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Firm-level pay agreements and within-firm wage inequalities: Evidence across Europe

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Abstract

This article investigates the relation linking single-employer bargaining – increasingly the norm in Europe – and within-firm wage dispersion – a significant driver of wage inequality. The study considers six European economies (Belgium, Spain, Germany, France, the Czech Republic and the UK), featuring different collective bargaining institutions, in 2006 and 2010. The authors account for complementary aspects of wage inequality by measuring it both as the ratio between the 90th and the 10th percentile of within-firm wages, and the wage gap between managers and low-layers employees. The authors find that firm-level bargaining has heterogeneous effects across inequality measures and countries, and also over time.

Keywords: within-firm wage inequalities, occupational wage-gap, firm-level bargaining, matched employer-employee data
JEL classification: J31, J33, J51, J52

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1 Introduction

During the last two decades, two major trends have affected the European labour markets. On the one hand, as part of the process of labour market deregulation and flexibilization that took place starting from the late 1990s, we have assisted to a widespread institutional shift of the locus of wage-bargaining. The "corporatist" system of industrial relations (Wallerstein et al., 1997) that had characterized most European countries in the second half of the 20th century – centered around "multi-employer" collective bargaining conducted at centralised (national or sectoral) level –, has progressively given way to an "hybrid" system (Braakmann and Brandl, 2016), where "single-employer" collective agreements bargained locally at the firm level have gained increasing importance (Visser et al., 2013).

The second trend is the progressive widening of wage inequalities within firms, in fact an important of component of overall wage inequality, accounting for around half of wage dispersion in most economies (Lazear and Shaw, 2007; Fournier and Koske, 2013; ILO, 2016). Many different factors have been touted to explain this phenomenon, such as firm-specific characteristics (organizational layers and size, in turn related to unionization), or the coexistence within the firm of different personnel (age, tenure, skills, gender) and job-related (type of contracts, occupations, tasks) profiles.

In this paper we try to establish whether there is a link between these two broad tendencies, by examining the effects of decentralization of the bargaining level on within-firm wage inequalities, in a sample of six selected European countries – Belgium, Spain, France, Germany, the Czech Republic and the United Kingdom – in the years 2006 and 2010. The literature is largely silent on this matter, with most studies exploring the effects of decentralization on inter-firm wage differences, that is comparing the dispersion of wages among workers that are covered by a firm-level agreement against the dispersion among workers who are not (Dell'Aringa and Lucifora, 1994; Hibbs and Locking, 1996; Palenzuela and Jimeno, 1996; Hartog et al., 2002; Rycx, 2003; Cardoso and Portugal, 2005; Checchi and Pagani, 2005; Plasman et al., 2007; Card and De La Rica, 2006; Dell'Aringa and Pagani, 2007; Dahl et al., 2013; Daouli et al., 2013). Instead, our main research question is whether firms that also adopt forms of firm-level collective bargaining, on top of more centralised agreements, exhibit a more unequal wage distribution

than firms that only adopt centralised bargaining.

Theoretically, the links between the level of collective bargaining and within-firm wage inequalities can be framed within several approaches, with contrasting predictions. We can distinguish among direct and indirect mechanisms. The Tournament theory (Lazear and Rosen, 1979) predicts a direct positive relation, as a more unequal wage structure is expected in firms that bargain at the firm level with the aim at increasing workers' effort via performance-related pay or other differentials in compensation schemes. Other theories predict the opposite result that firm-level bargaining reduces wage dispersion within the firm, essentially via two different direct channels. On the one hand, by extension of insider-outsider models accounting also for the role of union in collective negotiation of wages (Lindbeck and Snower, 1986, 2001), trade unions are expected to favor reduced wage differences among workers in order to maximize their consensus among the employees. On the other hand, theories of "fair wages" (Akerlof, 1984) suggest that firms have an incentive to use firm-level bargaining to mitigate within-firm wage differences, since too large pay inequalities across their employees, perceived as "unfair", may eventually end up as detrimental for effort and cooperation, hampering productivity and overall firm performance. If this is the case, firm-level agreements may respond to redistributive purposes, in turn reducing wage differences within the firm.

Indirect mechanisms linking within-firm wage inequalities to centralised vs. decentralized bargaining are offered by frameworks that explain deviations of wages from the so-called market-clearing wage on the basis of efficiency-wages, rent-sharing or differential compensations for unmeasured workers' ability. These models, in general, are more suited to explain inter-firm inequalities, as they compare wages of workers employed in firms that do implement non-market-based wage-setting against market-based wages, implicitly assuming that all workers in a firm are paid the same. However, it is clear that these different wage-setting practices all bargained at the firm level – as opposed to more centralised levels – may also impact on within-firm wage dispersion, to the extent that they are used selectively by employers to reshape the pay ladder within firms, favoring certain categories or types of employees. A number of theoretical reasons indeed suggests that pay-for-performance schemes are used differently across groups of employees that differently contribute to the firms' objectives (Bayo-Moriones et al., 2013).

Firms may want to differently compensate human capital or particularly valuable firm-specific resources (according to the resource-based view of the firm), or solve transaction costs and agency problems arising for different occupational groups (Eisenhardt, 1989; O'Shaughnessy, 1998). If this use of firm-level agreements is prevailing, we would expect that firms adopting firm-level bargaining present a more unequal wage structure. Yet, the actual implementation of such practices may also end up reducing within-firm inequalities vis a vis firms that only bargain at centralised levels, to the extent that workers or unions favour standardization of wages in the firm-level negotiations for egalitarian and redistributive purposes.

The few existing empirical studies that tackle the relation between bargaining levels and within-firm wage inequalities exploits relatively old data, dating back to the 1990s. In general, the evidence suggest that the sign of the relation may be country specific, reflecting the institutional specificities of national labour markets. Dell'Aringa and Lucifora (1994) examine Italian data for the year 1990, and find that within-firm wage dispersion does not differ between firms that only apply centralised bargaining and firms that also apply firm-level agreements. The result is confirmed in Dell'Aringa et al. (2004) for Italy, Spain, Belgium and Ireland on data for the year 1995. This study underlines, in particular, the importance of controlling for a wide range of firm and workers' specific characteristics: enterprises covered by a single-employer agreement display greater *unconditional* within-establishment inequalities than multi-employer bargaining firms, but such differences become statistically insignificant once controlling for other factors and potential endogeneity of the choice to bargain at the firm level. Conversely, Canal Dominguez and Gutierrez (2004) find that firm-level bargaining reduces within-firm wage dispersion in Spain, on data again for the year 1995. A related recent study, posing a slightly different question, is by Addison et al. (2014), exploiting a panel of German establishments over the period 1996-2008. The results show a modest widening of within-establishment wage dispersion for establishments that abandon sector-level collective bargaining.

We provide several contributions to this relatively limited empirical literature. The major departure pertains to the specific focus that we place on the occupation-related content of wage differentials within firms. In fact, existing studies all focus on a purely statistical characteriza-

tion of within-firm wage inequalities, taking traditional measures of within-firm wage dispersion like the standard deviation, the interquartile range, or the top-bottom wage ratio. In the same vein, we look at the wage distance between high-paid and low-paid employees (measured as the 90th-to-10th percentile wage-gap), but we complement this more standard analysis with an estimate of the effect that firm-level bargaining exerts on the wage-gap between apical positions (managers) and low-layers occupations (manual workers and elementary occupations).

The distribution of occupations is known to play a relevant role in explaining within-firm wage inequalities: more homogeneous wages within firms are expected in firms that, especially over the last two decades, followed the trend toward outsourcing some functions and services previously performed within the firm (ILO, 2016). And, indeed, concerning the determinants of within-firm inequalities, there is a recent renewed emphasis on the decline in wage premia of low-layers or low-skilled workers (Song et al. 2015) and the skyrocketing wages of professionals and managers (Piketty 2014; Mishel and Sabadish 2012). However, whether decentralization of wage bargaining contributed to this trends has not been investigated. In the analysis, beyond estimating the effect of firm-level bargaining on the two measures of within-firm wage inequality, we also explore the effect of firm-level bargaining on the components of the two wage-gaps. This allow to uncover whether the inequalities that we eventually find within firms arise from decentralization of wages favoring or discriminating specific categories of employees.

Second, we provide an updated analysis of the effect of firm-level bargaining on within-firm inequalities. We take advantage of the same matched employer-employee cross-country survey (the *European Structure of Earnings Survey*, SES – maintained by EUROSTAT) used by the above-mentioned studies focusing on the 1990s, but we cover more recent years as compared to previous studies. Beyond that, by accessing to the 2006 and 2010 waves of the SES data, we can ask whether the use of firm-level bargaining and its effects on inequalities change over time. This is interesting *per se*, but it may matter even more in relation to the global crisis hitting exactly in between the two survey-years available to us. A comparison of results over time will shed light on this, although we cannot claim to identify any causal direct effect of the crisis on these possible inter-temporal changes.

Third, and finally, as compared to previous works we also expand on the number of countries

analysed at the same time in the same study. This is important *per se*, as we can provide a relatively broad picture of the role of firm-level bargaining on inequalities across Europe. Moreover, the six countries under analysis span instances of different wage bargaining and institutional systems that coexist in Europe, thus allowing for interesting comparisons. Indeed, despite an hybrid system mixing centralised and firm-level collective bargaining is spread all over Europe, the distinction between firm-level bargaining and other forms of collective bargaining still has quite a different meaning across the various national contexts, depending on the legal and institutional framework of the country where each firm operates its industrial relations.

2   Wage setting structures in selected countries

Industrial relations across Europe nowadays are all characterised by hybrid collective wage bargaining systems, where agreements stipulated at national, sectoral and company levels coexist across firms. Most countries share a system of "organised decentralization" (Traxler, 1995), whereby firm-level collective agreements define an extra layer that is nested into agreements bargained at more centralised levels. Traditionally, more decentralised agreements cannot contravene the rights established by higher-level agreements, safeguarding the so-called favourability principle. In this respect, firm-level agreements are usually expected to improve wages above the level contracted at higher levels. However, derogations that worsen the pay conditions or other contractual conditions vis a vis centralised agreements are possible, in specific situations and if explicitly provided in the so-called opening clauses. The labour market reforms in the 1990s and beginning of 2000s widened the scope of such derogations, and a similar trend is reinforced in recent years, as an attempt to help firms hit by the global crisis.

Notwithstanding these similar features across countries, and a convergence toward an hybrid model where decentralised bargaining is gaining importance, there still are sharp differences in terms of bargaining coverage, structures and mechanisms of coordination (Visser et al., 2013). National, sector and company bargaining do not equally operate in all countries. The relative diffusion, scope and content of firm-level collective bargaining are highly heterogeneous. What single-employer agreements mean and the role they play in the different national contexts,

as compared to multi-employer agreements occurring at more centralised levels, varies widely across countries.

The countries selected in this study – Belgium, the Czech Republic, Germany, Spain, France and the United Kingdom – provide a good representation of the heterogeneity of the bargaining regimes in Europe. Such heterogeneity motivates our choice to run separate analysis by country. We turn now to a brief description of the main characteristics of the bargaining systems in the different countries, highlighting the relative role of lower and higher levels of bargaining, especially in the period considered in our analysis.

In Belgium, collective wage bargaining is highly structured with a central level at the top covering the entire private sector, an industry level covering specific industries, and company level negotiations at the bottom. Wage bargaining takes place predominantly at the central or cross-industry level, and company bargaining only accounts for 10% of the private sector coverage rate (Visser et al., 2013). Elements of pay and work conditions – including national minimum wage, job creation measures, training and childcare provision - are set in binding national agreements. Industry and company bargaining mostly address non-pay issues, not affected by the ceiling imposed by the central agreement (Visser et al., 2013). Opening clauses are present since 1982, but firm-level negotiations generally only agree on improvements upon what is settled at higher levels. The room for pay bargaining at the enterprise level is also limited due to indexation of wages in national agreements.

Notwithstanding two reforms occurred during the period under analysis (as reported in the *Labour Market Reforms*-LABREF database maintained by the European Commission[1]), the percentage of employees covered by collective bargaining has remained steady at 96% over the period 2006–2010 (source: ILOstat database[2]). According to the data from the *European Company Survey*-ECS (run by the Eurofound Industrial Relations Observatory), in 2009 66.08% of companies apply a collective agreement which has been negotiated at a higher level than the establishment or the company, while 88.2% of companies applying national, inter-sectoral or sectoral collective bargaining declare it was not possible for them to derogate from these agreements.

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[1]The LABREF dataset is available online at https://webgate.ec.europa.eu/labref/public.

[2]See the section "Industrial Relations" of the ILOstat website http://www.ilo.org/ilostat.

Spain and Germany present a less centralized bargaining system, where wages are predominantly set at the sector or industry level. The percentage of employees covered by enterprise-level agreements amounts to less than 9% in both countries in 2006 and such percentage does not significantly change in 2010 (source: the *Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts*-ICTWSS database).

In Germany, wages are bargained mostly at the industry level between individual trade unions and employers' organisations, although the agreements allow for flexibility at the company level. Collective agreements regulate a wide range of issues such as pay, shift-work payments, pay structures, working time, treatment of part-timers and training. Work councils play a central role because they can reach agreements with individual employers on issues not covered by collective agreements, or negotiate improvements on issues (pay and others) already covered by collective agreements, under the favourability principle. Opening clauses are present since 1993, and they were mostly used to increase wages, as a monetary compensation bargained by unions in exchange of more flexibility in covered firms (Brändle and Heinbach, 2013). Ellguth et al. (2012) estimate that, on average, firms pay via these clauses a 7% higher wage than otherwise, but their use can lead to a wage reduction up to 9 %. During the period considered in our analysis, some reforms were implemented in the field of wage setting policies, such as the introduction of binding minimum wages in several sectors (see LABREF data). However, the large prevalence of the higher bargaining levels remains quite stable over time. According to the ECS data, in 2009, the share of companies covered by forms of collective agreement higher than firm-level bargaining was as high as 66.92%, and the possibility to derogate from these higher levels of agreement was open to only a modest 17% of the surveyed companies.

In Spain, the wage bargaining structure shows a predominant role of industry-level wage setting, too. But there are features that are quite peculiar to this country. A first specific characteristic rests in the complex coexistence and interaction of negotiations at national and province-level, within industries. Moreover, as underlined in Plasman et al. (2007), firms adopt-

ing firm-level collective bargaining feature on average a higher union presence than in multi-employer bargaining firms. This may suggest that, in this country, union's pressure to compress wage inequalities may be particularly strong in firm-level bargaining firms. Opening clauses are present since 2001, but a significant labour market reform in September 2010 enlarged the scope of such derogations, allowing firm-level agreements to affect salary levels as well as the amount and distribution of working time. An allowance to fully suspend the collective agreement was also conceded to firms facing economic crisis (source: LABREF database). According to ILOstat, more than 70% of employees are covered by collective wage bargaining (76.64% in 2006 and 78.68% in 2010), while 66.09% of the companies in the ECS dataset report to contract their wages outside the firm in 2009.

The Czech Republic and the United Kingdom represent two instances of countries where firm-level collective agreements are prevailing over the other levels.

The UK is the obvious paradigmatic case of the Anglo-Saxon tradition of industrial relations, where wage bargaining is mostly un-coordinated, or takes place at the firm-level. In fact, only about a third of all employees (33.3% in 2006 and 30% in 2010, according to ILOstat) are covered by some forms of collective bargaining. When a collective agreement occurs, the majority of them are signed at the firm-level (53.4% of companies in 2009, according to the ECS). However, collective agreements do not establish legally binding norms and, as a rule, they contain no contractual obligations such as opening clauses, they are not subject to legal regulation, and pay rates cannot be claimed in court (Visser et al., 2013). Also, there are substantial differences across sectors of the economy. Collective agreements are very rare in the private sector, while in the public sector workers' coverage is more comparable to other countries (Fulton, 2013). In May 2010 an emergency budget was approved freezing wages for high earners in the public sector for a two-year period as a temporary measure to face the 2008 economic crisis (see LABREF data).

The Czech Republic well represents the tendency of former Soviet Union countries to em-

brace decentralised, market-oriented institutional settings. The employees covered by collective wage bargaining are 50.8% in 2006 and 50.1% in 2010 (ILOstat data). When collective agreements are reached, they occur at firm level: more than 80% of companies in Eurofound-ECS dataset declare to have conducted negotiations of wages at the firm or the establishment level, indeed. The law do provide a notion of favourability principle, since laws on collective bargaining exclude opening clauses and derogations that set less favourable terms than provided in the law or in agreements stipulated at higher levels. However, collective agreements signed at the industry level last for at least two years, while those signed at company level run for one year, and, thus, allow for more flexibility in reshaping the wage ladder in the enterprise.

The last country that we analyse, France, represents an outlying case where the levels of collective negotiations – intersectoral, industry or company – are closely intertwined and, in turn, they occur at both national or local level (Fulton, 2013, 2015). Industry level bargaining is the most important in terms of numbers of employees covered (97.3% in 2006 and 98% in 2010 according to ILOstat data). More than 50% of companies declare to apply centralised bargaining as opposed to firm-level bargaining in 2009 (see ECS data). A peculiarity of the country is the inversion of the favourability principle introduced in 2004, recognizing to firm-level agreements the possibility to derogate from any condition settled at more centralised levels if not explicitly prohibited (Keune, 2011). During the period under analysis, in particular in August 2008, a legislation was passed easing the conditions for company pay-agreements to diverge from industry level ones in the area of working times, at least indirectly impacting on wages.

Overall, one feature is noteworthy for the interpretation of the empirical analysis of the following sections. Following the process of progressive decentralization of collective bargaining occurred from the late 90s, the possibility to contract wages at the firm-level was already allowed by the law in all countries well before 2006. In this respect, any intertemporal change that we shall uncover in the relation between firm-level bargaining and within-firm wage inequalities should be taken as mirroring changes in the use of firm-level agreements, rather than a test of

the effect of moving from full centralization to full decentralization (or viceversa).

3   Data and main variables

The SES dataset collected by Eurostat is a well-known source of information for labour dynamics across Europe. It collects a rich number of earnings-related, personal and jobs-related variables for a vast set of workers, matched with information on some characteristics of the employing firms. As already mentioned, we consider here the 2006 and 2010 waves of the SES for Belgium, Germany, Spain, France, the Czech Republic and the United Kingdom. We pool the two waves of the survey in the empirical analysis, but the pooled data must be intended as a repeated cross-section, since the SES does not report any identification code that can be used to match the same firm or the same employee over time. The selection of countries ensures cross-country variation in the practice of firm-level bargaining across different institutional contexts.

The structure of the SES survey is such that, for each country, a random sample of firms (stratified by size, sector of activity and geographical location) is selected to be representative of the national industrial system. Then, within each selected firm, a representative sample of employees is drawn, and for those employees a large set of personal and job-related characteristics is provided, including age, gender, education, wages, type of contract, tenure, occupation type (according to the 2008 International Standard Classification of Occupations, ISCO), and others. As such, the SES data can be seen as a matched employer-employee dataset, representing a unique source for a consistent comparison across European economies, indeed repeatedly used in previous studies. Of course, the dataset has its own limitations. First, while the surveying procedure provides information on an impressive number of workers across Europe (about 10 million per survey year), for the firms that enter the data the sampling rate of employees varies by firm size and by country, thus limiting the information available in some countries. Second, the sample of business units considered in the survey is restricted to those with at least 10 employees, which limits the analysis as far as micro firms are concerned. Third, the data are very rich concerning employees' personal and work-related characteristics, but the information

on firms is limited to five variables: size class, geographical location, sector of activity, public vs. private control and – crucial for our purposes – the level of wage bargaining adopted in the firm.

The outcome variables of interest are two measures of *within-firm* wage inequalities. For each firm j, we first compute the ratio between the 90$^{\text{th}}$ and 10$^{\text{th}}$ percentile of the wages paid to the employees of firm j

$$\Delta w_j^{90/10} = \frac{w_j^{90}}{w_j^{10}} \tag{1}$$

yielding a characterization of the wage distribution between top and bottom earnings within the firm. This is in line with previous studies that focus on purely statistical characterization of dispersion of wages within firms.

Second, and departing from the literature, we provide an occupation-related characterization of inequalities, computing the ratio between the average wages of managers and of workers employed in low-layers positions

$$\Delta w_j^{\text{jobs}} = \frac{\mathbb{E}\left(w_j^{\text{Managers}}\right)}{\mathbb{E}\left(w_j^{\text{Low}}\right)} \tag{2}$$

that we can identify from information on the employees' occupation reported in the SES data according to the ISCO categories, at 1-digit level. We take employees with ISCO code 1 ("managers") to define apical managerial positions, while low-layers workers include employees with ISCO code 8 ("plant and machine operators, and assemblers") or 9 ("elementary occupations").

The two measures of inequality may correlate to some extent, but they allow to uncover potentially different uses made of the firm-specific flexibility allowed for by firm-level agreements. The first measure relates to the more standard question whether company-level agreements are used selectively across differently paid workers, resulting into more egalitarian vs. diverging wages according to the position of workers in the within-firm wage distribution. The occupation-related wage gap, instead, allows us to ask whether firm-level negotiations favor or reduce inter-occupational wage differences in relation to the hierarchical job structure within the enterprise.

Following an established practice in the literature on within-firm wage inequalities (at least

since Winter-Ebmer and Zweimüller, 1999), the two measures of wage inequality are based on adjusted residual wages. That is, the wages w that enter the two definitions above are the residuals from an augmented Mincerian wage-regression

$$\log\left(\hat{w}_{ij}\right) = b_0 + b_1 \boldsymbol{Z}_i + b_2 \operatorname{Firm}_j + \varepsilon_{ij} \tag{3}$$

where the (log-)wage of employee i of firm j, $\hat{w}_{ij}$, is regressed against a standard set of individual characteristics $\boldsymbol{Z}_i$ (age, tenure and tenure squared, gender, education, contract duration, part-time status, share of full-timer's hours, and occupation at 1-digit ISCO), plus firm fixed-effects $Firm_j$. Separate preliminary regressions are estimated by year (2006 and 2010) and sector (one digit NACE), within each selected country.

We use hourly wages, that in SES are reported as the compensation actually paid to the workers, without distinguishing between the wage components that are set through firm-level bargaining from the components agreed upon at more centralised levels. In particular, as it is often the case in the literature, we do not have information on un-bargained wage drifts. That is, of pay components unilaterally recognised by firms to some selected employees (or group of employees) on top of the wage set in a collective agreement, outside collective bargaining, whatever the level of collective bargaining adopted by the enterprise. Cardoso and Portugal (2005) find for Portugal that such unilateral components increase wage inequalities within firms, although the theoretical possibility remains open that wage drifts – much in line with the mechanisms that may lie behind firm-level collective bargaining – operate to re-equilibrate the internal pay structure, for instance for fairness reasons. Also, although unilateral wage drifts may affect in principle all types of firms, they are expected to be stronger and more frequent in firms that only bargain at national or industry level (e.g. when allowed for via opening clauses), as a way to gain flexibility and adjust the internal wage structure vis a vis the centralised agreements, but without going through a process of firm-level bargaining (Dell'Aringa and Pagani, 2007). If this is the case, then we expect such wage drifts to increase within-firm inequalities less in firms that bargain locally.

To answer our key research question on the relation between firm-level bargaining and within-firm wage inequalities, we exploit a variable present in SES that records the type of pay

agreement in place at any given firm. We define a dummy variable FLB distinguishing between firms that apply *firm-level* (also called "single-employer") collective bargaining versus firms that only apply *centralised* (or "multiple-employer") forms of collective bargaining. More precisely, firms defined as adopting only centralised bargaining models (FLB = 0) apply wage agreements classified by Eurostat as "national level or inter-confederal agreement", "industry agreement", or "agreement for individual industries in individual regions". Firms which engage firm-level bargaining models (FLB = 1), on top of centralised bargaining, also subscribe agreements classified as "enterprise or single employer agreements" or "agreements applying only to workers in the local unit".

We include in the analysis only the firms that implement at least some form of collective bargaining. These firms encompass the large majority of workers in the countries under analysis, whereas we exclude the relatively small set of firms which do not apply any form of collective bargaining, *i.e.*, contract wages separately with each single employee. Thus, our analysis must be intended as capturing the incremental impact of firm-level bargaining over other levels of collective wage bargaining.

The definition of within-firm inequalities – as well as the estimation of residual wages – requires that a minimum number of employees per firm are present in the sample. In particular, the professional wage-gap in Equation 2 implies that at least one manager and one lower-layer employee are sampled from the same firm. After careful consideration of alternative restrictions to the data, and sensitivity analysis about robustness of main results, we define our working sample as including only firms with at least three employees.

Table 1 shows the number of employees and firms covered by different types of collective agreements in 2006 and 2010 in our sample. Table 2 shows a difference-in-means test obtained by running a simple OLS regression of the two measures of (residual) wage inequality $\Delta w^{90/10}$ and Δw^{jobs} against the FLB dummy and a constant term. Considering the percentile wage-dispersion $\Delta w^{90/10}$, firms that adopt firm-level bargaining present, on average, higher inequality in Belgium and Spain, while lower dispersion in France, the United Kingdom, and the Czech Republic (except in 2010). In Germany, instead, the average $\Delta w^{90/10}$ do not differ statistically between the two groups of firms, in both 2006 and 2010. In terms of the professional wage-gap

Δw^{jobs}, the more common pattern seems to be that firms under firm-level bargaining display lower inequalities than other firms, although we observe insignificant coefficients on the FLB dummy in some country-year combination, and a positive coefficient for the Czech Republic in 2010. Of course, this exercise just provides a first descriptive assessment of the unconditional relation linking firm-level bargaining and wage inequalities. In the next session, we present the empirical framework that we design in order to obtain more reliable estimates, controlling for additional observables that may drive the differences in wage inequalities and for potential endogeneity of the FLB dummy.

4   Empirical models and estimation strategy

Our main research question pertains the identification of whether firms that apply firm-level collective bargaining on top of other forms of collective bargaining at more centralised levels, display higher or lower within-firm wage inequalities, and the variation of this relation across countries and over time. To this purpose, we pool the observations over t=2006 and t=2010, and specify the following baseline regression model

$$\Delta w_{jt}^d = \alpha + \beta_1 \, \text{FLB}_{jt} + \beta_2 \, \text{Y}_{2010} + \beta_3 \, \text{Y}_{2010} \times \text{FLB}_{jt} + \gamma \boldsymbol{X}_{jt} + \epsilon_{jt} \, , \tag{4}$$

where the dependent variable Δw_j^d is, alternatively, one of the two measures of (residual) wage inequality $\Delta w^{90/10}$ or Δw^{jobs}, computed as explained above for each firm j present in each survey year t (2006 or 2010). The set $\boldsymbol{X}_{jt}$ include control variables (discussed further below), while the main regressor is the dummy FLB indicating if firm j applies firm-level collective bargaining or not in the year t, which we include both as a stand-alone variable and interacted with the dummy Y_{2010} set to 1 for the year 2010, accounting for possible time-varying effects of firm-level collective bargaining over the two survey years. That is, conditional on the control variables included in the set $\boldsymbol{X}_{jt}$, the coefficient β_1 accounts for the difference in wage inequalities across firms that apply vs. firms that do not apply firm-level collective bargaining in 2006. The interaction coefficient β_3 captures whether the effect of collectively bargaining at the firm level in 2010 changes as compared to 2006.

As a further contribution to the identification of the links between firm-level bargaining and within-firm wage inequalities, we provide a dissection of the effects of firm-level bargaining on the wages of the groups of employees that we implicitly compare in the wage-gap measures. Obviously, it makes an important difference if, for instance, an hypothetical increase in $\Delta w^{90/10}$ comes from firm-level bargaining firms paying their top-paid employees more than the other firms, as opposed to a situation where firm-level bargaining increases inequality by lowering the wages at the bottom quantiles. In the two cases, The diverging interests between different groups of employees within the firm are clearly solved in opposite ways. Similarly, were firm-level bargaining found to have any effect on the professional wage-gap Δw^{jobs}, then it would be relevant to understand who benefits or loses between managers and low-layers workers.

To shed light on this underlying dynamics, we explore the relation between firm-level bargaining and the components (numerator and denominator) of the wage-dispersion measures $\Delta w^{90/10}$ and Δw^{jobs}. We estimate the following variation of the model in Equation (4)

$$w_{jt}^d = \alpha + \beta_1\, \text{FLB}_{jt} + \beta_2\, Y_{2010} + \beta_3\, Y_{2010} \times \text{FLB}_{jt} + \gamma \boldsymbol{X}_{jt} + \epsilon_{jt} \ , \tag{5}$$

where as dependent variable w_{jt}^d we employ, alternatively, the 90$^{\text{th}}$ or the 10$^{\text{th}}$ percentile of the within-firm distribution of (residual) log-wages, or take the average (residual) log-wages of managers and of low-layers employees. As in Equation (4), the identification works across firms with different wage-bargaining. Thus, the estimates of the coefficient β_1 on the FLB dummy gives the difference in outcomes across firm-level bargaining vs. other firms in 2006, whereas the coefficient on the interaction term $\text{FLB} \times Y_{2010}$ accounts for changes in the FLB effect over time. Notice that these separate regressions on the components of the two wage-gaps $\Delta w^{90/10}$ and Δw^{jobs} do not correspond to an exact split of the overall effects estimated from Equation (4) regressions. Nonetheless, the results are revealing of the underlying driving forces, telling which sub-group of employees is more likely to gain or loose from firm-level collective bargaining.

We apply a common empirical strategy for the estimation of the regression models in Equations 4 and 5.

First, the models are all estimated separately country by country. Pooling data across the six countries would allow to control for country fixed-effects, but that strategy would be dangerous

to follow, given the considerable differences in wage bargaining systems. In particular, while the definition of firm-level bargaining firms (FLB dummy =1) is homogeneous in SES across all countries, there is great variation across countries about what type of bargaining level is more likely to prevail in the control group of firms that do not apply firm-level bargaining (FLB=0). We avoid any assumption of homogeneity across national institutional settings, by allowing coefficient estimates to vary by country.

Second, we include the same set of controls $\boldsymbol{X}_{jt}$ in both regression 4 and 5, accounting for a number of other determinants of wage inequalities, beyond firm-level bargaining. Building on previous literature, wage dispersion within firms depends on firm characteristics as well as on personal and occupational characteristics of the workforce. The SES data allow to control for a variety of these confounding factors suggested by previous studies. As far as firm attributes are concerned, in SES we have information on firm size (as size-class by number of employees), and a dummy for private vs. public control on the firm. In general, the expectation is that within-firm wage dispersion is lower in large and publicly owned firms, as the unions tend to be more powerful in these contexts (Canal Dominguez and Gutierrez, 2004). Moreover, thanks to information on sector of main activity and geographical location of each firm, we can also control for the well-known variation of both wages and incidence of bargaining level across sectors and regions, via a full set of sector (reported in SES at 1-digit NACE) and regional (reported at NUTS-1 level) fixed-effects.

Concerning personal characteristics of the workforce, previous studies stress the relevance of gender, age, education, and experience. We capture all these features, by including in the empirical model the share of women employed in the firm, the share of employees with secondary or tertiary education, the mean tenure of workers in the firm, and a set of dummies for modal age of the workforce. Usually, wage dispersion is expected to rise with age, tenure and education, because wages tend to increase in all these characteristics, and dispersion is usually higher in firms where average wages are higher (Canal Dominguez and Gutierrez, 2004). As for gender, the well-documented existence of wage-gaps favourable to males would suggest that larger inequalities are to be expected in firms where the proportion of females is lower.

The type of jobs and contracts present in the firm are also known to play a role. Unions'

efforts to push for equalization of wages among their affiliates is usually identified as the channel trough which within-firm wage differences are influenced by factors like having a permanent vs. a fixed-term contracts, a full-time vs. a part-time job, or the relative weight of blue-collars vs. more professionalised occupations in the firm. Since full-time, permanent, blue-collar workers are generally more likely to unionize, dispersion is expected to be lower in firms with a larger proportion of these job and contract types (Canal Dominguez and Gutierrez, 2004). We control for these factors by including, for each firm, the share of managers and professionals (according to 1-digit ISCO codes 1 and 2), the share of part-time employees and the share of employees with a permanent contract.

Notice, however, that the correlations between the workforce characteristics and the measures of within-firm inequality may be complicated by unobservable compositional effects. In fact, employees with different characteristics may fall more or less frequently into the wage groups that we compare (percentile or occupation-related wages). For instance, notwithstanding the gender pay-gap, a firm with a 100% share of males can be more equal than a firm with a single female employee, to the extent that all the males employees earn the same wage (or quite similar wages) in the former firm. An equal reasoning may replicate for the other controls measuring features like age, tenure, job and contract types, and so on, in turn suggesting predictions in contrast with findings in the literature.[3]

Third, and finally, an important econometric caveat in estimating both regression 4 and 5, concerns the potential endogeneity of the FLB dummy, due to endogenous selection that causes a non-random distribution of firms between FLB and non-FLB status. Indeed, despite (i) we control for employer-specific components of wages and firm-level average wage by defining wages as residuals from the preliminary Mincerian regression, and (ii) we include a relatively rich set of controls and fixed-effects, there might still be unobserved characteristics that do matter for the decision to apply FLB and, at the same time, impact on the dependent variables of interest. To tackle this potential endogeneity/selection problem, we follow the "control-function" type of solution commonly adopted in the literature (Card and De La Rica, 2006; Daouli et al., 2013).

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[3]Some of the controls are not available for the Czech Republic. First, in the data there are no Czech firms with modal employees' age in the range 20-29 years old, so we omit this age category. Second, the Czech Republic defines a single NUTS-1 region, so we cannot further exploit regional dummies in the estimates for this country.

That is, we augment the model with a preliminary estimate of the probability (propensity score) that a given firm adopts firm-level collective bargaining. This is obtained from a first step Probit

$$\text{FLB}_j = \text{P}\left(\alpha_0 + \alpha_1 \boldsymbol{V}_j\right) \tag{6}$$

where FLB_j is the dummy for the *observed* presence of firm-level bargaining in firm j, P is the Probit link function, and $\boldsymbol{V}$ a set of covariates that affect the choice to bargain at firm-level. Separate first-step Probit regressions are estimated country by country, and the corresponding predicted probabilities $\widehat{\text{FLB}}_j = \text{P}\left(\hat{\alpha}_0 + \hat{\alpha}_1 \boldsymbol{V}_j\right)$ obtained for each firm are then included as an additional control variable in a second-step estimation of the main regression models in Equations 4 and 5.

The overall idea is that if FLB status is as good as randomly assigned conditional on observed controls, then conditioning also upon the propensity scores allows to clean any further bias due to unobserved firm characteristics, and, thus, a simple OLS on the second step will return correct estimates of the FLB dummy coefficient. The predictors $\boldsymbol{V}$ are for the most part the same as the controls appearing in the set $\boldsymbol{X}$ in the main equations. However, to ease identification, we exclude average tenure of the workforce, as it is sensible to assume that tenure affects wages and wage inequalities, but it does not directly impact the decision to adopt FLB. Also notice that, in place of sector and regional fixed-effects included in the set $\boldsymbol{X}$ (likely subject to incidental parameter problems in Probit estimates), the set of covariates $\boldsymbol{V}$ includes the GDP per capita (at purchasing power parity, base year 2006) and the unemployment rate in the region where each firm is located, thus controlling for macroeconomic-and-regional dynamics that may play a direct influence on the decision to apply firm-level bargaining.[4]

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[4]These additional variables are taken from EUROSTAT-Regional Statistics and measured at the level of NUTS-1 regions, since this is the precision of the information on firms' geographical location in SES. The results of the first-step Probit regressions are reported in Table 7 in Appendix. They show a satisfactory goodness of fit, in terms of relatively high values of the area under the ROC curve.

5 Results

5.1 Firm-level bargaining and the 90th-to-10th percentile wage-gap

We start by presenting the analysis of the effect of firm-level bargaining on the wage differences between top and bottom extremes of the wage distribution within firms.

In Table 3 we show the estimates of the specification of Equation 4 where we take the 90th-to-10th percentile wage-gap $\Delta w^{90/10}$ as the dependent variable. In general, the estimates suggest that firm-level bargaining has heterogeneous effects on wage dispersion, both across countries and over time. In 2006 (cf. the coefficients on the FLB dummy) we do not observe statistically significant differences between firms that adopt firm-level bargaining as compared to other firms in any country but the UK, where firm-level bargaining firms are less unequal.

The initial picture observed for 2006 does not change in 2010 in four countries (Belgium, Germany, the Czech Republic and the UK, cf. the insignificant interaction coefficients). Conversely, we detect a common inter-temporal pattern in France and Spain, whereby the distribution of wages becomes more unequal over time in firm-level bargaining firms (positive estimated interaction coefficients).

The estimates also reveal heterogeneities concerning the correlation of controls and wage inequality within-firms. Starting with workforce characteristics, the modal age of employees in the firm has largely an insignificant association with wage inequality in Belgium, Germany, Spain and France, while the relation with the $\Delta w^{90/10}$ wage-gap is stronger (positive) in the Czech Republic and the UK. If anything has to be noticed, a common result across all countries is that wage inequality is larger within firms with the most senior workforce (60+ years old). The share of women in the workforce, the average on-the-job tenure of employees and the share of permanent contracts show a negative association with within-firm wage dispersion in most countries, while educational levels, the share of part-time employees and the share of higher professional occupations tend to display a positive association (when significant) with within-firm wage dispersion. Further, moving to firm-level characteristics, we find that wage dispersion increases with firm size in Germany, Spain and France, but larger firms display lower wage dispersion than the baseline in the UK. Publicly-controlled firms feature lower wage

dispersion compared to private firms in Belgium, the Czech Republic and France. Notice also that the significant coefficient on the propensity score $\widehat{\text{FLB}}_j$ confirms the need to correct for endogeneity of the FLB dummy in most countries. The same holds throughout all the estimates of this article, although we do not stress it in the following.

We next explore the separate effect of firm-level bargaining on the 90th and the 10th percentile of the within-firm distribution of (residual) wages. The estimates of the corresponding specifications of Equation 5 are reported in Table 4

We highlight three main patterns, in turn revealing interesting dynamics underlying the findings emerged from Table 3. First, consider Belgium, the Czech Republic and Germany, where the relation between firm-level bargaining and the $\Delta w^{90/10}$ wage-gap was never significant in Table 3. In Belgium and the Czech Republic, the analysis by percentiles confirms that firm-level bargaining does not have any statistically significant effect. In Germany, conversely, firm-level bargaining firms feature both a lower 90th percentile and a lower 10th percentile than other firms in 2006 (cf. the coefficient on FLB dummy), and these differences do not change over time (insignificant interaction coefficients). The magnitudes of the FLB effect on the two percentiles are comparable, hinting at why we do not see, in Table 3, an overall statistically significant difference in the $\Delta w^{90/10}$ wage-gap between FLB and other firms. Yet, the underlying dynamics seem to be that the adoption of firm-level agreements in Germany reduces wages at both the top and the bottom extreme of the within-firm wage distribution.

Second, the analysis by percentiles suggests that the equality-enhancing effect of firm-level collective bargaining on $\Delta w^{90/10}$ observed in Table 3 for the UK mainly works through FLB practices favouring low-paid workers. Indeed, we find that in the UK firm-level bargaining firms show an higher 10th percentile wage than other firms in both 2006 and 2010.

Third, and finally, we also add to the understanding of the over time increasingly detrimental effect of firm-level bargaining detected in Table 3 for Spain and France. In both countries, indeed, we observe a clear divergence in the patterns of top-paid and low-paid employees: over time, the employees in the 90th percentile are paid significantly more in firm-level bargaining firms than in other firms, whereas the opposite holds for employees in the 10th of within-firm wage distribution. In Spain, in particular, the 10th percentile wages in firms adopting firm-level

agreements are lower than 10th percentile wages paid by other firms already in 2006.

Results on the controls are rather consistent across countries, although with some variation in the significance levels. Modal age tends to positively correlate with the 90th percentile and negatively with the 10th percentile. A higher proportion of women in the workforce associates with lower wages at the 90th percentile, but with higher wages at the 10th percentile. A similar pattern is also detected for mean in-job tenure (with the exception of Spain) and for the share of workers covered by permanent contracts. Conversely, the share of educated workforce associates with higher wages at the 90th percentile and lower wages at the 10th percentile, and exactly the same pattern is detected for the proportion of apical professions in the firm and for the share of part-time workers (not in Belgium). Next, concerning firm characteristics, we find that larger firms show higher wages at the 90th percentile, but lower wages at the 10th percentile (not in the UK), whereas publicly-owned firms tend to pay more than private firms their workers at the 10th percentile and to pay less their workers at the 90th percentile.

5.2 Firm-level bargaining and the wage inequalities between managers and low-layers workers

We then show the analysis of the relations between firm-level collective bargaining and wage inequality across occupations.

Table 5 reports the estimates of Equation 4, taking the within-firm professional wage-gap Δw^{jobs} as the dependent variable. Similarly to the analysis of the the 90th-to-10th percentiles wage-gap, our general finding is that the effect of firm-level bargaining is heterogeneous, both across countries and over time. However, the estimated effects do not exactly replicate the patterns emerged above for $\Delta w^{90/10}$. This supports that accounting for the occupational content of wage inequalities does convey relevant additional information.

In three countries, namely Belgium, the Czech Republic and the UK, firm-level bargaining does not have any statistically significant effect on the professional wage-gap, neither in 2006 nor in 2010, while there emerge some effects and over time variation in Germany, Spain and France.

In Germany, in 2006, the wage differential between managers and low-layers workers is

less unequal in firm-level bargaining firms than in other firms. However, there seems to be a reversal in the use of FLB over time, since such an inequality reducing effect of FLB vanishes in 2010. Indeed, the estimated interaction coefficient is of similar magnitude, but opposite sign as compared to the coefficient on the FLB dummy. In France and Spain, firm-level agreements show a somewhat opposite effect, more favourable to compressing the occupational wage-gap. In France, FLB firms feature a lower Δw^{jobs} than other firms in both 2006 and 2010. In Spain, firms that bargain at firm-level and other firms do not differ significantly in their occupational wage-gaps in 2006, while firm-level bargaining firms become less unequal than the other firms in 2010.

Concerning the estimates on the set of controls, starting from workforce characteristics, a higher share of women (when significant, i.e., Belgium, Germany and Spain) associates with a higher occupational wage-gap across professional groups. Average tenure shows quite varying results: it is negatively related to the professional wage-gap in France and the Czech Republic, while a positive association is detected in Belgium, and insignificant estimates are obtained for the other countries. Overall, a higher proportion of educated workers associates with a higher occupational wage-gap in most countries (not in France). A larger share of part-time contracts negatively relates with the professional wage-gap in Germany, Spain and the Czech Republic. The opposite relation holds in the case of the share of workers with permanent contracts, at least in Germany and Spain. Among firm-level characteristics, firm size seems to play a consistent role, as larger firms experience greater professional wage-gaps in all countries but France. Public control associate with reduced wage differences across occupations as compared to private firms, in most countries (not in Spain and the United Kingdom).

Our last step is to disentangle the underlying relations between firm-level bargaining and the two components of the occupational wage-gap, taking the average wage of either the managers or the low-layers employees as the dependent variable in model 5.

Table 6 reports the results. A first notable finding regards Belgium, the Czech Republic and the UK, namely the three countries for which, in Table 5 ,firm-level bargaining did not show any statistical association with the Δw^{jobs} wage-gap. Essentially, the same results replicate also for the components of the wage-gap: firm-level bargaining firms do not show differences as

compared to other firms in terms of average wages they pay to both managers and low-layers employees.

Second, as for Germany, the over time reversal in the effect of FLB on the professional wage-gap emerged in Table 5 seems to be driven by a change in the FLB practices towards managers. Indeed, FLB firms and other firms do not show differences in the average wages of their low-layers employees. Conversely, managers are paid on average less in FLB firms than in other firms in 2006, but they see an increase in their wages in 2010 in firms adopting FLB.

Finally, we find that a common underlying dynamics characterizes the overall equality-enhancing effect of FLB on Δw^{jobs} emerged in Table 5 above for France and Spain. In both countries, indeed, FLB firms are more equal than other firms due to both lower average wages paid to managers and higher average wages paid to low-layers workers. There is a different timing in the two countries, however. In France, this differential treatment of managers and low-layer employees across FLB and other firms is already in place in 2006, and remains unchanged in 2010. In Spain, it is only in 2010 that the average wages of the two occupational categories become statistically different across FLB and other firms.

Results on controls display, once again, heterogeneity across countries. The modal age of the workforce displays a significant association with wages of managers in Spain (positive) and in the UK (negative), while a relatively strong and negative association emerges with the average wage of low-layers employees in Belgium. The share of women in the workforce features a positive relation with managers' wages in Spain and Germany, but the relation is negative in France. Also, wages of low-layers employees are higher in firms with more women in the Czech Republic, while they decrease with the number of women in Germany and Spain. Average tenure does not display strong associations in most countries, whereas education does, and the share of employees with tertiary education, in particular: in all countries (but France), firms with relatively more educated workforce pay relatively higher wages to managers and relatively lower wages to low-layers employees. The coefficient estimates on the share of managers/professionals and the contract types do not display a systematic pattern. Among enterprise characteristics, firm size tend to favour managers, as in most countries (not in France) we observe that larger firms pay managers more than other firms. The opposite tend to hold for public firms as

compared to private firms.

6   Conclusions

While the contribution of the level of collective pay agreements to shaping inter-firm wage inequality across employees is well-documented, there is less evidence on whether wage-setting happening at the level of firms – on top of more centralised bargaining levels – can explain wage differences emerging within the firm. A priori, firm-level agreements may induce an increase in within-firm inequality if they selectively encompass some specific workers, as a way to providing incentives or premia and gaining flexibility with respect to higher levels of negotiation. Or, conversely, firm-level bargaining may reduce inequalities within firms if they respond to fairness motives or, more generally, to egalitarian and redistributive objectives of employees and unions.

Exploiting data for six European economies over the years 2006 and 2010, this paper shed light on four major points characterizing the relation between firm-level wage bargaining and within-firm wage inequalities.

First, as expected, results are specific to national frameworks, underscoring the need to estimate country-specific models. We find evidence that in most countries (Germany, Spain, France, and the UK) firm-level bargaining does affect within-firm inequalities. Conversely, in Belgium and the Czech Republic, firm-level bargaining does not appear to be used to shape the wage gradient, whatever the measure for inequality we adopt and the period we consider. This may be because the two countries are at opposite ends in terms of the role played in the system of industrial relations by firm-level bargaining, widely used in the Czech Republic, while used in a minority of firms in Belgium.

Second, the definition of within-firm wage inequality matters. In the countries where we do find a statistically significant effect of firm-level bargaining, indeed, the results vary by the two measures we adopt, even within the same country. The more standard, statistical characterization of wage inequality between high-paid and low-paid employees, namely the 90th-to-10th wage percentile ratio, shows that UK firms engaged in firm-level bargaining are

less unequal than other firms, whereas firm-level bargaining firms feature wider inequalities in France and Spain in 2010. The occupation-related measure of inequality, taking the wage-gap between managers and low-layers employees, shed light on different results. In Spain and France firm-level bargaining reduces inequality as compared to multi-employer bargaining, while the effect is more time-dependent in Germany.

In fact, and third, our analysis suggests that the effects of firm-level bargaining change over time. The inequality between high and low paid employees widens over time in firms bargaining locally in Spain and France, and the same happens in Germany to the occupational wage-gap. Conversely, the wage distance between managers and low-layers occupations reduces over time in Spanish and French companies that bargain locally. The widening inequality across workers that we observe in some countries certainly signals a change over the period of analysis in the use of firm-level agreements away from redistributive purposes. Conversely, the observed compression of wage-gaps between managers and low-layers employees may reflect fairness concerns toward top-management and CEOs' excessive pay relative to other employees. One would be tempted to link these inter-temporal patterns to the financial crisis and the great recession, which occurred in between the two years of the analysis. Further analysis trying to establish a more direct, causal link than we can do here would be particularly interesting.

Fourth, as the variation of results by inequality measure already suggests, we find that different types of workers are affected differently by the wage bargaining policy adopted by firms. When local bargaining increases inequality between high-paid and low-paid workers – as in Spain and France in 2010 – this happens through higher wages paid to high earners workers and lower wages paid to low earners workers. However, an opposite pattern underlies the equality-enhancing effect that firm-level bargaining exerts on the occupational wage-gap, again in Spain and France: firms that also bargain locally tend to pay managers less and manual workers more, compared to firms that only bargain at the sectoral or national level.

Overall, this study offers new evidence to inform the renewed debate on the determinants of increasing inequalities, highlighting the importance of the locus of collective wage bargaining as a potential driver of wage inequality arising within the firm.

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Tables

Table 1: Total number of firms and employees by country, year, and type of collective agreement in the sample.

Country	Year	Centralized		Firm-level	
		N. empl. obs.	N. firms obs.	N. empl. obs.	N. firms obs.
BE	2006	131339	7082	33852	1557
	2010	108109	5381	29145	1252
CZ	2006	122565	466	942397	1314
	2010	91588	517	985320	1502
DE	2006	1688535	5676	161995	1786
	2010	774884	7971	120223	1782
ES	2006	189372	21043	45900	3235
	2010	141643	15285	57641	3823
FR	2006	86640	10089	19036	811
	2010	180504	16281	37974	2828
UK	2006	32113	4357	33509	4821
	2010	43622	2735	41709	3344

Table 2: Within-firm wage inequalities: OLS Difference-in-means test across firms under firm-level bargaining and other firms, by country and year.

	Country	Year	Firm-level bargaining Coeff.	S.e.	Constant Coeff.	S.e.	Obs. N
$\Delta w^{90/10}$	BE	2006	0.0120**	(0.00463)	0.384***	(0.00211)	8639
		2010	0.00927*	(0.00382)	0.357***	(0.00179)	6633
	DE	2006	−0.00735	(0.00521)	0.495***	(0.00238)	7462
		2010	0.00868	(0.00532)	0.494***	(0.00238)	9753
	ES	2006	0.0784***	(0.00453)	0.410***	(0.00168)	24278
		2010	0.0838***	(0.00434)	0.403***	(0.00193)	19108
	CZ	2006	−0.0225*	(0.0104)	0.531***	(0.00953)	1780
		2010	−0.000329	(0.00960)	0.521***	(0.00866)	2019
	UK	2006	−0.0196***	(0.00551)	0.531***	(0.00399)	9178
		2010	−0.0730***	(0.00680)	0.489***	(0.00524)	6079
	FR	2006	−0.0317***	(0.00963)	0.472***	(0.00270)	10900
		2010	−0.0475***	(0.00412)	0.451***	(0.00214)	19109
Δw^{jobs}	BE	2006	0.000427	(0.0207)	−0.0166	(0.0115)	1411
		2010	−0.0179	(0.0179)	−0.0108	(0.00858)	1164
	DE	2006	−0.0706***	(0.0186)	−0.000797	(0.00913)	2706
		2010	−0.0115	(0.0170)	0.00555	(0.00747)	3529
	ES	2006	−0.0528*	(0.0212)	0.0597***	(0.0116)	2068
		2010	−0.154***	(0.0226)	0.0855***	(0.0138)	1695
	CZ	2006	0.0298	(0.0213)	0.0792***	(0.0192)	1598
		2010	0.127***	(0.0229)	−0.0490*	(0.0215)	1689
	UK	2006	−0.0156	(0.0260)	−0.0318	(0.0206)	1544
		2010	−0.124***	(0.0357)	−0.0228	(0.0259)	646
	FR	2006	−0.167***	(0.0216)	0.0479***	(0.00875)	2572
		2010	−0.108***	(0.0178)	0.0338***	(0.00638)	4323

Notes: Robust standard errors in parenthesis; asterisks denote significance levels:
* p<0.05, ** p<0.01, *** p<0.001

Table 3: FLB and 90th-10th percentile wage inequality

	BE	DE	ES	CZ	UK	FR
FLB	−0.00158	−0.00285	0.00510	−0.0103	−0.0129**	−0.00478
	(0.00420)	(0.00638)	(0.00458)	(0.0100)	(0.00634)	(0.00990)
Year 2010	−0.0334***	0.00454	−0.0326***	−0.0142	−0.0798***	−0.0151***
	(0.00265)	(0.00424)	(0.00273)	(0.0119)	(0.00842)	(0.00348)
FLB×2010	0.00148	0.00323	0.0217***	0.00496	−0.00420	0.0362***
	(0.00592)	(0.00846)	(0.00672)	(0.0129)	(0.00849)	(0.0114)
Prob. FLB	0.0953***	−0.000383	−0.226***	0.117**	−0.00772	0.105***
	(0.0355)	(0.0520)	(0.0250)	(0.0458)	(0.125)	(0.0359)
Modal age workers:						
20-29	−0.0297	0.0330	0.0101		0.00383	−0.0654*
	(0.0242)	(0.0455)	(0.0242)		(0.0127)	(0.0369)
30-39	−0.0133	0.0204	0.0264	0.0363***	0.0378***	−0.0557
	(0.0244)	(0.0446)	(0.0244)	(0.00985)	(0.0127)	(0.0370)
40-49	−0.00313	0.0156	0.0177	0.0120	0.0466***	−0.0577
	(0.0242)	(0.0446)	(0.0243)	(0.0119)	(0.0131)	(0.0360)
50-59	0.0197	0.0124	0.0157	0.0152	0.0470***	−0.0389
	(0.0250)	(0.0451)	(0.0248)	(0.0103)	(0.0139)	(0.0366)
60+	0.0322	0.103*	0.0785***	0.0955**	0.0309*	−0.0315
	(0.0311)	(0.0572)	(0.0284)	(0.0381)	(0.0166)	(0.0404)
% of women empl.	−0.0616***	−0.0490***	−0.0392***	−0.0230	−0.0386***	−0.0451***
	(0.00599)	(0.0119)	(0.00467)	(0.0157)	(0.00986)	(0.00603)
Mean experience empl.	−0.00216***	−0.00245***	0.00344***	−0.00468***	−5.36e−05	−0.000761***
	(0.000392)	(0.000522)	(0.000360)	(0.000980)	(0.000576)	(0.000287)
% empl. with tert. educ.	0.116***	0.0847***	0.165***	0.249***	0.103***	0.0799***
	(0.00836)	(0.0272)	(0.00634)	(0.0386)	(0.0159)	(0.00814)
% empl. with sec. educ.	0.0184***	0.0532***	0.0730***	0.0206	0.0592***	0.00665
	(0.00498)	(0.0185)	(0.00480)	(0.0275)	(0.0134)	(0.00802)
% managers and profess.	0.0931***	0.0688***	0.0745***	0.121***	0.251***	0.148***
	(0.00971)	(0.0204)	(0.00949)	(0.0260)	(0.0111)	(0.00853)
% part-time empl.	−0.0108	0.140***	0.109***	0.175***	0.0419***	0.00672
	(0.00773)	(0.0126)	(0.00664)	(0.0529)	(0.0108)	(0.00832)
% permanent contracts	−0.0781***	−0.0861***	−0.00416	−0.00757	−0.0464**	−0.160***
	(0.0101)	(0.0184)	(0.00509)	(0.0173)	(0.0190)	(0.0136)
Firm size:						
50–249 empl.	0.000931	0.0361***	0.121***	0.0163	−0.0631***	0.0378***
	(0.00562)	(0.00545)	(0.00357)	(0.0108)	(0.0131)	(0.00429)
≥ 250 empl.	−0.00323	0.0340***	0.193***	0.0112	−0.0652***	0.0490***
	(0.00967)	(0.00513)	(0.00641)	(0.0164)	(0.0117)	(0.00490)
Public firm	−0.0502***	−0.00360	0.0287	−0.0797***	0.0194	−0.0694***
	(0.0119)	(0.0140)	(0.00823)	(0.0116)	(0.0598)	(0.00937)
Constant	0.455***	0.529***	0.299***	0.463***	0.596***	0.624***
	(0.0340)	(0.0539)	(0.0259)	(0.0427)	(0.122)	(0.0401)
Observations	13.765	12.312	37.887	3.498	14.502	30.009
R-squared	0.187	0.064	0.197	0.230	0.123	0.118
Region FE	✓	✓	✓	✓	✓	✓
Sector FE	✓	✓	✓	✓	✓	✓

Notes: Bootsrapped standard errors in parentheses (200 repetitions); asterisks denote significance levels: * p<0.05, ** p<0.01, *** p<0.001

Table 4: Decomposition of FLB effects on the 90$^{\text{th}}$ and 10$^{\text{th}}$ wage percentiles

	BE		DE		ES		CZ		UK		FR	
	q_90	q_10	q_90	q_10	q_90	q_10	q_90	q_10	q_90	q_10	q_90	q_10
FLB	−0.00106	0.000520	−0.00945***	−0.00660*	−0.000250	−0.00535**	−0.00479	0.00548	−0.00414	0.00877***	−0.00187	0.00292
	(0.00276)	(0.00244)	(0.00343)	(0.00394)	(0.00260)	(0.00239)	(0.00521)	(0.00535)	(0.00373)	(0.00320)	(0.00500)	(0.00601)
Year 2010	−0.0189***	0.0145***	0.00678***	0.00223	−0.0174***	0.0151***	−0.00548	0.00871	−0.0392***	0.0406***	−0.00764***	0.00741***
	(0.00158)	(0.00135)	(0.00236)	(0.00262)	(0.00139)	(0.00131)	(0.00623)	(0.00728)	(0.00530)	(0.00419)	(0.00202)	(0.00162)
FLB×2010	0.00159	0.000108	0.00578	0.00255	0.0148***	−0.00693**	0.00125	−0.00371	−0.00431	−0.000113	0.0195***	−0.0167***
	(0.00332)	(0.00298)	(0.00451)	(0.00452)	(0.00346)	(0.00316)	(0.00693)	(0.00771)	(0.00533)	(0.00443)	(0.00600)	(0.00598)
Prob. FLB	0.0539***	−0.0415**	−0.0153	−0.0149	−0.133***	0.0928***	0.0595**	−0.0576***	−0.0112	−0.00350	0.0678***	−0.0374**
	(0.0173)	(0.0171)	(0.0238)	(0.0296)	(0.0151)	(0.0129)	(0.0259)	(0.0212)	(0.0739)	(0.0573)	(0.0183)	(0.0167)
Modal age workers:												
20-29	−0.0141	0.0156	−0.00923	−0.0423*	0.00651	−0.00356			0.00736	0.00353	−0.0306	0.0348**
	(0.0136)	(0.0117)	(0.0251)	(0.0244)	(0.0131)	(0.0109)			(0.00635)	(0.00660)	(0.0211)	(0.0165)
30-39	−0.00464	0.00867	−0.0135	−0.0339	0.0153	−0.0111	0.0183***	−0.0180***	0.0267***	−0.0111*	−0.0250	0.0308*
	(0.0138)	(0.0115)	(0.0250)	(0.0239)	(0.0129)	(0.0108)	(0.00523)	(0.00603)	(0.00684)	(0.00663)	(0.0209)	(0.0166)
40-49	0.00105	0.00418	−0.0175	−0.0331	0.0108	−0.00687	0.00668	−0.00533	0.0315***	−0.0151**	−0.0249	0.0329**
	(0.0139)	(0.0116)	(0.0249)	(0.0238)	(0.0131)	(0.0108)	(0.00628)	(0.00640)	(0.00635)	(0.00674)	(0.0208)	(0.0166)
50-59	0.0127	−0.00702	−0.0167	−0.0291	0.0101	−0.00561	0.00820	−0.00701	0.0332***	−0.0138*	−0.0146	0.0243
	(0.0141)	(0.0118)	(0.0252)	(0.0237)	(0.0133)	(0.0110)	(0.00538)	(0.00583)	(0.00681)	(0.00723)	(0.0210)	(0.0164)
60+	0.0193	−0.0129	0.0232	−0.0798**	0.0437***	−0.0348***	0.0538***	−0.0417**	0.0233***	−0.00762	−0.0108	0.0206
	(0.0175)	(0.0160)	(0.0317)	(0.0325)	(0.0147)	(0.0128)	(0.0184)	(0.0176)	(0.00895)	(0.00815)	(0.0224)	(0.0186)
% of women empl.	−0.0294***	0.0323***	−0.0203***	0.0287***	−0.0176***	0.0216***	−0.00670	0.0163**	−0.0215***	0.0171***	−0.0255***	0.0196***
	(0.00340)	(0.00323)	(0.00576)	(0.00646)	(0.00280)	(0.00247)	(0.00815)	(0.00750)	(0.00520)	(0.00427)	(0.00333)	(0.00321)
Mean experience empl.	−0.00125***	0.000907***	−0.000873***	0.00158***	0.00188***	−0.00156***	−0.00276***	0.00192***	−3.41e−05	1.95e−05	−0.000512***	0.000249*
	(0.000228)	(0.000190)	(0.000266)	(0.000301)	(0.000215)	(0.000176)	(0.000548)	(0.000481)	(0.000359)	(0.000287)	(0.000158)	(0.000144)
% empl. with tert. educ.	0.0587***	−0.0577***	0.0597***	−0.0251	0.0844***	−0.0804***	0.130***	−0.119***	0.0494***	−0.0531***	0.0369***	−0.0430***
	(0.00431)	(0.00406)	(0.0134)	(0.0169)	(0.00319)	(0.00306)	(0.0202)	(0.0193)	(0.00939)	(0.00736)	(0.00473)	(0.00388)
% empl. with sec. educ.	0.00871***	−0.00971***	0.0322***	−0.0210*	0.0384***	−0.0346***	−0.00260	−0.0232	0.0264***	−0.0328***	−0.000259	−0.00690*
	(0.00272)	(0.00263)	(0.00874)	(0.0114)	(0.00267)	(0.00239)	(0.0150)	(0.0145)	(0.00822)	(0.00699)	(0.00400)	(0.00370)
% managers and profess.	0.0438***	−0.0493***	0.0319***	−0.0369***	0.0382***	−0.0364***	0.0571***	−0.0637***	0.125***	−0.126***	0.0820***	−0.0660***
	(0.00600)	(0.00515)	(0.00957)	(0.0108)	(0.00466)	(0.00488)	(0.0166)	(0.0131)	(0.00592)	(0.00558)	(0.00484)	(0.00412)
% part-time empl.	−0.00418	0.00662*	0.0570***	−0.0829***	0.0551***	−0.0535***	0.0777***	−0.0969***	0.0258***	−0.0161***	0.00355	−0.00317
	(0.00418)	(0.00375)	(0.00675)	(0.00791)	(0.00342)	(0.00332)	(0.0301)	(0.0255)	(0.00612)	(0.00545)	(0.00412)	(0.00395)
% permanent contracts	−0.0345***	0.0436***	−0.0242***	0.0619***	0.000483	0.00465*	−0.00203	0.00554	−0.0277***	0.0188*	−0.0778***	0.0826***
	(0.00567)	(0.00617)	(0.00906)	(0.0107)	(0.00255)	(0.00238)	(0.00795)	(0.00835)	(0.00961)	(0.00979)	(0.00750)	(0.00651)
Firm size:												
50–249 empl.	0.000439	−0.000491	0.0217***	−0.0144***	0.0657***	−0.0554***	0.00895	−0.00736	−0.0330***	0.0301***	0.0201***	−0.0177***
	(0.00275)	(0.00287)	(0.00268)	(0.00314)	(0.00235)	(0.00182)	(0.00578)	(0.00566)	(0.00776)	(0.00724)	(0.00258)	(0.00217)
≥ 250 empl.	−0.00293	0.000297	0.0239***	−0.0101***	0.106***	−0.0876***	0.00620	−0.00498	−0.0332***	0.0320***	0.0226***	−0.0264***
	(0.00469)	(0.00472)	(0.00275)	(0.00313)	(0.00397)	(0.00347)	(0.00880)	(0.00795)	(0.00663)	(0.00592)	(0.00256)	(0.00230)
Public firm	−0.0219***	0.0283***	−0.0129*	−0.00926	0.0183***	−0.0105***	−0.0448***	0.0349***	0.00734	−0.0121	−0.0402***	0.0292***
	(0.00592)	(0.00583)	(0.00663)	(0.00830)	(0.00436)	(0.00379)	(0.00719)	(0.00558)	(0.0352)	(0.0268)	(0.00458)	(0.00407)
Constant	0.226***	−0.228***	0.270***	−0.259***	0.148***	−0.151***	0.244***	−0.219***	0.307***	−0.290***	0.315***	−0.309***
	(0.0203)	(0.0173)	(0.0289)	(0.0265)	(0.0134)	(0.0112)	(0.0223)	(0.0195)	(0.0722)	(0.0571)	(0.0234)	(0.0173)
Observations	13.765	13.765	12.312	12.312	37.887	37.887	3.498	3.498	14.502	14.502	30.009	30.009
R-squared	0.138	0.199	0.059	0.059	0.174	0.191	0.226	0.191	0.110	0.124	0.105	0.115
Region FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sector FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Bootsrapped standard errors in parentheses (200 repetitions); asterisks denote significance levels: * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 5: FLB and the wage-gap between managers and low-layers workers

	BE	DE	ES	CZ	UK	FR
FLB	0.00463	−0.0607∗∗∗	−0.00730	0.0156	0.0307	−0.0862∗∗∗
	(0.0227)	(0.0231)	(0.0224)	(0.0221)	(0.0315)	(0.0248)
Year 2010	0.00909	0.0167	0.0415∗∗	−0.106∗∗∗	−0.106 ∗ ∗	−0.0116
	(0.0163)	(0.0157)	(0.0199)	(0.0296)	(0.0537)	(0.0119)
FLB×2010	−0.0251	0.0555∗∗	−0.0839∗∗∗	0.0352	−0.0258	0.0190
	(0.0295)	(0.0278)	(0.0323)	(0.0318)	(0.0554)	(0.0302)
Prob. FLB	−0.311∗	−0.756∗∗∗	−0.710∗∗∗	0.367∗∗∗	0.493	0.145
	(0.161)	(0.168)	(0.182)	(0.104)	(0.676)	(0.137)
Modal age workers:						
20-29	0.0630	0.149	0.144∗∗∗		−0.218∗	0.176
	(0.0696)	(0.142)	(0.0441)		(0.121)	(0.169)
30-39	0.0957	0.243∗	0.143∗∗∗	0.0335	−0.227∗	0.201
	(0.0690)	(0.141)	(0.0342)	(0.0273)	(0.124)	(0.168)
40-49	0.118∗	0.237∗	0.129∗∗∗	−0.0599∗∗	−0.180	0.231
	(0.0687)	(0.140)	(0.0342)	(0.0287)	(0.123)	(0.168)
50-59	0.130∗	0.220	0.145∗∗∗	−0.0348	−0.164	0.270
	(0.0698)	(0.139)	(0.0374)	(0.0279)	(0.121)	(0.168)
60+	0.118	0.279∗	0.241∗∗∗	0.167∗∗∗	−0.243∗	0.283∗
	(0.156)	(0.156)	(0.0917)	(0.0600)	(0.136)	(0.172)
% of women empl.	0.0555∗	0.130∗∗∗	0.197∗∗∗	0.00441	0.0411	−0.0418
	(0.0305)	(0.0380)	(0.0389)	(0.0371)	(0.0539)	(0.0255)
Mean experience empl.	0.00489∗∗	−0.00157	0.00386	−0.00457∗∗	−0.00435	−0.00292∗∗∗
	(0.00199)	(0.00164)	(0.00266)	(0.00226)	(0.00302)	(0.00106)
% empl. with tert. educ.	0.110 ∗ ∗	0.0636	0.233∗∗∗	0.358∗∗∗	0.147	−0.190∗∗∗
	(0.0473)	(0.0759)	(0.0505)	(0.0820)	(0.100)	(0.0290)
% empl. with sec. educ.	0.0672∗∗	0.203∗∗∗	0.0760∗	−0.0734	−0.00143	−0.0784∗∗∗
	(0.0305)	(0.0607)	(0.0408)	(0.0531)	(0.0930)	(0.0288)
% managers and profess.	0.0408	−0.157∗∗∗	−0.215 ∗ ∗	−0.399∗∗∗	0.139∗	−0.0199
	(0.0565)	(0.0533)	(0.0859)	(0.0600)	(0.0751)	(0.0353)
% part-time empl.	−0.0238	−0.145∗∗∗	−0.162∗∗∗	−0.337∗∗∗	−0.0800	0.0610
	(0.0493)	(0.0376)	(0.0612)	(0.0917)	(0.0775)	(0.0382)
% permanent contracts	0.196∗∗∗	0.0388	0.212∗∗∗	0.0339	0.0994	0.0180
	(0.0522)	(0.0560)	(0.0460)	(0.0392)	(0.158)	(0.0532)
Firm size:						
50–249 empl.	0.107∗∗∗	0.0991∗∗∗	0.179∗∗∗	0.0602∗∗	0.0570	−0.0878∗∗∗
	(0.0302)	(0.0241)	(0.0298)	(0.0248)	(0.0580)	(0.0159)
≥ 250 empl.	0.146∗∗∗	0.0469∗∗	0.215∗∗∗	0.0447	−0.0330	−0.177∗∗∗
	(0.0473)	(0.0230)	(0.0565)	(0.0337)	(0.0579)	(0.0156)
Public firm	−0.0764	−0.268∗∗∗	0.0199	−0.131∗∗∗	0.184	−0.119∗∗∗
	(0.0487)	(0.0458)	(0.0504)	(0.0254)	(0.325)	(0.0383)
Constant	−0.322 ∗ ∗	−0.375 ∗ ∗	−0.352∗∗∗	0.0358	−0.564	0.134
	(0.154)	(0.176)	(0.0921)	(0.102)	(0.625)	(0.181)
Observations	2.416	4.396	3.443	3.006	2.059	6.895
R-squared	0.087	0.083	0.091	0.158	0.078	0.069
Region FE	✓	✓	✓	✓	✓	✓
Sector FE	✓	✓	✓	✓	✓	✓

Notes: Bootsrapped standard errors in parentheses (200 repetitions); asterisks denote significance levels: ∗ p<0.05, ∗∗ p<0.01, ∗∗∗ p<0.001

Table 6: Decomposition of FLB effects across managers and low-layers workers

	BE		DE		ES		CZ		UK		FR	
	Manag	Low	Manag	Low	Manag	Low	Manag	Low	Manag	Low	Manag	Low
FLB	0.00605	0.00142	$-0.0466{**}$	0.0141	-0.0128	-0.00548	0.0195	0.00385	0.0296	-0.00107	$-0.0412{**}$	$0.0451{***}$
	(0.0177)	(0.00735)	(0.0207)	(0.0117)	(0.0179)	(0.00888)	(0.0176)	(0.00671)	(0.0224)	(0.0150)	(0.0176)	(0.0148)
Year 2010	$9.62e{-}05$	-0.00899	0.00862	-0.00812	0.0229	$-0.0186{**}$	$-0.0790{***}$	$0.0268{**}$	$-0.0702{*}$	0.0353	-0.00862	0.00299
	(0.0125)	(0.00581)	(0.0143)	(0.00686)	(0.0158)	(0.00749)	(0.0221)	(0.0105)	(0.0369)	(0.0267)	(0.00838)	(0.00565)
FLB$\times$2010	-0.0198	0.00531	$0.0390{*}$	-0.0165	$-0.0485{*}$	$0.0354{***}$	0.0117	-0.0236	-0.0413	-0.0155	0.00421	-0.0148
	(0.0261)	(0.00856)	(0.0249)	(0.0157)	(0.0276)	(0.0111)	(0.0245)	(0.0105)	(0.0390)	(0.0256)	(0.0214)	(0.0190)
Prob. FLB	0.0164	$0.327{***}$	$-0.540{***}$	$0.216{***}$	$-0.498{***}$	$0.212{***}$	$0.284{***}$	$-0.0827{**}$	0.564	0.0711	0.0362	$-0.109{*}$
	(0.139)	(0.0717)	(0.130)	(0.0743)	(0.153)	(0.0772)	(0.0939)	(0.0402)	(0.455)	(0.308)	(0.104)	(0.0576)
Modal age workers:												
20–29	0.0241	-0.0389	0.134	-0.0147	$0.139{***}$	-0.00526			$-0.211{**}$	0.00735	0.109	-0.0674
	(0.0999)	(0.0238)	(0.145)	(0.0569)	(0.0328)	(0.0144)			(0.0969)	(0.0544)	(0.100)	(0.0727)
30–39	0.0402	$-0.0555{**}$	0.200	-0.0427	$0.144{***}$	0.00146	0.0197	-0.0137	$-0.211{**}$	0.0165	0.130	-0.0713
	(0.0998)	(0.0238)	(0.144)	(0.0611)	(0.0273)	(0.0124)	(0.0245)	(0.0106)	(0.0976)	(0.0556)	(0.0988)	(0.0722)
40–49	0.0583	$-0.0593{**}$	0.194	-0.0424	$0.129{***}$	0.000315	$-0.0568{**}$	0.00309	$-0.178{*}$	0.00148	0.143	-0.0876
	(0.0984)	(0.0234)	(0.145)	(0.0590)	(0.0273)	(0.0109)	(0.0271)	(0.0107)	(0.0985)	(0.0543)	(0.0993)	(0.0719)
50–59	0.0733	$-0.0566{**}$	0.179	-0.0406	$0.134{***}$	-0.0104	-0.0332	0.00163	$-0.195{**}$	-0.0313	$0.167{*}$	-0.103
	(0.100)	(0.0246)	(0.146)	(0.0590)	(0.0285)	(0.0113)	(0.0253)	(0.0104)	(0.0988)	(0.0539)	(0.0987)	(0.0723)
60+	0.0541	-0.0636	0.209	-0.0704	$0.211{***}$	-0.0297	$0.0964{*}$	$-0.0706{**}$	$-0.232{**}$	0.0105	$0.178{*}$	-0.105
	(0.133)	(0.0582)	(0.157)	(0.0701)	(0.0673)	(0.0324)	(0.0512)	(0.0293)	(0.107)	(0.0573)	(0.102)	(0.0779)
% of women empl.	0.0427	-0.0128	$0.0672{**}$	$-0.0626{***}$	$0.133{***}$	$-0.0634{***}$	0.0469	$0.0425{***}$	-0.000410	-0.0415	$-0.0389{**}$	0.00291
	(0.0319)	(0.0140)	(0.0312)	(0.0195)	(0.0331)	(0.0149)	(0.0289)	(0.0123)	(0.0418)	(0.0268)	(0.0155)	(0.0109)
Mean experience empl.	0.00110	$-0.00379{***}$	-0.000924	0.000641	0.00212	$-0.00173{*}$	$-0.00354{*}$	0.00103	-0.00236	0.00199	$-0.00254{***}$	0.000382
	(0.00187)	(0.000921)	(0.00150)	(0.000740)	(0.00218)	(0.000979)	(0.00206)	(0.000815)	(0.00218)	(0.00146)	(0.000755)	(0.000562)
% empl. with tert. educ.	0.0552	$-0.0550{***}$	-0.0876	$-0.151{***}$	$0.158{***}$	$-0.0743{***}$	$0.261{***}$	$-0.0971{***}$	0.0715	$-0.0757{*}$	$-0.102{***}$	$0.0886{***}$
	(0.0344)	(0.0197)	(0.0683)	(0.0385)	(0.0364)	(0.0181)	(0.0714)	(0.0325)	(0.0726)	(0.0449)	(0.0218)	(0.0153)
% empl. with sec. educ.	$0.0471{*}$	$-0.0202{*}$	0.0750	$-0.128{***}$	0.0543	-0.0218	-0.0544	0.0190	-0.0254	-0.0239	$-0.0588{***}$	$0.0196{*}$
	(0.0254)	(0.0108)	(0.0590)	(0.0212)	(0.0350)	(0.0138)	(0.0540)	(0.0178)	(0.0630)	(0.0423)	(0.0196)	(0.0112)
% managers and profess.	$0.0930{**}$	$0.0522{*}$	-0.0328	$0.124{***}$	$-0.123{*}$	$0.0927{**}$	$-0.205{***}$	$0.194{***}$	$0.115{**}$	-0.0236	0.000121	0.0201
	(0.0470)	(0.0293)	(0.0433)	(0.0376)	(0.0630)	(0.0366)	(0.0475)	(0.0321)	(0.0457)	(0.0421)	(0.0236)	(0.0225)
% part-time empl.	-0.0382	-0.0144	$-0.0842{***}$	$0.0609{***}$	$-0.100{**}$	$0.0610{***}$	$-0.260{***}$	$0.0766{***}$	-0.0671	0.0128	$0.0511{**}$	-0.00988
	(0.0461)	(0.0183)	(0.0294)	(0.0206)	(0.0505)	(0.0191)	(0.0898)	(0.0290)	(0.0528)	(0.0336)	(0.0236)	(0.0157)
% permanent contracts	0.0518	$-0.144{***}$	0.0115	-0.0273	$0.164{***}$	$-0.0479{***}$	0.0377	0.00382	0.131	0.0311	$0.0670{**}$	$0.0490{*}$
	(0.0567)	(0.0231)	(0.0462)	(0.0295)	(0.0402)	(0.0154)	(0.0344)	(0.0124)	(0.114)	(0.0577)	(0.0338)	(0.0294)
Firm size:												
50–249 empl.	$0.0613{***}$	$-0.0455{***}$	$0.109{***}$	0.00998	$0.157{***}$	$-0.0221{**}$	$0.0643{***}$	0.00412	$0.0667{*}$	0.00975	$-0.0532{***}$	$0.0346{***}$
	(0.0238)	(0.0122)	(0.0178)	(0.00996)	(0.0250)	(0.0109)	(0.0213)	(0.0106)	(0.0398)	(0.0311)	(0.0115)	(0.00792)
$\geq$ 250 empl.	0.0662	$-0.0801{***}$	$0.0595{***}$	0.0126	$0.183{***}$	-0.0324	$0.0640{**}$	0.0193	0.0349	$0.0679{***}$	$-0.104{***}$	$0.0730{***}$
	(0.0409)	(0.0216)	(0.0199)	(0.0109)	(0.0451)	(0.0221)	(0.0308)	(0.0149)	(0.0379)	(0.0262)	(0.0108)	(0.00859)
Public firm	-0.0209	$0.0555{**}$	$-0.182{***}$	$0.0860{***}$	0.00974	-0.0101	$-0.127{***}$	0.00489	0.247	0.0632	$-0.0541{*}$	$0.0653{***}$
	(0.0444)	(0.0266)	(0.0366)	(0.0224)	(0.0411)	(0.0204)	(0.0209)	(0.0118)	(0.220)	(0.149)	(0.0300)	(0.0168)
Constant	-0.163	$0.159{***}$	-0.212	$0.163{**}$	$-0.295{***}$	0.0568	0.0237	-0.0121	-0.556	0.00833	0.0460	-0.0877
	(0.134)	(0.0472)	(0.180)	(0.0654)	(0.0748)	(0.0351)	(0.0857)	(0.0274)	(0.421)	(0.286)	(0.111)	(0.0828)
Observations	2.416	2.416	4.396	4.396	3.443	3.443	3.006	3.006	2.059	2.059	6.895	6.895
R-squared	0.046	0.347	0.063	0.054	0.079	0.061	0.169	0.098	0.054	0.113	0.052	0.053
Region FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sector FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Bootsrapped standard errors in parentheses (200 repetitions); asterisks denote significance levels: * p<0.05, ** p<0.01, *** p<0.001

Appendix: FLB propensity scores

Table 7: Probit estimates of FLB propensity

	(1) BE	(2) DE	(3) ES	(4) CZ	(5) UK	(6) FR
Mean experience empl.	0.0300***	0.0243***	0.0409***	0.0755***	−0.0127***	0.00221
	(0.00313)	(0.00276)	(0.00184)	(0.00730)	(0.00277)	(0.00282)
Modal age workers:						
20-29	−0.0844	−0.890***	−0.110		0.115	0.125
	(0.252)	(0.246)	(0.218)		(0.0936)	(0.142)
30-39	0.0366	−0.564 ∗ ∗	−0.0319	−0.0328	0.141	0.285 ∗ ∗
	(0.250)	(0.245)	(0.218)	(0.104)	(0.0938)	(0.136)
40-49	0.00410	−0.498 ∗ ∗	−0.0881	0.0855	0.124	0.395***
	(0.249)	(0.244)	(0.218)	(0.117)	(0.0934)	(0.134)
50-59	−0.124	−0.559 ∗ ∗	−0.0560	0.0737	0.152	0.420***
	(0.251)	(0.245)	(0.219)	(0.107)	(0.0956)	(0.134)
60+		−0.829***	−0.113	−0.357	0.120	
		(0.298)	(0.232)	(0.299)	(0.110)	
% empl. with tert. educ.	0.109	0.662***	0.405***	0.455	−0.198 ∗ ∗	0.108
	(0.0793)	(0.135)	(0.0393)	(0.347)	(0.0991)	(0.0759)
% empl. with sec. educ.	0.137 ∗ ∗	0.728***	0.159***	0.117	−0.133	0.522***
	(0.0557)	(0.0982)	(0.0382)	(0.237)	(0.0945)	(0.0699)
% managers and profess.	−0.0209	0.0162	−0.186***	0.206	−0.00602	−0.581***
	(0.0906)	(0.110)	(0.0604)	(0.290)	(0.0594)	(0.0785)
% part-time empl.	−0.152 ∗ ∗	0.115*	−0.0164	0.0864	−0.0706	0.386***
	(0.0682)	(0.0648)	(0.0430)	(0.366)	(0.0560)	(0.0558)
% permanent contracts	0.510***	0.116	−0.156***	−0.279*	0.242 ∗ ∗	−0.262***
	(0.115)	(0.127)	(0.0385)	(0.151)	(0.0978)	(0.0797)
Firm size:						
50-249 empl.	0.704***	0.105***	0.624***	0.440***	−0.184 ∗ ∗	0.473***
	(0.0408)	(0.0383)	(0.0235)	(0.0855)	(0.0720)	(0.0385)
≥ 250 empl.	1.135***	0.179***	1.133***	1.164***	−0.290***	0.624***
	(0.0425)	(0.0375)	(0.0233)	(0.0916)	(0.0511)	(0.0387)
Public firm	−1.230***	−0.921***	0.570***	0.202	−1.346***	0.838***
	(0.0964)	(0.0404)	(0.0405)	(0.139)	(0.0403)	(0.0428)
NACE Sector:						
D	−0.413*	−0.293 ∗ ∗	−0.380***	0.609***	0.201	−1.373***
	(0.243)	(0.137)	(0.0667)	(0.218)	(0.311)	(0.180)
E	−0.809***	0.407***	0.272***	1.075***	0.141	1.157***
	(0.304)	(0.141)	(0.0803)	(0.305)	(0.328)	(0.155)
F	−1.140***	−1.096***	−0.882***	−0.894***	−1.032***	−1.334***
	(0.253)	(0.203)	(0.0770)	(0.225)	(0.318)	(0.278)
G	−0.853***	−0.451***	−0.493***	0.799***	0.405	−1.270***
	(0.245)	(0.156)	(0.0715)	(0.254)	(0.311)	(0.220)
H	−0.999***	0.275	−0.808***		−0.510	−0.486***
	(0.268)	(0.168)	(0.0832)		(0.334)	(0.182)
I	−0.441*	1.229***	−0.112	−0.168	−0.248	0.573***
	(0.248)	(0.136)	(0.0705)	(0.228)	(0.310)	(0.152)
J	−0.0811	−0.816***	−1.105***	0.216	0.562*	−0.00925
	(0.255)	(0.161)	(0.0818)	(0.309)	(0.315)	(0.158)
K	−0.744***	0.117	−0.509***	1.391***	0.0816	0.169
	(0.247)	(0.139)	(0.0728)	(0.286)	(0.314)	(0.155)
L			−0.101	2.351***	0.324	1.735***
			(0.111)	(0.364)	(0.311)	(0.159)
M	−0.966***	−0.0856	−0.953***	0.142	−0.676 ∗ ∗	−0.510***
	(0.282)	(0.157)	(0.0920)	(0.286)	(0.311)	(0.189)
N	−0.860***	0.973***	−0.670***		−1.004***	−0.554***
	(0.248)	(0.138)	(0.0834)		(0.312)	(0.163)
O	−0.602 ∗ ∗	0.394***	0.126*	1.703***	−0.496	0.338 ∗ ∗
	(0.254)	(0.139)	(0.0744)	(0.357)	(0.311)	(0.155)
Regional GDP pps	0.00120	0.000710	0.00371	0.302***	0.00649***	−0.00184
	(0.00157)	(0.00397)	(0.00231)	(0.0712)	(0.00181)	(0.00168)
Regional unemp. rate	0.00426	0.0357***	0.00866***		0.0716***	−0.0433***
	(0.00366)	(0.00585)	(0.00161)		(0.00832)	(0.0101)
Constant	−1.770***	−1.832***	−1.679***	−7.023***	0.544	−2.022***
	(0.374)	(0.329)	(0.235)	(1.437)	(0.351)	(0.243)
Observations	13.730	12.312	37.887	3.498	14.502	29.943
Area under ROC curve	0.781	0.811	0.825	0.870	0.875	0.935

Notes: Dependent variable is FLB dummy. Standard errors in parentheses; asterisks denote significance levels: * $p<0.05$, ** $p<0.01$, *** $p<0.001$