishment.

Table 1: wage bargaining and structural establishment/enterprise characteristics

Variable	Modality	WB Bargaining on Wages 2014-2016
	Intercept	**-3.264***** (0.607)
$I_{industry}$	CE : Production of foods, goods and energy	*ref.*
	FZ : Construction	-0.560 (0.388)
	GZ : Commerce et auto/moto repair	**-0.801***** (0.266)
	HZ : Transport and warehousing	-0.119 (0.321)
	IZ : Hotels and restaurants	-0.708 (0. 539)
	JZ : Information and communication	-0.287 (0.437)
	KL : Finance, insurance, real-estate	-0.542 (0.388)
	MN : Scientific, technical and administrative activities	**-1.142***** (0.267)
	OQ: (Public administration,) education and health	**-1.824***** (0.326)
	RU : Other service activities	0.398 (0.583)
I_{size}	11 to 20 employees	*ref.*
	20 - 49	0.123 (0.297)
	50 - 99	0.373 (0.302)
	More than 100	**1.111***** (0.280)
I_{age}	Up to 5 years	*ref.*
	6 - 9	**0.570**** (0.235)
	More than 10	**0.585***** (0.206)
E_{clone}	Non-clone establishments	*ref.*
	Enterprise of clones	-0.213 (0.160)
$E_{dispersion}$	Less than 10km gyration radius	*ref.*
	10 - 50	0.315 (0.235)
	50 - 150	0.297 (0.272)
	More than 150 km	**0.591**** (0.253)
	Overseas	0.278 (0.376)
$D_{enterprise}$	Same municipality	*ref.*

	Same metropolitan area	0.093 (0.261)
	Other	-0.094 (0.185)
D_{group}	Same municipality	*ref.*
	Same metropolitan area	**0.955**** (0.440)
	Same country	0.365 (0.327)
	Foreign owned group	0.349 (0.311)
	No group	-0.076 (0.323)
E_n	Less than 10 establishments	*ref.*
	10 - 49	-0.161 (0.197)
	50 - 99	0.310 (0.324)
	More than 100	-0.265 (0.274)
Controls	UR: Presence of a union representative (central)	*(+)****
	TEMP: share of temporary contracts	*n.s.*
	FEM: share of female employees	*n.s.*
	SEX: sex of the management representative	*n.s.*
	FT: share of full-time employees	*(+)****
1997 Obs.[10]	R^2 = 40.5% AIC = 1,479.808	*p<0.1; **p<0.05; ***p<0.01

Model of bargaining level. The structural characteristics of the establishments and their parent enterprise predict 24.5% of the variation in wage bargaining level (table 2). With this multinomial model where the dependent variable is the level at which wage bargaining took place, we show that the geography of the company plays as a significant role as the typical characteristics of the establishment to determine the level of formal bargaining on wages, bonuses and other allowances, and we validate three of our four hypotheses.

Two industries are preferentially associated with a particular level of wage bargaining. Hotels and restaurants on the one hand, and commerce, auto/moto repair establishments on the other hand, appear particularly reluctant to bargain at the central level compared to manufacturing establishments and with reference to the absence of collective bargaining on wages. Collective bargaining in these industries seems relatively absent, informal or local at best. The higher tendency of larger establishments to bargain on wages is confirmed at all levels, but especially at the local level (twice more than at the central level of the enterprise). By contrast, age seems to have a significant positive effect on wage bargaining only at the level of the company.

- Our first hypothesis **H1** is that the geographic dispersion of establishments favors negotiation at central level. **Empirically, we validate** this claim for wage bargaining since the gradient effect associated to geographical dispersion is significant and positive at the central level and for double level bargaining.

10 21 observations are discarded from our sample because of missing data on the share of female employees.

- Our second hypothesis **H2** is that the heterogeneity of size/activity of establishments favors negotiation at the local/establishment level rather than at company level. **Empirically, we validate** this claim for wage bargaining since clone companies tend to bargain significantly less frequently than non-clone companies at the local level.
- Our third hypothesis **H3** is that the number of establishments belonging to the firm is positively related to a central level bargaining. **Empirically, we validate** this claim for wage bargaining. Indeed, we find a significant negative gradient effect on local bargaining, meaning that the larger the number of establishments, the less frequently employers choose to bargain at the local level only.
- Our fourth hypothesis **H4** is that the distance of an establishment from its HQ favors its inclusion in a multi-establishment bargaining. Again, the questionnaire does not allow to disentangle multi-establishment and company levels. Under the assumption that answering "at the company" includes the former, **empirical evidence is mixed but likely supports H4**. In terms of distance to the enterprise's head office, establishments in the same metropolitan area as their *entreprise* HQ tend to conduct local formal bargaining on wages less frequently than if they are located closer (in the same municipality), and compared to establishments without formal bargaining on wages. However, being in the same metropolitan area (rather than the same municipality) as their group HQ is significantly associated with more bargaining at all levels. Individual distances to head offices therefore seem to play a more complex role than hypothesized.

Finally, among control variables, not surprisingly, we find a significant and strong (positive) effect of the presence of a union representative locally for local bargaining, and centrally for central bargaining. The share of employees on short-term contracts has a significant (positive) effect on bargaining at the local level whereas the share of employees on full-time contracts has a significant (positive) effect on bargaining at the central level (including at the double levels). Gender controls do not have an effect on the level at which this topic is bargained.

Table 2: level of wage bargaining and establishment/enterprise characteristics

Variable	Modality	WB Local	WB Central	WB Double
	Intercept	**-2.691***** (1.084)	**-4.194***** (0.669)	**-5.154***** (0.851)
$I_{industry}$	CE : Production of foods, goods and energy	*ref.*	*ref.*	*ref.*
	FZ : Construction	-0.165 (0.517)	-0.501 (0.407)	**-1.046**** (0.511)
	GZ : Commerce et auto/moto repair	-0.488 (0.384)	**-0.905***** (0.282)	**-0.647**** (0.318)
	HZ : Transport and warehousing	0.143 (0.433)	-0.141 (0.335)	-0.113 (0.615)
	IZ : Hotels and restaurants	-0.692 (0.904)	**-1.135*** (0. 594)	-0.169 (0.615)
	JZ : Information and communication	-0.341 (0.633)	-0.106 (0.459)	-0.860 (0.574)
	KL : Finance, insurance, real-estate	-0.463 (0.575)	-0.514 (0.401)	-0.634 (0.462)

	MN : Scientific, technical and administrative activities	**-1.112***** (0.394)	**-1.142***** (0.278)	**-1.114***** (0.321)
	OQ: (Public administration,) education and health	**-1.302**** (0.506)	**-1.763***** (0.349)	**-2.008***** (0.432)
	RU : Other service activities	0.320 (0.828)	0.556 (0.619)	0.102 (0.732)
I_{size}	11 to 20 employees	*ref.*	*ref.*	*ref.*
	20 - 49	0.224 (0.816)	-0.006 (0.328)	0.301 (0.428)
	50 - 99	0.681 (0.806)	0.227 (0.333)	0.357 (0.441)
	More than 100	**1.809**** (0.770)	**0.925***** (0.317)	**0.797*** (0.420)
I_{age}	Up to 5 years	*ref.*	*ref.*	*ref.*
	6 - 9	-0.039 (0.374)	**0.696***** (0.248)	0.468 (0.308)
	More than 10	0.086 (0.318)	**0.656***** (0.218)	**0.561***** (0.2)
E_{clone}	Non-clone establishments	*ref.*	*ref.*	*ref.*
	Enterprise of clones	**-0.437*** (0.243)	–0.147 (0.168)	-0.273 (0.197)
$E_{dispersion}$	Less than 10km gyration radius	*ref.*	*ref.*	*ref.*
	10 - 50	-0.292 (0.355)	**0.459*** (0.257)	0.502 (0.327)
	50 - 150	-0.073 (0.379)	0.326*** (0.295)	**0.720***** (0.351)
	More than 150 km	-0.188 (0.349)	**0.820***** (0.2)	**0.772**** (0.332)
	Overseas	-0.327 (0.582)	0.599 (0.396)	-0.078 (0.520)
$D_{enterprise}$	Same municipality	*ref.*	*ref.*	*ref.*
	Same metropolitan area	**-0.863*** (0.490)	-0.340 (0.273)	-0.231 (0.347)
	Other	0.149 (0.259)	-0.093 (0.194)	-0.118 (0.223)
D_{group}	Same municipality	*ref.*	*ref.*	*ref.*
	Same metropolitan area	**1.381**** (0.573)	**0.823*** (0.465)	**1.140**** (0.553)
	Same country	0.135 (0.458)	0.320 (0.353)	0.687 (0.434)
	Foreign owned group	0.296 (0.427)	0.289 (0.337)	0.614 (0.418)
	No group	-0.217 (0.465)	-0.097 (0.353)	0.115 (0.444)
E_n	Less than 10 establishments	*ref.*	*ref.*	*ref.*
	10 - 49	**-0.790**** (0.309)	0.038 (0.206)	-0.391 (0.246)
	50 - 99	-0.073 (0.502)	0.393 (0.336)	0.298 (0.388)
	More than 100	**-1.439***** (0.470)	-0.034 (0.285)	-0.532 (0.335)
Controls	URC: Presence of a central union representative	*n.s.*	*(+)***	*(+)***

	URL: Presence of a local union representative	*(+)***	*n.s.*	*n.s.*
	TEMP: share of temporary contracts	*(+)***	*n.s.*	*n.s.*
	FEM: share of female employees	*n.s.*	*n.s.*	*n.s.*
	SEX: sex of the management representative	*n.s.*	*n.s.*	*n.s.*
	FT: share of full-time employees	*n.s.*	*(+)***	*(+)***
1997 Obs.	R^2 = 24.5%	AIC = 3.872.598	*p<0.1; **p<0.05; ***p<0.01	

These conclusions and the tests of our four hypotheses are robust to the change of definition of the regression sample and clustering of standard errors by industry. In Appendix D, we show the results of the same model on samples where mono-establishments and establishments within UES are included.

4.2. Determinants of the company structure gender equality bargaining (GB) and working time bargaining (WT)

Gender equality bargaining. In 2017, 54.1% of the establishments included in REPONSE reported having bargained on the topic of gender equality. This proportion rises to 65.0% among the 2018 establishments of our sample of interest. Of these 1311 bargaining establishments, 126 conducted the bargain at the local level of the establishment (9.6%), 918 at the level of the company (70.0%), and 267 at the two levels simultaneously (20.4%).

We run the same multinomial model on gender equality bargaining as the one used to estimate the level of bargaining on wages, with the level of bargaining on wages added as a control variable. This derives from the idea that, wage bargaining being the most frequent bargaining topic, it can influence the level at which other topics are negotiated. In other words, once the employer and employee parties have discussed wages, they might as well discuss the other topics at that particular level.

This model accounts for half of the variation in equality bargaining level (Appendix E). Most variables play a similar role in predicting the presence of equality bargaining to the one they played in the model on wage bargaining. The main difference relates to business establishments in education and health: whereas they are significantly associated with less bargaining on wages at the central level, they are significantly associated with more bargaining on gender equality at the central level. This might be explained by the large proportion of educated women. Other differences correspond to the levels of significance in the two models. However, our main two hypotheses **H1 and H2 are still empirically validated**, even when we account for the (positive and significant) effect of the level of wage bargaining. There is some mixed evidence on **H3** (the effect of the number of establishments) and **H4** is not confirmed since co-location variables appear non significantly associated with the level of gender equality bargaining.

Working time bargaining. In 2017, 36.1% of the establishment included in REPONSE reported having bargained on the topic of working time. This proportion rises to 43.5% among the 2018 establishments of our sample of interest. Of these 878 bargaining establishments, 150 conducted the

bargain at the local level of the establishment (17.1%), 538 at the level of the company (61.3%), and 190 at the two levels simultaneously (21.6%).

We run the same multinomial model on working time bargaining as the one used to estimate the level of bargaining on gender equality, i.e. with the level of bargaining on wages added as a control variable.

This model accounts for about a third (29.2%) of the variation in working time bargaining level (Appendix F). Most variables play a similar role in predicting the presence of equality bargaining to the one they played in the models on gender equality bargaining. Once again, establishments in the education and health are significantly associated with more bargaining at the central level. Another significant difference pertains to establishments older than 10 years, which conduct significantly less working time bargaining at the central level on working time, whereas they conduct significantly more wage bargaining at the central level. This might correspond to the fact that working times are more dependent on local conditions (complementarity between colleagues and work organization) than wages.
Our main hypothesis **H1** is somewhat validated for working time bargaining, at the double level. **H3** (on the number of establishments) is confirmed, while the other hypotheses are not confirmed as effects do not appear significant in this model.

5. Conclusion

Despite a large variety of institutions and historical legacy, Europe has globally experienced a decentralization process from the industry to the firm level (OCDE, 2017). For example, the industry coverage dropped in Germany, while firm opt-out clauses flourished. In France, even if the industry coverage remains high, most of the collective agreements are now reached at the firm/workplace level and the hierarchy of norms have been reversed on all issues related to working time, including the compensation of overtimes: a firm level agreement can overturn an industry agreement. Europe converges towards the US scheme: although there is a wide variety of bargaining structures, most collective bargaining occurs at either the company or workplace level.
Collective bargaining in firms is structured by national legal frameworks, market conditions, internal power relations as well as individual representation. In this article, we have analyzed to which extent the structural organization of firms determines the presence and level of collective bargaining in multi-establishment firms, focusing on wages, gender equality and working time bargaining. The originality of our approach is to account for the geography and productive organization of firms.
We first built a theoretical model where employers face a trade-off between keeping bargaining as close as possible to the workplace characteristics and limiting the cost of bargaining (increasing with the number of establishment) by negotiating at the central level. We derived four hypotheses about the influence of the spatial and productive structure of multi-establishment companies on the optimal level of bargaining for the employer: centrally in geographically dispersed companies vs. locally in compact firms (H1), centrally in “clone” companies (in terms of size and industrial specialization) vs. locally in companies with an integrated production (H2), centrally in companies with many establishments vs. locally in small organizations (H3), and centrally in establishments located further

away from their firm and group HQ vs. locally for establishments located close to their HQs (H4). We tested these structural hypotheses on strategic choices by employers on the bargaining level, using a large representative sample of workplaces of multi-facility firms in France between 2014 and 2016. We empirically validated the first three hypotheses on wage bargaining, gender equality and working time. This means that, structurally in multi-establishment firms, geographical dispersion and productive organization affect the level of collective bargaining on major topics.

There are several perspectives for expanding the analysis that would require larger samples and additional detailed sources. Firstly, when assessing the geographical dispersion of firms, we could make use of alternative metrics, for instance to consider time distances instead of geometric distances, to account for the fact that different levels of transport connections have an impact on the organization of multi-establishment firms (Gumpert et al., 2021). Secondly, an analysis for different sectors with specific location strategies (concentrated clusters for manufacturing vs. homogenous coverage for commercial outlets or public services) could reveal a more complex effect of geographical dispersion on the centralization of collective bargaining. Thirdly, one could argue that the difference in local labor markets and the alternatives they provide to workers who are unsatisfied with their current working conditions could impact the process of collective bargaining in individual establishments. Even though we do not expect this aspect to have a systematic effect on the level of bargaining, it could be interesting to verify it with a control proxy.

Finally, since the level of bargaining within the firm is endogenous, it is hard to access the causal impact of the observed level on outcomes such as productivity or rent sharing. In that perspective, the recent legislative changes in France introducing the possibility for groups to fulfill the mandatory *entreprise* bargaining at multi-firm or group levels will provide the opportunity to both confirm some of our mechanisms and to evaluate the consequences on wages and firm performance, by exploiting the next wave of REPONSE which will be conducted in 2023 and available in 2024.

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Appendix A. Nash equilibrium of a negotiation at the level of a plant:

The negotiated wage is a Nash equilibrium that maximizes the sum of the log of the objective functions of the two players, weighted by their relative bargaining power. The goal of the employer is to maximize the company profits while the worker representatives claims higher wages. If the process fails, there is no income for workers and no production but the employer still faces the sunk cost of the bargaining process.

In the case of **workplace bargaining only**, the equilibrium thus follows from:

$$\max_{w_i}\left(1-\beta(0)\right)\ln\left(\pi_i-c+c\right)+\beta(0)\ln\left(w_i-0\right),$$

where π_i and w_i are respectively the operating profit extracted in an establishment and the wage level.

Since the operating profit is the value of production minus the wage bill, the program becomes

$$\max_{w_i}\left[1-\beta(0)\right]\ln\left(p_i L_i w_i^{\alpha}-w_i L_i\right)+\beta(0)\ln\left(w_i\right).$$

The first order condition gives

$$\frac{\beta(0)}{w_i}+\left[1-\beta(0)\right]\frac{\alpha\, p_i w_i^{\alpha-1}-1}{p_i w_i^{\alpha}-w_i}=0,$$

i.e

$$\beta(0)\left(p_i w_i^{\alpha-1}-1\right)=\left[1-\beta(0)\right]\left(\alpha\, p_i w_i^{\alpha-1}-1\right)=0.$$

Then, we have a simple relation between the markup and the bargained wage:

$$w_i^{1-\alpha}=\left(\beta(0)+\alpha-\alpha\beta(0)\right)p_i.$$

Plugging this value in the operating profit gives:

$$\pi_i=w_i L_i\left(p_i w_i^{\alpha-1}-1\right)=w_i L_i\left[-1+1/\left(\beta(0)+\alpha-\alpha\beta(0)\right)\right]$$

$$¿\left(1-\alpha\right)\left(1-\beta(0)\right)\left[\beta(0)+\alpha-\alpha\beta(0)\right]^{\alpha/(1-\alpha)}L_i\, p_i^{1/(1-\alpha)}.$$

Eventually the aggregated profit when the negotiations are conducted at the establishment level Π_e is equal to the sum of the operating profits of all facilities minus the costs of negotiation:

$$\Pi_e=\left(1-\alpha\right)\left(1-\beta(0)\right)\left[\beta(0)+\alpha-\alpha\beta(0)\right]^{\alpha/(1-\alpha)}\sum_{i-1}^{N}L_i\, p_i^{1/(1-\alpha)}-Nc$$

In the case of **centralized bargaining only**, the wage *w* is homogeneous across the firm. Let p_f be the weighted average markup $\left[\sum_{i-1}^{N}p_i L_i\right]/L_{\square}$.The firm operating profit π_f is then:

$$\pi_f = \left[\sum_{i-1}^{N} p_i L_i\right] w^{\alpha} - \left[\sum_{i-1}^{N} L_i\right] w = p_f w^{\alpha} - Lw.$$

Calculus similar to the previous case give the firm operating profit when the bargaining process is only at the firm level:

$$\pi_f = (1-\alpha)(1-\beta(d))\left[\beta(d)+\alpha-\alpha\beta(d)\right]^{\alpha/(1-\alpha)} L\, p_f^{1/(1-\alpha)},$$

Cutting-off the sunk cost of bargaining gives the net profit in case of centralized bargaining:

$$\Pi_f = (1-\alpha)(1-\beta(d))\left[\beta(d)+\alpha-\alpha\beta(d)\right]^{\alpha/(1-\alpha)} L\, p_f^{1/(1-\alpha)} - c(N).$$

Appendix B. Accessing secure data within the CASD remote environment and key variables

Survey and administrative datasets were accessed and joined within the remote environment of the French provider CASD (Centre d'Accès Sécurisé aux Données). Managed by a public institution to allow a secure access to accredited researchers and institutions, this non-profit service guarantees the anonymity of individuals and companies, through the accreditation and training of its users, and through checks of any analysis output before it is exported from the remote secure environment. The accreditation is given by the French statistical secret committee (detailed procedure on https://www.comite-du-secret.fr/procedure-en/).
We have had access to the 2017 version of the REPONSE, FLORES and LIFI databases, for a fee. Note that the anonymous version of REPONSE Survey is available for free to any researcher with a consistent research project through the French social data hub http://quetelet.progedo.fr. The full questionnaire is available in French on Quetelet or CASD websites.

The interest variables derive from the following answers of the managers to the REPONSE questionnaire (authors' translation):

Q. 7.1a&b In the last three years (2014 - 2016), have collective negotiations been undertaken with employee representatives or a mandated worker in the company/UES or establishment with the aim of reaching a collective agreement, whether or not it has been signed?
1 = YES at establishment level only (only for multi-establishment company/UES)
2 = NO
3 = (DK)
If YES
Q 7.2a. Have collective negotiations in the last three years covered the following topics a/b/i?
1 = YES at establishment level only (only for multi-establishment company/UES)
2 = YES at company level only (only for multi-establishment company/UES)
3 = YES at establishment and company level (only for multi-establishment company/UES)
4 = YES (for mono-establishment company)
5 = NO
6 = (DK)
a. Salaries, bonuses and other allowances

b. Working time
i. Professional equality between women and men

We remove “Don’t know” observations for the questions 7.1a&b or 7.2a. The interest variable e.g. WB takes the value “NO”, when the manager answers “NO” to 7.1a&b or 7.2a. The other potential values derive directly from answers to question 7.2a

Additional key variables of the REPONSE database include:

- "siret", the unique identifier of establishments in French public administrative databases
- "agetab1", the age of the establishment in 2017
- "secteur", the industry code of the establishment in 17 categories
- "eff_3112_et", the number of employees in the establishment on 31st Dec. 2016.
- "ues", the variable indicating if the establishment is part of an UES or not
- "multi", the variable indicating if the establishment is part of a multi-establishment enterprise or not
- "DSETAB", the presence of a union representative in the establishment
- "DSENTR", the presence of a union representative in the company
- "cdd_pct_r", the share of short-term contracts in the establishment
- "nbp_3112_ce_c", the share of full-time contracts in the establishment
- "nbp_3112_sexe_2", the share of female employees in the establishment
- “sexe”, the sex of the management representative

Key variables of the FLORES database include:

- "siret", the unique identifier of establishments in French public administrative databases
- "SIREN", the unique identifier of enterprises in French public administrative databases
- "DC", the unique identifier of the municipality in which the establishment is located
- "A88", the industry code of the establishment in 88 categories
- "DCSIEGE", the unique identifier of the municipality in which the head office of the enterprise is located

Key variables of the LIFI database include

- "ID_UL", the unique identifier of enterprises which are capitalistically controlled by other enterprises
- "ID_TG", the unique identifier of enterprises which are group heads

We have joined REPONSE and FLORES establishments using the SIRET unique identifier, and we have joined FLORES and LIFI enterprises using the SIREN identifier.

Appendix C. Distribution of variables across samples

The distributions are given for two samples: ALL corresponds to all the 4364 REPONSE establishments, and CORE corresponds to our core sample, that is the 2018 establishments from active multi-establishment companies, exclusive of UES.

$I_{industry}$ corresponds to one of 10 NAF industry codes describing the dominant production of the establishment (source: REPONSE 2017)

$I_{industry}$	**ALL**	**CORE**
CE : Production of foods, goods and energy	1033	545
FZ : Construction	260	95
GZ : Commerce et auto/moto repair	708	340
HZ : Transport and warehousing	364	173
IZ : Hotels and restaurants	148	34
JZ : Information and communication	185	75
KL : Finance, insurance, real-estate	280	114
MN : Scientific, technical and administrative activities	640	298
OQ: Public administration, education and health	619	303
RU : Other service activities	127	41
TOTAL	**4364**	**2018**

I_{size} is the total number of employees of the establishment at the end of 2016 (source: REPONSE 2017)

I_{size}	**ALL**	**CORE**
11-19	437	124
20-49	909	314
50-99	684	286
100+	2334	1294
TOTAL	**4364**	**2018**

I_{age} is the age of the establishment, measured as the difference between 2017 and its date of creation (source: REPONSE 2017).

I_{age}	**ALL**	**CORE**
3-5 years	552	238
6-9	896	428
10+	2916	1352
TOTAL	**4364**	**2018**

E_{clone} reflects the "cloned" character of the establishments in enterprise E and is used to test H2. E_{clone} = 1 when over 80% of establishments *i* in E share the same dominant industry code (NAF in 88 modalities) and if the coefficient of variation of their size is below 1 (source: FLORES Etablissements 2017). In that case, the majority of establishments *i* are similar in terms of size and activity, and are considered "clones". By contrast, E_{clone} = 0 when either of those two conditions are not met.

E_{clone}	**ALL**	**CORE**
0	1791	1353
1	875	664
NA	1698	1

TOTAL	**4364**	**2018**

$E_{dispersion}$ reflects the geographical dispersion of the enterprise E to which belongs the establishment i (source: FLORES Etablissements 2017). It is used to test H1 and is measured as the gyration radius of the centroids of the municipalities in which the establishments of E are located.

$E_{dispersion}$	**ALL**	**CORE**
0-10km	360	275
10-50	406	330
50-150	363	273
150+	1373	1008
Overseas	170	132
NA	1692	0
TOTAL	**4364**	**2018**

E_n is the number of active establishments in enterprise E, discretized in 4 categories, and is used to test H3.

E_n	**ALL**	**CORE**
0-1	1726	0
2-9	1355	1101
10-49	654	487
50-99	175	131
100+	434	299
NA	20	0
TOTAL	**4364**	**2018**

D_{group} represents the distance between the establishment *i* and the HQ of its financial group company G. It is measured qualitatively as a geographical co-presence of the two organizations (source: LIFI 2017, FLORES Entreprises 2017, FLORES Etablissements 2017).

D_{group}	**ALL**	**CORE**
Same municipality	382	122
Same city (AU)	285	144
Same country	901	486
Other	1380	664
No group	1416	602
TOTAL	**4364**	**2018**

$D_{enterprise}$ represents the distance between the establishment *i* and the HQ of its enterprise E. It is measured qualitatively as a geographical co-presence of the two organizations (source: FLORES Entreprises 2017, FLORES Etablissements 2017).

$D_{enterprise}$	**ALL**	**CORE**
Same municipality	2431	799
Same city (AU)	300	204
Other	1613	1015
TOTAL	**4364**	**2018**

URC, the presence of a union representative at the central level of the company (Boolean, source: REPONSE 2017).

URC	**ALL**	**CORE**
0	1493	371
1	2871	1647
TOTAL	**4364**	**2018**

URL, the presence of a union representative at the local level of the establishment (Boolean, source: REPONSE 2017).

URL	**ALL**	**CORE**
0	1938	683
1	2426	1335
TOTAL	**4364**	**2018**

TEMP represents the percentage of temporary contracts in the establishment (REPONSE 2017)

TEMP	**ALL**	**CORE**
Min	0	0
Q1	0.60	0.78
Median	4.38	4.26
Mean	7.70	7.25
Q3	9.72	9.73
Max	100	98
NA	28	15

FEM represents the percentage of female employees in the establishment (REPONSE 2017)

FEM	**ALL**	**CORE**
Min	0.41	0.41
Q1	18.18	18.75
Median	40.92	40.30
Mean	42.99	42.17
Q3	64.53	62.50
Max	100	100
NA	80	21

SEX, the sex of the management representative (REPONSE 2017).

SEX	**ALL**	**CORE**
1: Man	2256	1045
2: Woman	2108	973
TOTAL	**4364**	**2018**

FT represents the percentage of full-time employees in the establishment (REPONSE 2017).

FT	**ALL**	**CORE**
Min	0.17	0.17
Q1	71.43	71.89
Median	86.67	86.40
Mean	79.25	79.59
Q3	94.66	94.04
Max	100	100
NA	54	12

Appendix D. Sensitivity of regression of wage bargaining level (with UES establishments)

Variable	Modality	WB Local	WB Central	WB Double
	Intercept	**-2.213**** (0.884)	**-3.589***** (0.571)	**-4.956***** (0.742)
E_{clone}	Non-clone establishments	*ref.*	*ref.*	*ref.*
	Enterprise of clones	-0.224 (0.217)	0.066 (0.144)	-0.118 (0.171)
$E_{dispersion}$	Less than 10km gyration radius	*ref.*	*ref.*	*ref.*
	10 - 50	-0.210 (0.331)	**0.407*** (0.232)	0.450 (0.292)
	50 - 150	-0.299 (0.348)	0.186 (0.257)	0.380 (0.309)
	More than 150 km	-0.145 (0.320)	**0.731***** (0.241)	**0.600**** (0.293)
	Overseas	-0.80 (0.542)	**0.793***** (0.359)	0.282 (0.452)
$D_{enterprise}$	Same municipality	*ref.*	*ref.*	*ref.*
	Same metropolitan area	**-0.876*** (0.449)	-0.312 (0.239)	-0.330 (0.308)
	Other	0.180 (0.231)	0.054 (0.167)	-0.127 (0.194)
D_{group}	Same municipality	*ref.*	*ref.*	*ref.*
	Same metropolitan area	**1.347**** (0.520)	**0.**592 (0.390)	**1.068**** (0.469)
	Same country	0.224 (0.417)	0.165 (0.296)	**0.792**** (0.368)
	Foreign owned group	0.376 (0.393)	0.115 (0.283)	0.514 (0.357)
	No group	-0.229 (0.426)	-0.353 (0.297)	-0.051 (0.379)
E_n	Less than 10 establishments	*ref.*	*ref.*	*ref.*
	10 - 49	**-0.618**** (0.275)	0.125 (0.177)	-0.118 (0.211)
	50 - 99	-0.274 (0.442)	0.140 (0.283)	0.156 (0.333)
	More than 100	**-1.538**** (0.417)	-0.179 (0.240)	xb (0.286)
Controls	Industry	***	***	***
	Size	**	***	***
	Age	*n.s.*	*	*
	URC: Presence of a central union representative	*n.s.*	*(+)****	*(+)****
	URL: Presence of a local union representative	*(+)****	*n.s.*	*n.s.*
	TEMP: share of temporary contracts	*(+)****	*n.s.*	*n.s.*
	FEM: share of female employees	*n.s.*	*n.s.*	*n.s.*
	SEX: sex of the management representative	*n.s.*	*n.s.*	*n.s.*

	FT: share of full-time employees		*n.s.*	*(+)*** *(+)***
Obs: 2554	R^2 = 22.2%	AIC = 5,101.151	*p<0.1; **p<0.05; ***p<0.01	

Appendix E. Regression results for GB bargaining level

Variable	Modality	GB Local	GB Central	GB Double
	Intercept	**-5.298*** **	**-5.047*** **	**-5.485*** **
		(1.632)	(0.764)	(1.035)
$I_{industry}$	CE : Production of foods, goods and energy	*ref.*	*ref.*	*ref.*
	FZ : Construction	0.819	0.171	0.167
		(0.680)	(0.398)	(0.619)
	GZ : Commerce et auto/moto repair	-0.118	-0.226	0.327
		(0.530)	(0.277)	(0.372)
	HZ : Transport and warehousing	-0.413	0.330	0.543
		(0.592)	(0.307)	(0.415)
	IZ : Hotels and restaurants	-1.403	0.795	0.611
		(1.513)	(0.685)	(0.828)
	JZ : Information and communication	**1.793** **	**1.071** **	1.728***
		(0.751)	(0.502)	(0.639)
	KL : Finance, insurance, real-estate	0.064	**0.697** *	0.449
		(0.767)	(0.379)	(0.514)
	MN : Scientific, technical and administrative activities	0.335	-0.100	0.521
		(0.506)	(0.263)	(0.366)
	OQ: (Public administration,) education and health	0.210	**1.390*** **	**1.248** **
		(0.708)	(0.388)	(0.513)
	RU : Other service activities	**-2.413** *	0.324	-1.620
		(1.349)	(0.516)	(1.173)
I_{size}	11 to 20 employees	*ref.*	*ref.*	*ref.*
	20 - 49	-0.187	0.333	0.261
		(1.220)	(0.384)	(0.562)
	50 - 99	1.045	**0.781** **	0.594
		(1.160)	(0.390)	(0.573)
	More than 100	1.091	**1.159*** **	**1.082** **
		(1.132)	(0.364)	(0.544)
I_{age}	Up to 5 years	*ref.*	*ref.*	*ref.*
	6 - 9	0.558	0.361	**0.997** **
		(0.537)	(0.263)	(0.395)
	More than 10	0.716	0.346	**1.033*** **
		(0.476)	(0.233)	(0.352)
E_{clone}	Non-clone establishments	*ref.*	*ref.*	*ref.*
	Enterprise of clones	**-0.651** *	0.026	0.245
		(0.336)	(0.172)	(0.234)
$E_{dispersion}$	Less than 10km gyration radius	*ref.*	*ref.*	*ref.*
	10 - 50	-0.061	**0.808*** **	0.518
		(0.470)	(0.300)	(0.399)
	50 - 150	**-0.924** *	**0.671** **	0.637
		(0.545)	(0.322)	(0.416)
	More than 150 km	-0.606	**0.870*** **	0.379
		(0.478)	(0.295)	(0.396)
	Overseas	-0.764	**0.822** **	-0.052
		(0.837)	(0.418)	(0.619)

$D_{enterprise}$	Same municipality	*ref.*	*ref.*	*ref.*
	Same metropolitan area	-0.790 (0.703)	0.235 (0.286)	0.310 (0.407)
	Other	-0.195 (0.342)	-0.018 (0.189)	0.054 (0.251)
D_{group}	Same municipality	*ref.*	*ref.*	*ref.*
	Same metropolitan area	-0.101 (0.820)	0.095 (0.470)	-0.297 (0.622)
	Same country	-0.152 (0.650)	-0.204 (0.388)	-0.492 (0.497)
	Foreign owned group	0.380 (0.609).	0.100 (0.378).	-0.313 (0.478)
	No group	0.385 (0.665)	-0.474 (0.400)	**-0.858*** (0.514)
E_n	Less than 10 establishments	*ref.*	*ref.*	*ref.*
	10 - 49	0.026 (0.395)	0.312 (0.205)	0.063 (0.280)
	50 - 99	0.232 (0.692)	0.012 (0.328)	**-0.918*** (0.487)
	More than 100	-0.832 (0.741)	0.319 (0.286)	**0.820**** (0.392)
Controls	URC: Presence of a central union representative	*n.s.*	*(+)***	*(+)***
	URL: Presence of a local union representative	*n.s.*	*n.s.*	*n.s.*
	TEMP: share of temporary contracts	*n.s.*	*n.s.*	*n.s.*
	FEM: share of female employees	*n.s.*	*n.s.*	*n.s.*
	SEX: sex of the management representative	*n.s.*	*n.s.*	*n.s.*
	FT: share of full-time employees	*n.s.*	*n.s.*	*n.s.*
Control for the level of wage bargaining	No formal bargaining	*ref.*	*ref.*	*ref.*
	Local Level	*(+)***	*(+)***	*(+)***
	Central Level	*n.s.*	*(+)***	*n.s.*
	Both	*(+)***	*(+)***	*(+)***

1997 Obs. R^2 = 48.9% AIC = 2,633.842 *p<0.1; **p<0.05; ***p<0.01

Appendix F. Regression results for WT bargaining level

Variable	Modality	WT Local	WT Central	WT Double
	Intercept	**-5.202***** (1.483)	**-4.581***** (0.718)	**-3.739***** (0.966)
$I_{industry}$	CE : Production of foods, goods and energy	*ref.*	*ref.*	*ref.*
	FZ : Construction	**-1.352**** (0.681)	0.215 (0.335)	-0.505 (0.549)
	GZ : Commerce et auto/moto repair	**-1.050**** (0.424)	0.302 (0.238)	-0.330 (0.346)
	HZ : Transport and warehousing	-0.670 (0.413)	-0.057 (0.258)	-0.251 (0.349)
	IZ : Hotels and restaurants	**-8.823***** (0.0002)	0.240 (0.582)	-0.719 (0.751)
	JZ : Information and communication	-0.916 (0.683)	**0.912***** (0.342)	-0.294 (0.576)
	KL : Finance, insurance, real-estate	-0.262 (0.467)	0.237 (0.304)	-0.504 (0.465)
	MN : Scientific, technical and administrative activities	**-1.065***** (0.394)	0.051 (0.224)	-0.264 (0.317)
	OQ: (Public administration,) education and health	-0.481 (0.537)	**0.657**** (0.334)	-0.019 (0.461)
	RU : Other service activities	-0.168 (0.770)	0.563 (0.493)	-0.253 (0.753)
I_{size}	11 to 20 employees	*ref.*	*ref.*	*ref.*
	20 - 49	0.866 (1.143)	0.602 (0.385)	0.190 (0.537)
	50 - 99	0.657 (1.139)	**0.744***** (0.383)	-0.168 (0.560)
	More than 100	1.544 (1.090)	**1.037***** (0.362)	0.291 (0.521)
I_{age}	Up to 5 years	*ref.*	*ref.*	*ref.*
	6 - 9	0.193 (0.413)	-0.342 (0.234)	0.044 (0.341)
	More than 10	-0.005 (0.369)	**-0.435**** (0.209)	-0.297 (0.304)
E_{clone}	Non-clone establishments	*ref.*	*ref.*	*ref.*
	Enterprise of clones	-0.331 (0.240)	0.019 (0.148)	-0.344 (0.222)
$E_{dispersion}$	Less than 10km gyration radius	*ref.*	*ref.*	*ref.*
	10 - 50	0.511 (0.411)	0.207 (0.278)	0.670 (0.412)
	50 - 150	-0.039 (0.446)	0.070 (0.297)	0.468 (0.424)
	More than 150 km	0.552 (0.400)	0.178 (0.271)	**0.714***** (0.399)
	Overseas	0.562 (0.606)	0.476 (0.364)	**1.144**** (0.544)
$D_{enterprise}$	Same municipality	*ref.*	*ref.*	*ref.*
	Same metropolitan area	-0.808	-0.144	-0.154

		(0.530)	(0.234)	(0.391)
	Other	-0.003	0.099	**0.445****
		(0.241)	(0.162)	(0.227)
D_{group}	Same municipality	*ref.*	*ref.*	*ref.*
	Same metropolitan area	-0.211	0.318	0.004
		(0.672)	(0.399)	(0.533)
	Same country	0.420	0.224	-0.319
		(0.515)	(0.348)	(0.447)
	Foreign owned group	0.170	0.408	-0.492
		(0.500)	(0.338)	(0.433)
	No group	0.434	0.233	-0.181
		(0.548)	(0.363)	(0.458)
E_n	Less than 10 establishments	*ref.*	*ref.*	*ref.*
	10 - 49	0.059	0.212	-0.183
		(0.270)	(0.171)	(0.249)
	50 - 99	0.261	0.255	-0.325
		(0.473)	(0.275)	(0.414)
	More than 100	-0.434	**0.466****	-0.168
		(0.450)	(0.232)	(0.353)
Controls	URC: Presence of a central union representative	*n.s.*	*(+)***	*n.s.*
	URL: Presence of a local union representative	*n.s.*	*n.s.*	*(+)***
	TEMP: share of temporary contracts	*n.s.*	*(-)***	*n.s.*
	FEM: share of female employees	*n.s.*	*n.s.*	*n.s.*
	SEX: sex of the management representative	*n.s.*	*(-)***	*n.s.*
	FT: share of full-time employees	*n.s.*	*n.s.*	*n.s.*
Control for the level of wage bargaining	No formal bargaining	*ref.*	*ref.*	*ref.*
	Local Level	*(+)****	*n.s.*	*n.s.*
	Central Level	*(+)***	*(+)****	*(+)****
	Both	*(+)****	*n.s.*	*(+)****

1997 Obs. R^2 = 29.2% AIC = 3,346.590 *p<0.1; **p<0.05; ***p<0.01