Does the Gender Mix Influence Collective Bargaining on Gender Equality? Evidence from France

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Gender equality at work has become in recent years a priority for governments. In France, collective bargaining is the main lever to achieve progress on gender equality issues. In a two-tier bargaining framework, industries and firms are required by law to negotiate on the reduction of gender inequalities. Using firm-level survey data on labor relations issues combined with administrative data, this paper seeks to better understand the dynamics of collective bargaining on gender equality at the firm level by questioning the role played by the gender mix. We find that gender diversity favors gender equality bargaining at the firm level. Underrepresentation and overrepresentation of women reduce the probability of firms negotiating an agreement on gender equality. The introduction of sanctions in the recent period has prompted low-feminized firms to negotiate more on gender equality but had little impact on highly feminized firms.

Introduction

Despite a great convergence between women and men in terms of education, labor market participation, occupations, and working hours (Goldin 2014), women continue to earn lower wages in most developed countries (Blau and Kahn 2017). In 2019 in France, women's wages were 25% lower than men's all positions combined. For work of equal value, there remains

a gap of 9% (French Ministry of Labor). Policy options to narrow both the gender gap in wages and in employment include more and more firm-level actions, such as adopting "equal pay for equal work" policies and the need to report firm-level pay gaps, or adopting regulations to increase the share of women in management and on boards (Magda and Cukrowska-Torzewska 2018). In several countries, collective bargaining has become an important part of the "regulatory toolkit" to fight against gender inequalities in wages and working conditions (Milner et al. 2019), as recommended by the ILO (Pillinger et al. 2016). In the WageIndicator Collective Bargaining Agreements Database, 65% of collective agreements from the European sample contain at least one clause on gender equality—GE thereafter—(Besamusca et al. 2021). France is the country that has so far gone the furthest in regulating collective bargaining on GE, by introducing for the first time an obligation to negotiate on this topic. French firms are indeed required to commit to the reduction in gender inequalities by negotiating collective agreements on these issues. While this obligation has existed since 2001, non-compliance is sanctioned only since 2012. Not all firms had complied with the law before the introduction of sanctions but also, to a lesser extent, after (Milner et al. 2019). There is therefore a stake in understanding what leads firms to negotiate a collective agreement on GE, whether the negotiation takes place under strong regulation (as today in France or soon in some other countries) or in a less regulated environment (as before in France or today elsewhere).

In this paper, we aim at evaluating the extent to which the presence of women inside the establishment contributes to the negotiation of collective agreements on GE. We investigate in particular the influence that the share of women in the workforce and among employee representatives have on the likelihood that negotiations on GE take place and then result in a collective agreement or instead an action plan defined unilaterally by the employer. We first provide a descriptive analysis of differences in GE bargaining outcomes across French establishments depending on the share of women. We then assess the marginal effects on GE bargaining outcomes associated with different changes in the share of women throughout its distribution among French establishments.

Our empirical approach is based on the combination of establishment-, firm-, and industry-level data. We mainly use the exhaustive data provided by the French Ministry of Labor on the collective bargaining texts (collective agreements and unilateral employer action plans), filed by establishments from a representative sample provided by a large-scale survey on labor relations issues for two recent periods (2008–2010, 2014–2016). To control for the endogenous nature of the share of women, we use an instrumental variable strategy based either on past variations or industry-level variations in the share of

women, computed using administrative data. We take into account the role played by industry-level bargaining by comparing the bargaining behavior of establishments covered and not covered by an industry-level agreement on GE.

We find that contexts of gender diversity in the workforce and at the bargaining table, that is, where women and men are virtually equally represented, are those that are the most favorable to collective bargaining on GE. The enforcement of sanctions for non-complying establishments has sharply increased the propensity to negotiate in establishments with a more masculine workforce and employee representation but has had little impact on the propensity to negotiate in establishments with a more feminized workforce and employee representation. When negotiations are undertaken, their outcome has clearly improved between the two periods. Over the most recent period, the probability that negotiations on GE lead to an agreement is close to 50%, whatever the gender composition of the workforce and of the negotiators. While a stronger female presence in the workforce tends to encourage the negotiating parties to reach an agreement, the chances that negotiations result in an agreement are however significantly lower in highly feminized bargaining environments.

We combine and contribute to three streams of literature.

We first contribute to the literature about collective bargaining on gender equality, which has already identified the presence of women in leadership and negotiating positions as one of the main factors providing the conditions for effective GE bargaining (Milner and Gregory 2014).[1] The main argument underlying this positive relationship between the presence of female negotiators and GE bargaining outcomes is that women give more importance to GE-related issues. For instance, Heery and Kelly (1988) show that female British union officers are more likely to prioritize non-pay-related issues—*for example*, child care, maternity leave and sexual harassment—in collective bargaining than their male colleagues. Similarly, Harbridge and Thickett (2003) show in New Zealand that settlements covering predominately female populations of workers produced more advantageous family leave agreements than settlements covering predominately male populations, suggesting that female workers may be willing to trade off pay for other types of benefits. Although this role of women in helping effective GE bargaining has been shown by several authors (Dickens 1998, 2000; Gerstel and Clawson 2001; Williamson 2009, 2012), some others tend to downplay it (*e.g.*, Heery 2006). Female representation and participation in union organizing would not be sufficient to make a difference,

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[1] The other main factors identified in this literature include centralized bargaining systems, high bargaining coverage/union density, and supportive legislation.

due to the domination of unions by men and masculine conceptions of work (Creese 1995; Danieli 2006; Jones 2002; Wajcman 2000). Male-dominated unions are seen as particularly uninterested in GE issues within the literature. They often associate the gender pay gap and work-life balance problems as "women's issues", which fit poorly with the masculine culture that characterizes male-dominated unions and workplaces (Gregory and Milner 2009; Kirton and Greene 2005). In addition, some authors qualify women's greater interest in these women's issues, such as Brochard and Letablier (2017) and Guillaume (2017) in France, who stress that equal pay and work-life balance receive little attention irrespective of the gender composition at the firm level. This suggests that, even in female-dominated jobs, power and authority remain "a prerogative of men", regardless of individual and job characteristics (Fana et al. 2021). The diversity of findings in the literature can be explained by the scope analyzed in most existing studies on these issues, which are for the most part applied to a particular industry or a particular firm. In the present paper, we investigate the influence of the gender mix on GE bargaining outcomes for a representative sample of establishments in the French economy while controlling for a large set of establishment characteristics. This allows us to identify the marginal effect of increasing the share of women and to assess how this marginal effect varies depending on the initial balance of the gender mix. Our results confirm that male-dominated workplaces are unfavorable contexts for GE bargaining but also underline that female-dominated workplaces are not more favorable contexts. Moreover, while the probability of negotiating on GE has greatly increased in male-dominated workplaces—generally accustomed to collective bargaining—following the introduction of sanctions in 2012, it has hardly changed in female-dominated workplaces.

The second stream of literature, that we relate to, focuses on gender differences around negotiation outcomes and propensity to negotiate. These gender differences in individual behavior are related to collective bargaining with employer through the gender composition of the workforce and of representatives at the bargaining table. A well-known finding in this literature is that women are less likely to initiate negotiations ("women don't ask" in the words of Babcock and Laschever 2003), *that is*, in the professional context to ask for promotions and pay raises. This finding is especially defended by laboratory experiments (*e.g.*, Bowles et al. 2005, 2007; Dittrich et al. 2014) and field experiments (Leibbrandt and List 2015).[2] Some authors explain this finding by gender differences in the perception of bargaining. According to Babcock and Laschever (2003), the female gender role is incongruent with negotiating. In

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[2] See also Azmat and Petrongolo (2014), Babcock and Laschever (2003), and surveys of Bertrand (2011), Croson and Gneezy (2009); Exley et al. (2020).

the same way, Leibbrandt and List (2015) show that women are less likely to negotiate because they perceive negotiating as a less acceptable behavior (than men). Gender differences in propensity to negotiate may also be explained by gender differences in implicit or explicit preferences, such as risk aversion or fairness concerns (see, *e.g.*, Bertrand 2011; Croson and Gneezy 2009; Niederle 2016; Pfeifer and Stephan 2019).[3] The extension of these findings outside the laboratory setting is nevertheless questioned by recent survey data studies (Artz et al. 2018; Säve-Söderbergh 2019; Stevens and Whelan 2019), which instead show that women are as likely as men to initiate negotiations.[4] Once negotiations are initiated, most empirical evidence shows that women get lower outcomes than men (*e.g.*, Artz et al. 2018; Castillo et al. 2013; Säve-Söderbergh 2019).[5] This gender difference is partly explained by the experimental literature, which shows that women are less competitive, more cooperative and less assertive than men in bargaining situations (see Croson and Gneezy 2009). Beyond this average difference, women's bargaining performance depends on the context and the participants in the negotiation. Several authors indeed show that women negotiate better when negotiating with women (Bowles et al. 2007; Eckel and Grossman 2001; Hernandez-Arenaz and Iriberri 2018; Solnick 2007; Sutter et al. 2009). In addition, women negotiate better when they have a higher relative position power in the negotiation, *that is*, when they act as employers and in matrilineal firms (Andersen et al. 2018; Dittrich et al. 2014).

Such heterogeneities in individual behaviors depending on the context of the negotiation suggest heterogenous effects of women presence on collective bargaining outcomes. We take into account this heterogeneity by controlling for a large set of establishment characteristics and considering different levels of women presence among employee representatives.

Last, our work relates to the recent literature analyzing the contribution of firms to the gender wage gap, as the result of different pay policies either within or between firms. Within-firm inequalities arise when women are less paid than comparably productive male coworkers while doing the same job in the same firm. This is called the bargaining effect because, beyond cases of discrimination (Blau and Kahn 2017), such gender inequalities would result

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[3] Pfeifer and Stephan (2019) show that women perceive their wages more often as fair than men, while controlling for wages and working time, that may explain that they are less likely to negotiate than men.

[4] Stevens and Whelan (2019) show that women are not less likely to negotiate than men when they have the same opportunities to negotiate.

[5] In contrast, Stevens and Whelan (2019) find no significant gender difference in negotiation outcomes. Säve- Söderbergh (2019) provides evidence that women tend to ask for a lower wage than men. Artz et al. (2018) show that women are less likely than men to receive a wage increase, while they are equally likely to ask for a wage increase.

mainly from the fact that women do not bargain their wages as well as men do (see Bertrand 2011). Firms also contribute to the gender wage gap due to gender segregation and/or sorting across firms, *that is*, women are less likely to work at high-paying firms than men (see, *e.g.*, Barth et al. 2016; Bayard et al. 2003; Cardoso et al. 2016; Groshen 1991; Ludsteck 2014; Sorkin 2017). In their seminal paper, Card et al. (2016) show that firm-level productivity premiums explain 21% of the gender wage gap in Portugal, with 15–20 pp due to the sorting effect, and 1–6 pp due to the bargaining effect. Using the same methodology, Coudin et al. (2018) show that firms account only for 8% of the gender wage gap in France, with a dominant role of the sorting effect and a very small (and even negative) bargaining effect. Bruns (2019) and Gallen et al. (2019) find similar results in Germany and Denmark, respectively. Labor market institutions may explain this lower contribution of firms to the gender wage gap, in particular the higher minimum wage in France (Coudin et al. 2018) and collective bargaining (Bruns 2019).[6] The small (or negative) bargaining effect in France implies that gender inequalities in wages and employment are relatively low within French firms. This is something to keep in mind when analyzing the incentive of French firms to negotiate goals and measures to reduce gender inequalities, even if they may concern other aspects than wages and employment.

The remainder of the paper is organized as follows. The next section provides some institutional background on GE collective bargaining in France. The third section describes the different data used in the paper. The fourth section provides some descriptive evidence on differences in GE collective bargaining across establishments depending on the share of women. We explain the econometric approach in the fifth section and present the main results in the sixth section. The last section concludes. Additional results are relegated to an extended appendix.

Institutional Background

In France, it is through the negotiation of firm-level agreements that the legislator seeks to engage firms to act for equal employment and equal pay. Collective bargaining on GE in firms has gradually developed since the implementation of the *Roudy* Act in 1983, which introduced the obligation for the employer to submit a written report to the works council on the comparative situation of general employment and training conditions of women and

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[6] Bruns (2019) finds that collective agreements compress the gender wage gap within firms.

men, called *Rapport de situation comparée* (RSC). This act also gave, for the first time, the opportunity for employers to bargain with union delegates measures to reduce gender inequalities within the firm. In 2001, the *Génisson* Act turned this opportunity to bargain into an obligation, specifically on the firm's objectives in the area on GE at work and on the actions to achieve them. In addition to this mandatory negotiation on GE, the Act of March 23, 2006, initiated the definition and implementation of measures to remove gender wage inequality in the mandatory annual negotiations on the wage policy.

The period from 2010 onwards has been marked by an acceleration of firm level collective bargaining (see Figure 1). This has been strongly promoted by the public authorities through a set of laws imposing sanctions but also setting the various procedures and parameters of the negotiations. It then became common practice to refer to *bargained public policy* (Groux 2005) or *state managed bargaining* (Mias et al. 2016). The Act of November 9, 2010, introduced for the first time financial penalties (up to 1% of payroll) for firms with 50 employees and more not complying with the obligation to be covered by a collective agreement or, failing that, by a unilateral employer decision (action plan) for workplace GE. Negotiations on GE have then to be renewed after one year in case of an action plan, three years in case of a collective

FIGURE 1

Number of Texts on GE Bargained at the Firm and Industry Level
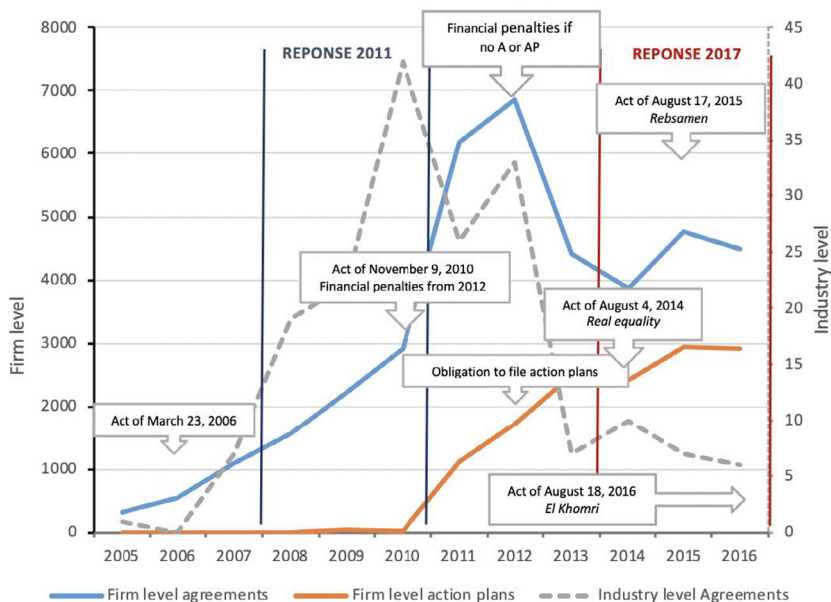
agreement. These sanctions were implemented from January 1, 2012, and have since been reinforced by the prohibition to bid on public contracts. The Decree of December 18, 2012, made bargaining on the effective compensation area compulsory. Finally, the *Real equality* Act (2014) streamlined obligations into a unique global negotiation on gender professional and pay equality, the *Rebsamen* Act (2015) has consolidated and streamlined the obligations of negotiation, merging equality bargaining with quality of working life and the *El Khomri* Act (2016) has taken further dispositions to develop collective bargaining and modernize social dialogue.

Milner et al. (2019) argue that in France, the "development of increasingly strong employer duties and complex compliance requirements has [. . .] created a distinctive model of 'bargained equality'" (p. 277–278). Another feature of the French negotiated equality model is that it is based on a principle of complementarity, enshrined in law, between industry and firm level collective bargaining. Both levels have an obligation to negotiate and bargaining at the firm level is supposed to add to agreements set at the industry level (on pay scales, classifications, joint initiatives on key issues of the industry) provisions tailored to address gender equality issues which are specific to the workplace. However, if legislation developments since 2013 have maintained pressure on GE bargaining, they have also generated uncertainties on enforcement mechanisms and procedures of agreements, especially between the time when the new laws were enacted and their decrees published. In particular, uncertainty touched the bargaining level (firm or industry) of the collective agreement required to be in compliance with the law and the validity period of the bargained texts. Furthermore, Mias et al. (2016) argue that by putting more pressure through financial penalties on the firm level, legal provisions have increasingly made the firm rather than the industry the locus of negotiation. This is likely to have driven the relationship between the two levels of negotiations from complementarity toward substitution, as illustrated by the fall in the number of industry level agreements between 2010 and 2016 while firm-level collective bargaining accelerated.

Thus, despite a real impetus given to negotiations on GE at firm level, the effectiveness of the *bargained gender equality policy* has yet to be assessed. In this paper, we will focus on two indicators: on the one hand, the compliance of firms with their legal obligations, and on the other hand, the signing of an agreement when the firms have actually negotiated.

Data

In this paper, we combine survey data on labor relations issues with administrative data for representative samples of French establishments.

The main data set consists in establishment- and firm-level information collected in the REPONSE[7] survey over its two most recent editions: 2011 and 2017. This survey is carried out by the French Ministry of Labor and covers several issues on labor relations and collective bargaining. In each edition of the survey, we mainly rely on data collected from the employer representative interviewed face to face in each establishment of the sample.[8] Samples of the 2011 and 2017 surveys are composed of 4,023 and 4,363 establishments, respectively, and are each representative of establishments of 10 employees and more from private and semi-public industries (excluding administration and agriculture). Most questions addressed to employer representatives cover the three-year period preceding the interview, *that is*, 2008–2010 for the 2011 survey, and 2014–2016 for the 2017 survey. It is the case for the questions that we exploit to define our dependent variables, which indicate whether (1) GE has been negotiated in the firm or the establishment; (2) the negotiation has resulted in a collective agreement at the firm- or establishment-level. The first question is slightly different between the two editions of the survey. While the 2017 survey questions refer to negotiations only, the 2011 survey questions refer to negotiations and discussions with respect to GE. Therefore, more firms are likely to be concerned in 2011 than in 2017, regardless of the actual differences in bargaining activity between the two editions. In addition, while the questions were addressed to all firms in 2011, they were addressed in 2017 only to firms with employee representatives (elected by employees or designated by labor unions).

Negotiations on GE have to be renewed every three years in case of collective agreement or over a shorter time period in other cases. Hence, we consider that firms with 50 employees and more that have not been negotiating on GE over each three-year period in the 2011 and 2017 surveys do not comply with their legal obligations. Furthermore, as we want to capture compliance with law using a similar question for 2011 and 2017, we focus our analysis on establishments from firms with 50 employees and more with at least an elected (or designated) employee representative. Our working samples are thus composed of 2,753 establishments in 2011 and 3,361 establishments in 2017.

As regards the outcomes of collective bargaining on GE, we make the choice to exploit exhaustive data on firm-level collective agreements and other texts related to collective bargaining, provided by the French Ministry of Labor over the period 2005–2016. By law, French firms are requested to report to the Ministry of Labor all collective agreements negotiated between employee and employer representatives. This also applies to other texts related to collective

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[7] REPONSE is the acronym of French *RElations PrOfessionnelles et NégociationS d'Entreprises*.

[8] In each edition of the REPONSE survey, data were also collected from an employee representative and a selection of employees in the establishment.

bargaining, such as disagreements, amendments or unilateral employer decisions (action plans in the field of GE). Information contained in these agreements is standardized by the Ministry of Labor to build a longitudinal firm-level dataset: the D@ccord database. Beyond variables identifying the establishment or firm filing the agreement (name, city, identification number, industry, branch agreement identification), each collective agreement is characterized with the following variables: type of text (agreement, amendment, denunciation, disagreement, accession to an agreement, unilateral decision of the employer), signatory unit (establishment, firm, group, branch), topic(s) of the negotiation (including wages, bonuses, employment, hours, union rights, labor conditions, on-the-job training, GE), signatories (union delegate, mandated employee, elected employee representative, works council, employer only, single delegation), the unions present at the negotiation and those signatories of the agreement (CGT, CFTC, CFDT, CFE-CGC, FO, others). Unlike REPONSE data, this dataset is not subject to reporting bias on the bargaining outcomes and makes it possible to analyze other results than just signing a collective agreement on GE over the three-year period (*e.g.*, filing an action plan). It also allows us to refine the information provided by survey data on the implementation of negotiations. Indeed, firms that claim having not negotiated on GE but that have filed an agreement on this topic have been reclassified as firms negotiating on GE.[9]

Beyond firm-level collective agreements, we also consider information on industry-level agreements.[10] These agreements initially apply only to firms that belong to the employer associations engaged in the negotiations but are generally extended to the whole industry in the months following the signing of the agreement. Information on industry-level agreements is public and available online. From these open data, we have retrieved information on agreements focused on GE. In particular, we know when the agreement was signed, when it was extended to the whole industry (when appropriate) and until when it was or is valid. From the extension date of the agreement, every firm belonging to the corresponding industry can be considered as covered by that agreement. Thus, we are able to identify whether firms are covered or not by an industry-level agreement on GE.

The last data source is the Annual Declaration of Social Data (DADS[11]), a French administrative file coming from firms' social security records, *that is*, the annual form that French firms have to fill for every employee subject to payroll taxes. As administrative data, DADS have the advantage to be exhaustive and so

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[9] Over the period 2014-2016, about 65% of firms have negotiated on GE following reclassification while they were initially about 55%.

[10] Note that the industry refers here to a finer level (over 250 IDCC) in the classification of firms than the level we already control for in our estimates (21 sections). This finer level is called *branche*.

[11] Déclaration Annuelle de Données Sociales.

to cover all firms from the REPONSE survey. The French National Statistical Institute (INSEE) transforms the raw DADS data into several files available for researchers under restricted access. We specifically exploit the position files (*fichier postes*) to get further information on the structure of the workforce and wages at firm level. In particular, we recover the total share of women in the workforce within the establishment and within the firm (for multi-establishment firms) using positions filled on December 31, each year. Then, to be consistent with the timetable of the REPONSE survey, we consider for each firm the average share of women over the two three-year periods (2008–2010, 2014–2016).

We are particularly interested in the role played by female negotiators on the employees' side at the bargaining table. Based on the REPONSE survey, we use the share of women among elected employee representatives as a proxy of the share of women among employee representatives at the bargaining table. This is a proxy because all elected employee representatives do not bargain with the employer in French firms. Until recently, only union delegates were authorized to do so. Among employee representatives, union delegates have the specificity to be designated by a labor union. Some of them are also elected as employee representatives. Previously and until 2008, an employee who was designated by one of the five major unions at the country level was automatically authorized to represent all employees in collective bargaining with the employer. Since 2008, to have the right to bargain with the employer, a union must have obtained at least 10% of votes at the first ballot of the professional elections, designed to elect the employee representatives. The REPONSE survey also provides information on several characteristics of the firm—or the establishment in case of multi-establishment firms—which are deemed, according to the literature, to explain a significant part of differences across firms in the propensity to negotiate on GE: industry, workforce size[12], region[13], presence of union representatives[14], legal category[15], publicly traded

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[12] See details on these characteristics in Table A1.

[13] The historical 22 regions in mainland France are considered here, *that is*, before the grouping into 13 regions operated by the territorial reform in January 2016. Controlling for the region is particularly relevant when examining bargaining outcomes on GE since certain regions have been the place of experiments designed to strengthen GE bargaining in SMEs, experiments conducted as part of the program *Territoires d'Excellence*.

[14] Several studies stress the importance of union representatives to get equal pay and work-life balance issues on the bargaining agenda (Heery 2006; Williamson 2012), although other studies mitigate their role given their weakness (Hantrais and Ackers 2005; Seeleib-Kaiser and Fleckenstein 2009) and lack of interest in these issues (Baird 2004).

[15] Five broad legal categories are distinguished: (1) simplified joint-stock companies, (2) other commercial companies, (3) legal person under public law subject to commercial law (public companies), (4) private law groupings (*e.g.*, associations), (5) other organizations. In the literature, Figart et al. (2002) and Whitehouse et al. (2001) stress out a particularly important weight of GE bargaining in public organizations, that provide a more receptive context for union influence (Heery 2006).

vs. privately held, belonging to a group vs. independent. If these characteristics are decisive in triggering negotiations on GE, we must control for them in order to correctly identify the effect of female presence on these bargaining outcomes.

Descriptive Analysis

In this section, as in the rest of the paper, we focus on establishments from firms with 50 or more employees. As smaller firms are not covered by the obligation to negotiate on GE, the proportion of them that have negotiated on this topic is consequently very small (<20%). In addition, we focus on firms with employee representatives because, as mentioned earlier, information on GE bargaining is available only for these firms in the 2017 edition of the REPONSE survey.

We first examine in Figure 2 the proportion of establishments having negotiated on GE and those having filed a text (agreement or action plan) on this topic over the two periods corresponding to the 2011 and 2017 surveys, *that is*, 2008–2010 and 2014–2016. We compare at the same time the proportions obtained among establishments covered and those not covered by an industry-level agreement on GE. Overall, the proportion of establishments having negotiated on GE has slightly increased between the two periods, from 58% in 2011 to 65% in 2017. In addition, the proportion of establishments having filed a text following negotiations has greatly increased, from 10% in 2011 to more than 40% in 2017. These figures are in line with those provided by the French bureau of labor (*Direction Générale du Travail*), as mentioned by Pochic et al. (2019). Although the introduction of financial penalties has led to a decrease in the proportion of establishments not covered by a text despite negotiations, it has not eliminated this phenomenon, still representing about 30% in 2017. This high proportion may result from the assimilation by some employer representatives of mandatory annual negotiations as negotiations on GE.[16] The introduction of financial penalties has led to closer propensities to negotiate between establishments covered and not covered by an industry-level agreement. However, the two types of establishments differ in 2017 in the outcome of negotiations: in establishments covered by an industry-level agreement, negotiations result less frequently in a local collective agreement than in an action plan (8.8% against 6.6%).

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[16] Initially focused only on wages, the mandatory annual negotiation for firms has been extended in 2014 to other bargaining topics, including the gender pay gap.

FIGURE 2
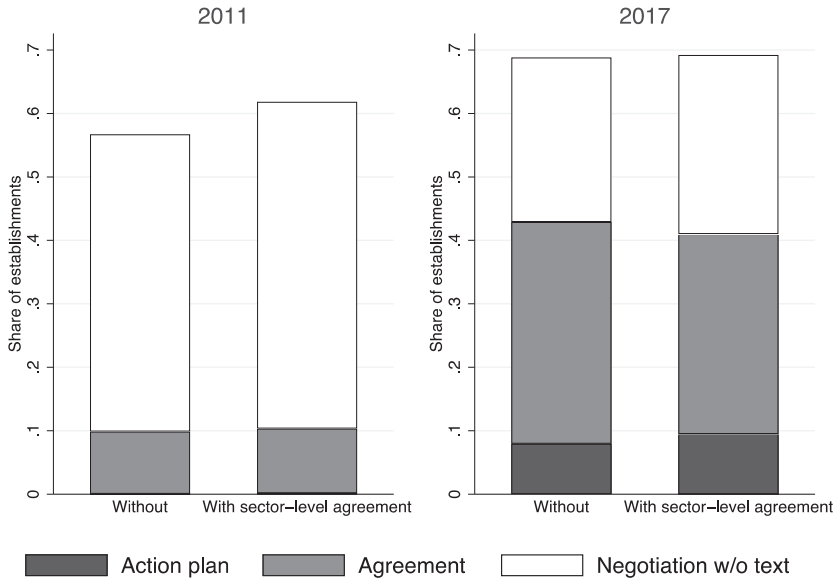
Notes: Firms with 50 or more employees with employee representatives. Percentages were computed using the establishment weights provided in the REPONSE survey. The periods corresponding to the 2011 and 2017 surveys are 2008–2010 and 2014–2016, respectively. Over 2008–2010, only 0.07% firms have filed an action plan, a percentage too small to appear graphically in the left-hand side panel.

We then compare in Figure 3, the average share of women in the workforce of establishments depending on whether a negotiation on GE has taken place and resulted into a text. Are establishments involved in GE bargaining more feminized? Figure 3 rather describes the opposite. In both periods, the average feminization rate is lower among establishments having negotiated on GE than among the others, but the difference is more pronounced in the more recent period due to the higher share of women in establishments without negotiation. However, there is hardly no difference in terms of gender mix between those establishments whose negotiations have resulted in a text (agreement or action plan) and those whose negotiations have not.

Does it mean that the probability for a firm to negotiate and sign a collective agreement on GE depends on the gender mix of the workforce? We first propose a descriptive answer to this question in Figure 4. Based on the 2017 sample of establishments, we have first computed the deciles of the distribution of the share of women in the workforce, allowing us to divide each

FIGURE 3

Share of Women in the Workforce: No Negotiation, Negotiation with or Without Agreement.
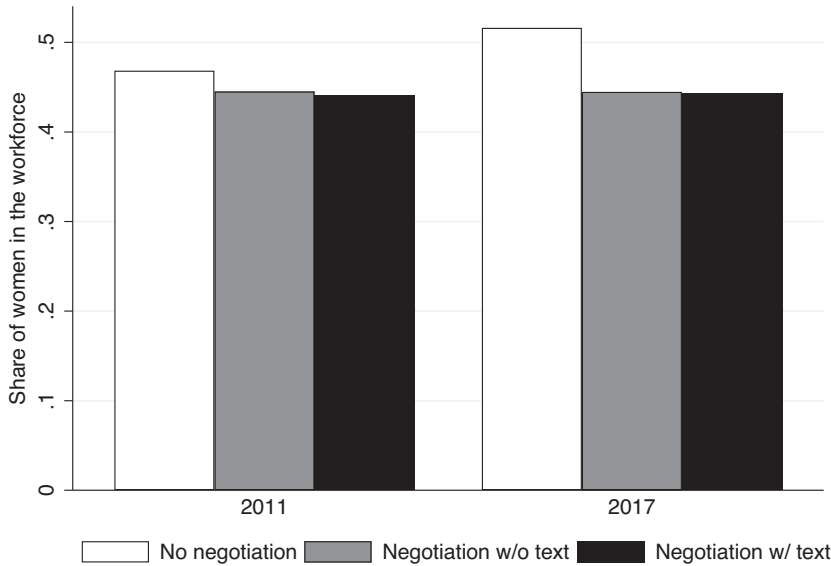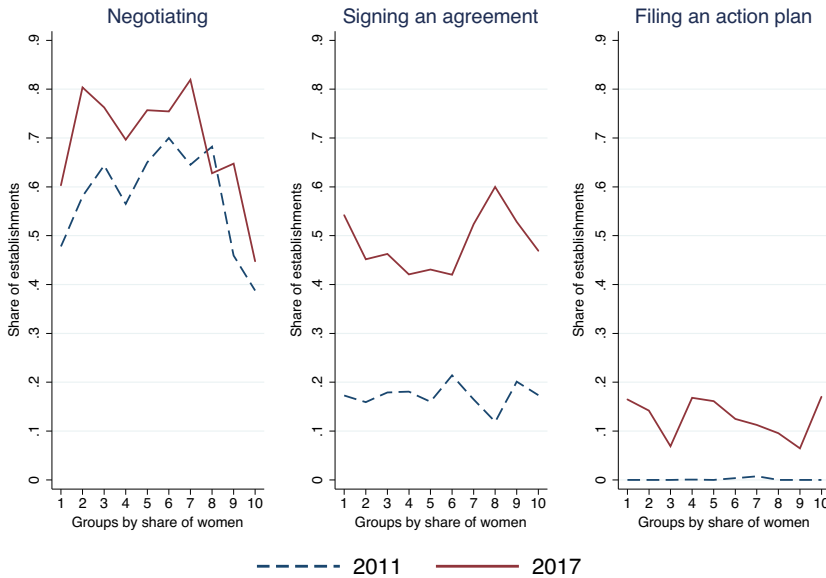

Notes: Establishments from firms with 50 or more employees and employee representatives. Percentages were computed using the establishment weights provided in the REPONSE survey.

sample (2011, 2017) in 10 groups of establishments. Theoretically, these groups have the same size in 2017. As there has been no significant changes in the distribution of the share of women between the two periods, they should also be balanced in 2011. Figure A1 (Appendix A) shows that each group made up represents about 10% of the sample in 2017 but also in 2011, with small variations compared to 2017. We then compute for each group the pro-portion of establishments having negotiated on GE, and the proportion of these establishments for which negotiations on GE have resulted in an agreement and in an action plan over the corresponding three-year period. These propor-tions are reported in dashed line for 2011 and solid line for 2017. The left-hand side panel shows that the proportion of establishments with GE bargain-ing is lower in the tails than in the middle of the distribution, thus forming an inverted-U shape relationship with the share of women. In other words, estab-lishments with a very low or a very high share of women are less likely to negotiate on GE than establishments where the gender mix is more balanced. This inverted-U shape is observed in both 2011 and 2017 but the proportions

FIGURE 4

PROPORTION OF ESTABLISHMENTS NEGOTIATING AND THEN FILING A TEXT ON GE BY THE SHARE OF WOMEN.

Notes: Establishments from firms with 50 or more employees with employee representatives. Proportions were computed using the establishment weights provided in the REPONSE survey. The left-hand side panel covers all establishments while the two others cover only establishments negotiating on GE. The 10 groups reported on the x-axis are formed using the decile threshold values from the 2017 distribution of shares of women. The values of these thresholds as well as sample distributions across these thresholds are reported in Figure A1 in Appendix A.

are much higher in 2017, except at the right end of the distribution where the proportions of the two periods are closer. We do not find the same shape when considering then the proportion of negotiating establishments having signed an agreement (see Figure 4, middle panel). While no clear relationship emerges in 2011, the probability of signing an agreement in 2017 is markedly higher in male-dominated and female-dominated establishments than in mixed establishments. However, as for the negotiation rate, the most feminized establishments (top 10%) report a signature rate which is lower with respect to other female-dominated establishments. In contrast, their likelihood of filing an action plan —used when negotiations could not lead to an agreement—is higher than that reported by other female-dominated establishments having negotiated on GE (see Figure 4, right-hand side panel). These highly feminized establishments

thus seem to have a specific negotiation behavior that it will be worth investigating further in the upcoming econometric analysis. Note that both the signature rate for agreements and the filing rate for action plans have increased between 2011 and 2017 among negotiating establishments and this whatever the workforce gender mix. The signature rate hovers around 50% in 2017 while it is capped at 20% in 2011. The filing rate fluctuates between 10% and 20% in 2017 while it is almost uniformly zero in 2011, as action plans were not yet defined in law.

Beyond the share of women in the workforce, we then look at how GE bargaining outcomes vary depending on the share of female among employee representatives—thereafter share of female reps. As for the share of women, we describe these variations across different threshold values defined using the 2017 distribution of the share of female reps over all establishments with employee representatives belonging to firms with at least 50 employees. Unlike the share of women, defining 9 threshold values of the share of female reps—so as to have 10 same-size groups of establishments—is not relevant given the shape of the distribution (see Figure B1 in Appendix S2). Over both periods, we observe a large proportion of establishments where the share of female reps is zero or 100%. Each extreme case represents at each period about 20% of the sample. Between these two extreme cases, the density follows an inverted-U shape, so that establishments are concentrated around 50% of female reps. This particular distribution encourages us to consider apart these extreme cases and two relevant thresholds between them: 33% and 50%.[17] Once groups of establishments are defined based on these threshold values, we then compute for each group the proportion of establishments having negotiated on GE, and then among the latter the proportion having signed an agreement and the proportion having filed an action plan. All these proportions are reported in Figure 5. Establishments where employee representatives are exclusively women are those where the negotiation rate is the lowest in both periods (see left-hand side panel). However, this is the only common feature between the two curves describing the negotiation rate of establishments by the share of female reps in 2011 and 2017. While the highest negotiation rate in 2011 is reached in establishments with female-dominated representatives (with at least one male representative), this is observed in 2017 in establishments where women are a minority among representatives (but still present). The negotiation rate has sharply increased between the two periods in

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[17] The extreme values are not exclusive to small establishments or firms, where the low number of employee representatives makes the shares 0% and 100% more likely. Indeed, the proportion of small firms is not especially high among those where employee representatives are exclusively women or exclusively men. Similarly, these extreme values are not exclusive to specific industries.

FIGURE 5

PROPORTION OF ESTABLISHMENTS NEGOTIATING AND THEN FILING A TEXT ON GE BY THE SHARE OF FEMALE REPS.
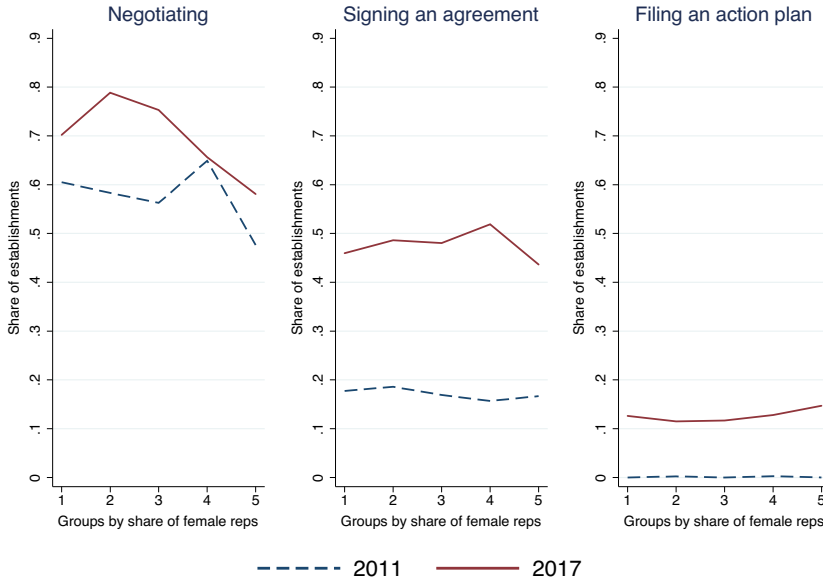
Notes: Establishments from firms with at least 50 employees and employee representatives. Proportions were computed using the establishment weights provided in the REPONSE survey. The left-hand side panel covers all establishments while the two others cover only establishments having negotiated on GE over the previous three-year period. The 5 groups reported on the x-axis are formed using the threshold values reported in Figure A2 in Appendix A.

the latter and particularly in establishments with less than one-third of female reps, where the negotiation rate has increased by almost 20 pp. In contrast, in establishments where women are the majority but not all representatives, the negotiation rate has hardly changed between the two periods. Among establishments having negotiated, the greater or lesser representation of women among representatives seems to have little impact on the likelihood of reaching an agreement or, conversely, of filing an action plan (see middle and right-hand side panels).

At this stage, we cannot infer any impact of the gender mix on GE bargaining outcomes because establishments may differ in terms of other explanatory factors for bargaining depending on their share of women. This is why, we propose in the next section a *ceteris paribus* analysis.

Identification Strategies

We aim at assessing the causal relationship between the share of women in the establishment and the negotiation of a local collective agreement on GE, which can also lead to an action plan or no text at all if negotiations between the employer and employee representatives fail. We first investigate the effect of the share of women on the likelihood that negotiations on GE take place, starting from the following specification:

$$y_i^* = \mathbf{x}'_i \beta + \delta_1 \text{Share}_i + \delta_2 \text{Share}_i^2 + \varepsilon_i, \quad \varepsilon_i \sim N(0, 1), \quad y_i = 1\left(y_i^* > 0\right) \quad (1)$$

where y_i is a binary variable which is equal to 1 if negotiations on GE have taken place, 0 otherwise.[18]

y_i^* is the unobserved latent variable, which is related to the observed y_i as described above. $\mathbf{x}_i$ includes all relevant establishment characteristics used as control variables, as described in Section Data.[19] Share_i refers to the share of women in the establishment i. Share_i is also introduced in quadratic form to account for non-linearities in the effect of the share of women on the probability of negotiating on GE.[20] We assume that residuals ε_i are normally distributed, consistently with a probit specification. In the second part of our analysis, we consider instead as dependent variable y_i an unordered categorical variable taking into account the different outcomes of GE bargaining: (1) no text, (2) agreement and (3) action plan. To analyze this data, we use a multinomial response model, specifically a multinomial probit model, assuming the following latent threshold model:

$$y_{ij}^* = \mathbf{x}'_i \beta + \delta_1 \text{Share}_i + \delta_2 \text{Share}_i^2 + \varepsilon_i, \quad (2)$$

where the ε's follow a multivariate normal distribution and where the observable dependent variable y_i is linked with its latent counterpart y_i^* via:

$$y_i = \begin{cases} j \text{ if } y_{ij}^* = \max\left(y_{i1}^*, y_{i2}^*, y_{i3}^*\right) \\ 0 \text{ otherwise} \end{cases} \quad (3)$$

Endogenous share of women. Statistically, the coefficient estimated on Share_i in equations (1) and (2) may only report a correlation between that

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[18] The reference period is the three-year period preceding the year of observation. Negotiations may have taken place both at establishment level and firm level in the case of multi-establishment firms.

[19] These characteristics include the size of the firm, the industry, the major occupational category (between (1) managers and professionals, (2) intermediate occupations, (3) clerical, sales and service workers, (4) blue-collar workers), union presence (one or more union delegates in the firm), capital holders (publicly traded *vs.* privately held), legal category, belonging to a group vs. independent.

[20] We have also tried a specification including in addition the cubic form of share$i$ among covariates but decided not to keep it as it does not add explanatory power and leads to the same results as with this specification.

proportion and the outcome y_i, and not necessarily a causal relationship. Indeed, Share$_i$ is likely to be correlated with the residual ε_i, due to plausible unobserved heterogeneity[21] and reverse causation issues.

To improve identification of the causal relationship between Share$_i$ and the outcome, we rely on a two-stage residual inclusion (2SRI) estimator (see *e.g.*, Terza et al. 2008), which is a nonlinear extension of the conventional instrumental variable (IV) method. Instead of replacing the endogenous variable by the first-stage predictor in the second stage, as in the conventional IV methods, the 2SRI method includes the first-stage residual as an additional regressor in the second stage. First proposed by Hausman (1978) in the linear context, this method proves to be consistent in the class of nonlinear models, for which the two-stage predictor substitution is inconsistent (see Terza et al. 2008).

To test exogeneity of the share of women with the 2SRI method, we use as instrument the average share of women among other establishments belonging to the same 2-digit industry, defined using the 88 divisions of the French nomenclature of activities (NAF). Reliance on the industry average to instrument the potentially endogenous variable is a common strategy in the economics literature (see, *e.g.*, Cassiman and Veugelers (2002) in research on R&D). The underlying idea is that after controlling for covariates, the industry average picks up the effect of industry-specific attributions uncorrelated to establishment-specific omitted factors. While the share of women in a particular establishment may influence its GE bargaining, the latter is unlikely to be related to the industry-wide average share of women, given the number of establishments in each industry. Moreover, we can reasonably expect the share of women in a given establishment to be positively correlated with the average share of women in the rest of the industry. We compute the latter share using for each period the total sample of establishments surveyed and applying the establishment weights provided to ensure the representativeness of the sample. We proceed in the same way to compute the average share of female reps among other establishments belonging to the same industry, which we will consider as an instrument for the share of female reps in the establishment.

The first-stage equation specifies the share of women (Share$_i$) as a function of exogenous variables, including those introduced in the y_i^* equation ($\mathbf{x}$) and the instrument (IndustryShare$_i$), that affects just the share of women:

$$\text{Share}_i = \mathbf{x}'_i \gamma + \theta \, \text{IndustryShare}_i + \nu_i, \tag{4}$$

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[21] Among unobserved factors of GE bargaining that may be correlated with the share of women, there is for instance the employer's sensitivity to GE issues: an employer who is very sensitive to these issues will presumably be more inclined to hire and promote women, but also to negotiate on GE.

IndustryShare$_i$ is correlated with Share$_i$ but not with the residual ε_i, so it can be excluded from the y_i^* equation. Both properties must be satisfied to ensure consistent IV estimates. A non-zero correlation between the instrument and the residual ε_i, as well as a weak correlation between IndustryShare$_i$ and Share$_i$, can induce an inconsistency in the IV estimates that exceeds the inconsistency of naive estimates. For each specification, we will check if IndustryShare$_i$ satisfies the IV strength and validity assumptions.

The second-stage equation is then specified as:

$$y_i^* = \mathbf{x}'_i \beta + \delta_1 \, \text{Share}_i + \delta_2 \, \text{Share}_i^2 + \delta_3 \, \hat{\nu}_i + \varepsilon_i, \qquad (5)$$

where $\hat{\nu}_i$ is the residual from the first-stage equation (4). Implementing a significance test on the coefficient δ_3 provides a simple and direct way to test the assumption that Share$_i$ is exogenous with respect to y_i^*. We will reject this assumption if δ_3 is significantly different from 0. This strategy allows us to address biases from unobserved heterogeneity and reverse causation.

Endogenous selection of bargaining establishments. To analyze the effect, the share of women has on the probability of signing an agreement or, failing that, of filing an action plan among establishments having started negotiations on GE, we face an additional methodological challenge: the non-random selection of the sub-sample of firms having negotiated on GE. To address biases from such endogenous selection, we use a non-parametric procedure designed to impose to this subsample of establishments the industry-size composition of the whole sample of establishments. We rely on the cell-by-cell approach suggested by Lemieux (2002), which is equivalent to the well-known reweighting method of DiNardo et al. (1996) while being more flexible. This consists first of dividing the data into a limited number J of industry-size cells, using the following dummy variables: we consider 18 industries, as defined in Table A1, and within each industry we distinguish 4 size groups (50–99, 100–199, 200–499, 500 employees and more). For each cell j, at period t, we then estimate a reweighting factor Ψ_{jt} to be used in the computation of the counterfactual sample weight ω_{jt}^c:

$$\omega_{jt}^c = \Psi_{jt} \, \omega_{jt}, \qquad (6)$$

with ω_{jt} the original sample weight of cell j at period t. The reweighting factor Ψ_{jt} is defined as:

$$\Psi_{jt} = \frac{\eta_{jt}^c}{\eta_{jt}}, \qquad (7)$$

where η_{jt} corresponds to the share of cell j in the sub-sample and η_{jt}^c is the share of the same cell. j in the whole sample, at period t. That is, the

numerator stands for the counterfactual sample share of cell j that we want to impose to be identical in the subsample. The resulting counterfactual sample weights allow to control for unobserved factors related to the industry and the size of the firm, which may affect both the decision to negotiate on GE and the decision to sign a collective agreement on this issue, and thus induce a selection bias in estimates.[22]

Results

We first analyze the extent to which a stronger female presence, both within the workforce and among employee representatives, affects the likelihood of starting negotiations on GE in the establishment, and then investigate how it can affect the likelihood that these negotiations result in a collective agreement or another bargaining outcome.

On the probability to start negotiations on GE. The influence of the gender mix. We first assess how the share of women affects the probability of negotiating on GE. Coefficient estimates for both periods are reported in Table 1. For each period, column (1) reports the coefficient on the share of women while assuming it is exogenous and has a linear effect on the probability of negotiating. Column (2) adds the quadratic form of the share of women, as in Equation 1, to possibly take into account its non-linear effect on the probability of negotiating. Column (3) reports coefficient estimates from Equation 5, including the residual from the first-stage equation 4 to address potential biases from unobserved heterogeneity and reverse causation.[23] The coefficient associated with this residual is non-significant in 2011, while it is weakly significant in 2017, implying that this specification is relevant only in 2017. Our preferred specification in 2011 is then that reported in column (2), where the significant coefficient on the quadratic term indicates that the effect of the share of women on the probability of negotiating is indeed nonlinear and so the specification reported in column (1) not relevant. Coefficient estimates from column (2) indicate that, in both periods, the share of women has

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[22] The conventional Heckman (1979) sample-selection correction procedure could not be used here in the absence of a relevant exclusion restriction that could be used in a first stage to explain the probability of negotiating on GE.

[23] In both periods, we use as instrument the industry-level share of women, which is strongly correlated with the establishment-level share of women and not correlated with the dependent variable indicating negotiations on GE, as shown in Table B1. We report at the top of this table the coefficient associated to each candidate instrument when included in the first-stage equation (see the left side) and in the second-stage equation (see the right side).

TABLE 1

The Influence of the Share of Women on the Probability of Negotiating on GE

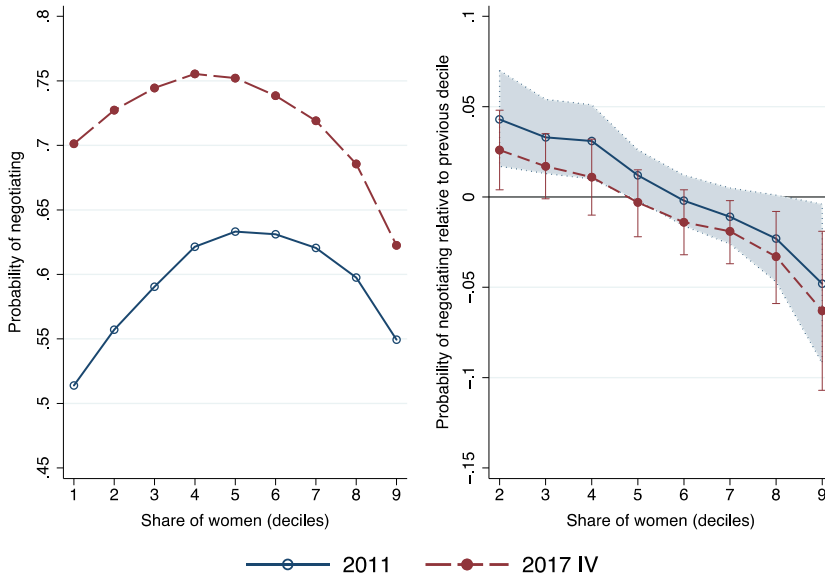|	2011 (1)	2011 (2)	2011 (3)	2017 (1)	2017 (2)	2017 (3)
Share of women	0.106 (0.249)	2.317** (0.712)	2.064*** (0.470)	−0.428 (0.270)	3.012*** (0.773)	2.650*** (0.570)
Share of women^2	–	−2.300** (0.768)	−2.456*** (0.497)	–	−3.618*** (0.782)	−3.861*** (0.636)
First-stage residual	–	–	0.571 (0.335)	–	–	0.807* (0.403)
Observations	2,562	2,562	2,562	3,199	3,199	3,199

Notes: Statistical significance: ***$p < 0.01$, **$p < 0.05$, *$p < 0.01$. Estimates weighted using establishment weights provided in the REPONSE survey. Robust standard errors and bootstrapped standard errors (200 replications) for the 2SRI estimator in columns (3) are given in parentheses. All regressions include the set of controls defined in Section Identification Strategies. Columns (3) report coefficient estimates from Equation 5, including the residual from the first-stage equation (4) to address potential biases from unobserved heterogeneity and reverse causation. To obtain estimates in columns (3), we use as instrument the industry-level share of women (without the establishment in question), which is strongly correlated with the establishment-level share of women but not correlated with the dependent variable indicating negotiations on GE, as shown in Table 3. We report at the top of Table 3 the coefficient associated to this instrument when included in the first-stage equation (see the left side) and in the second-stage equation (see the right side).

a positive effect on the probability of negotiating but the magnitude of this effect decreases when the share of women increases until eventually it becomes zero or even negative. Such nonlinearity is consistent with the descriptive evidence reported in Figure 4 (left-hand side panel) and is persistent for both periods while controlling for endogenous issues in column (3).

To better understand how this effect varies depending on the share of women in the establishment, we take again the 9 decile-thresholds of the 2017 distribution of the share of women (as defined in Figure A1) and report in Figure 6 the probabilities of negotiating predicted using these threshold values (see left-hand side panel). Overall, controlling for differences in characteristics between establishments, we find again that GE bargaining has particularly increased between 2011 and 2017 in male-dominated establishments, more than in female-dominated establishments. Interestingly, the difference in probability between the two periods decreases with the share of women: it is almost 20 pp at the 1st decile while it is less than 10 pp at the 9th decile. Otherwise, the probability of negotiating follows a similar inverted-U shape in 2011 and 2017 depending on the share of women. It increases with the share of women when they are poorly represented and decreases above a certain threshold when women are (highly) overrepresented in the workforce, while it does not vary significantly between these two extreme cases. Due to the higher probability increase in the lower part of the distribution, the 2017 curve is flatter in this area than the 2011 curve. In contrast, the 2017 curve is steeper than that

Notes: Estimates weighted using establishment weights provided in the REPONSE survey. Decile threshold values on the x-axis correspond to the following percentages: 1: 10.1%, 2: 18%, 3: 25.9%, 4: 37.2%, 5: 47.4%, 6: 56.5%, 7: 64%, 8: 72.8%, 9: 84.3%. "IV" estimates refer to estimates obtained using the 2SRI estimator. IV estimates are preferred to probit estimates in 2017 given the non-zero coefficient on the first-stage residual in Table 1. All regressions include the set of controls defined in Section Identification Strategies.

of 2011 in the upper part of the distribution. In the right-hand side panel, we report changes in probability resulting from the transition from one decile-threshold to another and the corresponding 95% confidence intervals. The latter clearly indicate whether changes in probability are significantly different from 0 in the overall population of the establishments of interest, depending on whether they include or not zero. In 2011 transitions up to the 4th decile-threshold are each associated with an increase in the probability of negotiating —up to 5 pp—while in 2017 only the transition from the 1st to the 2nd decile induces a significant increase in the probability of negotiating—with half the magnitude of 2011. Thus, increasing the share of women in male-dominated establishments was more decisive for GE bargaining in 2011 than in 2017. On the other side of the distribution, the probability of negotiating in 2017 starts

to decline from a lower share of women and with greater magnitude than in 2011.[24]

We investigate in Figure 7 whether the larger decline in the top of the distribution in 2017 can be attributed to the use of industry-level agreements. Given the numerous legislative changes that occurred over this period, we can suspect that some establishments have chosen to apply an industry-level agreement, instead of negotiating locally, because of uncertainty about the right level of collective bargaining to be in compliance with the law. This behavior is likely to be more prominent in highly feminized establishments, because they operate in industries where firm-level bargaining is traditionally less established and industry-level bargaining on GE has particularly increased between the two periods (see Figure B2 in Appendix S2). To capture this possible behavior, we analyze how the effect of the share of women varies depending on whether the establishment is covered by an industry-level agreement or not, by interacting in the previous regression the share of women and the dummy variable indicating the coverage by an industry-level agreement. Figure 7 reports the predicted probabilities of negotiating at the different deciles of the share of women among industry-level covered establishments (right-hand side panel) and uncovered establishments (left-hand side panel). These estimates are in line with our guess that highly feminized establishments have been more likely to apply an industry-level agreement on GE instead of negotiating a local agreement, given the larger decline for highly feminized establishments covered by an industry agreement. However, this specific behavior of highly feminized establishments does not explain totally their lower probability of negotiating in 2017, given the decrease also found in non-covered establishments. Therefore, this decrease can also be partly attributed to the gender composition of the workforce. This finding is in line with the overrepresentation of feminized sectors, such as human health and social action or trading, among the firms that were sanctioned between 2013 and 2016 for non-compliance with the law (Pochic et al. 2019).

The literature provides different explanations for both the increase in the lower part and the decrease in the upper part of the distribution. These explanations are linked either to the overall share of women in the workforce or to the share of female reps. Indeed, the increased interest for women's issues at the bargaining table may be just linked to their increasing share in the workforce—*that is*, the share of women in the workforce is now large enough for their working conditions to be discussed—or may also result from their greater

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[24] Transitions from the 6th decile-threshold are each associated to a decrease in the probability of negotiating in 2017, while only the transition from the 8th to the 9th decile-threshold is associated to a significant decrease in the probability of negotiating in 2011.

FIGURE 7
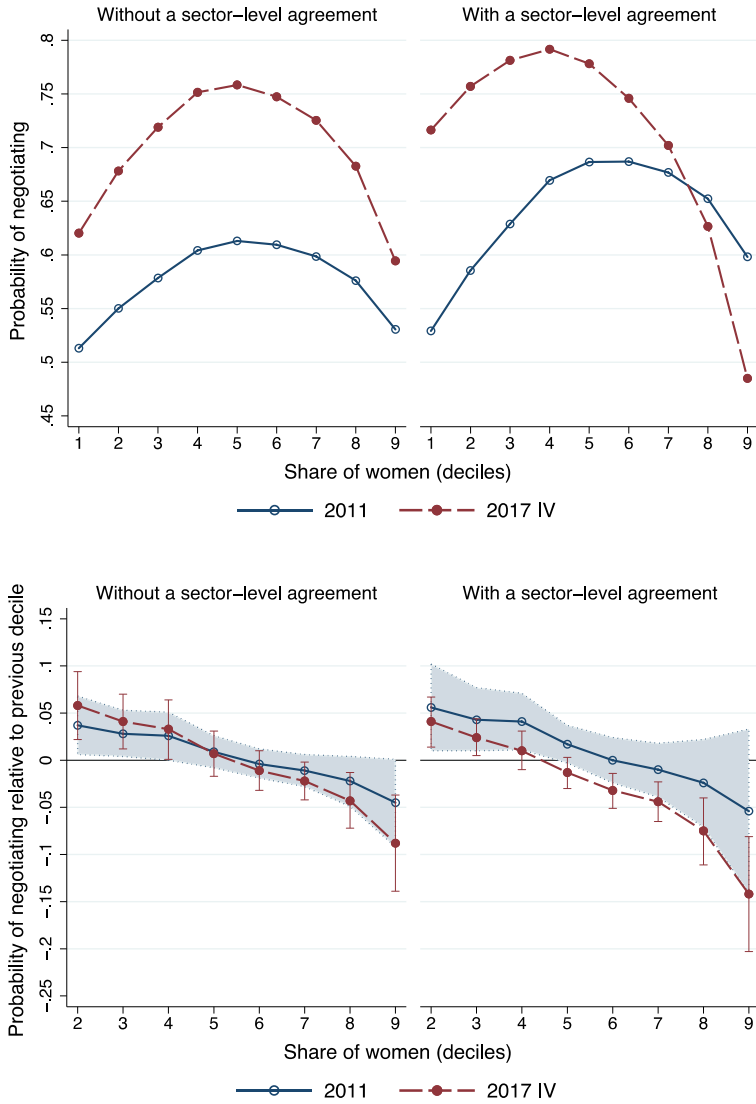
Notes: Estimates weighted using establishment weights provided in the REPONSE survey. "IV"
estimates refer to estimates obtained using the 2SRI estimator. IV estimates are preferred to
probit estimates in 2017 given the non-zero coefficient on the first-stage residual in Table 1.
All regressions include the set of controls defined in Section Identification Strategies.

influence at the bargaining table through their greater representation among employee representatives. The decline in GE bargaining above a certain share of women may come from a reduced interest for equal opportunities between men and women when the latter are largely overrepresented in the workforce. This is consistent with what Pochic et al. (2019) observe in firms from feminized industries, which often fail to perceive the stakes of GE bargaining. This decline may also be linked to the lower propensity to negotiate of women (see Exley et al. 2020), who are likely to be the majority among employee representatives. To disentangle this specific role of female reps from the overall influence of a greater female presence in the workforce, we then investigate the effect of the share of female reps on the likelihood to initiate negotiations on GE.

The role of female representatives. We report in Figure 8 (left-hand side panel) the predicted probabilities of negotiating on GE at the different thresholds of the 2017 distribution of the share of female reps, as defined in Section Descriptive Analysis. These are predicted using estimations of equation (1) when replacing the share of women by the share of female reps (coefficient estimates are reported in Table B1 in Appendix S2).[25] The probability of negotiating follows an inverted-U shape depending on the share of female reps especially in 2017, the curve being rather flat in 2011. It is increasing between 0% and 33% of female reps, remaining constant up to 50% of female reps and then decreasing to reach its minimum for 100% of female reps. In the right-hand side panel of Figure 8, we report changes in probability resulting from the transition from one threshold to another as well as the corresponding 95% confidence intervals. The latter confirm the flat curve in 2011, as all include zero, while they support in 2017 the increasing probability in the first third and the decreasing probability in the second half of the distribution. While the 2017 curve mimics the curve obtained for the share of women over the same period, the 2011 curve does not replicate the increase in probability found on the first decile-thresholds of the share of women (see Figure 6). This suggests that the increased interest for women's issues at the bargaining table along the share of women is not specifically due to the influence of female reps. While existing literature has focused on the role of female negotiators in collective bargaining outcomes, we show that the weight of women in the workforce is already affecting the start of negotiations on GE.

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[25] Predictions and marginal changes plotted in Figure 8 are those corresponding to columns (2) in Table B1 in Appendix S2, as the specification used in columns (3) turns out to be not relevant without significant effect of the first-stage residual.

FIGURE 8

THE INFLUENCE OF THE SHARE OF FEMALE REPS ON THE PROBABILITY OF NEGOTIATING ON GE.
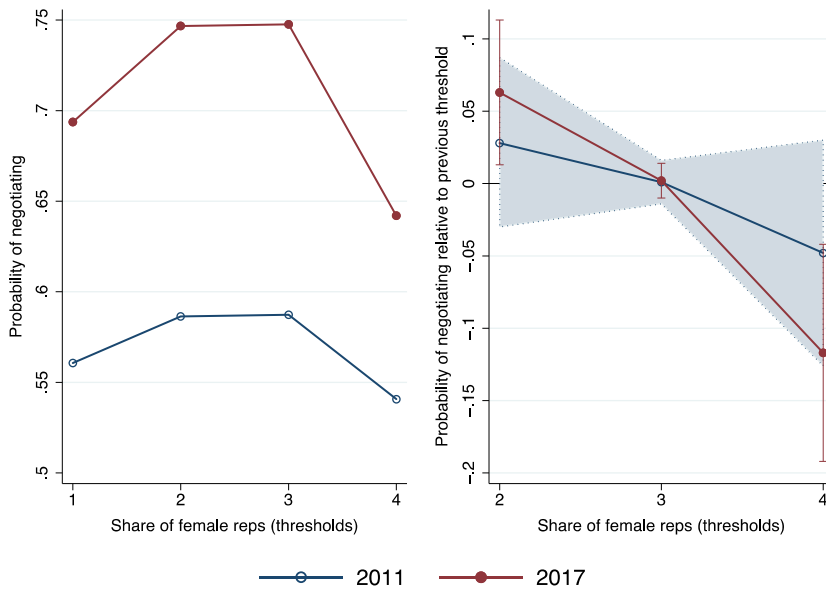
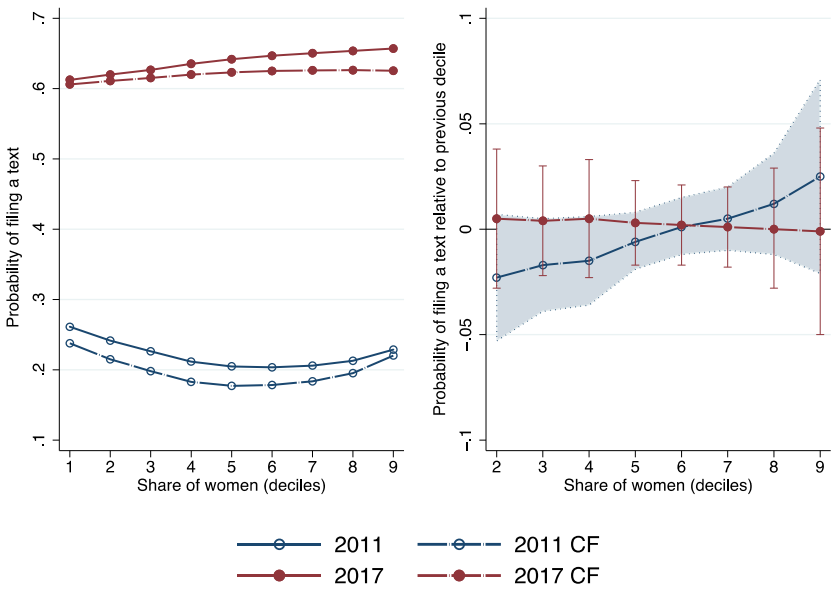*Notes*: Estimates weighted using establishment weights provided in the REPONSE survey. Threshold values on the x-axis correspond to the following percentages: 1: 0%, 2: 33%, 3: 50%, 4: 100%. All regressions include the set of controls defined in Section Identification Strategies.

On the outcome of negotiations on GE. Once negotiations on GE have been initiated, do women play a role in the outcome of these negotiations? Do they facilitate the signing of an agreement on this issue? To answer that, we analyze in this section how variations in the total share of women in bargaining establishments affect the probability of reaching a text on gender equality, which can either be an agreement or an action plan. This distinction only makes sense in 2017, after the action plan has been legally defined as an alternative to the agreement for establishments to comply with the law. As 2011 precedes the law, texts on GE over the corresponding period include almost exclusively agreements.

The influence of the gender mix. We first assess how the share of women affects the probability of filing a text on GE—agreements and action plans combined. We report in Figure 9 the predicted probabilities of filing a text for the different deciles of the share of women (see left-hand side panel), as well as changes

FIGURE 9

The Influence of the Share of Women on the Probability of Filing a Text on GE.

Notes: Estimates weighted using establishment weights provided in the REPONSE survey. Decile threshold values on the x-axis correspond to the following percentages: 1: 10.1%, 2: 18%, 3: 25.9%, 4: 37.2%, 5: 47.4%, 6: 56.5%, 7: 64%, 8: 72.8%, 9: 84.3%. IV estimates refer to estimates obtained using the 2SRI estimator. IV estimates are preferred to standard probit estimates given the non-zero coefficient on the first-stage residual in Table B2 in Appendix S2. "CF" means that counterfactual weights were applied to control for selection into the sample of establishments negotiating on GE. All regressions include the set of controls defined in Section Identification Strategies.

in probability resulting from the transition from one threshold to another and the corresponding 95% confidence intervals (see right-hand side panel).[26] The latter

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[26] Predicted and marginal changes plotted in Figure 9 correspond to the coefficient estimates reported in Table B2 in the Appendix S2. The specifications plotted in Figure 9 are those reported in column (2) for both periods. With the counterfactual weights, the 2SRI estimator is not relevant in 2017 given the non-significant coefficient on the first-stage residual. For 2011, we report only coefficients estimated using OLS because the industry share of women seemingly is not a valid instrument on this period, according to Table B1. We obtain similar coefficients when using the lagged share of women—not correlated with the probability of filing a text—as an alternative instrument for the share of women. These additional results are available upon request from the authors.

clearly always include 0, indicating that none of the changes in probability is significantly different from 0. As a consequence, the share of women does not affect the probability of filing a text on GE, once negotiations on this issue have been engaged, in both periods.

This overall zero effect may hide in 2017 different effects of the share of women depending on the type of text considered. We then investigate how variations in the share of women affect the probability of signing an agreement on the one hand, and the probability of filing an action plan on the other hand. These two outcomes are analyzed jointly with respect to the no-text bargaining situation using the multinomial probit model described in Section Identification Strategies.
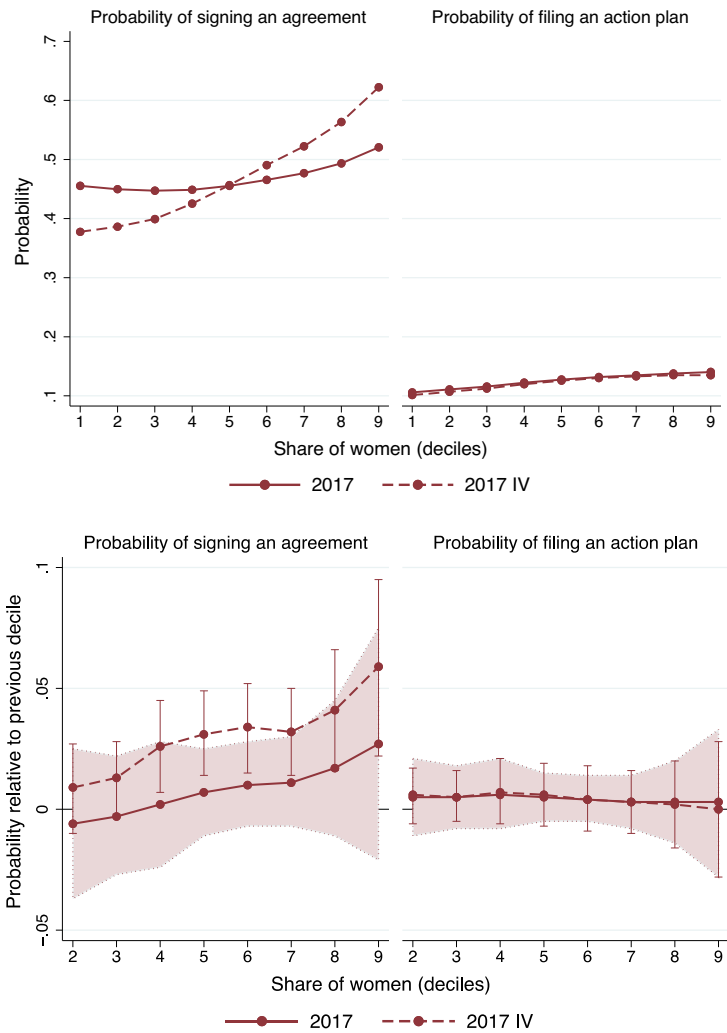
We report in Figure 10 the predicted probabilities of signing an agreement and filing an action plan at the different thresholds of the 2017 distribution of the share of women (see upper panel), as well as changes in probability from one threshold to another (see lower panel). These probabilities are predicted using estimations of equation (5) with a multinomial probit model, whose coefficient estimates are reported in Table B3 in Appendix S2. The marginal increases in the probability of signing an agreement across the thresholds of the share of women are almost all significant, except between the first two thresholds. In addition, the positive effect associated to a change in the share of women is increasing with the share of women: between the 8th and the 9th threshold, the probability increases by more than 5 pp while the increase is half between the 3rd and the 4th threshold. Therefore, among the establishments that have negotiated on GE, the likelihood that an agreement being signed is higher when women occupy a larger share of the workforce. This suggests that employer and employee representatives have more incentive to reach an agreement on this topic in more feminized establishments, possibly because of the higher stake of the agreement in these establishments. However, there is no significant variation in the probability of filing an action plan all along the distribution of the share of women. This outcome seemingly is orthogonal with the share of women in the establishment.

We investigate in the next section whether and to what extent the share of female reps plays a similar role in signing a GE agreement and whether it plays a more decisive role in the filing of an action plan.

Role of the share of female reps. As for the share of women, we find that the share of female reps does not affect the probability of filing a text on GE, once negotiations on this issue have been engaged, in both periods (see Table B4 and Figure B1 in Appendix S2). We then investigate how variations in the share of female reps affects the probability of signing an agreement on the one hand, and the probability of filing an action plan on the other hand. Coefficient

FIGURE 10

The Influence of the Share of Women on the Probability of Signing an Agreement/Filing an Action Plan on GE (Multinomial Probit).

Notes: Estimates weighted using establishment weights provided in the REPONSE survey. Decile threshold values on the x-axis correspond to the following percentages: 1: 10.1%, 2: 18%, 3: 25.9%, 4: 37.2%, 5: 47.4%, 6: 56.5%, 7: 64%, 8: 72.8%, 9: 84.3%. IV estimates refer to estimates obtained using the 2SRI estimator. IV estimates are preferred to standard probit estimates given the non-zero coefficient on the first-stage residual in Table B3 in Appendix S2. All regressions include the set of controls defined in Section Identification Strategies.

FIGURE 11

The Influence of the Share of Female Reps on the Probability of Signing an Agreement/
Filing an Action Plan on GE (Multinomial Probit).
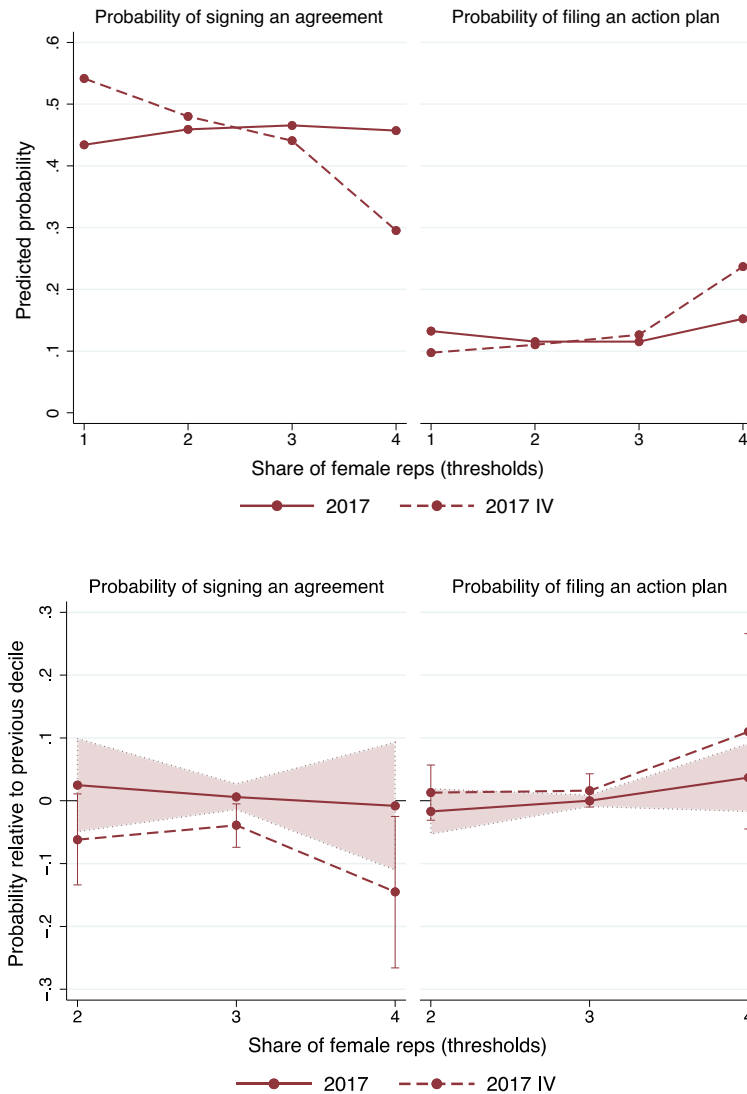
Notes: Estimates weighted using establishment weights provided in the REPONSE survey. Threshold values on the x-axis correspond to the following percentages: 1: 0%, 2: 33%, 3: 50%, 4: 100%. IV estimates refer to estimates obtained using the 2SRI estimator. All regressions include the set of controls defined in Section Identification Strategies.

estimates are reported in Table B5 in Appendix S2. As previously, we focus on the predicted probabilities and corresponding marginal changes derived from these estimates, here reported in Figure 11, that allow us to better capture the non-linear effect of the share of female reps on the outcome of negotiations on GE in 2017. When using the IV specification[27], the probability of signing an agreement declines when passing from one threshold to another (see left-hand side panel) while the probability of filing an action plan shows an increase (see right-hand side panel). The changes in probability and the corresponding 95% confidence intervals reported in the lower part of Figure 11 indicate that only the decrease in the probability of signing an agreement is significantly different from 0. Specifically, when the share of female reps goes from 50% to 100%, the probability of signing an agreement decreases by about 15 pp. There is also a significant decrease in that probability when the share of female reps goes from 33% to 50%, but it is smaller in magnitude (about 6 pp).

To sum up, the place of women at the bargaining table has had in recent times an impact on the outcome of firm-level negotiations on GE, which was not the case over 2008–2010, before the recent reforms on GE bargaining. Surprisingly, more women at the bargaining table reduces the likelihood that negotiations on GE lead to an agreement, while a more feminized workforce has a rather positive influence. This does not necessarily imply that a strong female presence at the bargaining table undermines the success of negotiations on GE. Indeed, beyond signing an agreement, the success of negotiations on GE is also assessed by the quality of the agreement, *that is*, the thickness of gender inequality reduction targets and actions defined to achieve them. The signing of an agreement could be less likely in very feminized bargaining environments, because the demands of the employee representatives for the reduction of gender inequalities are more ambitious and less likely to get employer approval. Thus, agreements in these environments would be less frequent but more effective in addressing inequalities, an interesting hypothesis to test but which is outside the scope of this paper.

Conclusion

We analyze the influence of the gender mix in initiating collective bargaining on gender equality (GE) in French establishments and, once initiated, how it affects the outcome of these negotiations. Using administrative and survey data for a representative sample of French establishments over two recent

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[27] The IV specification reported in column (3) in Table B5 in the Appendix S2 is our preferred specification to analyze the probability of signing an agreement.

periods (2008–2010 and 2014–2016), we show that contexts of gender diversity in the workforce are those that are the most favorable to initiate collective bargaining on GE in both periods. We indeed find that the probability of negotiating increases with the share of women when they are poorly represented and ends up decreasing when women become (strongly) overrepresented in the workforce. This non-linear effect is an original result compared with existing evidence in the literature, which describes a single positive effect or no effect. In addition, while existing studies link the bargaining outcome to the gender of negotiators, we show that the gender composition of the workforce plays a role in initiating negotiations which is independent to that associated to the gender composition of employee representatives.

While there has been a general increase in GE bargaining between the two periods, due to financial penalties against firms not complying with the obligation to negotiate, the increase has been relatively more pronounced in male-dominated establishments and almost zero in highly feminized establishments. We show that the situation of the latter can be partly explained by the application of industry-level agreements instead of negotiating a local agreement, given temporary uncertainty on the right bargaining level to comply with law. Indeed, between 2014 and 2016, the law has modified each year the parameters of the French model of negotiated equality. This contributed to the disorientation of the actors and pushed some of them to postpone their negotiations.

When negotiations are undertaken, the likelihood of them leading to an agreement has increased overall with the introduction of financial penalties. In addition, we show that an agreement on GE is more likely to be reached in more feminized establishments, an original result in a literature rather focused on the gender of negotiators. Conversely, we show that the chances of reaching an agreement are significantly lower in highly feminized bargaining environments, a finding that does not echo with those in the literature.

This last finding leaves open the question of the role of women in the success of negotiations on GE. Indeed, it would be inappropriate to conclude that a greater female presence at the bargaining table undermines the success of negotiations on GE if it reduces the likelihood that an unambitious agreement will be signed in the fight against gender inequalities. Assessing the quality of collective agreements is particularly timely in the field of GE, where agreements are often suspected to be "empty shells." It is therefore a major challenge for the future to better understand the role of women in GE bargaining.

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APPENDIX A

Descriptive Statistics

FIGURE A1

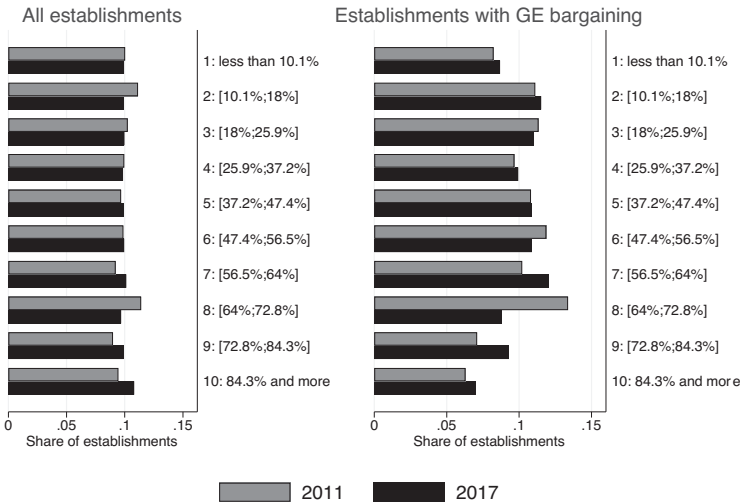SAMPLE DISTRIBUTIONS ACROSS DECILE THRESHOLDS OF THE SHARE OF WOMEN

FIGURE A2

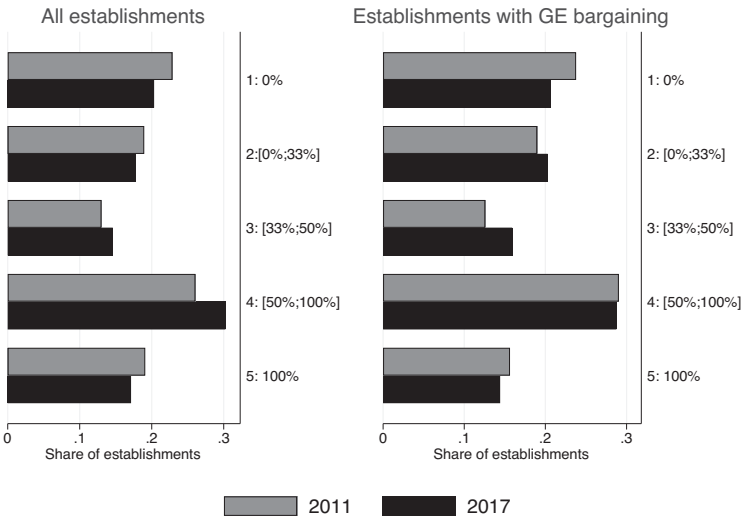SAMPLE DISTRIBUTIONS ACROSS THRESHOLDS OF THE SHARE OF FEMALE REPS

TABLE A1

Explanatory Variables: Means and Frequencies

Variables	REPONSE 2011	REPONSE 2017
Total share of women	0.454	0.466
Share of female employee representatives	0.434	0.446
Presence of union representatives	0.780	0.747
Belonging to a group	0.578	0.645
Publicly traded	0.044	0.272
Legal category		
1. Simplified joint-stock companies	0.000	0.000
2. Other commercial companies	0.749	0.771
3. Public companies	0.035	0.014
4. Private law groupings (*e.g.*, associations)	0.186	0.181
5. Other organizations	0.030	0.034
Firm size		
50−99 employees	0.226	0.204
100−199 employees	0.161	0.166
200−499 employees	0.170	0.146
500 employees and more	0.444	0.485
Industry*		
B – Extractive industries	0.006	0.002
C – Manufacturing	0.142	0.125
D – Electricity, gaz, steam, aircon	0.011	0.008
E – Water production and distribution	0.013	0.015
F – Construction	0.050	0.059
G – Trading	0.219	0.213
H – Transport and storage	0.095	0.077
I – Accommodation and catering	0.047	0.047
J – Information and communication	0.028	0.038
K – Finance and insurance	0.054	0.046
L – Real estate activities	0.008	0.022
M – Specialized, scientific and technical activities	0.054	0.068
N – Administrative and support services	0.051	0.048
P – Teaching	0.029	0.027
Q – Human health and social action	0.156	0.182
R – Arts, entertainment and recreation	0.006	0.007
S – Other services	0.020	0.014
U – Extra-territorial activities	0.120	0.000
Observations	2,753	3,361

Note: Figures are obtained using establishments weights provided in the REPONSE survey.
*Sections from the French nomenclature of activities (NAF).

Additional Estimates

TABLE B1

INSTRUMENT STRENGTH AND VALIDITY FOR THE SHARE OF WOMEN

	First stage		Second stage	
	2011 (1)	2017 (2)	2011 (3)	2017 (4)
Dependent variable:	*Share of women*		*Negotiating on GE*	
Industry share of women	0.817***	0.834***	−0.467	−0.673
	(0.038)	(0.039)	(0.406)	(0.492)
Observations	2,562	3,199	2,562	3,199
Weights	Standard	Standard	Standard	Standard
Dependent variable:	*Share of women*		*Filing a text on GE*	
Industry share of women	0.807***	0.796***	−1.420**	0.850
	(0.041)	(0.040)	(0.530)	(0.460)
Observations	1,684	2,580	1,684	2,580
Weights	Standard	Standard	Standard	Standard
Dependent variable:	*Share of women*		*Filing a text on GE*	
Industry share of women	0.792***	0.772**	−1.327*	0.602*
	(0.042)	(0.045)	(0.521)	(0.476)
Observations	1,684	2,574	1,684	2,574
Weights	CF	CF	CF	CF
Dependent variable:	*Share of women*		*Signing an agreement on GE*	
Industry share of women	–	0.796***	–	0.936*
		(0.040)		(0.452)
Observations		2,580		2,580
Weights	Standard	Standard	Standard	Standard
Dependent variable:	*Share of women*		*Signing an agreement on GE*	
Industry share of women	–	0.772***	–	0.628
		(0.045)		(0.452)
Observations		2,574		2,574
Weights	CF	CF	CF	CF
Dependent variable:	*Share of women*		*Filing an action plan on GE*	
Industry share of women	–	0.796***	–	0.053
		(0.040)		(0.675)
Observations		2,580		2,580
Weights	Standard	Standard	Standard	Standard
Dependent variable:	*Share of women*		*Filing an action plan on GE*	
Industry share of women	–	0.772***	–	0.324
		(0.045)		(0.678)

TABLE B1 (Continued)

	First stage		Second stage	
	2011	2017	2011	2017
	(1)	(2)	(3)	(4)
Observations		2,574		2,574
Weights	CF	CF	CF	CF

Notes: Statistical significance: ***$p < 0.01$, **$p < 0.05$, *$p < 0.01$. Estimates weighted using establishment weights provided in the REPONSE survey. Robust standard errors are given in parentheses. All regressions include the set of controls defined in Section Identification Strategies. "Standard" means that estimates are weighted using establishment weights provided in the REPONSE survey, while "CF" means that counterfactual weights are applied to control for selection into the sample of establishments negotiating on GE (see subsection Endogenous selection of bargaining establishments in Section Identification Strategies for details).

TABLE B2

Instrument Strength and Validity for the Share of Female Reps

	First stage		Second stage	
	(1)	(2)	(3)	(4)
	2011	2017	2011	2017
Dependent variable:	*Share of female reps*		*Negotiating on GE*	
Industry share of female reps	0.676***	0.694***	−0.483	0.075
	(0.090)	(0.100)	(0.398)	(0.419)
Observations	2,417	3,048	2,417	3,048
Weights	Standard	Standard	Standard	Standard
Dependent variable:	*Share of female reps*		*Filing a text on GE*	
Industry share of female reps	0.832***	0.755***	−0.789	−0.393
	(0.107)	(0.111)	(0.533)	(0.440)
Observations	1,596	2,473	1,596	2,473
Weights	Standard	Standard	Standard	Standard
Dependent variable:	*Share of female reps*		*Filing a text on GE*	
Industry share of female reps	0.814***	0.698***	−0.643	−0.268
	(0.111)	(0.112)	(0.520)	(0.454)
Observations	1,596	2,467	1,596	2,467
Weights	CF	CF	CF	CF
Dependent variable:	*Share of female reps*		*Signing an agreement on GE*	
Industry share of female reps	–	0.755***	–	−0.616
		(0.111)		(0.467)
Observations		2,473		2,473
Weights		Standard		Standard
Dependent variable:	*Share of female reps*		*Signing an agreement on GE*	
Industry share of female reps	–	0.698***	–	−0.618
		(0.112)		(0.462)

TABLE B2 (Continued)

	First stage		Second stage	
	(1) 2011	(2) 2017	(3) 2011	(4) 2017
Observations		2,467		2,467
Weights		CF		CF
Dependent variable:	*Share of female reps*		*Filing an action plan on GE*	
Industry share of female reps	–	0.755*** (0.111)	–	0.533 (0.599)
Observations		2,473		2,473
Weights		Standard		Standard
Dependent variable:	*Share of female reps*		*Filing an action plan on GE*	
Industry share of female reps	–	0.698*** (0.112)	–	0.922 (0.629)
Observations		2,467		2,467
Weights		CF		CF

Notes: Statistical significance: ***$p < 0.01$, **$p < 0.05$, *$p < 0.01$. Estimates weighted using establishment weights provided in the REPONSE survey. Robust standard errors are given in parentheses. All regressions include the set of controls defined in Section Identification Strategies. "Standard" means that estimates are weighted using establishment weights provided in the REPONSE survey, while "CF" means that counterfactual weights are applied to control for selection into the sample of establishments negotiating on GE (see subsection Endogenous selection of bargaining establishments in Section Identification Strategies for details).

Supporting Information

Additional Supporting Information may be found in the online version of this article:

Appendix S1. Descriptive statistics.
Figure A1. Kernel density estimate of the share of female reps.
Figure A2. Distribution of deciles of the share of women depending on the coverage by an industry-level agreement on GE.
Appendix S2. Estimates.
Table B1. The influence of the share of female reps on the probability of negotiating on GE.
Table B2. The influence of the share of women on the probability of filing a text on GE.
Table B3. The influence of the share of women on the probability of signing an agreement/filing action plan on GE (multinomial probit).
Table B4. The influence of the share of female reps on the probability of filing a text on GE.

Table B5. The influence of the share of female reps on the probability of signing an agreement/filing action plan on GE (multinomial probit).

Figure B1. The influence of the share of female reps on the probability of filing a text on GE.