Collective Bargaining for Women:
How Unions Can Create Female-Friendly Jobs

Viola Corradini   Lorenzo Lagos   Garima Sharma[*]

September 8, 2024

Abstract

Why aren't workplaces better designed for women? We study the role of unions in improving workplaces for women. Starting in 2015, Brazil's largest trade union federation made women central to its agenda. Using a difference-in-differences design that leverages variation in unions' affiliation to this federation, we find that "bargaining for women" increased female-friendly amenities in collective bargaining agreements, which were then reflected in practice. These changes led women to queue for jobs at treated establishments and separate from them less—both revealed preference measures of firm value. We find no evidence that these gains came at the expense of workers' wages, employment, or firm profits. Instead, better amenities raised worker productivity by reducing turnover and absenteeism. Larger improvements occurred where women were initially a lower share of workers or union leaders. Our findings show that shifting union priorities towards women improved workplaces without meaningful tradeoffs and instead benefited both workers and employers. They illustrate the potential for unions to improve workplace quality by focusing on the needs of less represented workers.

Key words: gender gap; amenities; collective bargaining; unions
JEL Codes: J31, J33, J51, J52

Despite significant labor market progress over the past several decades, women continue to disproportionately suffer large earnings losses because they are in charge at home (Kleven et al., 2019). Across 142 countries, over 30% of working women cite having to balance family and work as their main challenge (ILO and Gallup Inc., 2017). While governments and scholars alike have argued that making workplaces more female-friendly is key to reducing gender disparities in the labor market—for instance, Goldin (2014) argues that changing the structure of jobs may cause all remaining gender earnings gaps to disappear—little is known about how this change might materialize, nor its consequences for workers and employers.

This paper studies the role of unions in making workplaces female-friendly. Given that unions negotiate pay and benefits on behalf of over 17% of workers worldwide, one might naturally expect them to be effective agents of change (Visser, 2019). We therefore ask and answer two questions. First, can unions improve workplaces for women by shifting advocacy towards them? Simply shifting the union's priorities does not guarantee that workplaces will change. Employers might never agree to change, or, even if they do agree, they might only provide amenities at the expense of wages or employment. Our second question is thus: how are female-friendly amenities paid for? Answering these questions has proven difficult due to both a lack of exogenous variation in union advocacy and because workplace amenities are seldom observed. Absent variation in advocacy, observed expansions of female-friendly amenities might simply reflect changes to an establishment's labor supply (which could impact amenities independently of union actions), or to labor demand (which could affect worker outcomes independently of amenities). Without data on amenities, expansions of female-friendly amenities may never even be observed.

To overcome these challenges, we study a natural experiment in Brazil that led its largest trade union federation (or "union central"), the *Central Única dos Trabalhadores* (CUT), to prioritize women's needs in collective bargaining.[1] Starting in 2015, the CUT adopted a new platform to advance female-friendly amenities in collective bargaining, including six months of paid maternity leave, flexible work schedules, and childcare. It also amplified women's voices in the union in several ways—most notably, by reserving 50% of seats in its state and national level executive bodies for women. Because unions seldom change affiliation to their union central, and neither workers nor establishments choose their union, the reform represents a top-down shift in union priorities towards women that is unrelated to changes in an establishment's labor demand or labor supply. This motivates using a difference-in-differences design to compare amenities and associated costs at establishments negotiating with CUT-affiliated unions to non-CUT affiliates. The two sets of establishments closely resembled each other in baseline characteristics; together they employed over 19% of formal workers in Brazil, or 11.5 million workers across 80,000 establishments.

Unique to the Brazilian setting, our analysis relies on linking three rich sources of data: (i) establishment-level amenities from the text of all collective bargaining agreements (CBAs), (ii) worker outcomes from linked employer-employee records covering the universe of formal workers in

---

[1] Union centrals are umbrella organizations that coordinate priorities among local unions. Over half of all formal workers in Brazil are covered by collective bargaining and 20% of unions affiliate with CUT.

Brazil (RAIS), and (iii) union affiliation and leadership covering all unions. CBAs offer high quality information on 137 different types of amenities offered by establishments, including maternity leave, workplace safety, absences, and work hours. The administrative data track workers over time and report their gender, wages, and instances of maternity leave.

We begin by using a revealed preference approach to identify which amenities are valued by women and which by men, relying on the idea that workers gravitate to employers with better working conditions. Employer-to-employer moves thus reveal valuable firms (Sorkin, 2018; Morchio and Moser, 2020), and correlating these values with CBA clauses reveals valuable amenities. We find that women value amenities that enable balancing work and home, including maternity protections, childcare payments, absences, and workday reductions ("female-centric" amenities). In contrast, men value higher pay and safety, such as clauses governing profit sharing, hazard pay, life-insurance, and safety equipment ("male-centric" amenities). In an out-of-sample sense check, we find that female amenities increase—and male amenities decline—with the share of women in an establishment's workforce, providing the first clue that representation could influence amenities.

Our main empirical analysis studies the causal effect of prioritizing women in collective bargaining on female and male-centric amenities, and its downstream effects on workers and employers.

Our first main result is that female-centric amenities improved on paper and in practice. On paper, we find that the CUT reform increased female-centric amenities by 19%. This constitutes a large improvement, equivalent to moving from the average baseline amenity count at a minority female establishment to one where over 80% of workers were originally women. Provisions governing leaves and childcare accounted for a majority of the increase, suggesting that the reform especially spurred benefits for women of childbearing age.

Amenities on paper translated into practice. Drawing on the text of collective bargaining agreements, we identify three dimensions of the workplace that they could affect: the duration of paid maternity leave (corresponding with leave extension clauses), job protection after maternity (job protection clauses), and the share of women among managers (equal opportunity clauses). Our evidence shows improvements on all three measures: the share of women taking extended maternity leaves grew 14% with corresponding gains in job protection, and women among managers grew 2%.

We next examine where unions achieved the greatest improvements in female-friendly amenities. A union voice model would predict larger increases in workplaces where women initially lacked voice, either as a minority among workers or within union leadership. In contrast, a model where employers only provide amenities when their provision is cheap would mainly predict increases in minority female workplaces, regardless of women's representation in the union. Our evidence supports the voice hypothesis and contrasts with empty promises. Examining heterogeneity by the baseline female share of workers and union leaders, we find that female-friendly amenities saw the largest increase where women comprised a low share of workers or union leaders. Strikingly, the positive impact on amenities declined monotonically with the baseline female share of employment. However, contrary to the notion of empty promises, amenities also improved significantly in workplaces with many female workers who lacked union representation.

Our second main result is that women valued the changes to the work environment ushered by the CUT reform, which rules out a purely compensating differences explanation for better amenities. Women were less likely to separate from and more likely to queue for jobs at treated establishments, both of which are revealed preference measures of firm value (Krueger and Summers, 1988; Holzer et al., 1991). Retention among women increased by 1.8pp. While we do not directly observe job queues, we proxy for them using probationary contracts that are commonly used by employers to screen applicants. The share of women among probationary workers grew 10%. These findings show that female-friendly amenities attracted women to CUT-affiliated employers.[2]

How was the union-driven improvement in female-friendly amenities paid for? There exist three possible explanations. First, better amenities could come at the expense of workers if employers offset their costs by reducing wages or employment. Second, better amenities could also prompt tradeoffs for employers by reducing the firm's profits. Finally, better amenities could increase the surplus present within the employment relationship, by raising worker productivity or satisfaction, or by allowing employers to attract and retain higher quality workers.

Our third main result is that female-friendly amenities improved without observed tradeoffs for workers or employers. Instead, better amenities raised worker productivity.

There is no decline in wages or employment. Compensating differences would predict that women's wages should disproportionately decline to finance the improvement in female-friendly amenities (Rosen, 1986). Alternatively, both men and women's wages could decline. However, we detect no impact on the earnings of either new or incumbent workers, male or female, and have the power to rule out small changes.[3] Given no decline in workers' wages, employers may instead employ fewer or relatively inexpensive workers, such as men or older women. However, we find no statistically significant impact on either employment or worker composition and are able to rule out small changes with a high level of confidence.[4] If anything, the growing appeal of CUT-affiliated employers meant that the share of women among workers increased slightly at treated establishments. Finally, there is no evidence that male amenities decline. Retention among men increases slightly, suggesting that they valued the changes to the work environment inspired by the CUT reform. Together these findings show that prioritizing women in collective bargaining improved the work environment for women without yielding tradeoffs for workers.

If workers did not pay for the new amenities, perhaps firms did so through lower profits. Both the empirical evidence and theoretical reasons point against this explanation. Empirically, there is no treatment effect on establishment exit, which is an important margin of adjustment in Brazil, where 8.7% of control establishments exited within two years of the reform. For the subsample of establishments that report profits to Orbis, there is no decline in measured profits. Theoretically, the CUT reform shifted union priorities rather than increasing the bargaining power of CUT-

---

[2]Retention improves alongside the reform's impact on amenities (attenuates with an establishment's baseline female share of workers or union leaders).

[3]We rule out wage declines exceeding 1.3% with 95% confidence. By way of benchmark, workers value leave clauses, many of which are classified as female-friendly, at 7.3% of their wage (Lagos, 2024).

[4]We reject a decline in employment exceeding 1.6% with 95% confidence.

affiliated unions. CUT unions were thus not positioned to capture a larger share of surplus from employers.[5] Indeed, while greater bargaining power for the union generally predicts changes in employment, we find a precisely estimated zero effect.[6]

The finding that the CUT reform improved female-friendly amenities without reducing wages, employment, or firm profits suggests a third possibility: that better amenities raised worker productivity. To investigate this channel, we identify two measures of workers' effective productivity that are observed in the data: retention and absenteeism. We find positive effects on both. A simple calculation reveals that women's higher retention alone would cover the cost of the most expensive female-friendly amenity advocated by the CUT, namely maternity leave extensions. Retention especially increased for more highly educated workers (those with high school degrees), suggesting potentially even greater cost savings than indicated by the simple estimate. While the average establishment in our sample lost 5% of workdays to absenteeism at baseline, the reform reduced absences by 0.19pp (or 4.5%).[7] Finally, within-firm spillovers present perhaps the clearest evidence that employers benefited from enhancing their amenities for women. Multi-establishment firms exposed to the reform were significantly more likely to expand amenities to other establishments negotiating with non-CUT unions, with magnitudes resembling the reform's direct effect on amenities.

Together, our findings show that prioritizing women in collective bargaining increased the provision of valuable amenities for women, that it did so without imposing costs on workers or employers, and instead raised workers' effective productivity. This suggests that Brazilian employers were originally inside their frontier provision of female-friendly amenities. The reform brought them closer to the frontier, and, in so doing, unions successfully improved working conditions for nearly 2.5 million workers across Brazil, especially those who had most lacked representation to begin with.[8] Below we explore potential reasons why firms were operating inside the frontier.

However, before delving into these reasons, we ask a final policy-relevant question: how did unions improve female-friendly amenities? We study the role of two channels—the shift in priorities embodied in the CUT's new female-focused platform, and appointing new women leaders to unions.

Our fourth and final result is that, here, unions successfully enhanced the work environment for women through a shift in priorities even without increasing women's presence in union leadership. The CUT transmitted its new priorities to local union leaders in two ways. First, via the introduction of new curricula on the female-focused fight plan at its training schools. Second, via the adoption of the fight plan into the official agendas of affiliated unions (including four prominent national confederations representing metalworkers, social security, commerce, and telecommunica-

---

[5]If anything, the position of the Workers' Party weakened around the time of the reform because of the impeachment of President Dilma Rousseff between December 2015 and August 2016.

[6]An increase in union bargaining power would move a monopsonistic employer up her labor supply to increase employment. Employers may alternatively move up their labor demand curve and reduce employment.

[7]Larger effects on retention and absenteeism are found at establishments with larger improvements in female-friendly amenities.

[8]These 2.5 million workers work at establishments where we find larger effects on female-friendly amenities, i.e., with a baseline female share below 60%. Over 74% of establishments inhabit this category.

tions workers). We find that female-friendly amenities increased the most where the CUT effectively transmitted its new priorities to local unions—establishments located near a CUT training school, and those negotiating with a confederation that added female amenities from the platform to their own agenda. In contrast, new female union leaders did not drive the reform's impact on amenities. The quota only applied to the CUT's state and national level executive bodies and had a small spillover effect on women's presence in local union boards (0.7pp or 2% increase). These few newly elected women leaders negotiated, if anything, slightly smaller increases in female-friendly amenities compared to unions without new female leaders.

We conclude by considering why unions and firms may have initially failed to recognize the value of amenities for women. On the union side, qualitative accounts suggest that the failure was rooted in overlooking the needs of women workers before the reform.[9] This disparity in voice by gender is exactly what inspired the reform to begin with, and the reform got unions to focus on women (Godinho Delgado, 2017), spurring greater gains where women initially comprised a minority among workers or union leaders.

On the firm side, being inside the frontier provision of amenities has three possible foundations. The first is the union voice model (Freeman and Medoff, 1984). Because firms may rely on unions to channel workers' needs, when unions did not prioritize women, firms did not learn which amenities would enhance worker satisfaction and retention. By channeling women's preferences, the reform enabled firms to identify and adopt valuable amenities. A second explanation features firms that are slow to change: even as women have increasingly been entering the labor market, firms may be slow to adapt to the evolving needs of their workforce. Firms that were historically designed for men may be gradually re-optimizing for women workers, but in the short-run, they may be inside their frontier provision of female-focused amenities. Our paper shows that unions can help speed up this adjustment to the frontier. Finally, firms may never have experimented with female-friendly amenities and therefore not know their relative benefits and costs. The reform prompted experimentation, ultimately securing the expansion of female-friendly amenities over time and across employers.

Ultimately, all three of these explanations generate similar observable implications. Each aligns with reduced turnover and absences that are worth the cost of providing expensive amenities. Each also predicts that amenities will spill over to the untreated establishments of exposed firms. Determining exactly why firms were inside their frontier provision of amenities is beyond the scope of this paper. Instead, the important point is that unions could improve workplaces for women by shifting advocacy towards them. When Brazilian unions did so by prioritizing the needs of workers that accounts suggest had previously been overlooked, these gains came without observed costs and instead benefited both workers and employers.

---

[9]Section 1 discusses the backdrop and aftermath of the CUT reform. Interviews with CUT leaders reveal that before the reform, women's demands were often disregarded as unappealing to the base (Martins, 2021; Munhoz and Silotto, 2019; Recoaro, 2022). A former president of the bank workers' union of São Paulo notes of the pre-reform period: "We fought for equality of opportunity to be one of the axes of the campaign. So they say: oh, but this is a subject that... doesn't have the appeal of the base". A second female leader notes: "In their minds, we saw problems that did not exist".

This paper contributes to three literatures. First on the provision of female-friendly amenities in workplaces. While women are known to disproportionately value workplace amenities like flexibility (Mas and Pallais, 2017; Wiswall and Zafar, 2017; Maestas et al., 2023), and scholars argue that providing these amenities can eliminate gender gaps in the labor market (Goldin, 2014), there exists little evidence on how this change might materialize, nor its implications for workers and employers. We study the role of unions in improving female-friendly amenities. In addition, we ask whether union-driven improvements in the workplace for women come at the expense of wages (Gruber, 1994) or employment (Summers, 1989). Our results show that unions can improve female-friendly amenities, and that, when they do so by prioritizing the needs of workers who were previously overlooked, these improvements can materialize without tradeoffs for workers or employers by raising worker productivity. These findings align with existing evidence that better workplace conditions or wages can reduce employee turnover (Harju et al., 2021; Emanuel and Harrington, 2022; Derenoncourt and Weil, 2024), and are among the first to show that unions can prompt such gains.[10]

Second, the paper adds to our understanding of unions and inequality. While profit-maximizing firms care about the marginal worker, it is unclear who the union cares about (Farber, 1986). Unions have long struggled to organize workers with competing interests (Hill, 1996) and unionization has mixed effects for different worker groups, raising wages for low skill workers (Card, 1996; Farber et al., 2021) and black workers (Ashenfelter, 1972), but not necessarily women (DiNardo et al., 1996; Card et al., 2004, 2020; Bolotnyy and Emanuel, 2022). However, given that women negotiate less over pay than men (Dittrich et al., 2014; Leibbrandt and List, 2015; Biasi and Sarsons, 2022), unions could conceivably step in on their behalf. We provide quasi-experimental evidence that prioritizing women in collective bargaining can improve female-friendly amenities without meaningful tradeoffs. The union helped especially in workplaces where women initially lacked representation among workers or union leaders, highlighting that whose preferences are augmented by unions matters. In this case, a top-down endeavor to prioritize women was sufficient to drive change, without having to identify new female union leaders.[11]

Finally, the paper contributes to the revealed preference literature in two ways. First, we combine employer-employee data on worker moves with rich information on amenities offered by establishments to uncover which amenities are disproportionately valued by women and which by men. The real-world decisions reflected in these worker moves leverage a higher stakes environment to uncover valuable amenities than has been possible in experiments. Encouragingly, our findings corroborate the experimental finding that women value workplace flexibility (Mas and Pallais, 2017;

---

[10]Other external actors who can add amenities include governments and international buyers. For instance, Boudreau (2023) finds that multinational companies' efforts to improve workplace safety at supplier factories improved safety at no cost to workers or employers. Similarly, the literature studying the effect of government-mandated parental leave on women's labor market outcomes does not typically find trade-offs for workers in the long-run (Schönberg and Ludsteck, 2014; Lalive et al., 2013; Lalive and Zweimüller, 2009), with a few exceptions, e.g. Bailey et al. (2019).

[11]The finding that female union leaders did not drive the reform's impact on amenities aligns with existing studies which document the limited impact of women on corporate boards on female workers' labor market outcomes (Bertrand et al., 2018; Maida and Weber, 2020).

Wiswall and Zafar, 2017; Maestas et al., 2023). In addition, the approach identifies several other amenities valued by women that have not received attention in the literature, e.g., medical exams, absences, and policies for dependents. Second, we provide quasi-experimental evidence that workers move toward workplaces that improve amenities, consistent with several papers that infer amenity values using job transitions (Sorkin, 2018; Taber and Vejlin, 2020; Lamadon et al., 2022).

Outline   The rest of the paper proceeds as follows. Section 1 describes the institutional context and CUT reform. Section 2 describes the data and details our approach for classifying amenities as female- or male-centric. Section 3 presents the empirical strategy. Section 4 presents our main results on the causal effect of changing union priorities on female-friendly amenities and how amenities were paid for. Section 5 offers the union voice model as a lens through which to view our findings, and discusses why firms may have been inside their frontier provision of amenities. Section 6 concludes.

1   Institutional Context

We begin by describing the collective bargaining structure in Brazil, emphasizing the distinction between unions, which represent workers in collective bargaining, and union centrals, which coordinate the activities of affiliated unions. We then describe the 2015 pro-women reform enacted by Brazil's largest union central (the CUT), which provides the top-down shift in priorities at affiliated unions we use for identification.

1.1   Collective Bargaining and Union Centrals

Types of CBAs   Brazil has two types of collective bargaining agreements (CBAs): sectoral and firm-level. In sectoral CBAs, unions negotiate with employer associations that represent establishments in a specific industry and geography, for example, the car manufacturers of Curitiba. In firm-level CBAs, unions negotiate with individual employers, for example, Volkswagen. Given their wider coverage, sectoral agreements typically set general floors for wage and non-wage benefits. By contrast, firm-level agreements generally build on these floors to expand benefits for workers at individual employers (Horn, 2009). Our main analysis studies the impact of the CUT reform on firm-level CBAs. However, we leverage amenities contained in sectoral CBAs to identify clauses that are disproportionately valued by women, and those disproportionately valued by men (Section 2.2).

Union determination   The union that negotiates CBAs on behalf of workers at an employer is chosen neither by the workers nor by the employer. Rather, representation depends on two factors: 1) industry (or category); and 2) geographic location (municipality).[12] Examples of unions include

---

[12]For a few professions, the worker's occupation rather than the industry determines representation in collective bargaining, such as architects, journalists, and musicians. Occupation-based unions comprise approximately 15% of unions negotiating CBAs in Brazil and rarely overlap with industry-based negotiations.

the bank workers' union of São Paulo, and the teachers' union of Florianopolis.

Neither workers nor employers can change their union. As a legacy of Brazil's corporatist past, the first union that is approved to represent a given category of workers in a geography enjoys a lifetime monopoly.[13] As such, workers can only influence their unions' priorities from within, for example, by voting in union elections, running for union leadership, or voicing their concerns to union leaders. At the same time, employers cannot avoid their assigned union, since all employers in the same category and geography cell are bound by negotiations conducted with this union. Naturally, union assignment by these cells produces an incredibly fragmented union landscape in Brazil, with over six thousand labor unions.

CBA coverage   Neither workers nor employers can opt out of CBAs negotiated by their union. Coverage is universal, which means that workers need not be union members in order to enjoy negotiated benefits.[14] Consequently, union membership is low (at around 15%) and only comprises workers willing to pay membership dues in exchange for additional benefits provided by unions outside of CBAs, e.g., recreational facilities and private health insurance plans. Importantly, individual work contracts cannot withdraw the benefits negotiated in CBAs, meaning that CBA provisions constitute a general floor for benefits. Similarly, CBAs cannot derogate provisions granted by the federal labor code. CBA clauses therefore build on top of these basic guarantees enjoyed by all workers.

Negotiation process   Union priorities play a central role in determining the content of CBA negotiations. Before the expiration of an existing CBA, the union organizes a General Assembly where workers vote on the list of demands (or *pauta de reivindicações*) that they want to prioritize in the next negotiation. Union leaders typically select the topics that are discussed at these assemblies and are up for vote into the *pauta*. The *pauta* then constitutes the official list of demands presented by unions to employers for negotiation. As discussed below, the 2015 CUT reform importantly changed the content of *pautas* to include female-friendly amenities. Most CBAs are signed for a duration of 12 months, yielding annual negotiations.[15] The union board decides the composition of representatives to send to bargaining tables. They can comprise both board members and non-members.

Union centrals   Unions can affiliate with union centrals (or *centrais sindicais*), which are somewhat analogous to trade union federations such as the AFL-CIO in the United States. These centrals are national level, umbrella organizations that coordinate the activities of local unions and lobby for political favor (Liukkunen, 2019). While union centrals do not directly participate in

---

[13]President Getúlio Vargas instituted this "monopoly union" framework, known as *unicidade sindical*, in the late 1930s as a means to co-opt the labor movement by enabling the federal government to control which union is given the right to represent workers in collective bargaining.

[14]Despite universal coverage, only 50% of workers are covered by a CBA partly because not every union negotiates a CBA for each of its covered municipalities.

[15]In some cases negotiations occur once every two years, which is the maximum possible duration for a CBA.

collective bargaining, they are indirectly involved in coordinating union priorities *across* worker categories. For example, union centrals help organize general strikes, plan annual conferences for union representatives, financially support local unions, represent constituent unions in public discussion forums, and steer union attention toward broad priorities such as gender and racial equality.

Brazil has nine union centrals, depicted in the right panel of Figure 1. The *Central Única dos Trabalhadores* (CUT) is the largest of these organizations, representing 30.4% of all organized workers in Brazil in 2016.[16] CUT is Latin America's largest union central, and among the largest in the world. It has close ties to Brazil's most prominent left-leaning political party, the *Partido dos Trabalhadores* (PT), or Workers' Party. For example, union leaders from the CUT regularly transition into political careers in the PT (Lang and Gagnon, 2009). President Luiz Inácio Lula da Silva was one such leader, who led a metalworkers' union within CUT before becoming a founding member of the PT.

CUT has vertically organized congresses and executive boards at the state and national levels. Congresses are meetings of delegates elected by individual unions to develop a common agenda for unions affiliating with CUT.[17] Delegates convene once every three years to vote on CUT's overarching priorities for the subsequent 3 years, which are recorded in a book of resolutions known as the "fight plan". State and national executive boards comprise a smaller group of leaders elected by CUT congresses to oversee its day-to-day functioning. They manage CUT's finances, oversee the execution of its fight plan, train local union leaders, and organize committees to tackle specific topics including gender and racial equality.[18]

1.2 CUT Reform

The CUT reform we study arose from the close relationship between this union central and the Workers' Party (PT). In 2011, the PT implemented a 50% quota for women in its leadership positions, and Dilma Rousseff, its female presidential candidate, became Brazil's first woman president. These events heightened calls for gender equality even within the CUT. Its 2015 state and national congresses witnessed an unprecedented focus on women, and together they passed a reform that instituted a top-down shift in priorities towards women (Godinho Delgado, 2017).

The reform achieved this shift in two ways. First, the CUT adopted a female-focused platform which outlined the female-friendly amenities to advance during collective bargaining, known as its "fight plan". Second, it elevated women's voices and needs within the union in several ways. We will later show that the reform did not increase women's direct representation in union leadership,

---

[16] The other union centrals are: *Força Sindical* (FS), *União Geral dos Trabalhadores* (UGT), *Central dos Trabalhadores e Trabalhadoras do Brasil* (CTB), *Nova Central Sindical de Trabalhadores* (NCST), *Central Geral dos Trabalhadores do Brasil* (CGTB), *Central dos Sindicatos Brasileiros* (CSB), *Intersindical - Central da Classe Trabalhadora*, and *Central Sindical e Popular - Conlutas*.

[17] Delegates typically belong to local unions affiliated with the CUT. The number of delegates that each union gets to elect to different congresses depends on the size of its base, as outlined in the CUT constitution here.

[18] For instance, CUT established the National Committee of Working Women (SNMT) in 1986 to campaign for universal childcare. In 2003, the SNMT was refashioned as the Department of Working Women and given a broader mandate to advocate for gender equality within CUT.

i.e., the number of female leaders. Rather, through means one and two, it shifted union advocacy towards women.[19]

Backdrop   The demand for the 2015 reform stemmed from a desire to elevate women's needs within the CUT. Despite the establishment of a vertical network of women's bodies dating back to 1994—including a national-level secretariat, the *Secretaria Nacional da Mulher Trabalhadora* (SNMT), sectoral secretariats, and local women's collectives known as *coletivos de mulheres*—these entities historically played a minimal role in shaping official policies for the union central (Godinho Delgado, 2017). Interviews with former CUT leaders reveal that women's demands were often disregarded as not appealing to the base. For instance, a former president of the Bank Workers' Union of São Paulo notes of the pre-reform period, "We fought for equality of opportunity to be one of the axes of the campaign. So they say: oh, but this is a subject that... doesn't have the appeal of the base" (Martins, 2021, p. 160). A second female leader notes: "In their minds, we saw problems that did not exist" (Munhoz and Silotto, 2019, p. 116). Reflecting an extreme form of dismissal, a former male CUT leader remarked of the women's agenda, "feminists are very annoying, they make politics out of spite because they do not have children" (Recoaro, 2022, p. 191). Female leaders of the CUT were excluded from prominent positions on its national executive board. Although a 1994 reform already reserved 30% of seats on the national board for women, important positions such as President, General Secretary, and Treasurer remained the purview of men (Godinho Delgado, 2017).

Against this backdrop, the passage of a 50% quota for women in the Workers' Party and Dilma Rousseff's election as President prompted calls for gender equality even within the CUT. These calls galvanized male and female union leaders alike. Together, Vagner Freitas, the then-President of CUT, and Rosane Da Silva, the former head of the SNMT, authored a series of opinion pieces titled "Parity between men and women approved in the PT is an example to be followed" (Godinho Delgado, 2017). The authors emphasized, "the absence of women in positions of power means that issues that affect the lives of women workers are not prioritized by unions". They urged the CUT to prioritize women workers' needs, both by adding female-friendly amenities to its official bargaining platform, and by implementing a 50% quota for women in its state and national leadership. These opinion pieces proved pivotal, sparking discussions on and ultimately securing the passage of the 2015 reform at each of the CUT's twenty seven state congresses and its national congress. Over two thousand union delegates attended these congresses.

The Reform   The 2015 CUT reform did two things. First, it adopted a female-focused platform outlining the female-friendly amenities to advance during collective bargaining. For the first time, the CUT's fight plan, which encodes the central's official list of priorities to target during collective bargaining, featured a 14-page long section dedicated to women's issues (Figure 2a illustrates the cover of the fight plan). The female-friendly amenities included on the new platform were

---

[19]Appendix D provides an account of the sources consulted to describe the CUT reform.

developed at CUT's annual meeting of women, known as the "Encontro Nacional de Mulheres", which was itself convened for the first time in over a decade. These amenities included extending paid maternity leave from the state mandate of four months to six months, reducing work hours and offering flexible schedules to accommodate women's household responsibilities, and employer-provided childcare. The word *mulheres* (women) appeared 203 times in the 2015 CUT fight plan, compared to 46 occurrences in 2012 and 74 in 2009. Local unions use the fight plan as a blueprint to develop their own agenda—the *pauta*—that they present to employers for negotiation.[20] Our evidence shows that the shift in priorities embodied in the female-focused platform was important for improving female-friendly amenities.

Second, to bolster its new priorities, CUT elevated women's voices in the union central in several ways. Perhaps the most publicized aspect of its strategy was implementing a 50% quota for women in the state and national-level executive boards, which was ratified in 2012 and implemented in 2015. The quota enhanced a 1994 policy that already reserved 30% of seats for women. Figure 2b shows that the quota had bite at the national level. The share of women on the CUT's national board rose from 35% to 50% right in 2015, and remained at this higher level thereafter.[21]

Even beyond the quota, however, the reform sparked several measures to elevate women's voices within the CUT. Roundtables, committees, and delegations were now required to include women.[22] The women's meeting that drafted the female-friendly demands for the fight plan was instituted as a recurring event to similarly craft demands before each CUT congress. The CUT also strengthened women's collectives in its affiliated unions. It prohibited affiliates from dissolving their women's collectives amid union budget cuts in 2017, when union dues switched from being mandatory to optional.[23,24] Finally, women began to feature prominently among speakers at official CUT gatherings (Godinho Delgado, 2017).[25]

Importantly, the reform did not materially increase women's representation in union leadership, i.e., the *number* of female union leaders. The 50% quota for women only applied to the CUT's state and national executive boards, which do not bargain contracts. It embellished an existing 1994 quota that reserved 30% of seats for women. To investigate any potential spillover effects of the reform on local union leadership, we use a difference-in-differences design to compare the gender composition of union boards of CUT-affiliated unions to non-affiliates around the time of

---

[20]As stated by the first female president of the bankers' union of São Paulo: "Change begins with the *pautas*... by intervening in the *pautas* one can shift the perspective... emphasizing issues that were previously considered unimportant" (Martins, 2021, p. 177).

[21]The CUT implemented the gender quota by expanding the size of its national board from 33 to 50 representatives.

[22]Reflecting on the 2015 reform, the Vice President of the CUT, Carmen Foro remarked "Now there is an awareness that men cannot speak alone" (Godinho Delgado, 2017).

[23]The law making union contributions voluntary was enacted in November 2017 and thus does not affect our period of study.

[24]Some CUT-affiliated entities revived their dormant women's collectives soon after the reform. Examples include two large national confederations representing municipal workers and health workers, and the agricultural workers' federation of Rio Grande do Sul.

[25]For example, the first three speakers at the 2016 annual meeting of the national confederations of service workers, CONTRACS, were all women and spoke at length about the confederation's desired and planned efforts to advance female-friendly amenities. Link to video here.

the reform. We find that the reform had a small positive spillover effect on the share of women on local union boards, a 0.7pp or 2% increase over baseline (Figure B2). However, the evidence shows that these few newly elected female leaders did not drive the reform's impact on amenities (Section 4.1).[26] The reform did not affect other measures of female representation, including the number of female delegates at CUT congresses (which remained stable at 42% from 2012 onwards (Recoaro, 2022)) or the share of contracts signed by women.

In sum, the CUT reform effected a top-down shift in union priorities towards women. It did so by, first, adding female-friendly amenities to its bargaining platform and publicizing it to local union leaders (the female-focused fight plan), and, second, by elevating women's voices in public discussions within the union.

Disseminating new priorities The CUT transmitted its new priorities to local union leaders in a few different ways. First, training schools operated by the CUT introduced new courses designed to educate union leaders on the female-focused platform (Franco Oliveira, 2017). The CUT runs seven training schools across the country to instruct union leaders on the priorities and strategies for successful negotiation. Union leaders cite these schools as being vital for imparting them with necessary skills (Martins, 2021; Silva, 2021; Recoaro, 2022).[27] Following the reform, CUT's training schools introduced a new required module on the importance of and strategies for negotiating female-friendly amenities. Beyond the CUT, some of its affiliates also introduced similar training courses on female amenities.[28] A second method of transmission was that unions adopted the female-focused fight plan into their own agendas. For instance, four large national confederations incorporated the female fight plan into their own agendas, representing metalworkers (CNM), social security workers (CNTSS), commerce (CONTRACS), and telecommunications workers (FITRATELP).[29]

In Section 4.1, we use this information on how the CUT disseminated its priorities to local unions, as well as the identity of union board leaders, to probe the role of two channels in driving the reform's impact on amenities: shifting union priorities, and appointing new women to union leadership.[30]

Summary In summary, the CUT reform ushered a top-down shift in union priorities towards women. This shift involved, first, adopting a female-focused platform and publicizing it to local

---

[26]Section 4.1 shows that unions with new female leaders negotiated, if anything, slightly smaller increases in female-friendly amenities compared to unions without new women leaders. We also do not find larger effects at unions that sent female leaders to the CUT's national executive board.

[27]A survey of union leaders in the CUT finds that 63% report learning how to perform their roles in training schools.

[28]Examples of CUT affiliates that introduced new training courses on female-focused amenities include the confederation of service workers (CONTRACS), the confederation of metal workers (CNM), and the state branch of the CUT in Bahia. The first two also adopted the female-focused fight plan into their own official agendas presented for negotiation.

[29]These four confederations also identified the female-focused fight plan as an important priority for the CUT to enact at its 2015 congresses. See *Caderno de subsidios ao debate (12o CONCUT)* here.

[30]We find that, here, unions improved the provision of female-friendly amenities by prioritizing women's needs, even without needing to find and appoint new female leaders.

union leaders (the female-focused "fight plan"), and second, elevating women's voices in public discussions in the union. Importantly, the reform did not increase the bargaining power of unions relative to employers, but instead, got unions to focus on women. Therefore, any improvements for women resulting from the reform will reflect this shift in priorities rather than a greater share of surplus accruing to workers.[31]

Before turning to our main analysis, it is worth noting the absence of spillovers to other union centrals in Brazil. Spillovers were unlikely in this context. Other union centrals did not have ties to the Workers' Party. We find that the female share of the national boards of other union centrals remained stable around the time of the CUT reform (Figure 2b). At *Força Sindical*, which is the CUT's main competitor, the share of women even declined slightly in 2017.[32] Further, upon analyzing the records and congresses of other union centrals, there is no evidence that other union centrals undertook actions to promote women's issues akin to the CUT. Appendix D describes this evidence in detail.

2   Data and Amenity Classification

To study how the CUT reform affects the workplace for women and at what cost, we need data on wages, amenities, and employment at the establishment level. In addition, we require information on each negotiating union's affiliation to a union central. This section first describes our data. We then detail the data-driven approach to classifying amenities as male- or female-centric.

2.1   Data Sources

Our analysis relies on linking three sources of data: (i) amenities at the establishment-level from the text of all collective bargaining agreements; (ii) worker outcomes from linked employer-employee data on the universe of formal sector workers; and (iii) union affiliation and leadership from the registry of unions. For information on amenities, we use CBA clauses scraped from the Ministry of Labor's *Sistema Mediador* registry, which tracks and stores every CBA signed in Brazil since 2009. To register an agreement, clauses need to be classified into 137 different clause types, e.g., overtime pay, childcare assistance, profit sharing, paid leave, etc.[33] We extract the number of clauses of each type as a measure of amenities offered to workers.

For information on worker-level outcomes we use linked employer-employee data known as

---

[31]Several reasons point to no increase in union bargaining power and are discussed in Section 4. For example, if anything, the Workers' Party grew weaker around the time of the reform following the impeachment of Dilma Rousseff between December 2015 and August 2016.

[32]The only case for potential positive spillovers on female representation in the national board is the union central *Conlutas*, where the share of women in national leadership grew from 30% in 2015 to 50% in 2018. *Conlutas* was established as an offshoot of the CUT in 2004 when public sector workers exited the CUT following a controversial pension reform enacted by President Lula's PT government. *Conlutas* has a very small number of affiliated unions (79), all of which represent workers in the public sector. Due to its small size, and its focus on the public sector—which constitute fewer than 1% of establishments in our sample—all results are robust to excluding *Conlutas* from the analysis. Results are available upon request.

[33]Figure B3 shows an example of a maternity leave clause.

Relaçao Anual de Informacões Sociais (RAIS). These are administrative data that cover the universe of formal workers in Brazil. Essentially, the federal government requires each employer to report key information regarding each worker employed in any given year. For each work spell, RAIS reports average monthly earnings, leaves taken, and (6-digit) occupation. It also reports worker characteristics like gender, age, and education; and establishment characteristics such as location (municipality) and industry (6-digit). We link RAIS to CBAs using an establishment identifier, known as CNPJ, that is common to both datasets.

For information regarding each union's affiliation to a union central and its leadership composition over time, we use the national registry of unions, known as *Cadastro Nacional de Entidades Sindicais* (CNES). We infer the gender of leaders using the R package *genderBR*, which codes a name as female if most people with that name in the Brazilian census are women (and similarly for men).[34] Among all union leaders between 2005 and 2019, 27.7% are women, 67% are men, and 5% are unclassified. CBAs record the same union identifier as CNES, which we use to link contracts to unions, and, thus, union central affiliation and board composition.

2.2 Classifying Female-Centric Amenities

By matching CBAs to signing establishments in RAIS we can track workers across jobs, observing not only their wages but also a comprehensive set of amenities provided at each job. However, whether a CBA clause is differentially valued by women relative to men (what we denote as a female-centric amenity) is not directly observed in these data. We adopt two approaches to classify clauses as female-centric. Here we describe the key steps of each approach, with details in Appendix C.

1) Intuitive approach In the intuitive approach, we classify 20 of the 137 pre-specified clause types in *Sistema Mediador* as disproportionately valued by female workers (Table 2, Column 1). They fall into four broad themes, detailed in Table A1: (1) Leaves, e.g., following maternity, adoption, or a miscarriage; (2) Maternity and childcare, e.g., employment protection after maternity, childcare assistance, and policies for dependents; (3) Workplace harassment and discrimination, e.g., sexual harassment and equal opportunities in promotions; and (4) Flexibility and part-time work, e.g., workday controls, uninterrupted shifts, and part-time contracts. Themes (1)-(3) include clauses that one could reasonably associate with women. The last theme reflects the fact that women disproportionately value flexibility in work hours (Goldin and Katz, 2011; Mas and Pallais, 2017; Maestas et al., 2023).

2) Data-driven approach In the data-driven approach, we aim to identify CBA clauses that correlate with women's disproportionate desire to work at an establishment relative to men. The underlying model motivating this approach is one where workers of gender $G \in \{F, M\}$ share a common ranking over establishments $j \in \mathcal{J}$. A worker's utility from working at establishment j is rising in the wage and amenities that it offers to their group G. In particular, we assume that the

---

[34]Developed by Fernando Meireles and posted on GitHub.

gender-specific value of working at an establishment (denoted V_j^G) is a linear function of wages, amenities, and an unobserved component:

$$V_j^G = \beta_w^G \psi_j^G + \sum_{z \in Z} \beta_z^G a(z)_j + \epsilon_j^G \tag{1}$$

where Z denotes the set of all amenities. The classification problem is then to find the set of amenities for which the difference $\beta_z^F - \beta_z^M$ is positive, which we denote as "female-centric", as well as those for which this difference is negative, which we denote as "male-centric".[35]

The approach to identifying female and male-centric amenities thus requires measuring the value of employment, wages, and amenities provided at each establishment. We estimate the value of employment at an establishment as its gender-specific PageRank value by leveraging worker flows across establishments (Sorkin, 2018; Morchio and Moser, 2020). This is a revealed preference measure of the value of working at an establishment, which relies on the idea that good employers attract more workers, especially from other good employers.[36] For wages, we estimate gender-specific wage premiums at an establishment (ψ_j^G) using gender-specific AKM models.[37] For amenities, we use the average annual count of clauses $a(z)_j$ for each of the 137 clause types $z \in Z$ in the CBAs covering establishment j.

Hence, while we measure the gender-specific value of employment and wage premiums at each establishment, we only observe a proxy for amenities without knowing which clause types are disproportionately valued by women and which by men. To identify these clauses, we take the difference between the female and the male version of Equation (1) and estimate the following hedonic regression:

$$V_j^F - V_j^M = \beta_w^F \psi_j^F - \beta_w^M \psi_j^M + \sum_{z \in Z} \beta_z a(z)_j + \epsilon_j \tag{2}$$

where $\beta_z = \beta_z^F - \beta_z^M$ captures the value of the amenity for women relative to men. We estimate this regression using lasso to select amenities that are the most predictive of utility differences between women and men, controlling for gender-specific wage premia. We deem the top 20 clauses with the highest values of β_z as "female-centric", and the bottom 20 with the lowest values of β_z "male-centric". To the best of our knowledge, this is the first time that such a rich description of the work environment has been combined with administrative data on worker flows to uncover the features of the workplace that are valued by different groups of workers.[38]

---

[35] An advantage of the data-driven approach relative to the intuitive approach is that it identifies male-centric clauses, allowing us to test for tradeoffs in male amenities following the CUT reform.

[36] Appendix E describes the approach in detail and Appendix C describes our implementation.

[37] AKM is the acronym for Abowd et al. (1999), the first paper to estimate firm-specific wage premiums with linked employer-employee data. Their underlying model also assumes a common job ladder among workers and identifies the firm effect job switchers (see Appendix E for details and Appendix C for implementation).

[38] Several papers elicit workers' willingness-to-pay for a small set of workplace attributes such as flexibility and wage growth (e.g. Mas and Pallais (2017) for workers on an online platform, and Wiswall and Zafar (2017) for NYU college students). They find that women value flexibility in work schedules more than do men. In the same context as ours, Lagos (2024) quantifies the wage-equivalent value of CBA clauses undistinguished by gender.

Omitted variable bias While the data-driven approach is a predictive exercise, mitigating omit-
ted variable bias is still important. For example, establishments that want to hire more women
may redouble their recruitment efforts or provide other job features that are valued by women, in
addition to increasing observed clauses. Because we do not directly observe recruitment intensity or
perfectly observe the work environment, we may erroneously identify a clause as valuable because
it covaries with these unobserved features.[39] To mitigate this bias, we use amenities $a(z)_j$ from
sectoral CBAs negotiated with several employers in an industry and geography instead of firm-level
agreements negotiated with a single employer. Unlike the latter, sectoral CBAs are not influenced
by demand shocks affecting individual employers.[40] Using sectoral CBAs for classification is also
important because we use firm-level CBAs to study the CUT reform's causal effect. Using separate
CBAs for classification and analysis prevents a mechanical relationship between clauses identified as
female-centric and those that increase after the reform. Women switching to treated establishments
following the rise in female-centric amenities is then not a pre-determined result.

Estimation sample We estimate Equation (2) in the cross-section of establishments for which
we can estimate V_j^G, ψ_j^G, and $a(z)_j$. First, because we must observe PageRank values for both
genders, which can only be estimated for the largest super-connected set of employers (i.e., each
establishments must hire from and lose a worker to another establishment in the set), our sample
is restricted to the 2009-2016 intersection of these gender-specific super-connected sets. Second,
AKM wage premiums are only estimated for the largest connected set of establishments for which
estimates are not noisy (average size $\geq$ 10 workers). The sample is thus also restricted to the
2009-2016 intersection of these largest connected sets between genders. Third, we reduce noise in
the over-year average of clause types $a(z)_j$, by restricting the sample to employers covered by at
least four sectoral CBAs between 2009-2016.

Normalization Both PageRank values and AKM wage premiums must be normalized to make
the gender difference in them interpretable. For AKM premiums, we normalize ψ_j^F and ψ_j^M relative
to the restaurant sector—a fairly competitive industry where one can reasonably assume a zero
wage premium for both genders. For PageRank values, V_j^F and V_j^M are unique up to unknown
multiplicative factors. Our results are robust to three alternative methods for calculating $V_j^F -
V_j^M$. The first chooses the establishment with the smallest gender gap in wage premiums as the
normalizing establishment, and divides the female value of all other establishments by the ratio
$\frac{V_j^F}{V_j^M}$ at this establishment. The second simply assumes the multiplicative factor is the same for
both genders, i.e., no normalization is needed. The third method re-scales the values V_j^F and V_j^M
to a scale from 0 to 100. Our base method for identifying male and female-centric amenities in
the data-driven classification uses a 50% random sample of establishments and the first method for
normalizing PageRank values.

---

[39]Including ψ_j^G partly addresses this concern by accounting for recruitment efforts operating through wages.

[40]The results are not driven by industry-specific amenities and are similar when including industry fixed effects to
leverage variation across geography; see footnote 42.

Results   Table 2, Columns 2 and 3 list amenities identified as female and male-centric using the data-driven approach. Clauses are ranked in descending order of the absolute value of $\hat{\beta}_z$. The clauses in red are those also intuitively classified as female-centric.

In line with the intuitive definition, the data-driven approach reveals that women disproportionately value clauses governing leaves (e.g., following adoption and miscarriage), childcare, and maternity (e.g., childcare assistance, maternity protections, and policies for dependents). In addition, they value 12 other provisions missing from the intuitive classification, including absences, extensions or reductions of the workday, medical exams, and health education campaigns.

On the male side, the approach also obtains sensible results. Men highly value additional pay, such as clauses governing on-call pay, profit sharing, hazard pay, workday compensation, life insurance and death or funeral assistance. They also disproportionately value workplace safety, such as protections for injured workers, machine and equipment maintenance, and safety equipment.[41,42]

The fact that "female workforce" clauses appear among those disproportionately valued by men highlights the fact that our approach does not account for variation in the text of clauses. These "female workforce" clauses vary widely in content, including items that are clearly beneficial to women (e.g., free provision of sanitary pads), as well as those clearly beneficial to men (e.g., forbidding women to cast concrete or install scaffolding). It is likely, then, that our data-driven approach captures the latter. While the availability of pre-specified clause types allows us to have a simple measure of CBA content that avoids the drawbacks that plague more complicated topic models—such as text pre-processing, choosing the number of topics, and noisy estimates—it is not a faultless measure.

Sense checks   Out-of-sample sense checks indicate that both the "intuitive" and "data-driven" approaches identify clauses that women (or men) value disproportionately more than the other gender. Using firm-level CBAs signed in 2014—the year prior to the CUT reform—we find that female (male)-centric clauses increase with the share of women (men) at an establishment.[43] Figure 3a shows that intuitively classified female-centric clauses increase almost linearly with this share. Figure 3b shows a similar relationship for male and female-centric clauses defined using the data-driven method. Specifically, all-male workplaces offer $\approx$1.5 more male than female clauses, with this gap shrinking to almost zero at all-female workplaces. Interestingly, female clauses per the data-driven classification only begin to increase once women comprise the majority in an establishment (above the 50% threshold). This suggests either that women successfully advocate for these amenities once in the majority, or that establishments provide them to attract female workers—both implying higher value among women.

---

[41]Tables A2 and A3 offer specific examples of clauses identified as female and male-centric.

[42]The clauses classified as female-centric remain similar across various normalizations of PageRank values (Tables A4 and A5). Moreover, the classification is not driven by industry- or geography-specific amenities, since it is invariant to including industry- and state-fixed effects. The rank correlation of the coefficient β_z on the selected clauses with and without these fixed effects is positive and statistically significant (0.56 with p-value< 0.01).

[43]In addition, the number of female clauses is strongly positively correlated with the difference between women and men's PageRank valuation of an establishment (Figure B4).

3   Empirical Strategy

We employ a difference-in-differences strategy to study the CUT reform's effect on amenities and labor market outcomes. This section first describes the three analysis samples we use to study the reform's effect on collective bargaining agreements, establishments, and workers. We then detail our empirical approach and identifying assumptions.

3.1   Analysis Samples

We construct three analysis samples to study the CUT reform's effects on negotiated CBAs, establishments, and workers. Appendix C provides detail.

1) Amenities sample   To study the evolution of amenities, we construct a balanced panel of each pair of establishment-and-negotiating union covered by firm-level collective bargaining between 2012 and 2017. Each of these pairs can be thought of as constituting a unique worker group, because the same union represents any category (usually industry) of workers in a given geography.[44] Our analysis focuses on clauses in firm-level CBAs because most improvements in amenities and working conditions are achieved through these agreements (Horn, 2009; Liukkunen, 2019).[45]

While not every establishment-union pair renegotiates its contract every year, we obtain a balanced panel of contracts by exploiting the fact that, during our period of study, the coverage of old CBAs is automatically extended until a new agreement is negotiated (Lagos, 2024). Given both that all CBAs were required to be registered in *Sistema Mediador* beginning in 2009, and that they span at most 2 years, our panel paints an accurate picture of active CBAs between 2012 and 2017. Our results are robust to instead using an unbalanced panel that comprises only new contracts.

2) Establishment sample   To study the possible downstream effects of changing amenities on labor market outcomes as well as wage and employment tradeoffs, we construct a sample of establishments signing CBAs in our *amenities sample*, and track their outcomes in RAIS. Outcomes include employment, the share of women among workers, and mean log wages. We make two additional restrictions to this sample. First, we restrict attention to establishments that employed both men and women at baseline (2014). Second, we only consider an establishment signing a contract as covered if it lies within the CBA's geographic coverage. This restriction allows us to exclude headquarters that sign contracts on behalf of their subsidiaries, and are hence outside the contract's geographic coverage.

---

[44]Most signing establishments (93%) negotiate with a single union over the entire study period, meaning that employers rarely negotiate with more than one worker category.

[45]In an informal conversation, the President of the bankers' union of São Paulo also confirmed that most amenity improvements are achieved through firm-level CBAs. Sector-level negotiations typically involve several tens (or even hundreds) of employers, making it difficult to reach consensus over a rich set of amenities. Unions therefore typically reserve these topics for negotiation with individual employers.

3) Incumbent worker sample   To study individual worker-level outcomes such as wages and retention, we construct a sample of incumbent workers employed at establishments in the *establishment sample* at baseline (2014). We track these workers wherever they go, i.e., not conditional on staying at their baseline employer.

Treatment definition   Following the 2015 reform, CUT-affiliated unions prioritized women in their collective bargaining strategy. While the reform was enacted in 2015, the gender quota was approved in 2012 (see Section 1.2), suggesting that CUT's pro-women pivot may have been anticipated and spurred unions to switch affiliation to avoid or benefit from the pivot. Although unions rarely switch their union central affiliation, we define treatment using a union's 2012 CUT affiliation to avoid bias from selection into or out of CUT affiliation. Figure B5 confirms that neither treated nor comparison unions systematically switched affiliation away from or toward the CUT following its 2012 announcement of a gender quota. Thus, there is no concern from endogenous selection even had we used a later affiliation year.

Treatment is defined in the following way. In the *amenities sample*, a treated establishment-union pair is one where the negotiating union was affiliated with the CUT in 2012. In the *establishment sample*, a treated establishment is one belonging to a treated pair.[46] Finally, in the *incumbent worker sample*, a worker is treated if employed at a treated establishment in 2014, i.e., at the baseline year.

Descriptive statistics   Table 1 provides descriptive statistics for our starting sample, i.e., the *amenities sample*. Column 1 describes the full sample, and Columns 2 and 3 report information by treatment status.

Panel A reports sample sizes. Our sample comprises more that 211 thousand firm-level CBAs signed by 89,897 establishment-union pairs. These pairs cover 80,131 signing establishments and 4,409 signing unions. On average, each pair signs new contracts in 2.4 out of the 6 years spanning our study (2012-2017). Of all pairs, 21% are treated and 79% are in the comparison group.

The amenities sample covers over 19% of total formal employment in Brazil and 2.1% of establishments. These numbers highlight two points. First, only a select set of employers negotiate firm-level CBAs. Second, these establishments are substantially larger than the average establishment in Brazil, employing 143 workers on average compared to 16 among all establishments (Table A6).[47] The *establishment sample*, where establishments must additionally have been employing both men and women in 2014, covers 15% of the total 2014 workforce, and otherwise resembles the amenities sample in the size, sector, and regional distribution of its establishments.

Panel B of Table 1 describes contract provisions at baseline (2014). CBA negotiations (at the pair-year observation level) feature 24.7 clauses on average, of which 3.2 are classified "female-

---

[46]Over 93% of establishments negotiate with a single union and 98% with all unions with the same union central affiliation. For the remaining 2% of establishments, treatment is defined as negotiating with any treated union.

[47]Compared to the average Brazilian establishment, an establishment signing firm-level CBAs is more likely to operate in manufacturing rather than commerce (difference of 16-19pp for each); and is more likely to be located in the affluent Southeast and less in the poorer Northeast region of Brazil (Table A6).

centric" per our data-driven definition (Section 2.2). On average, contracts feature 1.7 more male clauses than female clauses. These numbers are statistically indistinguishable across treated and control contracts. Although the share of female-specific clauses may appear to be small, this statistic may not accurately represent the value and importance of these clauses. For example, even a single contract provision extending maternity leave by 60 days may prove very valuable to young women. Thus, in addition to considering how the CUT reform affects amenities on paper, we will infer how valuable these changes are to women by studying revealed preference changes in their sorting behavior across establishments.

Panels C and D document establishment- and union-level characteristics, respectively, at baseline (2014). Our sample comprises large employers (especially in the treated group). The average establishment employs 143 workers, over a third of whom are women. A majority of establishments employ both men and women (82%). On the union side, treated unions have larger boards but with a similar share of women as comparison unions (around 23%), indicating no baseline difference between CUT and non-CUT affiliates. Only about 17% of unions have a female president.

Treated and comparison establishments exhibit substantial overlap along a number of observable dimensions, including their distribution of size, geography, industry, and share of women in the workforce (Figure B6). Table A7 statistically explores differences by treatment status. Treated establishments are larger than control establishments, but employ a similar share of women. They are more likely to be located in the Northeast region (15% treated versus 11% control) and engage in manufacturing (32% treated versus 28% control). All analyses control for differences in industry and geography across treatment status through 2-digit-industry by year and geography by year fixed effects.

3.2 Differences-in-Differences Design

To measure the causal effect of the CUT reform on negotiated amenities and labor market outcomes, we compare treated units of observation (i.e., pairs, establishments, or incumbent workers) with the comparison group using a dynamic difference-in-differences specification:

$$Y_{it} = \sum_{j=2012}^{2017} \beta^{t=j}(D_i \times \delta_{t=j}) + \alpha_i + \gamma X_{it} + \varepsilon_{it} \tag{3}$$

where i indexes the unit of observation and t indexes a year. The treatment indicator D_i is interacted with year fixed effects δ_t. The specification also includes unit fixed effects α_i, as well as time-varying fixed effects X_{it}, i.e., industry-year and geography-year fixed effects.[48,49] Idiosyncratic errors are captured by ε_{it} and standard errors are clustered by establishment.[50]

---

[48]For industry we use the first two digits of Brazil's CNAE codes. There are 87 unique industries, including textile production, road transportation, and construction.

[49]For geography we use either states (27 in total) or microregions, which are neighboring municipalities grouped into 543 units that capture local labor markets.

[50]Clustering by establishment assumes that establishments negotiate with unions that, as of 2012, were affiliated at random with a union central. Results are unchanged when clustering by union.

The coefficients of interest, β^t, capture the effect of treatment in year t relative to the baseline year (β^{2014} is normalized to zero). The model allows for average differences between treated and the comparison units, absorbed by unit fixed effects α_i. The identifying variation occurs within the same unit, comparing outcomes in any year relative to 2014, and within the same time period, comparing treated and comparison units. The identifying assumption is that outcomes would have evolved in parallel at treated and comparison units absent the CUT reform, conditional on covariates. We assess the plausibility of this assumption by testing for parallel trends in the pre-period.

To summarize the average post-period impact of the CUT reform we run a "pooled" version of the above regression, which amounts to replacing the full interaction of D_i with year-specific indicators δ_t with a single interaction for the post-period, $D_i \times \delta_{t \geq 2015}$. In addition, to make treatment effects in worker-level regressions interpretable as establishment-level averages, we weight each incumbent worker by the inverse of (own-gender) employment at their baseline employer (Jäger et al., 2021). Finally, it is worth noting that outcomes that may change as a downstream consequence of changing amenities (e.g., wages and retention) are unscaled by the amenity change since we do not directly observe the value workers assign to said amenities.

4   Results: Impact of the CUT Reform

This section presents our main results. We start by analyzing the CUT reform's effect on amenities, finding disproportionate gains in women's amenities on paper and in practice. Next, we investigate whether women valued these changes to CUT workplaces, by studying the reform's impact on two revealed preference measures of firm value—retention, and job queues. We conclude by evaluating how the female-friendly amenities were financed, exploring the presence of tradeoffs for workers (wages and employment), employers (profits), and improvements in worker productivity.

4.1   Amenities: On Paper and In Practice

Negotiated amenities   We first study the CUT reform's average effect on amenities. Table 3 reports the pooled DID treatment effect on female and male-centric clauses, and Figure 4 reports year-specific effects.[51]   Female amenities evolved in parallel prior to the reform.   Immediately following the reform, however, female clauses in treated contracts rose sharply in number (intensive margin), incidence (extensive margin), and as a share of all clauses. On the intensive margin, the number of intuitively defined female clauses grew by 0.156 (SE 0.013)—a 17% increase over baseline (Panel A). Data-driven female clauses rose 0.302 (SE 0.021), denoting a 19% increase. These effect sizes represent substantial improvements, equivalent to moving from the average baseline amenity count at an establishment with a minority female population, to one where over 80% of workers were women (Figure 3). The reform did not simply increase the number of clause types already being provided in contracts, for example, going from 1 to 5 maternity leave clauses. Rather, it

---

[51]Figure B7 plots the raw path of female-centric clauses in treated and comparison contracts. Figure B8 includes similar plots for male-centric clauses and the ratio of male-to-female clauses.

introduced new female-centric clauses, increasing the sum of unique clause types by 12% (Panel B).

The CUT reform also increased the occurrence of any female-centric clause (Panel C). On the extensive margin, female-centric clauses grew by 1.7pp (SE 0.003), denoting a 5% gain over baseline. Using the data-driven classification, this effect was 3.4pp (SE 0.003), representing a 9% increase. All four types of female-friendly clauses increased—leaves, childcare, anti-harassment, and flexibility (Column 2-5), with clauses governing leaves and childcare accounting for 76% of the total improvement in amenities. The CUT reform's effect on female-friendly amenities is thus likely to differentially impact workers in childbearing ages, which is a fact that we later exploit to zoom in on the labor market outcomes of these workers.

Female-friendly amenities improved not just in number and incidence, but also as a share of all clauses. As a share of all clauses, female-friendly amenities improved by 0.5pp (SE 0.001), a 10% increase over baseline, and data-driven clauses rose 2.1pp (SE 0.001), denoting a 30% increase.[52] Male-friendly amenities witnessed a small fall from favor in contracts (Column 7). While the number of male-centric clauses increased slightly, this increase was more than overshadowed by the improvement in female-centric clauses, resulting in a 0.3pp (SE 0.002) decline in the share of male clauses among all clauses.[53] Both the extensive margin and share of male-centric amenities declined by trace amounts: 0.1pp (SE 0.003) relative to 46% at baseline for the former, and 0.3pp (SE 0.002) relative to 14% for the latter (Column 7). We later show that men were no more likely to quit treated establishments, suggesting that the marginal male worker did not value these small declines. Overall, the reform caused the ratio of female-to-male clauses to grow by 21% over baseline (Column 8).[54] The CUT reform thus increased the female orientation of contracts, driven by an increase in female-focused clauses.

Through what mechanisms did the CUT manage to achieve the improvements in female-friendly amenities? And what portable insights does this generate for how unions might improve workplaces for women in other contexts with similar collective bargaining structures? We examine the role of two channels: the top-down shift in priorities, appointing new women to union leadership.[55]

Our results show that shifting priorities was key for increasing female-friendly amenities, with no role for increasing women's direct representation in union leadership. Consistent with an important role for the priority shift, we find that the largest improvements in amenities occurred where the CUT effectively transmitted its female-focused priorities to local union leaders (Panel A, Table 4).

---

[52]Figure B9 shows parallel trends in the evolution of data-driven female amenities at affected and unaffected establishments prior to the CUT reform.

[53]The small increase in male amenities is unlikely to be related to the CUT reform since it occurs in 2017, two years following the passage of the reform, whereas the the positive impact on female-friendly amenities occurs sharply in 2015 (Figure 4). Moreover, unlike the positive effect on female amenities, the effect on male amenities is not robust to clustering standard errors at the union level (Table A8).

[54]Results are robust to reasonable amendments to the data-driven definition of male- and female-centric amenities, the inclusion of more granular industry-geography-year fixed effects, and conditioning on establishment-union pairs with coverage in 2014 (Tables A9, A10, A11, and A12).

[55]It is worth emphasizing that the reform did not affect the bargaining power of unions (see Section 1.2). The reform neither improved the bargaining position of CUT-affiliated unions nor allocated more resources to collective bargaining, including budgets or the number of representatives at the bargaining table.

First, amenities increased the most in contracts negotiated by unions covered by one of the four national confederations that adopted the CUT's female-focused platform into their own agendas.[56] These unions achieved twice the improvement in amenities compared to unions affiliated with a different confederation (Column 2). Together the four confederations, representing metalworkers (CNM), social security (CNTSS), commerce (CONTRACS), and telecommunications workers (FI-TRATELP), represent over 5% of formal workers in Brazil covered by sectoral CBAs. A second channel employed by the CUT to disseminate its female-focused priorities to local union leaders was via the introduction of training curricula on the importance of and strategies for negotiating female amenities at its seven training schools. This training bore fruit, and we find substantially larger improvements in female-friendly amenities in microregions with a CUT training school compared to those without one (Column 3).

By contrast, increasing women's direct representation through new female union leaders did not drive the reform's effect on amenities. First, amenities did not disproportionately improve in contracts negotiated by unions whose industry gained a female representative on CUT's national board (Column 4). Second, although the reform resulted in a small increase in the share of women among union leaders (0.7pp or 3% relative to baseline, Figure B2), these few newly elected female union leaders did not account for the reform's effect on amenities. If anything, we find that unions with new female leaders negotiated slightly *smaller* improvements in amenities compared to unions without new women leaders (Column 5). Finally, the reform did not affect other measures of women's representation, including the share of contracts signed by women or the number of female delegates attending CUT congresses. Together our results show that, in this case, unions successfully improved the work environment for women by shifting advocacy towards them, even without having to identify and appoint many new women to union leadership.[57]

While the estimates so far capture the reform's average effect on amenities, we next investigate *where* union priorities achieved the greatest improvements in female-focused amenities. The union voice model would predict a larger impact at employers where women could not already advocate for themselves, either as a minority among workers or among union leaders. In contrast, a model where employers only agree to amenities when their provision is cheap would mainly predict effects in minority female establishments, regardless of female representation in the union.

To evaluate the content of these predictions, we study heterogeneity in the treatment effect on amenities by an establishment's baseline female share of workers, and baseline female representation in union leadership. We split establishments into four bins by their female share of employment: 0-19%, 20-39%, 40-59%, and over 60%. The bins comprise 30%, 24%, 21%, and 26% of establishments respectively. Since few establishments employed over 60% women at baseline, we pool them together to increase precision. Our evidence supports the voice hypothesis and contradicts empty promises. Consistent with the reform advancing women's preferences in workplaces where they

---

[56]In total twenty confederations affiliate with the CUT.

[57]Approximately a quarter of CUT-affiliated union leaders were already women. The fraction of women union leaders in Brazil is close to their average share across many parts of Europe and Latin America (Skorge and Rasmussen, 2021).

previously lacked voice and representation, we find that amenities disproportionately increased at establishments where women constituted a smaller share of workers at baseline (Column 2, Table 5 and Figure 5), smaller share of union leaders (Column 3), and unions without a female president or vice president (Column 4). However, contrary to the notion of empty promises, we also find significant improvements in workplaces that employed many women workers who lacked union representation (Table A13). The magnitude of the treatment effect for these establishments—with many women workers but few female union leaders—is two-thirds the average effect across all employers. Our findings thus closely align with a union voice model and contrast with empty promises. [58]

On a final note, it is worth highlighting that CBA clauses represent equilibrium outcomes resulting from negotiations between unions and employers. As such, our results evidence employers agreeing to sign off on female-friendly amenities. This willingness has four possible foundations. First, amenities on paper may never translate into practice, which we rule out below. Second, if amenities do materialize in reality, they could precipitate tradeoffs for workers. Employers may offset the cost of amenities by reducing wages or hiring fewer or relatively inexpensive workers such as men or older women. Third, the reform could precipitate tradeoffs for employers, by reducing firm profits. Lastly, however, providing valuable amenities could increase the surplus within the employment relationship. Better amenities could improve retention or allow employers to get more effort out of female workers. This last scenario generates the prospect of a "free lunch", wherein valuable amenities pay for themselves. The next paragraph provides evidence against the first explanation, and Section 4.3 investigates the other three.

Actual amenities   To assess whether a change in amenities on paper translated into practice, we draw on the text of female-centric clauses to identify three measures of the work environment that they could directly influence: (i) the share of female managers—corresponding to equal opportunity clauses; (ii) the length of maternity leaves—corresponding to clauses that extend maternity leave; and (iii) job protection following maternity leave—corresponding to job protection clauses.

The reform positively affected all three measures (Figure 6). The share of women among managers at treated establishments increased by 2% relative to baseline. Women also took longer maternity leaves, with a 14% treatment effect on the share of mothers taking leaves longer than the state mandate of 120 days. Despite taking longer leaves, mothers were no less likely to return to their employer following motherhood, implying longer periods of job protection. These results imply that the CUT reform led to real improvements in the workplace for women.

A natural follow-up question is whether observed amenities improved in tandem with contracts. Our results above show that contracted amenities saw the largest increase in workplaces with a lower baseline female share of workers. Specifically, the impact on contracted amenities declined monotonically with women's share in the workforce, categorized into bins of 0-19%, 20-39%, 40-59%, 60-100% (Figure 5). Correspondingly, we find that observed amenities improved the most

---

[58]Section 5 discusses the union voice model as a framework to view our results (Freeman and Medoff, 1984).

where the reform prompted the largest improvements on paper. The largest treatment effects on actual amenities–the share of women among managers, and maternity leave extensions–occur at establishments with low female shares of workers, 0-19%, 20-39%, or 40-59% (Figures 8a- 8c). Women were not less likely to return from maternity leaves despite taking longer leaves, implying longer periods of job protection. Observed amenities did not change at workplaces with no change in contracts (baseline female share above 60%).

Even as female amenities rose, male amenities may have declined. To evaluate this possibility, we draw on the text of male-centric clauses. Per the data-driven approach, men value safety. We find no treatment effect on workplace safety as captured by the share of workers taking work-related injury leaves (Figure 6). If anything, workplace safety improved slightly, with a -3% treatment effect on workers taking injury leave. Thus, at least on this dimension, the workplace did not deteriorate for men.

4.2   Revealed preference changes in firm value

Our analysis of improvements in actual amenities is limited to observables in the RAIS data. To more comprehensively understand whether workers actually valued these changes to CUT workplaces, we study the reform's impact on two revealed preference measures of job quality: employee retention and job queues.

Retention   Retention serves as a revealed preference measure of an employer's attractiveness (Krueger and Summers, 1988). We find a 1.8pp (SE 0.004) increase in retention among incumbent women, representing a 6% decline in separation rates.[59] The gender difference in this treatment effect is 0.08pp (SE 0.003), suggesting that incumbent women disproportionately valued the reform over its value for incumbent men (Table 6, Column 1). Since we find the largest improvement in amenities related to maternity and childcare, we also zoom in on retention among workers of childbearing age (20-35 years). The positive effect on retention for these workers resembles the magnitude for all workers (Figure 7a).

However, higher retention need not imply that women valued jobs at CUT-affiliated employers more if it reflects fewer firings instead of fewer quits. To assess this possibility, we decompose the treatment effect on retention into a component explained by employer-to-employer transitions, likely reflecting quits, versus transitions into unemployment, more likely after a firing. Consistent with a higher revealed preference value of CUT employers, we find that the treatment effect on retention is explained by fewer voluntary employer-to-employer transitions as opposed to fewer firings into unemployment (Table 6, Column 2).[60]

If better amenities drove the improvement in retention, then we would expect larger effects on retention at employers where the reform prompted larger improvements in female-friendly ameni-

---

[59]The one-year baseline retention rate among women is 68%.

[60]Specifically, incumbent women were 1.8pp more likely to stay at their baseline employer and 0.7pp more likely to be employed in the formal sector if working at a treated establishment. The difference indicates that voluntary transitions among incumbents declined by 1.1pp.

ties. Our findings align with this hypothesis. First, exploring heterogeneity by the baseline share of women in the workplace, we find a larger increase in retention at establishments with a smaller baseline female share of workers, which witnessed the greatest upgrades in amenities (Figure 8d). Strikingly, the impact on retention tracks that on amenities and declines monotonically with the initial share of women among workers. Second, we find larger improvements in retention at establishments where the CUT effectively transmitted its top-down change in priorities, and achieved the largest increase in female-friendly amenities, i.e., establishments negotiating with a union affiliated with one of the four national confederations that adopted the female-focused fight plan into their own agendas, and establishments located near a CUT training school (Table 4, Panel B).

Since the share of male-centric clauses negligibly fell, men may value CUT employers less. However, we find a 1.0pp increase in retention for incumbent male workers (Table 6), representing a 3% decline in separation relative to baseline. That men were no more likely to exit treated establishments suggests that the reform did not make them worse off. Thus, although the reform disproportionately improved working conditions for women, it did so without losses for men (in contracted or observed amenities, or by leading them to other jobs).

Job queues Job queues constitute a second revealed preference measure of value (Holzer et al., 1991). Because we do not directly observe applications, we use workers in the probationary period, i.e., the first 3 months of tenure, as a proxy measure. Since Brazilian labor law permits employers to terminate probationary workers without severance pay, such contracts are commonly used to screen workers.[61] We find a 0.6pp increase (SE 0.003) in women's share among probationary workers (Figure 7b), a 1.7% improvement over baseline. This suggests that women were more likely to queue for jobs at treated establishments.

Although precise, the magnitude of this estimate is small. Three factors likely dampen the estimate of women's queuing response at CUT establishments. The first (as previously discussed) is our inability to directly observe changes in amenity values to scale our treatment effects.[62] The second is information frictions that may prevent workers from learning of newly instituted amenities at CUT establishments.[63] Finally, employers may potentially screen women out during hiring, such that any change in composition among probationary workers is already muted.

In sum, we find that the improvement in female-friendly amenities increased the attractiveness of CUT establishments to women. Appendix F uses these revealed preference changes in firm value to quantify the CUT reform's effect on worker welfare.

---

[61]For example, 25% of all separations occur between 3 months and 3 months and 1 day.

[62]Since PageRank values can only be estimated for the super-connected set of firms, it is infeasible to separately estimate pre and post-period values covering a reasonably large sample of firms given only 3 years of data per period.

[63]As an anecdotal example, an economics professor believed that she was eligible for extended maternity leave because a co-worker at the same institution had obtained such an extension. However, this professor's location was not covered by the same CBA as her colleague, meaning that she was ineligible for the maternity leave extension.

4.3 Explanations

Our analysis thus far describes the positive impact of the CUT reform on female-friendly amenities, and shows that women valued the changes to workplaces brought about by the CUT reform, as seen in lower separation rates and an increase in the female share of new probationary hires. How were the improvements in female-focused amenities paid for? There exist three possible explanations. First, better amenities could lead to tradeoffs for workers. Employers may offset the cost of amenities by lowering wages, as predicted by compensating differences (Rosen, 1986), or employ fewer or relatively inexpensive workers such as men or older women (Summers, 1989). Second, increasing the provision of amenities could also prompt tradeoffs for employers, by reducing firm profits. Finally, better amenities could increase the surplus within the employment relationship by raising worker productivity or satisfaction, or better enabling employers to recruit and retain high quality workers. This last scenario generates the prospect of valuable amenities paying for themselves. We investigate each explanation in turn below.

Tradeoffs for workers First, amenity gains could yield tradeoffs for workers. Compensating differences would predict that women's wages should disproportionately decline. If both men and women pay for female-friendly amenities, then all workers' wages would decline. Finally, since Brazilian employers cannot reduce the nominal wages of existing workers without union approval, wage adjustments may only realize for new workers. We therefore separately study the reform's effect on the mean log wage of established workers, with over twelve months of tenure, and new workers, with tenure below 12 months, separately by gender.

Table 7, Panel A reports the treatment effect on wages. The reform had no meaningful impact on the mean log wage of any worker group—established or new, women or men. All point estimates are small and precise. The only decline in wages occurred for new male workers, whose wages declined by a small amount (0.6%, SE 0.003).[64] This effect is not robust to including fixed effects accounting for time-varying shocks in an industry and location. We rule out wage declines exceeding 1.2-1.3% for new workers, and 0.7-0.8% for established workers with a high level of confidence (95%). By way of benchmark, (Lagos, 2024) finds that workers value leave clauses, many of which are classified as female-centric, worth 7.8% of their wage on average.[65] Lastly, given the similar point estimates for the effect of the reform on men and women's wages, the gender wage gap remained unchanged.

Three additional results furnish evidence against wage declines as a means to fund amenities. First, because employers who offer better amenities may upgrade their workforce, such that the zero treatment effect on wages masks an effective wage decline for higher quality workers, we explore the reform's effect on the wages of incumbent workers, who were employed by an establishment in the year before the reform and whose composition is unchanged. Tracking incumbent workers, we find a precise null treatment effect on the wages of both men and women (Table 6, Column 3).

---

[64]Figures B11a and B11b show parallel pre-trends for the wage outcomes without substantial changes in the post-treatment years. The small decline in new male workers' wages is not robust to including industry-geography-year fixed effects.

[65]That paper pools men and women together when estimating the value of amenities.

Second, for a more direct measure of union-negotiated wage changes, we extract the percentage wage adjustments negotiated in collective bargaining agreements (Table 7, Column 6a). The treatment effect on these wage adjustments is positive, 0.032pp (SE 0.021), and we rule out declines exceeding 0.009pp with a high degree of confidence (95%). Finally, to investigate if wage declines manifest in workplaces that experienced the largest improvement in amenities, we explore heterogeneity in treatment effects by the baseline share of women in an establishment. Here, too, we detect no heterogeneity, and precisely rule out small declines in wages at workplaces that witnessed larger upgrades in amenities, i.e., those with a small baseline female share of employment (Figure 8e). Overall, there is no evidence that employers reduced wages to finance female-focused amenities.

If employers cannot offset the cost of amenity improvements through wages, they may instead reduce employment (Summers, 1989). Table 7, Panel B reports the treatment effect on employment and Figure B11c shows parallel pre-trends. We find no statistically significant impact on either the employment or hiring at treated employers, and can rule out declines exceeding 1.5pp with a high degree of confidence (95%). We also find no decline in the overall employment or hiring of female workers; if anything, as previously discussed, women's share in the workforce increased by 0.2pp, and among probationary workers by 0.6pp. Turning to heterogeneous treatment effects, employment did not decline in workplaces that experienced the largest improvement in amenities (Figure 8f). We rule out declines exceeding 0.5pp in the most impacted workplaces.

A third dimension of adjustment is worker composition: employers may switch to hiring men or older women. That women rose as a share of workers provides evidence against employers substituting to male workers. There is also no treatment effect on the mean age or tenure of female workers (Table A14). In sum, although the CUT reform led to valuable improvements in female-friendly amenities, there is no evidence that these gains came at the expense of workers' wages or employment.

Tradeoffs for employers   Amenities could also improve by redistributing surplus from firms to workers: if workers did not pay for the improvement in amenities, then perhaps firms did so through lower profits.

We find empirical evidence and theoretical reasons against this explanation. Table 7 (Panel C) reports treatment effects on profits, measured in two different ways. The first is firm exit, which is a non-trivial margin of adjustment in Brazil, where 8.7% of control group establishments exited within two years of the reform. We also directly measure profits for a select sample of firms in Orbis data. There is no statistically significant treatment effect on either exit (point estimate -0.3pp, SE 0.3) or measured profits (point estimate 0.70pp, SE 1.17). For the sample of establishments which are observed in Orbis, we rule out a decline in profits exceeding 1.59pp with high confidence (95%).

Theoretically, profits could only decline if CUT-affiliated unions successfully bargained away a larger share of surplus from employers. However, there is little reason to believe that the CUT reform enhanced unions' bargaining power; rather, it shifted union priorities towards women. If anything, the position of the Workers' Party grew increasingly precarious around the time of the

reform due to the impeachment of President Dilma Rousseff (between December 2015 and August 2016). Moreover, while an increase in union bargaining power generally predicts changes in employment—either moving right along a firm's upward-sloping labor supply curve or left along its labor demand curve—we find a precisely estimated zero effect. In sum, there is no evidence that profits declined to pay for female-focused amenities.

Increase surplus Finally, providing valuable amenities for women could increase the surplus within the employment relationship by improving workers' effective productivity. For instance, employers may be able to retain and attract higher quality female workers, or get more effort out of them. We already document that improving amenities increased women's retention. A simple back-of-the-envelope calculation indicates that the resulting decline in replacement costs would pay for the most expensive female-friendly amenities advocated by the CUT, namely, extending paid maternity leave by two months.[66] In addition, we find that employers were disproportionately able to retain higher quality women workers, with high school degrees, compared to workers without degrees (Figure B12). This suggests that cost savings may be even greater than the simple estimate if training and hiring costs are higher for more highly educated workers.

We also investigate effects on a second measure of worker productivity, absenteeism. High rates of absenteeism prevail in many developing countries, with especially high rates found in manufacturing industries (Adhvaryu et al., 2024). The average Brazilian employer in our sample lost 4.1% of annual workdays to absences at baseline. The reform reduced absenteeism by 0.19pp, which is a 4.4% reduction relative to baseline (Table 7, Panel (d)).

Both measures of productivity, retention and absenteeism, improved more in workplaces that saw the largest gains in amenities (Figure 8d, Table A15).

Finally, in perhaps the clearest investigation of whether providing female-friendly amenities benefited employers, we examine the presence of within-firm spillovers. Employers who benefit from providing amenities should voluntarily expand them to other establishments of the firm negotiating with non-CUT affiliated unions. Figure B13 reports results. Consistent with employers benefiting from improving their amenities for women, we find evidence of within-firm spillovers. Multi-establishment firms exposed to the reform through one establishment were significantly more likely to expand female-friendly amenities to untreated establishments of the firm compared to entirely unexposed firms. The magnitude of spillover effects resembles the reform's direct effect

---

[66]We compare the replacement costs of workers not retained in the counterfactual to the additional costs incurred due to extended paid maternity leaves. Women are 2.3pp less likely to leave establishments that improve amenities (Figure 8d). If replacement costs are two annual salaries of the lost worker (Jäger and Heining, 2022), then higher retention leads the average employer to save $3.3 \times 24 \times$ monthly salary since the number of fewer workers hired over a year is the geometric sum $2.3 + 2.3(0.31) + 2.3(0.31)^2 + ... \approx 3.3$ (where 0.31 is the average annual separation rate among women in control establishments at baseline with the share of women in the workforce below 60%). The rationale behind the geometric sum is: you hire 2.3 fewer women, whose replacements would have left with probability 0.31 and so on. On average, in these same establishments, 1.3 women take maternity leaves within any given year. Assuming that they all take the two month extension, the cost to the employer is $1.3 \times 2 \times$ monthly salary. Since $3.3 \times 24 > 1.3 \times 2$, the savings from increased retention would entirely pay for longer maternity leaves. The same would hold true if we replace replacement costs with recruitment costs (equivalent to 3 instead of 24 months of salary) and triple the number of women taking leave. The 2.3 and 1.3 are both rates.

on amenities. The share of female managers at indirectly exposed firms increased by 2% relative to baseline, share of women taking extended maternity leaves grew 8%, and retention improved 0.8pp.[67]

Robustness   Brazil experienced a recession between 2014 and 2016. Our findings may be driven by the recession instead of a shift in union priorities if CUT unions either represent systematically different industries, differently impacted by the recession, or if these unions differently responded to the recession. Several findings point against these explanations. First, the positive effect on female amenities reflects an increase in CUT contracts as opposed to any potential recession-induced decline in non-CUT contracts (Figure B7). Second, there is little reason to expect the recession to have increased the CUT's demand for female-focused amenities such as maternity leave or childcare payments, as opposed to clauses that shield workers' wages, which may arguably constitute a more natural demand during a recession. Third, we find heterogeneous treatment effects, with the largest amenity gains occurring at establishments with a small female share of workers and union leaders. This heterogeneity counters the idea that the CUT in general responded differently to the recession. Finally, all specifications account for two-digit-industry and location-specific time varying shocks.

4.4   Summary

This paper set out to answer two questions. First, can unions improve workplaces for women by shifting priorities towards them? Second, how are these amenities paid for? Our results show that unions can indeed improve workplaces for women and that the resulting benefits need not come with costs. Specifically, the CUT reform that led unions to prioritize women in collective bargaining increased the provision of valuable amenities for women, both on paper and in practice. Women valued these changes, becoming less likely to separate from and more likely to queue for jobs at CUT establishments. We find no evidence that female-focused amenities came at the expense of either women or men's wages or employment, or of firm profits. While male amenities may have declined (in some unobserved way), men did not exit more. Instead, we find that the reform potentially paid for itself, by improving women's effective productivity, increasing their retention, and reducing absences. Firms exposed to female-friendly amenities were significantly more likely to expand them to other (untreated) establishments of the firm.

5   Discussion

That providing valuable amenities benefited women without making men or employers worse off suggests that Brazilian employers were initially inside their frontier provision of female-friendly amenities. What explains this puzzle? Does it reflect a failure of the union or a failure of the firm?

---

[67]Although within-firm spillovers could also reflect equity considerations, spillovers on female managers are harder to square with a desire for equity since they are likely unobserved by workers at other establishments.

The union voice model provides a natural framework to view our results. Union voice posits that unions help workers express preferences for desirable workplace amenities with less fear of being taken advantage of by employers and having other compensation cut by revealing their willingness to pay to employers (Freeman and Medoff, 1984). The union has bargaining clout and is more trusted by workers than the employer. However, if unions represent the median worker's preferences and women constitute the minority (e.g. Farber (1978)), or if unions are male-dominated and women mistrust them, then the union may not adequately represent women's preferences. Then, even if providing valuable amenities could raise women's productivity, such as by reducing turnover or absences, women's lack of voice or trust in the union could lead to an inefficient under-provision of female-friendly amenities before the CUT reform. The reform could deliver some "free lunch" results of the kind that we find by elevating women's preferences where they previously lacked voice and raising their productivity. Female-friendly amenities would improve without reducing wages, employment, or firm profits.

Just as predicted by this theory, we find that female-friendly amenities saw the greatest increases in workplaces where women previously constituted a minority among workers or within union leadership. The improvements in amenities did not come at the expense of either workers or employers and instead raised workers' effective productivity.

Why, then, did the union and firm initially fail to recognize the value of amenities? On the union side, qualitative accounts surrounding the reform reveal that the failure was likely rooted in overlooking women's needs before the reform. The description in Section 1.2 shows that women had little voice within unions before the CUT reform. This disparity in voice by gender is exactly what inspired the reform to begin with, and the reform got unions to focus on women's needs (Godinho Delgado, 2017).[68]

On the firm side, being inside the frontier provision of female-friendly amenities has three possible foundations. The first is the union voice model (Freeman and Medoff, 1984). Because firms may rely on unions to channel workers' needs, when unions did not prioritize women, firms did not learn which amenities would enhance worker satisfaction and retention. By channeling women's preferences, the reform enabled firms to identify and adopt valuable amenities. A second model features firms that are slow to change. Although women have increasingly been entering the labor market, firms may only slowly adjust to the evolving needs of their workforce. Historically, workplaces were designed primarily for men, but now they must also focus on women. Although firms are adjusting and optimizing to cater to the needs of women workers, this adjustment may be slow and in the short run, firms may be inside their frontier provision of amenities. Our results show that unions can help speed this adjustment to the frontier. A final model posits that firms may never have experimented with female-friendly amenities and therefore not know their relative benefits and costs. The reform enabled experimentation and ultimately secured the persistence and

---

[68]Hanna et al. 2014 show in "learning through noticing" that even people with a great deal of experience may persistently be off the production frontier because they fail to notice important features of the data that they possess, but providing information helps them learn.

expansion of female-friendly amenities over time and across employers.[69]

Ultimately, all three of these explanations generate similar observable implications. Each is consistent with reduced turnover and absences which are worth the cost of providing expensive amenities. Each also predicts that amenities will spill over to the untreated establishments of exposed firms. Determining exactly why firms were inside their frontier provision of female-friendly amenities is beyond the scope of this paper. Instead, the important point is that unions could successfully improve workplaces for women by prioritizing their needs. When unions focused on the needs of workers that accounts suggest had previously been overlooked, the resulting gains came without costs and instead benefited both workers and employers.

6   Conclusion

This study finds that one reason that workplaces do not provide job features valued by women is that decision-makers do not prioritize women's preferences. Studying a top-down shift in union priorities at Latin America's largest trade union federation, the *Central Única dos Trabalhadores* (CUT), which led its affiliated unions to adopt a female-focused bargaining agenda, we find that female-friendly amenities improved without leading to losses for workers or employers. The reform increased the provision of amenities such as maternity leaves, childcare, and flexibility. Although these improvements raised the attractiveness of the affected workplaces to women (as seen in lower separation rates and an increase in the female share of new probationary hires), they surprisingly did not precipitate losses for workers or employers. Instead, better amenities raised workers' effective productivity through lower turnover and absences.

In sum, we provide causal evidence that shifting union priorities towards women can improve workplaces for them. While gender gaps in virtually all labor market outcomes have narrowed rapidly over the last century, more recently reducing inequality has proven harder (Blau and Kahn, 2006; Goldin, 2014; Blau and Kahn, 2017). Our findings reveal a promising role for advocating women's interests in collective bargaining, and demonstrate that this approach had especially large effects in workplaces where women previously lacked representation.

That unions could increase valuable amenities for women without imposing costs and instead by raising productivity implies that Brazilian employers were initially inefficiently under-providing female-friendly amenities. The cost savings from retention alone would pay for the most expensive amenity advocated by the CUT, namely maternity leave extensions. In line with firms benefiting from offering better amenities, we also find within-firm spillovers. Overall, our findings suggest that unions can improve workplaces for both workers and employers by emphasizing the needs of workers who lack representation.

Our findings raise several new questions. First, given that priorities can affect compensation and

---

[69]A learning-and-adoption explanation for amenities would mirror a growing set of empirical papers in developing countries which find that exposure to a new and profitable technology fosters its adoption over time. Examples of such technologies include a new cutting technology to manufacture footballs studied in Atkin et al. (2017) and lucrative management practices studied in Bloom et al. (2019).

inequality, how do these priorities emerge? An older literature emphasizes the inherently political nature of labor unions and suggests that their objectives are shaped by their internal organization (Ross, 1950; Farber, 1986).[70] In light of our findings, this hypothesis is especially fruitful to revisit empirically. Second, if decision-makers' priorities can influence workplace conditions, can they also influence investments that impact worker productivity? Studying how productivity evolves as a consequence of such investments is an exciting avenue for future research.

---

[70]In the "Ross-Dunlop debate" of the 1940s, while John Dunlop argued that it is useful to analyze unions as maximizing a well-defined objective function, Arthur Ross contended that a union's internal structure and political process likely determine its objective function. Our study examines a top-down change in the union's priorities or objective, but further research on the political economy of unions would be useful.

References

Abowd, J. M., Kramarz, F., and Margolis, D. N. (1999). High Wage Workers and High Wage Firms. *Econometrica*, 67(2):251–333.

Adhvaryu, A., Gauthier, J.-F., Nyshadham, A., and Tamayo, J. (2024). Absenteeism, productivity, and relational contracts inside the firm. *Journal of the European Economic Association*, page jvae026.

Anderson, S. P., De Palma, A., and Thisse, J.-F. (1992). *Discrete Choice Theory of Product Differentiation*. MIT press.

Ashenfelter, O. (1972). Racial Discrimination and Trade Unionism. *Journal of Political Economy*, 80(3, Part 1):435–464.

Atkin, D., Chaudhry, A., Chaudhry, S., Khandelwal, A. K., and Verhoogen, E. (2015). Markup and Cost Dispersion across Firms: Direct Evidence from Producer Surveys in Pakistan. *American Economic Review*, 105(5):537–44.

Atkin, D., Chaudhry, A., Chaudry, S., Khandelwal, A. K., and Verhoogen, E. (2017). Organizational Barriers to Technology Adoption: Evidence from Soccer-Ball Producers in Pakistan*. *The Quarterly Journal of Economics*, 132(3):1101–1164.

Bailey, M. J., Byker, T., Patel, E., and Ramnath, S. (2019). The Long-Run Effects of California's Paid Family Leave Act on Women's Careers and Childbearing:New Evidence from a Regression Discontinuity Design and U.S. Tax Data. *NBER Working Paper*, (w26416).

Berger, D., Herkenhoff, K., and Mongey, S. (2022). Labor market power. *American Economic Review*, 112(4):1147–93.

Bertrand, M., Black, S. E., Jensen, S., and Lleras-Muney, A. (2018). Breaking the Glass Ceiling? The Effect of Board Quotas on Female Labour Market Outcomes in Norway. *The Review of Economic Studies*, 86(1):191–239.

Biasi, B. and Sarsons, H. (2022). Flexible Wages, Bargaining, and the Gender Gap. *The Quarterly Journal of Economics*, 137(1):215–266.

Blau, F. D. and Kahn, L. M. (2006). The U.S. Gender Pay Gap in the 1990S: Slowing Convergence. *ILR Review*, 60(1):45–66.

Blau, F. D. and Kahn, L. M. (2017). The Gender Wage Gap: Extent, Trends, and Explanations. *Journal of Economic Literature*, 55(3):789–865.

Bloom, N., Brynjolfsson, E., Foster, L., Jarmin, R., Patnaik, M., Saporta-Eksten, I., and Van Reenen, J. (2019). What Drives Differences in Management Practices? *American Economic Review*, 109(5):1648–83.

Bolotnyy, V. and Emanuel, N. (2022). Why do women earn less than men? evidence from bus and train operators. *Journal of Labor Economics*, 40(2):283–323.

Boudreau, L. (2023). Multinational enforcement of labor law: Experimental evidence from bangladesh's apparel sector. *Mimeo*.

Card, D. (1996). The Effect of Unions on the Structure of Wages: A Longitudinal Analysis. *Econometrica*, pages 957–979.

Card, D., Cardoso, A. R., Heining, J., and Kline, P. (2018). Firms and Labor Market Inequality: Evidence and Some Theory. *Journal of Labor Economics*, 36(S1):S13–S70.

Card, D., Lemieux, T., and Riddell, W. C. (2004). Unions and Wage Inequality. *Journal of Labor Research*, 25(4):519–559.

Card, D., Lemieux, T., and Riddell, W. C. (2020). Unions and Wage Inequality: The Roles of Gender, Skill and Public Sector Employment. *Canadian Journal of Economics*, 53(1):140–173.

Derenoncourt, E. and Weil, D. (2024). Voluntary Minimum Wages. Technical report, National Bureau of Economic Research.

DiNardo, J., Fortin, N., and Lemieux, T. (1996). Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach. *Econometrica*, 64(5):1001–44.

Dittrich, M., Knabe, A., and Leipold, K. (2014). Gender differences in experimental wage negotiations. *Economic Inquiry*, 52(2):862–873.

Emanuel, N. and Harrington, E. (2022). The Payoffs of Higher Pay. Technical report, Working Paper.

Farber, H. S. (1978). Individual Preferences and Union Wage Determination: The Case of the United Mine Workers. *Journal of Political Economy*, 86(5):923–942.

Farber, H. S. (1986). The Analysis of Union Behavior. *Handbook of Labor Economics*, 2:1039–1089.

Farber, H. S., Herbst, D., Kuziemko, I., and Naidu, S. (2021). Unions and Inequality over the Twentieth Century: New Evidence from Survey Data. *The Quarterly Journal of Economics*, 136(3):1325–1385.

Feenstra, R. C. (1994). New Product Varieties and the Measurement of International Prices. *American Economic Review*, pages 157–177.

Felix, M. (2022). Trade, Labor Market Concentration, and Wages. *Working Paper*.

Franco Oliveira, E. (2017). Ação sindical e a questão de gênero: um estudo sobre a participação das mulheres nas direções da Central Única dos Trabalhadores–CUT. *Diss. Universidade Federal da Bahia*.

Freeman, R. B. and Medoff, J. L. (1984). What Do Unions Do? *ILR Review*, 38:244.

Gerard, F., Lagos, L., Severnini, E., and Card, D. (2021). Assortative Matching or Exclusionary Hiring? The Impact of Employment and Pay Policies on Racial Wage Differences in Brazil. *American Economic Review*, 111(10):3418–57.

Godinho Delgado, D. (2017). Trade Unions in Transformation. Building Trade Union Power with Gender Equality: The Case of the Unified Workers' Central of Brazil. Technical report, Friedrich-Ebert-Stiftung.

Goldin, C. (2014). A Grand Gender Convergence: Its Last Chapter. *American Economic Review*, 104(4):1091–1119.

Goldin, C. and Katz, L. F. (2011). The Cost of Workplace Flexibility for High-Powered Professionals. *The Annals of the American Academy of Political and Social Science*, 638(1):45–67.

Gruber, J. (1994). The Incidence of Mandated Maternity Benefits. *American Economic Review*, 84(3):622–641.

Guedes de Oliveira, K. (2022). Uma análise sobre as questões de gênero na Central Única dos Trabalhadores (2003-2016). *Diss. Universidade de São Paulo*.

Harju, J., Jäger, S., and Schoefer, B. (2021). Voice at work. *Working Paper No. 28522*.

Hill, H. (1996). The Problem of Race in American Labor History. *Reviews in American History*, 24(2):189–208.

Holzer, H. J., Katz, L. F., and Krueger, A. B. (1991). Job Queues and Wages. *The Quarterly Journal of Economics*, 106(3):739–768.

Horn, C. H. (2009). *Collective Bargaining in Brazil: A Study on Joint Regulation of the Employment Relationship in Manufacturing*. VDM Verlag.

ILO and Gallup Inc. (2017). Towards a Better Future for Women and Work: Voices of Women and Men. Technical report, ILO, Gallup.

Jäger, S. and Heining, J. (2022). How Substitutable Are Workers? Evidence from Worker Deaths. Technical report, NBER Working Paper No 30629.

Jäger, S., Schoefer, B., and Heining, J. (2021). Labor in the Boardroom. *The Quarterly Journal of Economics*, 136(2):669–725.

Kleven, H., Landais, C., and Sogaard, J. E. (2019). Children and Gender Inequality: Evidence from Denmark. *American Economic Journal: Applied Economics*, 11(4):181–209.

Krueger, A. and Summers, L. (1988). Efficiency Wages and the Inter-industry Wage Structure. *Econometrica*, 56(2):259–93.

Lagos, L. (2024). Union Bargaining Power and the Amenity-Wage Tradeoff. *IZA Working Paper No. 17034*.

Lalive, R., Schlosser, A., Steinhauer, A., and Zweimüller, J. (2013). Parental Leave and Mothers' Careers: The Relative Importance of Job Protection and Cash Benefits. *The Review of Economic Studies*, 81(1):219–265.

Lalive, R. and Zweimüller, J. (2009). How does parental leave affect fertility and return to work? evidence from two natural experiments. *The Quarterly Journal of Economics*, 124(3):1363–1402.

Lamadon, T., Mogstad, M., and Setzler, B. (2022). Imperfect Competition, Compensating Differentials, and Rent Sharing in the US Labor Market. *American Economic Review*, 112(1):169–212.

Lang, K. and Gagnon, M.-J. (2009). Brazilian Trade Unions: In (In)Voluntary Confinement of the Corporatist Past. *Relations Industrielles / Industrial Relations*, 64(2):250–269.

Leibbrandt, A. and List, J. A. (2015). Do Women Avoid Salary Negotiations? Evidence from a Large-Scale Natural Field Experiment. *Management Science*, 61(9):2016–2024.

Liukkunen, U. (2019). *Collective Bargaining in Labour Law Regimes: A Global Perpective*, chapter The Role of Collective Bargaining in Labour Law Regimes: A Global Approach, pages 1–64. Springer Nature.

Maestas, N., Mullen, K. J., Powell, D., von Wachter, T., and Wenger, J. B. (2023). The Value of Working Conditions in the United States and the Implications for the Structure of Wages. *American Economic Review*, 113(7):2007–47.

Maida, A. and Weber, A. (2020). Female Leadership and Gender Gap within Firms: Evidence from an Italian Board Reform. *ILR Review*, 0(0):0019793920961995.

Martins, G. L. (2021). Sindicalismo feminista: a potência transformadora das mulheres no Sindicato dos Bancários de São Paulo, Osasco e Região. *Diss. Universidade de São Paulo*.

Mas, A. and Pallais, A. (2017). Valuing Alternative Work Arrangements. *American Economic Review*, 107(12):3722–59.

Morchio, I. and Moser, C. (2020). The Gender Gap: Micro Sources and Macro Consequences. In *CEPR Discussion Paper No. 16383*.

Munhoz, I. T. and Silotto, G. (2019). A ausência de mulheres nos cargos de direção nos Sindicatos de São Paulo: as possíveis causas para a baixa representatividade nos três maiores sindicatos da CUT. *Revista Parlamento e Sociedade*.

Recoaro, D. A. (2022). Sindicalismo de movimento social e a organização das mulheres na CUT: uma inspiração feminista. *Diss. Universidade de Coimbra*.

Redding, S. J. and Weinstein, D. E. (2016). A Unified Approach to Estimating Demand and Welfare. *CEPR Discussion Paper No. DP11421*.

Rosen, S. (1986). The Theory of Equalizing Differences. In *Handbook of Labor Economics*, volume 1, pages 641–692. Elsevier.

Ross, A. M. (1950). *Trade Union Wage Policy*. Univ of California Press.

Schönberg, U. and Ludsteck, J. (2014). Expansions in maternity leave coverage and mothers' labor market outcomes after childbirth. *Journal of Labor Economics*, 32(3):469 – 505.

Silva, T. R. B. (2021). Narrativa, memória e luta por reconhecimento: trajetória de mulheres dirigentes sindicais da FETRAF-RS/CUT. *Diss. Universidade Federal do Rio Grande do Sul*.

Skorge, Ø. S. and Rasmussen, M. B. (2021). Volte-face on the welfare state: Social partners, knowledge economies, and the expansion of work-family policies. *Politics & Society*, 50(2):222–254.

Sorkin, I. (2018). Ranking Firms Using Revealed Preference. *The Quarterly Journal of Economics*, 133(3):1331–1393.

Staiger, D. O., Spetz, J., and Phibbs, C. S. (2010). Is There Monopsony in the Labor Market? Evidence from a Natural Experiment. *Journal of Labor Economics*, 28(2):211–236.

Summers, L. H. (1989). Some Simple Economics of Mandated Benefits. *American Economic Review*, 79(2):177–183.

Taber, C. and Vejlin, R. (2020). Estimation of a Roy/Search/Compensating Differential Model of the Labor Market. *Econometrica*, 88(3):1031–1069.

Visser, J. (2019). Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS) Database, version 6.0. *Amsterdam Institute for Advanced Labour Studies (AIAS), University of Amsterdam*.

Wiswall, M. and Zafar, B. (2017). Preference for the Workplace, Investment in Human Capital, and Gender. *The Quarterly Journal of Economics*, 133(1):457–507.

Tables and Figures

Table 1: Sample Descriptives

	All (1)	Treated (2)	Control (3)
Panel A: Sample characteristics			
Collective bargaining agreements	211,569	42,513	169,056
Establishment-union pairs	89,897	19,039	70,858
Signing establishments	80,131	18,103	62,028
Signing unions	4,409	886	3,523
Avg. years of CBA negotiation (per pair)	2.35	2.23	2.39
Panel B: CBA negotiation characteristics			
Avg. clause count	24.7	23.1	25.1
Avg. female clause count (intuitive)	1.67	1.81	1.63
Avg. female clause count (data-driven)	3.16	3.15	3.16
Avg. male clause count (data-driven)	4.87	4.59	4.94
Panel C: Establishment-level characteristics (2014, baseline)			
Avg. employment	143	198	127
Avg. share of women in workforce	0.38	0.36	0.38
Share employing both men and women	0.82	0.83	0.82
Share of single establishment firms	0.64	0.63	0.64
Panel D: Union-level characteristics (2014, baseline)			
Avg. size of union board	18.8	24.3	17.3
Avg. share of women in board	0.23	0.23	0.22
Share with female president or vice president	0.17	0.18	0.17

Notes: Table shows descriptive statistics for the sample of establishment-union pairs negotiating firm-level CBAs registered in *Sistema Mediador* between 2012 and 2017. All CBAs are valid, non-amendment, firm-level agreements that have a union counterpart with information on 2012 union central affiliation. We additionally drop contracts signed by more than one union if these unions have different CUT affiliation in 2012 (fewer than 0.33% of CBAs). On the signing establishment's side, we restrict to CBAs where the employer appears in RAIS and has active employees in 2014. Treated units are those where the union counterpart was affiliated to CUT in 2012. See Appendix C for more details. The starting sample described in Panel A has observations at the pair-year level for years when CBA negotiations occurred, i.e., the new contracts panel. Statistics in Panel B are averages across these pair-year observations. Panels C and D use unique establishment and union observations in the baseline year (2014), respectively.

Table 2: Female- and Male-Centric Amenities

Intuitive definition	Data-driven definition		
Female clauses	Top 20 female clauses	Top 20 male clauses	Rank
Abortion leave	Childcare assistance	On-call pay	1
Abortion protections	Absences	Life insurance	2
Adoption leave	Adoption leave	Strike procedures	3
Childcare assistance	Other: holidays and leaves	Other: protections for injured workers	4
Equal opportunities	Seniority pay	Profit sharing	5
Female workforce	Maternity protections	Salary deductions	6
Maternity assistance	Abortion protections	Female workforce	7
Maternity leave	Paid leave	Transfers	8
Maternity protections	Night pay	Machine and equipment maintenance	9
On-call	Nonwork-related injury protections	Duration and schedule	10
Other: holidays and leaves	Abortion leave	Working environment conditions	11
Paid leave	Policy for dependents	Salary payment - means and timeframes	12
Part-time contracts	Extension/reduction of workday	Hazard pay (danger risk)	13
Paternity protections	Guarantees to union officers	Safety equipment	14
Policy for dependents	Renewal/termination of the CBA	CIPA: accident prevention committee	15
Sexual harassment	Medical exams	Other assistances	16
Special shifts	Unionization campaigns	Death/funeral assistance	17
Uninterrupted shifts	Health education campaigns	Workday compensation	18
Unpaid leave	Waiving union fees	Collective vacations	19
Workday controls	Salary adjustments/corrections	Tools and equipment	20

Notes: Table lists the clause types that were selected as "female-centric" based on intuition (column 1) and with our data-driven approach (column 2), which also allows us to define "male-centric" clauses (column 3)—refer to Section 2.2 for details on the data-driven approach. The clauses in column 1 are listed in alphabetical order while those selected with the data-driven approach are ranked on the basis of the coefficients β_z coming from the estimation of Equation (2). That is, the first female clause listed is the one with the highest estimate of β_z, the second is the one with the second highest value of β_z, etc. Similarly, the male clauses are ranked from the one with the lowest estimate of β_z to the one with the 20th lowest estimate. In columns 2 and 3, we highlight in red the clauses that also belong to the intuitive definition of female-centric clauses.

Table 3: Effect of CUT Reform on Negotiated Amenities

	Intuitive definition (female clauses)					Data-driven		
	All	Leave	Maternity	Harassment	Flexibility	Female	Male	F/(F+M+1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Intensive margin (number of clauses)								
$D_i \times \delta_{year \geq 2015}$	0.156***	0.078***	0.042***	0.009***	0.028***	0.302***	0.130***	0.032***
	(0.013)	(0.006)	(0.004)	(0.001)	(0.008)	(0.021)	(0.029)	(0.002)
Mean outcome	0.94	0.25	0.23	0.02	0.45	1.58	2.55	0.15
Panel B: Intensive margin (sum of unique clause types)								
$D_i \times \delta_{year \geq 2015}$	0.123***	0.047***	0.042***	0.008***	0.027***	0.155***	0.067***	
	(0.010)	(0.004)	(0.004)	(0.001)	(0.004)	(0.014)	(0.017)	
Mean outcome	0.69	0.18	0.20	0.02	0.30	1.26	1.58	
Panel C: Extensive margin								
$D_i \times \delta_{year \geq 2015}$	0.017***	0.012***	0.020***	0.008***	0.022***	0.034***	-0.001	
	(0.003)	(0.002)	(0.002)	(0.001)	(0.003)	(0.003)	(0.003)	
Mean outcome	0.31	0.12	0.15	0.02	0.23	0.36	0.46	
Panel D: As a share of all clauses								
$D_i \times \delta_{year \geq 2015}$	0.005***	0.001***	0.001***	0.000***	0.003***	0.021***	-0.003**	
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)	
Mean outcome	0.05	0.01	0.01	0.00	0.03	0.07	0.14	
Observations	600,840	600,840	600,840	600,840	600,840	600,840	600,840	600,840

Notes: Table reports the coefficients for DID regressions—see Equation (3)—estimating the effect of the CUT reform on the female-centric and male-centric amenities included in CBAs. The unit of observation is a union-employer pair. Panel A reports effects on the total number of clauses, an intensive margin measure of amenities. Panel B reports effects on the sum of unique clause types in the corresponding categories exist in a contract, capturing changes to the *space* of female (male) clauses (as opposed to their number). For example, two anti-harassment clauses will raise the outcome value by two in Panel A of Column 6 but by one in Panel B. Panel C reports effects on a cumulative indicator for whether any clause of the corresponding type exists in a contract as an extensive margin measure of amenities. Panel D uses the share of clauses among all clauses in a contract. Under each panel we report the mean of the dependent variable among the treated at baseline (2014). The sample is the filled panel of establishment-union pairs by year. All columns control for pair fixed effects, as well as time-varying state and industry fixed effects. Standard errors are clustered at the establishment level.

Table 4: Heterogeneity Analysis to Explore Potential Mechanisms

	Baseline (1)	Prioritize fight plan (2)	Has a CUT training school (3)	Female leader in CUT (4)	Union gained female leader (5)
		Full interaction: $D_i \times \delta_{year \geq 2015} \times H_i$			

Panel A: Female clauses (intensive margin)

	Baseline (1)	Prioritize fight plan (2)	Has a CUT training school (3)	Female leader in CUT (4)	Union gained female leader (5)
$D_i \times \delta_{year \geq 2015}$	0.302***	0.201***	0.230***	0.331***	0.333***
	(0.021)	(0.023)	(0.022)	(0.021)	(0.022)
$D_i \times \delta_{year \geq 2015} \times H_i$		0.311***	0.423***	-0.190***	-0.223***
		(0.048)	(0.066)	(0.061)	(0.049)
Sum of coefficients		0.512	0.653	0.141	0.110
p-value		[0.000]	[0.000]	[0.017]	[0.017]
Mean outcome	1.58	1.58	1.58	1.58	1.58
Observations	600,840	600,840	600,840	600,840	600,840

Panel B: Female retention

	Baseline (1)	Prioritize fight plan (2)	Has a CUT training school (3)	Female leader in CUT (4)	Union gained female leader (5)
$D_i \times \delta_{year \geq 2015}$	0.018***	0.014***	0.014***	0.023***	0.018***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
$D_i \times \delta_{year \geq 2015} \times H_i$		0.015**	0.024***	-0.032***	0.001
		(0.006)	(0.007)	(0.006)	(0.006)
Sum of coefficients		0.028	0.038	-0.009	0.019
p-value		[0.000]	[0.000]	[0.123]	[0.001]
Mean outcome	1.00	1.00	1.00	1.00	1.00
Observations	19,757,916	19,757,916	19,757,916	19,757,916	19,757,916

Notes: Table tests for heterogeneity in the effect of the CUT reform on female-centric clauses (data-driven approach) and female retention according to baseline indicator variables related to potential mechanisms. The dummy to test for heterogeneity in the effects (H_i) is fully interacted with the treatment dummy (D_i) and the post-period dummy ($\delta_{year \geq 2015}$). The table only reports the coefficients on the effects that determine the treatment effect for the baseline group ($H_i = 0$) and the differential effect relative to the baseline group—with the sum of both coefficients representing the treatment effect for the group of interest ($H_i = 1$). In column (2), H_i is an indicator for whether the union assigned to the unit of observation corresponds to an industry that explicitly prioritized the female friendly fight plan at the 2015 CUT congress. In column (3), H_i is an indicator for whether the micro-region where the establishment is located has a CUT training school. In column (4), H_i is an indicator for whether the union assigned to the unit of observation corresponds to an industry that gains a female representative in the CUT national board in 2015. In column (5), H_i is an indicator for whether the union's share of women in the board increased after the reform (dropping the H_i and $H_i \times \delta_t$ terms from the regression). Panel A uses the filled panel sample and Panel B uses the incumbent sample weighing observations by the inverse (own-gender) employment at baseline. Standard errors are clustered at the establishment level.

Table 5: Heterogeneity by Baseline Female Representation

	Baseline	Full interaction: $D_i \times \delta_{year \geq 2015} \times H_i$		
		$H_i = $ low % women in estab.	$H_i = $ low % women in union	$H_i = $ no woman Pres/VP
	(1)	(2)	(3)	(4)
Panel A: Intensive margin				
$D_i \times \delta_{year \geq 2015}$	0.302***	0.140***	0.001	-0.059
	(0.021)	(0.028)	(0.038)	(0.044)
$D_i \times \delta_{year \geq 2015} \times H_i$		0.305***	0.364***	0.398***
		(0.040)	(0.041)	(0.049)
Sum of coefficients		0.445	0.364	0.339
p-value		[0.000]	[0.000]	[0.000]
Mean outcome	1.58	1.58	1.58	1.58
Panel B: As a share of all clauses				
$D_i \times \delta_{year \geq 2015}$	0.021***	0.009***	0.005***	-0.004**
	(0.001)	(0.001)	(0.002)	(0.002)
$D_i \times \delta_{year \geq 2015} \times H_i$		0.023***	0.020***	0.030***
		(0.002)	(0.002)	(0.002)
Sum of coefficients		0.032	0.025	0.025
p-value		[0.000]	[0.000]	[0.000]
Mean outcome	0.07	0.07	0.07	0.07
Observations	600,840	600,840	592,224	592,224

Notes: Table tests for heterogeneity in the effect of the CUT reform on female-centric clauses (data-driven approach) according to the baseline representation of women among workers (column 2) and within union boards (columns 3-4). The dummy to test for heterogeneity in the effects (H_i) is fully interacted with the treatment dummy (D_i) and the post-period dummy ($\delta_{year \geq 2015}$). The table only reports the coefficients on the effects that determine the treatment effect for the baseline group ($H_i = 0$) and the differential effect relative to the baseline group—with the sum of both coefficients representing the treatment effect for the group of interest ($H_i = 1$). In column (2), H_i is an indicator for whether the share of women workers is below the median across our sample in 2014 (around 1/3). In column (3), H_i is an indicator for whether the share of women in union boards is below this 1/3 threshold in 2014. In column (4), H_i is an indicator for whether there is no women president of vice-president in the local union board as of 2014. All regressions use the filled panel sample and includes establishment-union pair fixed effects as well as time-varying state and industry fixed effects. Standard errors are clustered at the establishment level.

Table 6: Differential Effects by Gender for Incumbent Workers

	Stay at baseline employer	Employed in formal sector	Log wages
	(1)	(2)	(3)
$D_i \times \delta_{year \geq 2015}$	0.010***	0.002	-0.000
	(0.002)	(0.002)	(0.001)
$D_i \times \delta_{year \geq 2015} \times Female_i$	0.008***	0.005**	0.002
	(0.003)	(0.002)	(0.002)
Observations	55,658,850	55,658,850	46,825,585
R^2	0.56	0.32	0.87

Notes: Table reports the coefficients for the gender-pooled DID regression estimating the effect of the CUT reform on retention, formal sector employment, and wages of incumbent workers. Treatment status of incumbent workers is based on the CUT-affiliation of the union negotiating with their baseline (2014) employer. These workers are tracked wherever they go. The regression interacts treatment status with dummy variables for the post period (after 2014) and gender. Regressions include worker fixed effects, industry-year-gender fixed effects, microregion-year-gender fixed effects, and tenure-year-gender fixed effects. To make treatment effects in worker-level regressions interpretable as establishment-level averages, we weight each incumbent worker by the inverse of employment at their baseline employer. Standard errors are clustered by establishment and reported in parentheses.

Table 7: Impact of CUT Reform on Establishment-Level Outcomes

Panel A: Wages

	Mean log(w) [women; $t > 12$] (1a)	Mean log(w) [men; $t > 12$] (2a)	Mean log(w) [women; $t \leq 12$] (3a)	Mean log(w) [men; $t \leq 12$] (4a)	Mean gender wage gap (5a)	CBA wage adjustments (6a)
$D_i \times \delta_{year \geq 2015}$	-0.004	-0.003	-0.005	-0.006*	-0.001	0.032
	(0.002)	(0.002)	(0.004)	(0.003)	(0.002)	(0.021)
Mean outcome	7.460	7.627	7.174	7.311	-0.150	0.781
Observations	323,271	329,960	260,956	289,334	334,562	123,432

Panel B: Employment

	Log employment (1b)	Share women [workforce] (2b)	Share women [probation] (3b)	Log hires (4b)	Share women [hires] (5b)	Share women [separations] (6b)
$D_i \times \delta_{year \geq 2015}$	-0.002	0.002**	0.006**	-0.009	0.004*	0.004**
	(0.007)	(0.001)	(0.003)	(0.009)	(0.002)	(0.002)
Mean outcome	4.044	0.369	0.357	3.034	0.366	0.360
Observations	353,626	353,626	275,879	325,823	325,823	332,506

Panel C: Profits

	Log wage bill (1c)	Establishment exit (2c)	Profit margin (3c)	Absences (4c)
$D_i \times \delta_{year \geq 2015}$	-0.010	-0.003	0.702	-0.186*
	(0.008)	(0.003)	(1.167)	(0.113)
Mean outcome	11.431	0.087	7.759	4.111
Observations	351,593	61,716	2,874	335,819

Notes: Table reports the coefficients for the establishment-level DID regression from Equation (3), comparing treated to comparison establishments on wage, employment, and profit outcomes. An establishment is treated if the union with which it negotiates is affiliated to CUT in 2012. Each regression includes establishment fixed effects, industry-year fixed effects, and microregion-year fixed effects. Panel A uses workers' main spell in a given year. The terms in brackets indicate the subsample among which the mean of log wages is calculates, i.e., tenure > 12 months and tenure ≤ 12 months for either women or men. Panel B uses all spells observed at an establishment in a given year. The terms in brackets indicate the subsample among which the share of women is calculated, i.e., among all workers, among workers in probation, among hires, and among separated workers. Panel C studies three imperfect measures related to firm profits. Standard errors are clustered by establishment and reported in parentheses.

Figure 1: Workers' Bargaining Structure
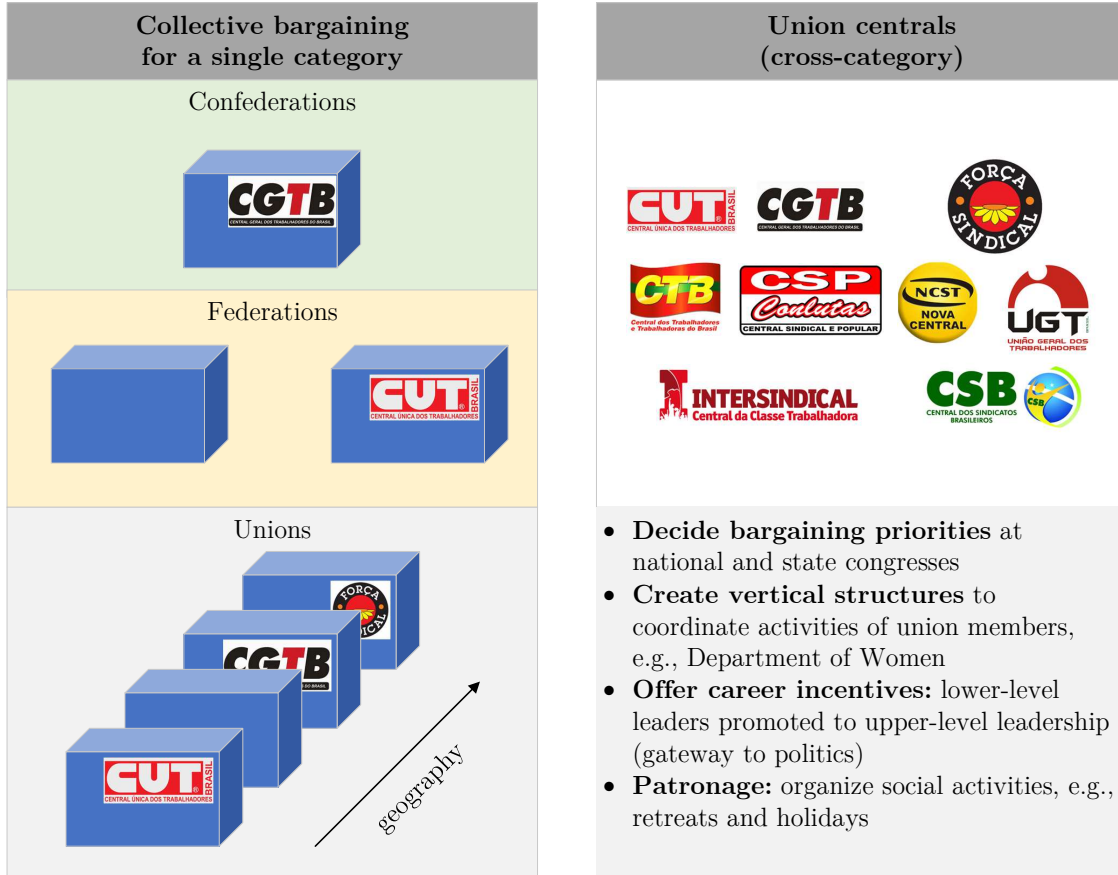
Notes: Figure depicts the organizations representing workers in collective bargaining (as blue blocks on the left panel) and the union centrals they can affiliate with (as logos on the right panel). All workers in a category-geography cell (e.g., bank workers in São Paulo) are represented by a single union. Unions can integrate geographically within the same category, forming a federation (at the state level) or a confederation (at the national level). Local unions, federations and confederations can affiliate with union centrals (*centrais sindicais*), which are depicted in the figure as union central logos "stamped" on the blue blocks. Union centrals are associations of unions, representing cross-category interests and operating on a nationwide level, with political objectives and coordination functions. Union centrals cannot directly participate in collective bargaining.

Figure 2: The 2015 CUT Reform

(a) Female-centric "fight plan"


(b) Gender parity in national leadership
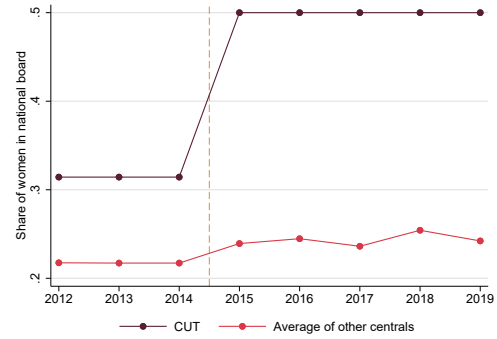
Notes: Figure 2a is the cover page of the book of resolutions (or "fight plan") developed at the 2015 meeting of CUT Women (*Encontro Nacional das Mulheres*) to detail concrete strategies for achieving parity in practice at all levels of unions within CUT. It recommends steps for giving women more actual voice in all levels of the union—like representation on committees and a say in union's list of demands (or *pautas*). It also specifies amenities like maternity leave extensions and subsidized childcare to highlight during collective bargaining. This book of resolutions was subsequently adopted by delegates at the 2015 CUT National congress (full text here). The word count for *mulheres* (women) in the 2015 National Congress book of resolutions is 203, compared to only 46 occurrences in 2012 and 74 in 2009. Figure 2b plots the annual share of women on CUT's national executive committee and the average share in the other 7 union centrals (*Intersindical* is dropped due to missing information on its board). Refer to Figure B1 for the plots corresponding to each individual union central.

Figure 3: Sense Checks for Female- and Male-Centric Amenities

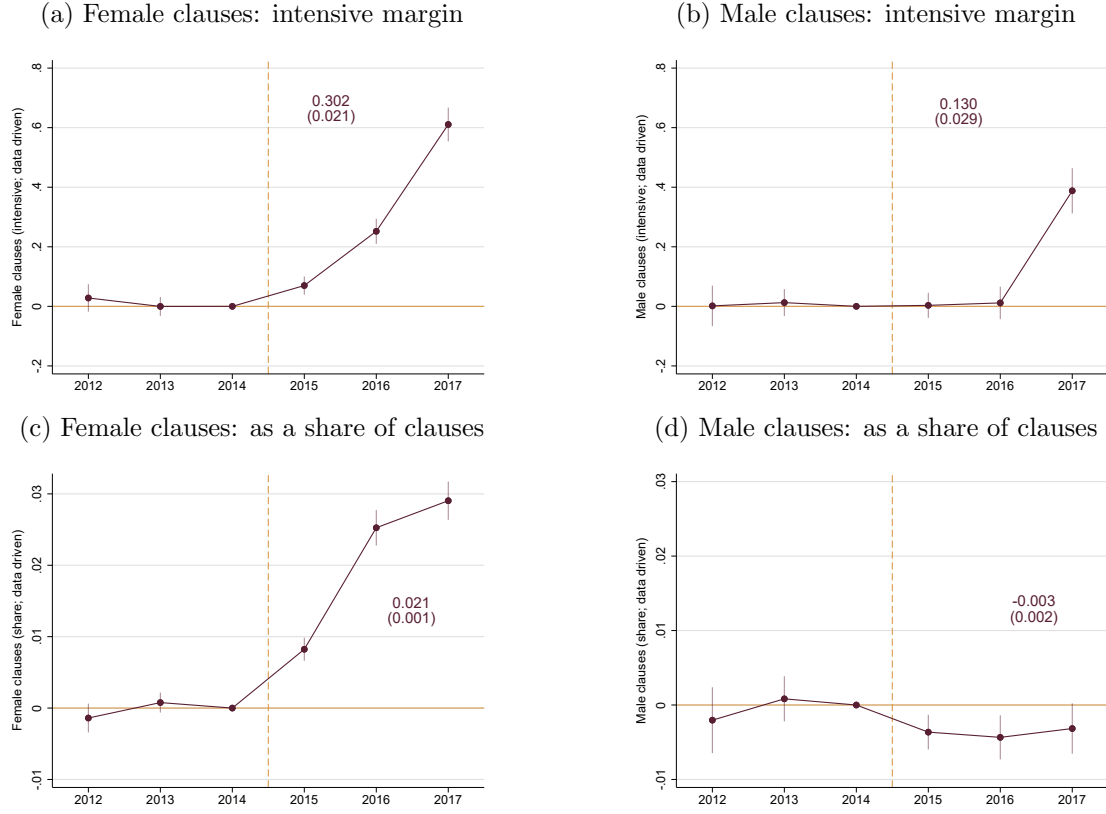(a) Intuitive female clauses and share of women
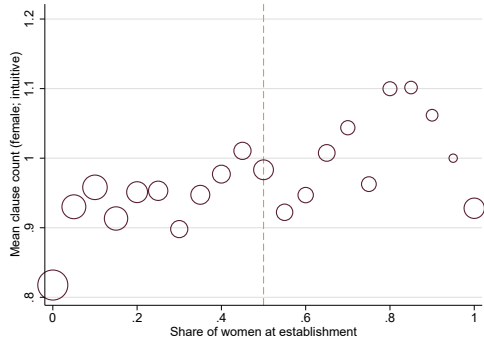
(b) Data-driven clauses and share of women
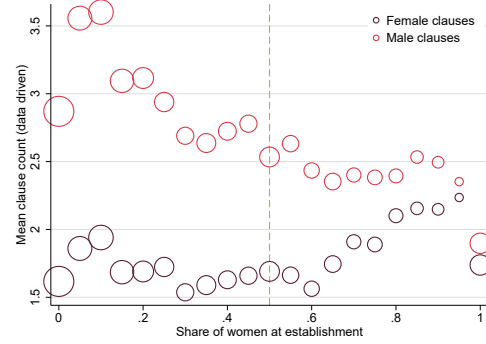
Notes: Figures depict binned scatterplots of the number of female-centric (and male-centric) clauses contained in firm-level CBAs signed at baseline (2014) by the share of women in the workforce of the establishment. The bins in the bottom figures are set to rounded values (in 0.05 increments) of the share of women at the establishment, with the size of the markers scaled to represent the number of pairs observed in a given bin. Figure 3a uses the intuitive definition of female-centric amenities, while Figure 3b uses the data-driven approach for both female- and male-centric amenities. The vertical line indicates 50% of women in the workforce. The sample consists of the establishments in our new contracts panel at baseline (2014). Regressing the y-axis variables in the bottom figures on the share of women at establishments reveals a positive (negative) and statistical significant relation between female (male) centric clauses and the share of women at the establishment. For the intuitive definition of female-centric clauses, the slope is 0.141 (SE 0.048). For the data-driven definition of female-centric clauses, the slope is 0.381 (SE 0.148). For the data-driven definition of male-centric clauses, the slope is -1.121 (SE 0.204).

Figure 4: Effect of the CUT Reform on Female- and Male-Centric Amenities

(a) Female clauses: intensive margin

(b) Male clauses: intensive margin

(c) Female clauses: as a share of clauses

(d) Male clauses: as a share of clauses

Notes: Figures show estimates of the δ_t coefficients for $t \in [2012, 2017]$ (with 2014 omitted) from the DID specification in Equation (3) on the intensive margin (top figures) and shares (bottom figures) of female-centric (left side) and male-centric (right side) clauses, defined using the data-driven method. All figures use the filled panel. Confidence intervals at a 95% level are reported. Standard errors are clustered at the establishment level.

Figure 5: Effect on Amenities by Share of Female Workers at Establishment
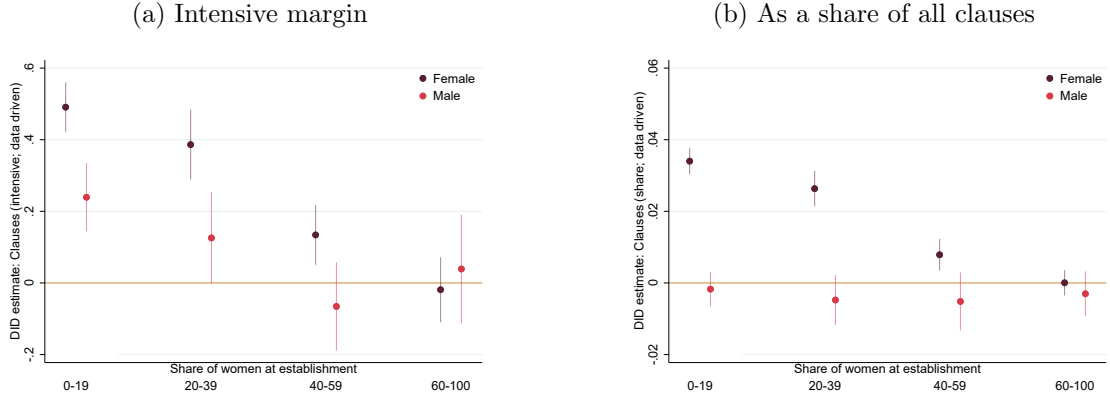
(a) Intensive margin

(b) As a share of all clauses

Notes: Figures show estimates of the treatment effect ($\delta_{year \geq 2015}$) from the DID specification in Equation (3) on the number of female- and male-centric clauses (data-driven approach) computed on subsamples of union-establishment pairs according to the 2014 share of female workers in the establishment. We use the filled panel. From left to right, the bins comprise 30%, 24%, 21%, and 26% of establishments. Confidence intervals at a 95% level are shown. Standard errors are clustered at the establishment level.
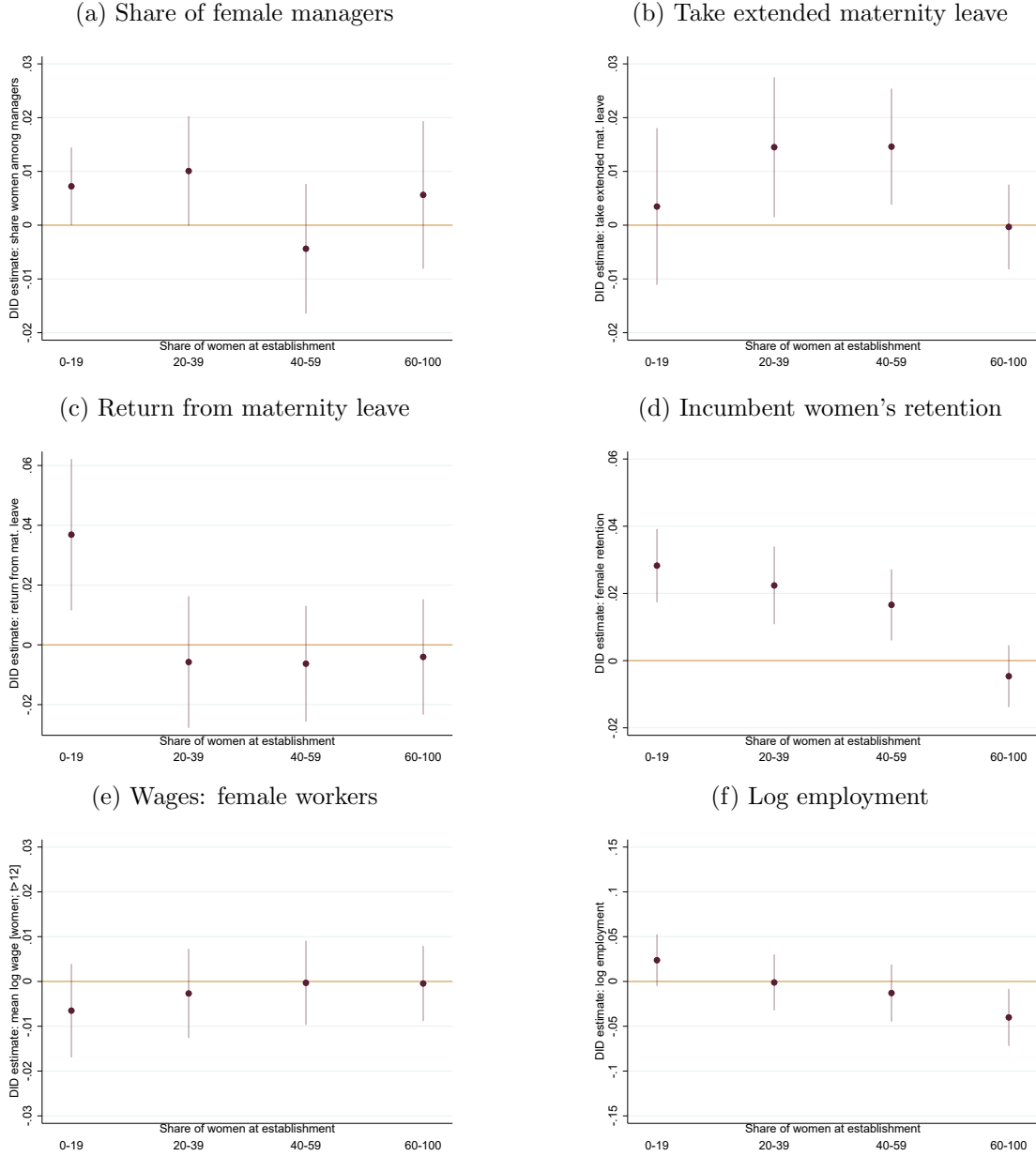
Figure 6: Changes in Firm Environment
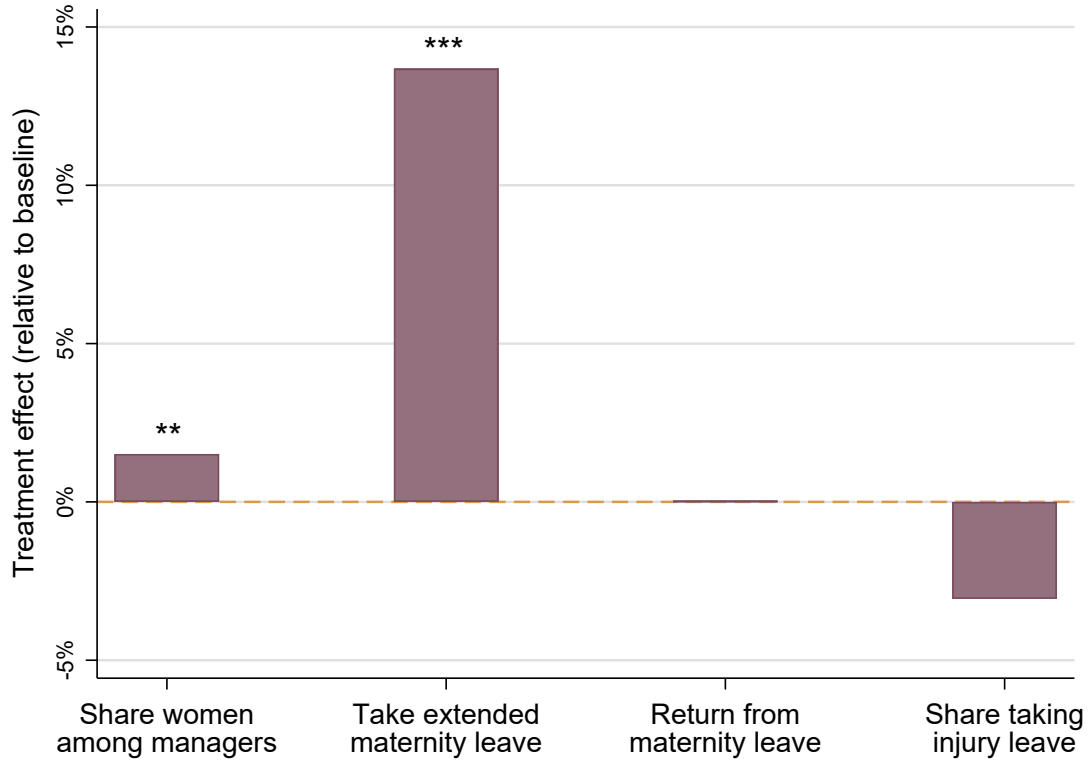
Notes: Figure reports results from four separate establishment-level DID regressions in Equation (3), with treatment effects reported relative to the mean among the treated at baseline (in percentage terms). The outcome variables are: 1) the share of women among managers; 2) the share of women on maternity leave who remain on leave longer than than the state-mandated 120 days (i.e., extended maternity leave); 3) the share of women taking maternity leave who remain employed at the employer where they took maternity leave (i.e., return from maternity leave); and 4) the share of workers taking leave due to a workplace injury. Each regression includes establishment fixed effects, industry-year fixed effects, and microregion-year fixed-effects. Two stars indicate significance at the 5% confidence level, while three starts significance at the 1% level. Standard errors are clustered by establishment.

Figure 7: Revealed Preference Measures of Firm Value

(a) Incumbent women's retention

(b) Share of women among probationary workers

Notes: Figures test for revealed preference measures of whether women value the changes induced by the CUT reform in treated establishments. Figure 7a show effects on retention from the baseline DID specification in Equation (3) among incumbent women ages 20-35, which includes worker fixed effects, industry-year fixed effects, microregion-year fixed effects, and tenure-year fixed effects. The dependent variable is an indicator for whether the worker is observed at their baseline (2014) employer in year t. To make treatment effects in worker-level regressions interpretable as establishment-level averages, we weight each incumbent worker by the inverse of (own-gender) employment at their baseline employer. Figure 7b shows effects on the share of women among probationary workers (i.e., those whose tenure at the establishment does not exceed 3 months) using the DID specification in Equation (3) based on employment spells observed at the establishment level. Regressions include establishment fixed effects, industry-year fixed effects, and microregion-year fixed effects. Confidence intervals at a 95% level are reported. Standard errors are clustered at the establishment level.

Figure 8: Downstream Effects by Share of Female Workers at Establishment

(a) Share of female managers

(b) Take extended maternity leave

(c) Return from maternity leave

(d) Incumbent women's retention

(e) Wages: female workers

(f) Log employment

Notes: Figures show estimates of the treatment effect ($\delta_{year \geq 2015}$) from the DID specification in Equation (3) on downstream outcomes of the CUT reform computed on subsamples of establishments divided according to the 2014 share of female workers. From left to right, the bins comprise 30%, 24%, 21%, and 26% of establishments. Figure 8a reports effect on the share of women among managers. Figure 8b reports effect on the share of women on maternity leave who remain on leave longer than the state-mandated 120 days (i.e., extended maternity leave). Figure 8c reports effect on the share of women taking maternity leave who remain employed at the employer where they took maternity leave (i.e., return from maternity leave). Figure 8d reports effect on remaining at the baseline employer among women in the incumbents sample (weighed by the inverse of female employment at the baseline employer). Figure 8e reports effect on the mean log wage among women with at least 1 year of tenure. Figure 8f reports effect on log employment. All figures use the establishment sample, except for Figure 8d that relies on the incumbent sample. Confidence intervals at a 95% level are shown. Standard errors are clustered at the establishment level.

Online Appendix

1

A   Appendix Tables

Table A1: Clauses in the Intuitive Definition of Female-Centric Amenities

Group	Clause Type	Description
Leaves		
	Abortion leave	Leave in cases of miscarriage/abortion
	Adoption leave	Leave following the adoption of a child
	Maternity leave	Leave concerning the birth of a child
	Paid leave	Leave during which worker receives normal pay
	Unpaid leave	Leave during which worker does not receive normal pay
	Other: holidays and leaves	Provisions on holidays/leaves outside predefined clause types
	Female workforce	General provisions concerning female workers
Maternity and childcare		
	Childcare assistance	Payments to assist with childcare support
	Maternity assistance	Payments to assist with becoming a mother
	Abortion protections	Employment protections concerning miscarriage/abortion
	Maternity protections	Employment protections for mothers
	Paternity protections	Employment protections for fathers
	Policy for dependents	Workplace benefits that apply to dependents
Workplace harassment and discrimination		
	Sexual harassment	Rules/penalties pertaining to harassment in the workplace
	Equal opportunities	Initiatives/statements on equality of opportunity for workers
Flexibility and part-time work		
	Workday controls	Rules restricting the duration of the workday
	Special shifts	Work shifts for subgroups of workers, e.g., women, minors, students
	On-call	Rules on workers' availability outside of the normal workday
	Uninterrupted shifts	Rules concerning back-to-back shifts
	Part-time contracts	Directives on temporary/part-time employment contracts

Notes: Table lists the *Sistema Mediador* clause types used in our intuitive definition of female-centric amenities. The descriptions provided in this table are purposefully vague—clauses of a given type can vary to some degree. The clauses were chosen based on the content of CUT's fight plan and the existing literature on workplace amenities valued by women, restricting ourselves to only 20 clause types.

Table A2: Examples of Female-Centric Amenities

Childcare assistance	The company will reimburse all female employees, the monthly amount of R$ 110, as a "day care allowance", per child up to 6 years old. This benefit applies to any employee with custody of the child(ren).
Absences	The employee will receive full pay for absences upon proof of the following cases: a) bereavement (5 consecutive days); b) hospitalization of direct family or legal dependents; c) medical and dental consultations; d) marriage (5 working days)
Adoption leave	The employee who adopts or obtains legal custody for adoption will be granted maternity leave as follows: a) 120 days for children up to 1 year old; b) 60 days, for children from 1 to 4 years old; c) 30 days for children from 4 to 8 years old.
Other: holidays and leaves	The start of vacations cannot coincide with Saturdays, Sundays, holidays, or days already compensated. Vacations will start on the first working day of the week, communicated to the union within 10 working days by the company.
Seniority pay	The company will pay the employee who completes 5 uninterrupted years of work an additional 5% per length of service payable monthly, calculated on the monthly fixed base salary.

Notes: Table lists examples of CBA clauses from the top 5 clause types selected as "female-centric" or "male-centric" based on our data-driven approach—refer to Section 2.2 for details on the data-driven approach. The clauses were selected based on the number of unique tokens appearing in the clause that are within the top 20 TF-IDF tokens of each specific clause type.

Table A3: Examples of Male-Centric Amenities

On-call pay	The company will pay an additional 35% of the normal hours to employees, when scheduled to be on-call. This additional pay will not apply when the on-call becomes a service actually provided, in which case overtime will be due.
Life insurance	The company will maintain group life insurance, guaranteeing a single and total indemnity of at least R\$ 10,000 in the event of death or permanent disability of the employee resulting from an accident at work.
Strike procedures	The union assumes formal commitment not to promote or encourage stoppages, except in cases of non-compliance with clauses of this agreement or current laws, and even so, only after communicating the transgressions in writing to the employers.
Other: protections for injured workers	The company will communicate to Social Security, and subsequently to the union, injuries incurred by employees at the company or while commuting to/from work.
Profit sharing	The company will maintain a Profit Sharing Program with the amount made available for payment may be up to 1 nominal salary per employee. The payment period after the calculation of the results will be the month of February.

Notes: Table lists examples of CBA clauses from the top 5 clause types selected as "female-centric" or "male-centric" based on our data-driven approach—refer to Section 2.2 for details on the data-driven approach. The clauses were selected based on the number of unique tokens appearing in the clause that are within the top 20 TF-IDF tokens of each specific clause type.

Table A4: Robustness of Data-Driven Female-Centric Amenities

Clause type	Times selected: data-driven (out of 6 methods)	Selected in baseline data-driven approach: (no state and industry FEs)	(state and industry FEs)
Childcare assistance	6	1	1
Absences	6	1	1
Adoption leave	6	1	0
Other: holidays and leaves	6	1	1
Seniority pay	6	1	1
Maternity protections	6	1	0
Paid leave	6	1	1
Night pay	6	1	0
Abortion leave	6	1	0
Policy for dependents	6	1	0
Waiving union fees	6	1	1
Salary adjustments/corrections	6	1	1
Nonwork-related injury protections	5	1	0
Extension/reduction of workday	5	1	1
Renewal/termination of the CBA	5	1	0
Medical exams	5	1	0
Abortion protections	4	1	0
Unionization campaigns	4	1	0
Adoption protections	4	0	0
Guarantees to union officers	3	1	1
Health education campaigns	3	1	0
Military service protections	3	0	1
Separation/dismissal	2	0	1
Other employment protections	2	0	0
Awards	1	0	0
Moral harassment	1	0	1
Maternity leave	1	0	0

Notes: Table lists all of the clauses identified as female-centric in any of the 6 methods implemented based on the estimation of Equation (2). Methods vary in 1) the sample of establishments covered by sectoral CBAs used, i.e., a random sample or the full sample; and 2) the measure of PageRank values used to determine gender gaps, i.e., normalized, non-normalized, or rankings. The initial column simply shows the number of times the clause is picked as female-centric by one of these 6 methods (clauses in the table are sorted in descending order as per the values of this column). The next column is an indicator for whether the clauses is selected as a female-centric by the baseline method, i.e., using a random sample and normalized PageRanks. The final column is an indicator for whether the clause is selected as female-centric by the baseline method but where the lasso includes state and industry fixed effects. Note that the Spearman correlation of the coefficients on clauses using the data-driven lasso approach versus an OLS using these same clauses but adding state and industry fixed effects is 0.56 with p-value below 0.01.

Table A5: Robustness of Data-Driven Male-Centric Amenities

Clause type	Times selected: data-driven (out of 6 methods)	Selected in baseline data-driven approach: (no state and industry FEs)	(state and industry FEs)
On-call pay	6	1	1
Life insurance	6	1	1
Strike procedures	6	1	1
Other: protections for injured workers	6	1	1
Female workforce	6	1	1
Machine and equipment maintenance	6	1	1
Duration and schedule	6	1	0
Working environment conditions	6	1	0
Salary payment - means and timeframes	6	1	0
Hazard pay (danger risk)	6	1	0
Workday compensation	6	1	0
Tools and equipment	6	1	0
Profit sharing	5	1	1
Transfers	5	1	0
Safety equipment	5	1	0
Other assistances	5	1	0
Death/funeral assistance	5	1	0
Salary deductions	4	1	0
Equal opportunities	4	0	0
Collective vacations	3	1	0
Union fees	3	0	0
CIPA: accident prevention committee	2	1	1
Unpaid leave	2	0	0
Part-time contracts	2	0	0
Food assistance	1	0	0
Performance evaluation	1	0	0
Employment/hiring rules	1	0	0

Notes: Table lists all of the clauses identified as male-centric in any of the 6 methods implemented based on the estimation of Equation (2). Methods vary in 1) the sample of establishments covered by sectoral CBAs used, i.e., a random sample or the full sample; and 2) the measure of PageRank values used to determine gender gaps, i.e., normalized, non-normalized, or rankings. The initial column simply shows the number of times the clause is picked as male-centric by one of these 6 methods (clauses in the table are sorted in descending order as per the values of this column). The next column is an indicator for whether the clauses is selected as a male-centric by the baseline method, i.e., using a random sample and normalized PageRanks. The final column is an indicator for whether the clause is selected as male-centric by the baseline method but where the lasso includes state and industry fixed effects. Note that the Spearman correlation of the coefficients on clauses using the data-driven lasso approach versus an OLS using these same clauses but adding state and industry fixed effects is 0.56 with p-value below 0.01.

Table A6: Establishment Descriptives—RAIS vs. Analysis Samples

	All RAIS (1)	Amenities sample (2)	Difference p-value (3)	RAIS: employ men and women (4)	Establishment sample (5)	Difference p-value (6)
Employment and firm characteristics						
Size	16.19	143.11	0.00	31.87	150.22	0.00
Share women	0.45	0.38	0.00	0.45	0.40	0.00
Employs both men and women	0.46	0.82	0.00	1.00	1.00	1.00
Single person firm	0.27	0.04	0.00	0.00	0.00	1.00
Single establishment firm	0.77	0.65	0.00	0.77	0.63	0.00
Sector						
Agriculture & extraction	0.09	0.04	0.00	0.05	0.03	0.00
Manufacturing	0.09	0.28	0.00	0.11	0.30	0.00
Construction & utilities	0.05	0.06	0.00	0.04	0.05	0.00
Commerce	0.39	0.23	0.00	0.41	0.24	0.00
Services	0.38	0.39	0.00	0.38	0.39	0.00
Region						
North	0.04	0.05	0.00	0.05	0.05	0.00
Northeast	0.16	0.12	0.00	0.16	0.12	0.00
Central	0.10	0.07	0.00	0.10	0.08	0.00
South	0.21	0.21	0.00	0.20	0.21	0.00
Southeast	0.49	0.56	0.00	0.49	0.54	0.00
N establishments	3,798,207	80,131		1,739,255	61,752	
N workers	61,492,768	11,467,760		48,564,436	9,276,475	
% workforce	100%	19%		79%	15%	

Notes: Table compares descriptive statistics of establishments in Brazil's formal sector (Column 1) and our analysis samples, i.e., the amenity sample (Column 2) and the establishment sample (Column 5). The p-values of the differences between these samples are reported in Columns 3 and 6. The bottom of the table includes the number of unique establishments and workers in each sample, as well as the percentage of the formal workforce present in the corresponding sample.

Table A7: Treated and Control Establishments Descriptives

	Amenities sample			Establishment sample		
	Treatment	Control	Diff. p-value	Treatment	Control	Diff. p-value
	(1)	(2)	(3)	(4)	(5)	(6)
Employment and firm characteristics						
Size	198.21	127.03	0.00	200.37	135.95	0.00
Share women	0.36	0.38	0.00	0.38	0.40	0.00
Employs both men and women	0.83	0.82	0.00	1.00	1.00	1.00
Single person firm	0.03	0.04	0.00	0.00	0.00	1.00
Single establishment firm	0.66	0.65	0.11	0.64	0.63	0.06
Sector						
Agriculture & extraction	0.03	0.04	0.00	0.02	0.03	0.00
Manufacturing	0.32	0.27	0.00	0.33	0.29	0.00
Construction & utilities	0.08	0.06	0.00	0.06	0.04	0.00
Commerce	0.21	0.24	0.00	0.19	0.25	0.00
Services	0.37	0.39	0.00	0.39	0.38	0.04
Region						
North	0.04	0.05	0.00	0.05	0.06	0.00
Northeast	0.15	0.11	0.00	0.16	0.11	0.00
Central	0.09	0.06	0.00	0.11	0.07	0.00
South	0.22	0.20	0.00	0.22	0.20	0.00
Southeast	0.50	0.58	0.00	0.46	0.56	0.00
N establishments	18,103	62,028		13,677	48,075	
N workers	3,588,153	7,879,607		2,740,517	6,535,958	

Notes: Table compares descriptive statistics of establishments between the treated (Columns 1 and 4) and comparison groups (Columns 2 and 5) in our analysis samples, i.e., the amenity sample and the establishment sample. The p-values of the differences between the treated and comparison groups are reported in Columns 3 and 6. The bottom of the table includes the number of unique establishments and workers in each group.

Table A8: Effect of CUT Reform on Negotiated Amenities (Cluster at Union-Level)

	Intuitive definition (female clauses)					Data-driven		
	All	Leave	Maternity	Harassment	Flexibility	Female	Male	F/(F+M+1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Intensive margin (number of clauses)								
$D_i \times \delta_{year \geq 2015}$	0.156*	0.078**	0.042*	0.009**	0.028	0.302**	0.130	0.032*
	(0.083)	(0.040)	(0.023)	(0.004)	(0.031)	(0.144)	(0.159)	(0.017)
Mean outcome	0.94	0.25	0.23	0.02	0.45	1.58	2.55	0.15
Panel B: Intensive margin (sum of unique clause types)								
$D_i \times \delta_{year \geq 2015}$	0.123*	0.047	0.042*	0.008**	0.027	0.155*	0.067	
	(0.067)	(0.031)	(0.022)	(0.004)	(0.021)	(0.080)	(0.095)	
Mean outcome	0.69	0.18	0.20	0.02	0.30	1.26	1.58	
Panel C: Extensive margin								
$D_i \times \delta_{year \geq 2015}$	0.017	0.012	0.020*	0.008**	0.022	0.034*	-0.001	
	(0.015)	(0.011)	(0.012)	(0.004)	(0.015)	(0.020)	(0.015)	
Mean outcome	0.31	0.12	0.15	0.02	0.23	0.36	0.46	
Panel D: As a share of all clauses								
$D_i \times \delta_{year \geq 2015}$	0.005	0.001	0.001	0.000	0.003	0.021	-0.003	
	(0.004)	(0.001)	(0.001)	(0.000)	(0.003)	(0.015)	(0.006)	
Mean outcome	0.05	0.01	0.01	0.00	0.03	0.07	0.14	
Observations	600,840	600,840	600,840	600,840	600,840	600,840	600,840	600,840

Notes: Table reports the coefficients for DID regressions—see Equation (3)—estimating the effect of the CUT reform on the female-centric and male-centric amenities included in CBAs. The unit of observation is a union-employer pair. Panel A reports effects on the total number of clauses, an intensive margin measure of amenities. Panel B reports effects on the sum of unique clause types in the corresponding categories exist in a contract, capturing changes to the *space* of female (male) clauses (as opposed to their number). For example, two anti-harassment clauses will raise the outcome value by two in Panel A of Column 6 but by one in Panel B. Panel C reports effects on a cumulative indicator for whether any clause of the corresponding type exists in a contract as an extensive margin measure of amenities. Panel D uses the share of clauses among all clauses in a contract. Under each panel we report the mean of the dependent variable among the treated at baseline (2014). The sample is the filled panel of establishment-union pairs by year. All columns control for pair fixed effects, as well as time-varying state and industry fixed effects. Standard errors are clustered at the union level, instead of at the establishment level, which reduces the number of clusters from around 80 thousand to about 4.4 thousand.

Table A9: Effect of CUT Reform on Negotiated Amenities (CBA coverage in 2014)

	Intuitive definition (female clauses)					Data-driven		
	All	Leave	Maternity	Harassment	Flexibility	Female	Male	F/(F+M+1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Intensive margin (number of clauses)								
$D_i \times \delta_{year \geq 2015}$	0.099***	0.044***	0.022***	0.005***	0.028***	0.121***	0.111***	0.009***
	(0.015)	(0.006)	(0.004)	(0.001)	(0.010)	(0.023)	(0.031)	(0.002)
Mean outcome	1.62	0.43	0.39	0.03	0.77	2.71	4.38	0.25
Panel B: Intensive margin (sum of unique clause types)								
$D_i \times \delta_{year \geq 2015}$	0.072***	0.023***	0.023***	0.003***	0.022***	0.077***	0.051***	
	(0.010)	(0.004)	(0.004)	(0.001)	(0.005)	(0.014)	(0.016)	
Mean outcome	1.19	0.31	0.35	0.03	0.51	2.17	2.71	
Panel C: Extensive margin								
$D_i \times \delta_{year \geq 2015}$	0.020***	0.012***	0.011***	0.004***	0.021***	0.005*	0.009**	
	(0.003)	(0.002)	(0.002)	(0.001)	(0.003)	(0.003)	(0.003)	
Mean outcome	0.53	0.21	0.25	0.03	0.40	0.62	0.79	
Panel D: As a share of all clauses								
$D_i \times \delta_{year \geq 2015}$	0.005***	0.001***	0.001***	0.000***	0.003***	0.004***	0.001	
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)	
Mean outcome	0.08	0.01	0.01	0.00	0.06	0.11	0.25	
Observations	366,516	366,516	366,516	366,516	366,516	366,516	366,516	366,516

Notes: Table reports the coefficients for DID regressions—see Equation (3)—estimating the effect of the CUT reform on the female-centric and male-centric amenities included in CBAs. The unit of observation is a union-employer pair. The sample is the filled panel of establishment-union pairs by year, restricted to establishment-union pairs with CBA coverage in 2014. Panel A reports effects on the total number of clauses, an intensive margin measure of amenities. Panel B reports effects on the sum of unique clause types in the corresponding categories exist in a contract, capturing changes to the *space* of female (male) clauses (as opposed to their number). For example, two anti-harassment clauses will raise the outcome value by two in Panel A of Column 6 but by one in Panel B. Panel C reports effects on a cumulative indicator for whether any clause of the corresponding type exists in a contract as an extensive margin measure of amenities. Panel D uses the share of clauses among all clauses in a contract. Under each panel we report the mean of the dependent variable among the treated at baseline (2014). The sample is the filled panel of establishment-union pairs by year. All columns control for pair fixed effects, as well as time-varying state and industry fixed effects. Standard errors are clustered at the establishment level.

Table A10: Effect of CUT Reform on Negotiated Amenities (Using State and Industry FEs in Lasso for Data-Driven Clauses)

	Intuitive definition (female clauses)					Data-driven		
	All	Leave	Maternity	Harassment	Flexibility	Female	Male	F/(F+M+1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Intensive margin (number of clauses)								
$D_i \times \delta_{year \geq 2015}$	0.156***	0.078***	0.042***	0.009***	0.028***	0.315***	0.117***	0.030***
	(0.013)	(0.006)	(0.004)	(0.001)	(0.008)	(0.027)	(0.019)	(0.002)
Mean outcome	0.94	0.25	0.23	0.02	0.45	2.11	1.37	0.20
Panel B: Intensive margin (sum of unique clause types)								
$D_i \times \delta_{year \geq 2015}$	0.123***	0.047***	0.042***	0.008***	0.027***	0.128***	0.079***	
	(0.010)	(0.004)	(0.004)	(0.001)	(0.004)	(0.017)	(0.011)	
Mean outcome	0.69	0.18	0.20	0.02	0.30	1.53	0.88	
Panel C: Extensive margin								
$D_i \times \delta_{year \geq 2015}$	0.017***	0.012***	0.019***	0.008***	0.022***	0.036***	-0.006**	
	(0.003)	(0.002)	(0.002)	(0.001)	(0.003)	(0.003)	(0.003)	
Mean outcome	0.31	0.12	0.14	0.02	0.23	0.35	0.32	
Panel D: As a share of all clauses								
$D_i \times \delta_{year \geq 2015}$	0.005***	0.001***	0.001***	0.000***	0.003***	0.020***	0.001	
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	
Mean outcome	0.05	0.01	0.01	0.00	0.03	0.08	0.06	
Observations	600,840	600,840	600,840	600,840	600,840	600,840	600,840	600,840

Notes: Table reports the coefficients for DID regressions—see Equation (3)—estimating the effect of the CUT reform on the female-centric and male-centric amenities included in CBAs. The lasso for selecting clauses from the data-driven approach includes state and industry fixed effects. The unit of observation is a union-employer pair. Panel A reports effects on the total number of clauses, an intensive margin measure of amenities. Panel B reports effects on the sum of unique clause types in the corresponding categories exist in a contract, capturing changes to the *space* of female (male) clauses (as opposed to their number). For example, two anti-harassment clauses will raise the outcome value by two in Panel A of Column 6 but by one in Panel B. Panel C reports effects on a cumulative indicator for whether any clause of the corresponding type exists in a contract as an extensive margin measure of amenities. Panel D uses the share of clauses among all clauses in a contract. Under each panel we report the mean of the dependent variable among the treated at baseline (2014). The sample is the filled panel of establishment-union pairs by year. All columns control for pair fixed effects, as well as time-varying state and industry fixed effects. Standard errors are clustered at the establishment level.

Table A11: Effect of CUT Reform on Female Amenities

	Female-Centric Clauses: Intensive Margin					
	(1)	(2)	(3)	(4)	(5)	(6)

Panel A: Intuitive definition

	(1)	(2)	(3)	(4)	(5)	(6)
$D_i \times \delta_{year \geq 2015}$	0.156***	0.156***	0.156***	0.193***	0.297***	0.099***
	(0.013)	(0.013)	(0.013)	(0.014)	(0.019)	(0.015)
Mean outcome	0.94	0.94	0.94	0.94	0.94	1.62

Panel B: Data-driven definition

	(1)	(2)	(3)	(4)	(5)	(6)
$D_i \times \delta_{year \geq 2015}$	0.302***	0.347***	0.262***	0.331***	0.417***	0.121***
	(0.021)	(0.026)	(0.017)	(0.022)	(0.030)	(0.023)
Mean outcome	1.58	2.05	1.17	1.58	1.58	2.71
Data-driven clauses	baseline	any	all	baseline	baseline	baseline
Geography-year FEs	state	state	state	microregion	micro×ind	state
CBA coverage in 2014	no	no	no	no	no	yes
Observations	600,840	600,840	600,840	600,840	600,840	366,516

Notes: Table reports the coefficients for DID regressions—see Equation (3)—estimating the effect of the CUT reform on female amenities included in CBAs. The dependent variable is the total number of clauses per pair-year as an intensive margin measure, with Panel A using the intuitive definition of female-centric clauses and Panel B using the data-driven approach. Columns (1)-(3) modify the dependent variable by changing the clauses that are chosen as female-centric in the data-driven approach: a) *baseline*: top 20 clauses using a random sample and normalized PageRank values for the gender gaps; b) *any*: counts any of the clauses selected across 6 approaches as female-centric; c) *all*: counts only those clauses that are selected in all 6 approaches as female-centric. Refer to Table A4 for a list of the clauses used in each of these scenarios. Columns 4 adds more granular time-varying fixed effects at the geographic level, i.e., using microregion instead of state. Columns 5 uses a microregion-industry time-varying fixed effect. Column 6 requires that pairs are covered by a CBA at baseline to test whether effects are driven by changes in the amenities among units with active CBAs rather than by gains in coverage. Standard errors are clustered at the establishment level.

Table A12: Effect of CUT Reform on Female Amenities

Female-Centric Clauses: As a Share of All Clauses

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Intuitive definition						
$D_i \times \delta_{year \geq 2015}$	0.005***	0.005***	0.005***	0.005***	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Mean outcome	0.05	0.05	0.05	0.05	0.05	0.08
Panel B: Data-driven definition						
$D_i \times \delta_{year \geq 2015}$	0.021***	0.021***	0.022***	0.017***	0.011***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Mean outcome	0.07	0.08	0.04	0.07	0.07	0.11
Data-driven clauses	baseline	any	all	baseline	baseline	baseline
Geography-year FEs	state	state	state	microregion	micro×ind	state
CBA coverage in 2014	no	no	no	no	no	yes
Observations	600,840	600,840	600,840	600,840	600,840	366,516

Notes: Table reports the coefficients for DID regressions—see Equation (3)—estimating the effect of the CUT reform on female amenities included in CBAs. The dependent variable is the share of female-centric clauses among all clauses per pair-year, with Panel A using the intuitive definition of female-centric clauses and Panel B using the data-driven approach. Columns (1)-(3) modify the dependent variable by changing the clauses that are chosen as female-centric in the data-driven approach: a) *baseline*: top 20 clauses using a random sample and normalized PageRank values for the gender gaps; b) *any*: counts any of the clauses selected across 6 approaches as female-centric; c) *all*: counts only those clauses that are selected in all 6 approaches as female-centric. Refer to Table A4 for a list of the clauses used in each of these scenarios. Column 4 adds more granular time-varying fixed effects at the geographic level, i.e., using micro-region instead of state. Columns 5 uses a microregion-industry time-varying fixed effect. Column 6 requires that pairs are covered by a CBA at baseline to test whether effects are driven by changes in the amenities among units with active CBAs rather than by gains in coverage. Standard errors are clustered at the establishment level.

Table A13: Heterogeneity by Low Representation of Women in the Workplace vs. Union

	Baseline (1)	Low % women in workpl and union (2)	Low % women in workpl only (3)	Low % women in union only (4)
Panel A: Female clauses (data-driven)				
Intensive margin	0.302***	0.476***	0.184*	0.198***
	(0.021)	(0.031)	(0.105)	(0.038)
As a share of all clauses	0.021***	0.033***	0.012***	0.012***
	(0.001)	(0.002)	(0.004)	(0.002)
Panel B: Male clauses (data-driven)				
Intensive margin	0.130***	0.212***	0.008	0.050
	(0.029)	(0.043)	(0.149)	(0.059)
As a share of all clauses	-0.003**	-0.002	-0.011*	-0.006*
	(0.002)	(0.002)	(0.006)	(0.003)
Observations	600,840	267,336	35,934	165,138

Notes: Table shows the effect of the CUT reform on female- and male-centric clauses (data-driven approach) according to the baseline representation of women in the workplace versus union boards. Each cell in the table reports the difference-in-differences coefficient for a separate regression, where the dependent variable depends on the panel (female vs. male clauses) and the row (intensive vs. share margin). The columns denote the sample on which the DID specification in Equation (3) is run. Column (1) is the full analysis sample. Column (2) is restricted to establishments where the 2014 share of female workers and union board members are both below 1/3. Column (3) is restricted to establishments where the 2014 share of female workers (and not union board members) is below 1/3. Column (4) is restricted to establishments where the 2014 share of female union board members (and not workers) is below 1/3. All regressions use the filled panel sample and includes establishment-union pair fixed effects as well as time-varying state and industry fixed effects. Standard errors are clustered at the establishment level.

Table A14: Impact of CUT Reform on Composition of the Female Workforce

	Share poached in (1)	Mean years of age (2)	Mean months of tenure (3)	Mean hours in contract (4)	Mean years of schooling (5)
$D_i \times \delta_{year \geq 2015}$	-0.001	-0.012	0.172	-0.033	-0.001
	(0.002)	(0.041)	(0.215)	(0.025)	(0.010)
Mean outcome	0.209	33.5	43.1	42.0	11.3
Observations	342,207	342,207	342,207	342,207	342,207

Notes: Table reports the coefficients for the establishment-level DID regression from Equation (3), comparing treated to comparison establishments on characteristics of their female workforce. An establishment is treated if the union with which it negotiates is affiliated to CUT in 2012. Each regression includes establishment fixed effects, industry-year fixed effects, and microregion-year fixed effects. Standard errors are clustered by establishment and reported in parentheses.

Table A15: Downstream Effects by Representation of Women in the Union

	Fem clauses [intensive] (1)	Fem clauses [share] (2)	Share women [managers] (3)	Share extend [mat leave] (4)	Share women [workforce] (5)	Share women [probation] (6)	Retention [women; 20-35] (7)	Retention [men; 20-35] (8)	Absences (9)
High % women in union	0.001	-0.004**	0.005	0.009**	-0.000	0.009*	0.003	0.005	-0.004
	(0.038)	(0.002)	(0.006)	(0.004)	(0.002)	(0.006)	(0.006)	(0.007)	(0.208)
Low % women in union	0.364***	0.025***	0.005*	0.009***	0.003**	0.006*	0.020***	0.014***	-0.219*
	[0.000]	[0.000]	[0.093]	[0.009]	[0.020]	[0.064]	[0.000]	[0.000]	[0.098]
Difference: low vs. high	0.364***	0.030***	-0.001	-0.001	0.003	-0.004	0.017*	0.008	-0.215
	(0.041)	(0.002)	(0.006)	(0.005)	(0.003)	(0.006)	(0.007)	(0.007)	(0.241)
Mean outcome	1.58	0.07	0.33	0.06	0.37	0.36	1.00	1.00	4.76
Observations	592,224	592,224	256,468	138,142	349,131	275,459	10,794,708	18,696,126	331,985

Notes: Table shows heterogeneity in the effect of the CUT reform on female-centric clauses (data-driven approach) and downstream outcomes according to the baseline representation of women in the union boards. The dummy to test for heterogeneity in the effects (H_i) is fully interacted with the treatment dummy (D_i) and the post-period dummy ($\delta_{year \geq 2015}$). In this table, H_i is an indicator for whether the share of women in union boards is below this 1/3 threshold in 2014. The table reports the coefficients on the effects that determine the treatment effect for the baseline group (high % women in union) and the differential effect relative to the baseline group (i.e., difference: low vs. high)—with the sum of both coefficients representing the treatment effect for the group of interest (high % women in union). Columns denote the dependent variable in the regression: (1)-(2) use the filled panel sample, (3)-(6) and (9) use the establishment sample, and (7)-(8) use the incumbent sample weighting observations by the inverse of (own-gender) employment at the baseline employer. Standard errors are clustered at the establishment level. Standard errors are shown in parentheses; p-values are reported in brackets.

B Appendix Figures

Figure B1: Gender Parity in National Leadership by Union Central
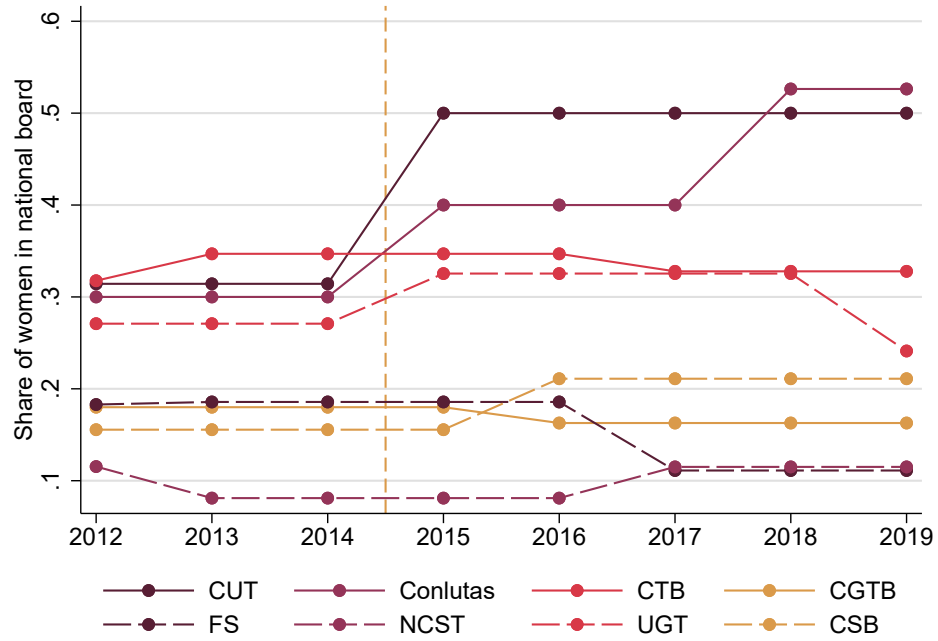
Notes: Figure plots the annual share of women on each union central's national executive committee (*Intersindical* is dropped due to missing information on its board). The line for CUT is the same as in Figure 2b, while the unweighted average of all other union centrals make up the other line reported in Figure 2b. Solid lines refer to "combative" union centrals, while dashed lines represent "cooperative" union centrals. The second largest union central and main competitor to CUT is *Força Sindical* (FS).

Figure B2: Impact on Gender Representation in Local Union Boards

(a) Share of women in union board

(b) Woman president or vice-president
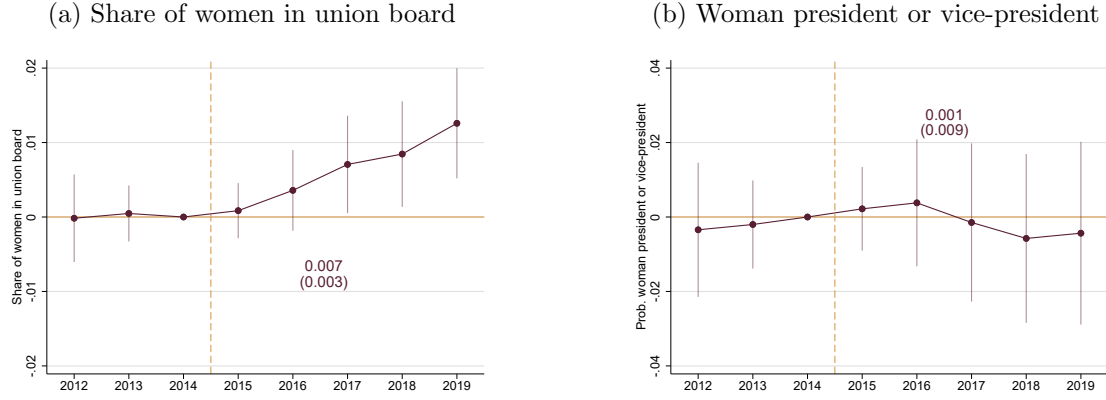
Notes: Figures show estimates of the δ_t coefficients for $t \in [2012, 2019]$ (with 2014 omitted) from an event-study specification similar to the one in Equation (3) on measures of women representation within local union boards. The sample is restricted to unions in our analysis sample (results are similar without imposing this restriction). The equation we estimate is slightly different from Equation (3) as the unit of observation here is the union-year so we include union fixed effects instead of establishment-union pair fixed effects. Figure B2a uses the share of women in the union board as a dependent variable, while Figure B2b uses a dummy indicating whether the union's president (or vicepresident) is a woman. Confidence intervals at a 95% level are reported. Standard errors are clustered by union.

Figure B3: Example of a Maternity Leave Clause

Notes: Figure shows an example of a maternity leave clause in a CBA. The clause is classified under the "Holidays and Licenses" broad group (9 in total) and the "Maternity Leave" clause types (137 in total). This particular clause extends maternity leave duration from the state-mandated 120 days to 180 days—inclusive to adopting mothers. It also extends post-maternity job protection by 6 months. The paper relies on the clause type classification of the different clauses, ignoring the variation in the text that may exist within each individual clause belonging to a specific type.

Figure B4: Additional Sense Checks for Female- and Male-Centric Amenities

(a) Value gaps and intuitive female clauses
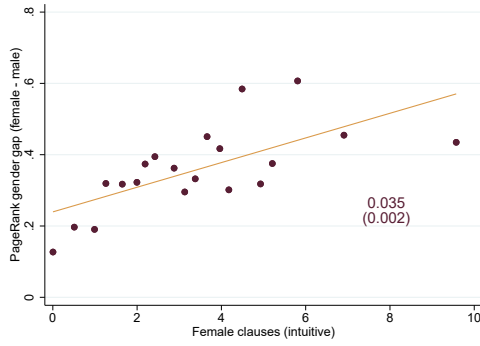
(b) Value gaps and data-driven female clauses
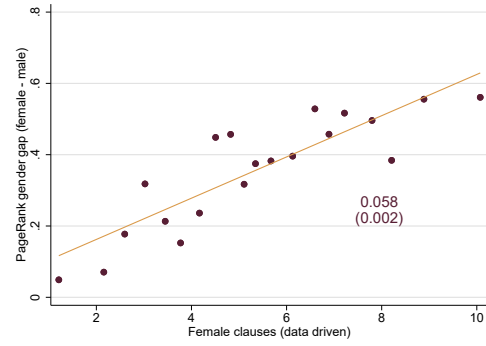
Notes: Figures depict binned scatterplots of the establishment-level gender gaps in PageRank values by the average female-centric clauses from sectoral CBAs applying to the establishment. Figure B4a uses the intuitive definition of female-centric amenities, while Figure B4b uses the data-driven approach. The sample used is the one used to estimate Equation (2), i.e., establishments in the intersection of the gender-specific super-connected sets covered by sectoral CBAs in at least 4 different years between 2009-2016.

Figure B5: Union Affiliation to CUT Over Time
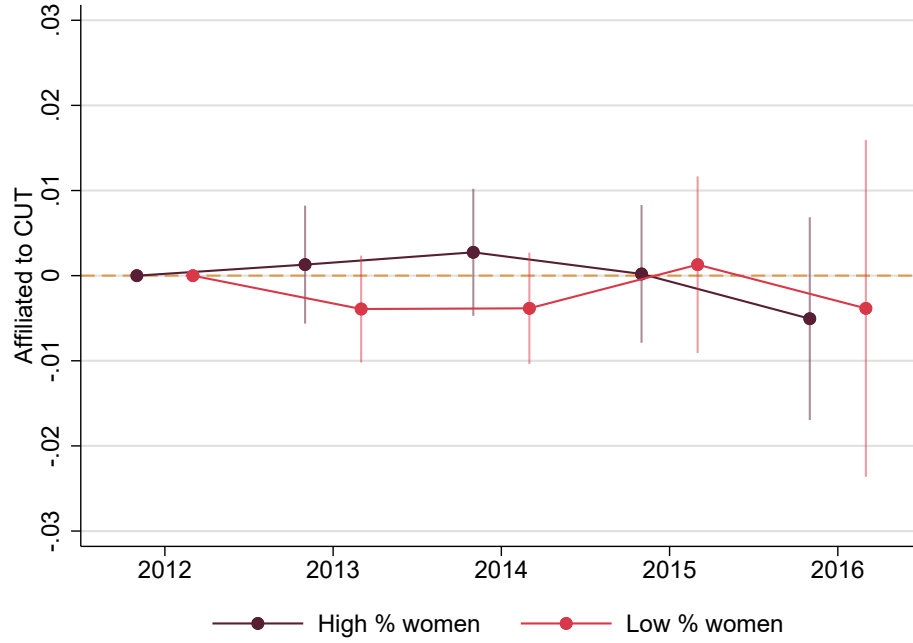
Notes: Figure plots changes in the probability of being affiliated to CUT between 2012 and 2016 separately for unions having either a high or a low share of women among the workers they represent (above or below the mean, i.e., 33% women). Coefficients represent the change with respect to 2012, in which the probability of being a CUT-affiliate is normalized to zero. Unions are weighted by the size of the workforce that they represent, computed by summing the 2012 worker count across establishments negotiating firm-level CBAs with the union. That is, if an establishment negotiates with n unions, we split the workforce count evenly to those n unions (results are robust to removing these weights). The sample is restricted to the unions in the filled panel, where only 3% of unions ever switch affiliation to or from CUT. Standard errors are clustered at the union level.

Figure B6: Baseline Characteristics of Treated and Control Establishments

(a) Establishment size

(b) Industry

(c) Region

(d) Share of women employees
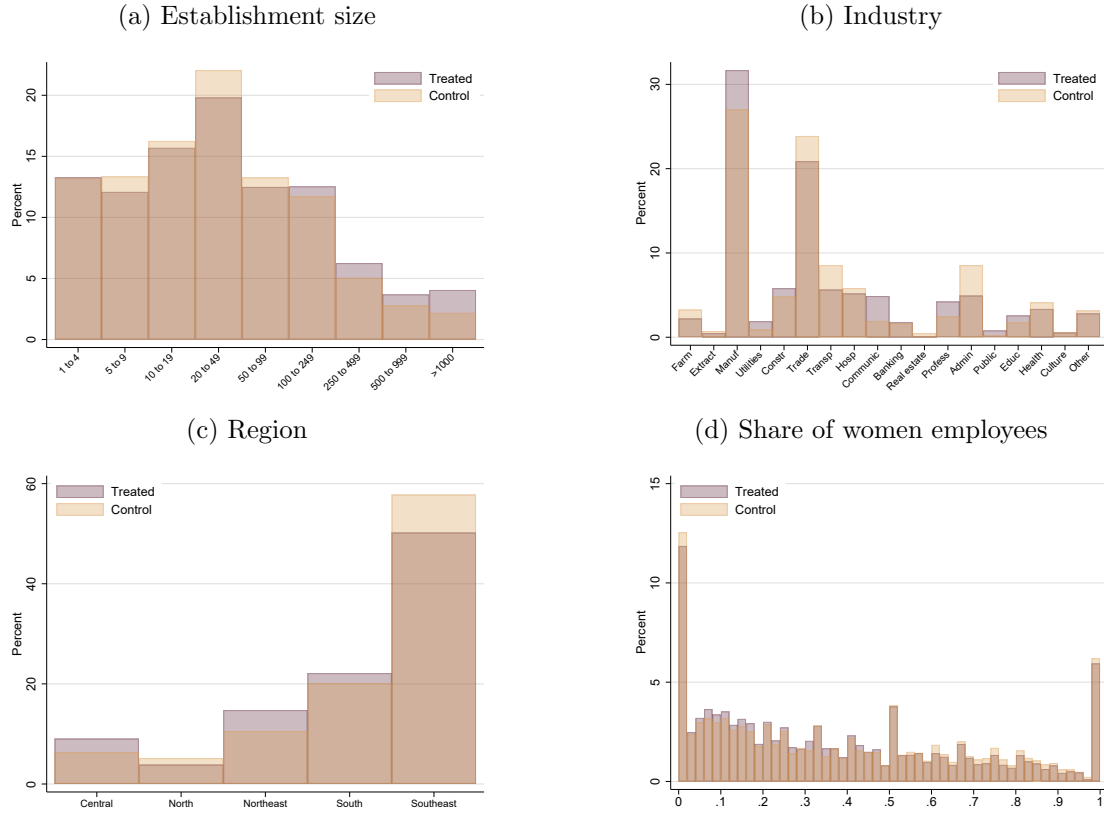
Notes: Figures show the treated and control establishments distributions of size, industry, regional location, and female share of employment at baseline. The establishments come from the starting sample detailed in Table 1.

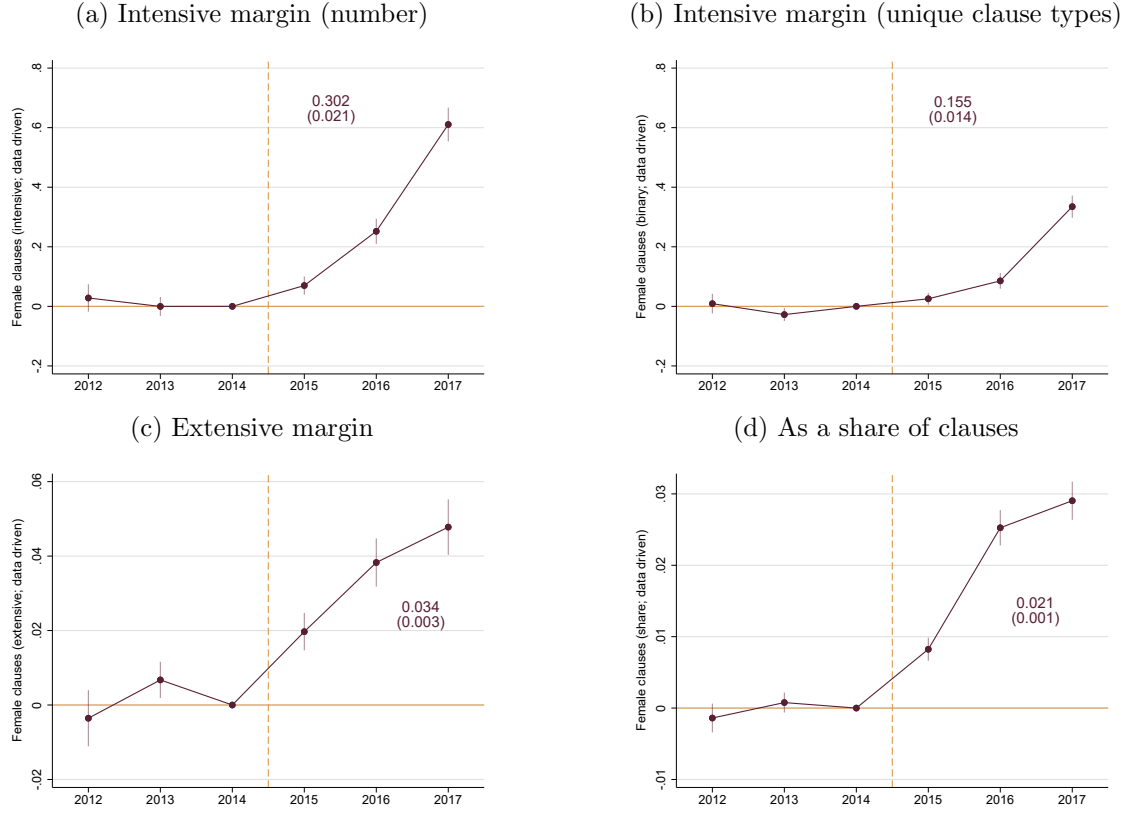Figure B7: Trends in Female-Centric Clauses (Data-Driven Approach)

(a) Filled panel

(b) New contracts
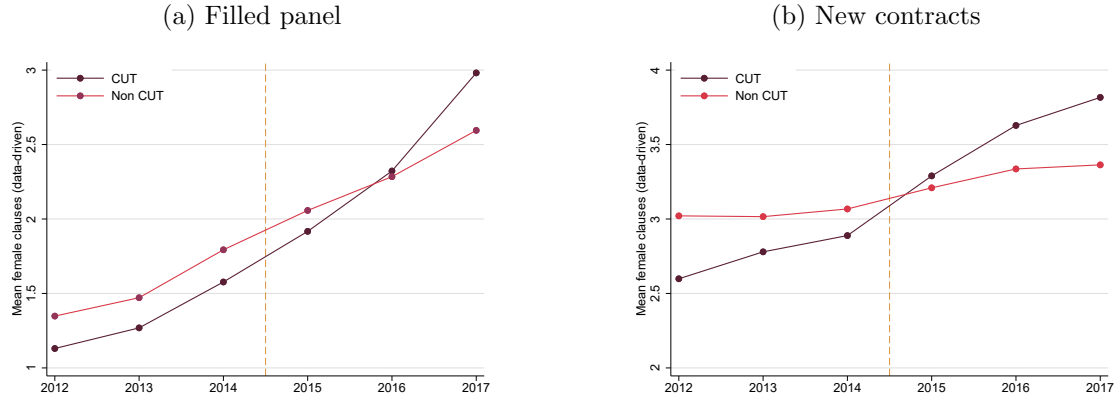
Notes: Figures plot the raw average number of female-centric clauses for treated (CUT) and control (Non CUT) establishment-union pairs over the years. Female-centric clauses are based on the data-driven classification. Figure B7a plots the average number of female-centric clauses for the filled panel, while Figure B7b plots the average number of female-centric clauses in newly signed contracts of the given year. Mean female clauses are lower in the filled panel and react slowly to changes in new contracts because of pairs that do not have CBA coverage in a given year.

Figure B8: Additional Trends in Clauses (Data-Driven Approach)

(a) Male-centric clauses

(b) Female-to-male ratio
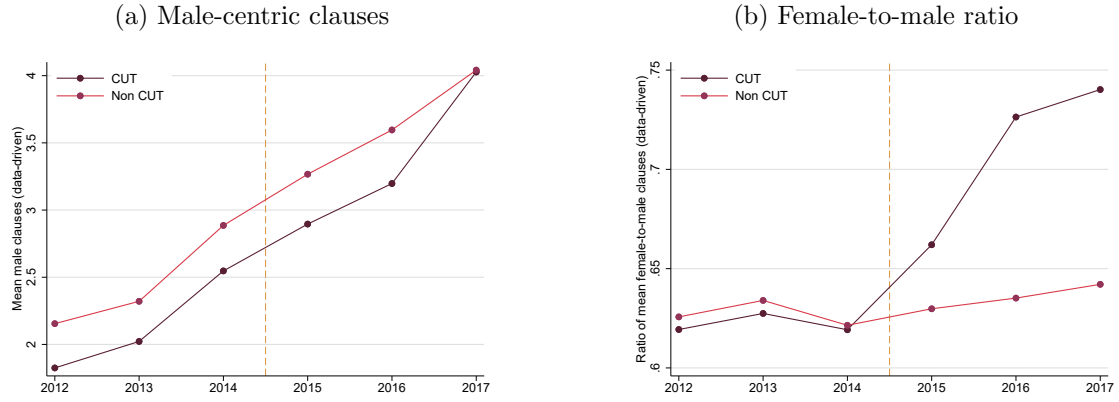
Notes: Figures plot the raw trends in clauses for treated (CUT) and control (Non CUT) establishment-union pairs over the years in he filled panel. Both female- and male-centric clauses are based on the data-driven classification. Figure B8a plots the average number of male-centric clauses, while Figure B8b plots the ratio of the mean female-to-male clauses.

Figure B9: Effect of the CUT Reform on Female-Centric Amenities

(a) Intensive margin (number)

0.302
(0.021)

(b) Intensive margin (unique clause types)

0.155
(0.014)

(c) Extensive margin

0.034
(0.003)

(d) As a share of clauses

0.021
(0.001)

Notes: Figures show estimates of the δ_t coefficients for $t \in [2012, 2017]$ (with 2014 omitted) from the DID specification in Equation (3) on all margins considered for female-centric clauses, defined using the data-driven method. Confidence intervals at a 95% level are reported. Standard errors are clustered at the establishment level. All figures use the filled panel.

Figure B10: Effect on Amenities by Low Reprentation of Women in the Workplace vs. Union
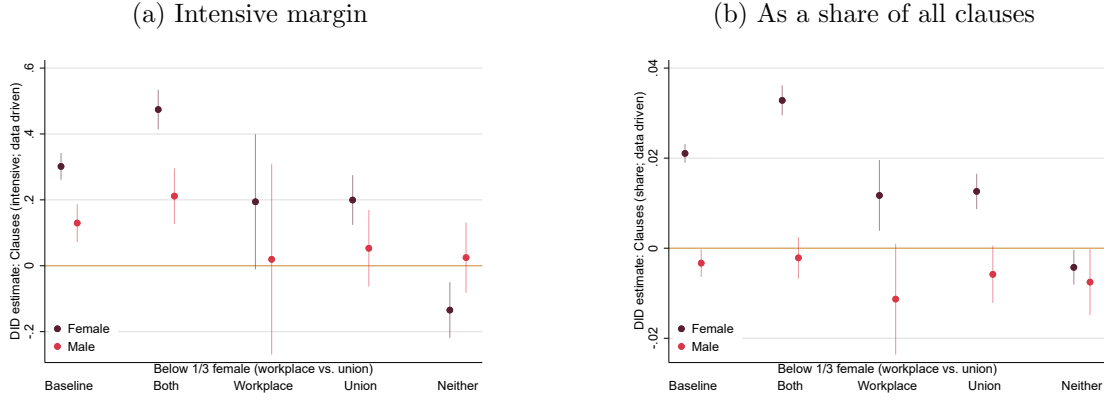
(a) Intensive margin

(b) As a share of all clauses

Notes: Figures show estimates of the treatment effect ($\delta_{year \geq 2015}$) from the DID specification in Equation (3) on the number of female- and male-centric clauses (data-driven approach) computed on the full analysis sample (*Baseline*) and four mutually exclusive and collectively exhaustive subsamples based on the representation of women at the workplace versus the union. Low representation of women in the workplace (union) refers to having a 2014 share of female workers (union board members) below 1/3. The *Both* (*Neither*) subsample denotes when there is low female representation in both (neither) the workplace and (or) the union. The *Workplace* (*Union*) subsample denotes when there is low female representation in the workplace (union) only. We use the filled panel. Confidence intervals at a 95% level are shown. Standard errors are clustered at the establishment level.

Figure B11: Effects on Wages and Employment
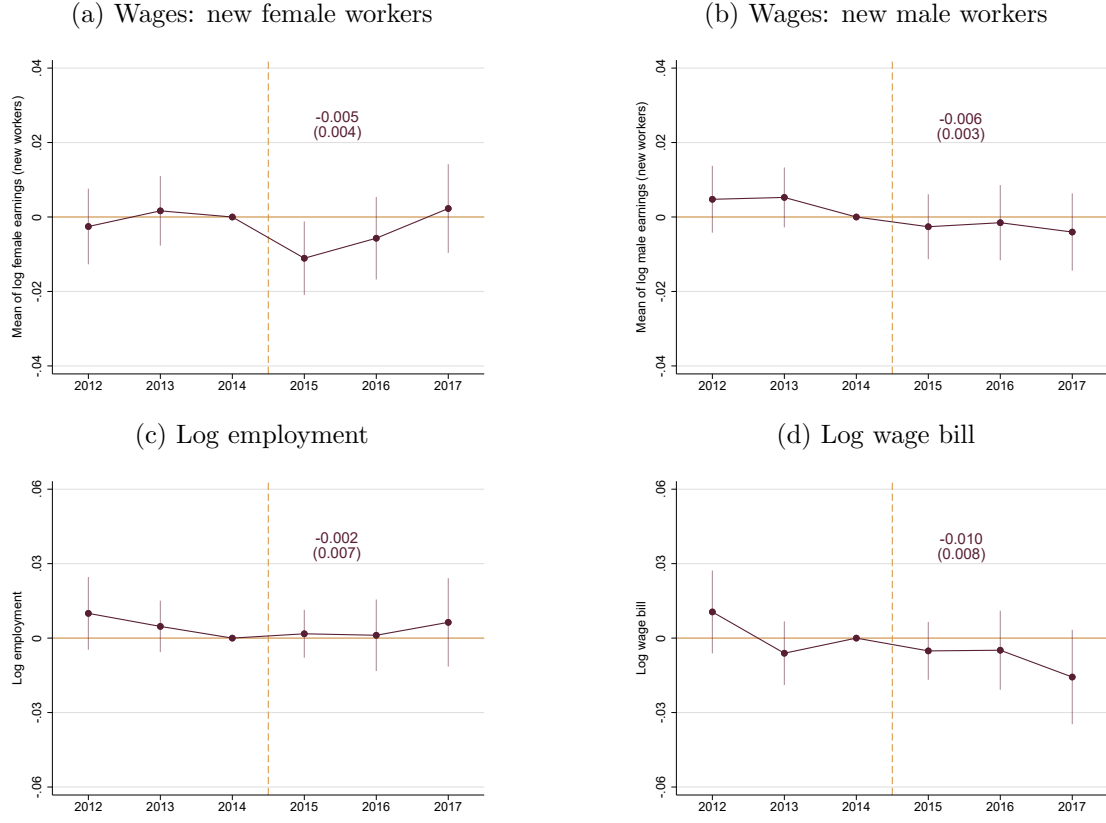
Notes: Figures report the results of the establishment-level DID regression in Equation (3) with outcome variables: mean log wages for new female hires, mean log wages for new male hires, log of total employment, and log of the wage bill. Each regression includes establishment fixed effects, industry-year fixed effects, and microregion-year fixed effects. The figure plots estimates of the δ_t coefficients for $t \in [2012, 2017]$ with 2014 omitted. Confidence intervals at a 95% level are reported. Standard errors are clustered by establishment.

Figure B12: Heterogeneity in Women's Retention by Education Group
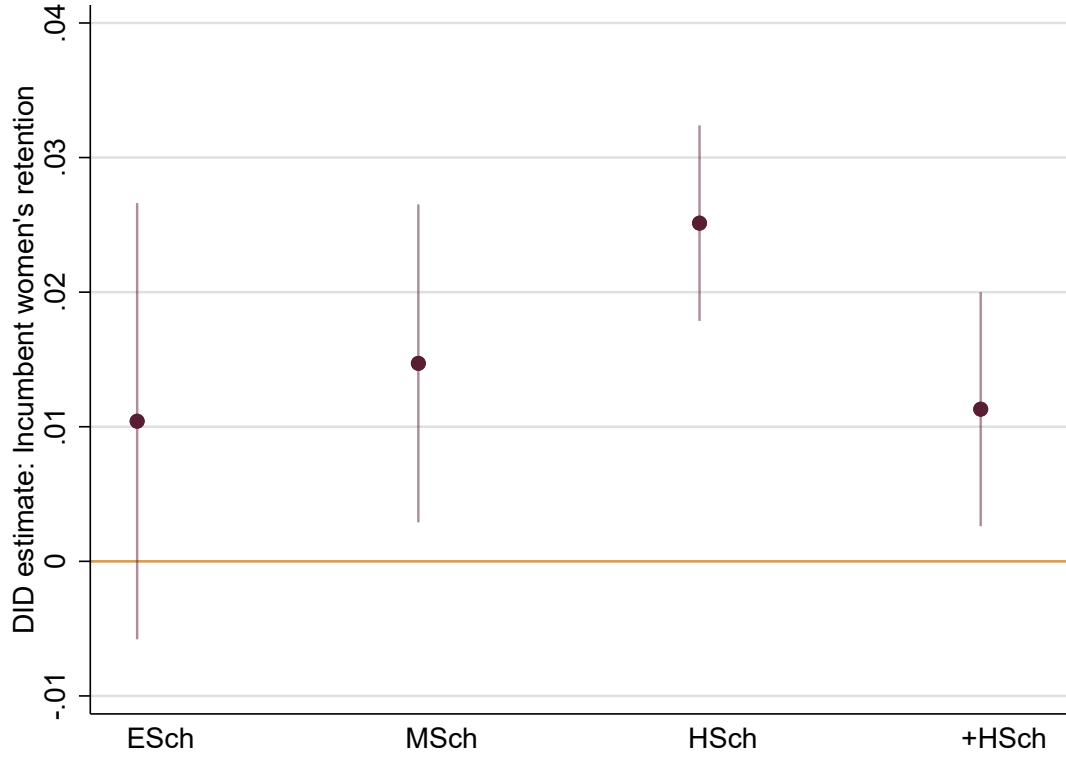
Notes: Figure show estimates of the treatment effect ($\delta_{year \geq 2015}$) from the DID specification in Equation (3) on retention using subsamples of incumbents by education groups. We split the sample by level of education at baseline, i.e., completed elementary or less (ESch), some or completed middle school (MSch), some or completed high school (HSch), and more than high school (+HSch). To make treatment effects in worker-level regressions interpretable as establishment-level averages, we weight each incumbent worker by the inverse of (own-gender) employment at their baseline employer. Confidence intervals at a 95% level are shown. Standard errors are clustered at the establishment level.

Figure B13: Spillover Effects at Multi-Establishment Firms
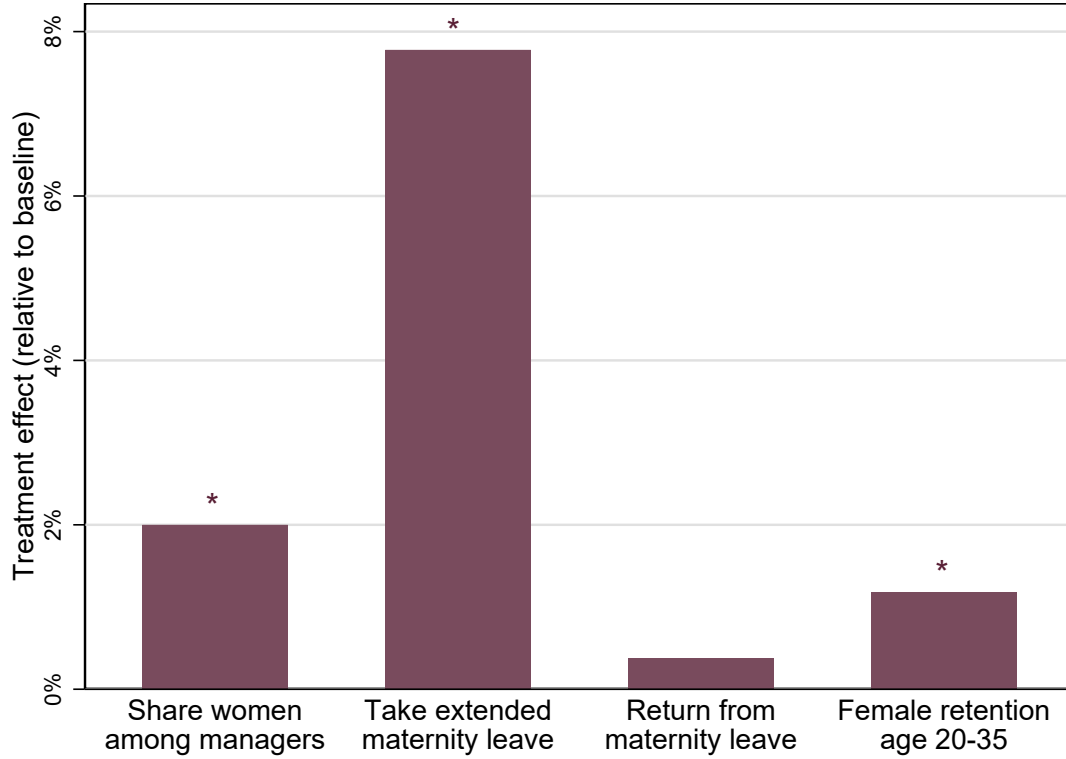
Notes: Figure shows the effects (in percentage terms relative to baseline) from DID regressions—see Equation (3)—estimating the spillover effect of the CUT reform at multi-establishment firms on firm environment outcomes and female retention. In this analysis, for each one of our samples, we use the first 8 digits of the CNPJ identifier to observe whether establishments in the control group are part of a firm that has an establishment in the treated group. Once that has been determined, we drop all treated observations and redefine treatment ($D_i = 1$) as an observation in the original control group whose establishment belongs to a firm that has an originally defined treated establishment. The regressions for the first three bars use the establishment sample and are related to the firm environment (see Figure 6). The regression for the last bar uses the incumbent sample and is weighted by the inverse of (own-gender) employment at the baseline employer. Standard errors are clustered at the establishment level.

C Data Appendix

C.1 Sample construction

To analyze the CUT reform's impact on various outcomes, we construct three main analysis samples. The first is a sample to study changes in CBA clauses at the establishment-union pair level (henceforth, simply *pair* level). The second is a sample at the establishment level to study changes in the workplace. The third is a sample at the worker level used to track the labor market outcomes of incumbent workers. In addition to these three main samples, we also construct two panel datasets at the local union level and at the union central level to study the gender composition of their boards.

Amenities sample Amenities (on paper) are captured by CBA clauses signed by establishment-union pairs. We first construct a yearly panel of the new CBAs signed by a pair in a given year, i.e., new contracts. We then use this sample to construct a balanced panel containing the active clauses applying to a pair over time, i.e., filled panel.

1. New contracts: We construct this sample using the set of CBAs registered on *Sistema Mediador*. We restrict to valid, non-amendment, firm-level CBAs signed between 2012 and 2017 (inclusive). Each CBA contains information on who signs the agreement—the CNPJ identifiers of the employer(s) and union(s) signing it—and, importantly for our analysis, how many clauses it contains classified into clause types.[71]

The union identifier allows us to merge these data with data on union affiliation to union centrals coming from CNES. The employer identifier allows us to merge these data with information in RAIS, e.g., industry, microregion, and employment. We drop CBAs signed by unions with missing information about their 2012 union central affiliation (around 1.5% of contacts).[72] We additionally drop contracts signed by multiple unions with different union central affiliations: this is fewer than 0.33% of CBAs.[73]

Almost all pairs negotiate at most one contract per year: 96% of CBAs are the only agreement signed by a pair that year and 85% of pairs always negotiate at most one CBA per year during our study period. As for the remaining 15%, we take the maximum count of a given clause type across the CBAs negotiated by the pair in a given year.[74] In this way we obtain a sample of newly negotiated CBAs at the pair-year level, reporting the number of clauses for each clause type.

---

[71] *Sistema Mediador* classifies clauses into 137 categories, e.g., maternity assistance, overtime pay, life insurance, procedures in relation to strikes and strikers, etc.

[72] Unions that decide not to affiliate with any union central—which are registered in CNES as "Not-Affiliated"—are not dropped. The CBAs signed by these unions are part of the control group.

[73] Of the remaining agreements, 89.8% are negotiated between a single establishment and a single union, 7.3% are negotiated by a single union with two or more establishments, 2.5% are signed by one establishment and two or more unions with the same CUT or non-CUT affiliation, and only 0.5% by multiple unions and multiple establishments.

[74] We do this to avoid double-counting clauses as the multiple agreements per pair-year often result from misclassified CBA amendments or single-issue CBAs that are renegotiated more frequently than a year.

On the signing establishment's side, we restrict to pairs that have non-missing industry and microregion information, and that employs workers at baseline (2014). These restriction drop 8.5% of observations. This comprises the starting sample with observations at the pair-year level reported in the descriptive statistics of Table 1.

2. Filled panel: This sample fills in the amenities information for pairs in the *new contracts* sample for years when a new firm-level CBA was not signed. In filling the panel, we consider the institutional context regarding the automatic extension of CBAs into the future. That is, for a given pair, contracts expiring after September 2012 are automatically extended into the future until a new CBA is signed (Lagos, 2024). Although CBAs expiring before that date were not extended, we observe contracts starting 3 years prior to our study period, i.e., starting in 2009. Since the maximum duration of a CBA is 24 months, by the start of our study period (i.e., 2012) we can already be certain whether any CBA applies to a given pair-year. As such, these institutional features allow us to generate a balanced panel at the pair-year level.

To aggregate amenities at the pair-year level, for each year we only consider the contract(s) covering at least 6 months of the year.[75] If more than one contract per pair-year remains, we take the maximum count of a given clause type across CBAs—similarly to what done for the *new contracts* sample. If a pair is not covered by a firm-level CBA in a given year (even after filling the panel), we set the clause count for each clause type to zero. As such, this procedure produces a yearly balanced panel at the establishment-union pair level.

Establishment sample   To study changes in the workplace, we match the contracts in our *amenities sample* to the signing establishments in RAIS. Establishments covered by contracts negotiated by unions affiliated to CUT in 2012 form our treatment group, while establishments covered by CBAs signed by unions not affiliated to CUT in 2012 make up our comparison group.

We start with the list of establishments that are part of the pairs in our *new contracts* sample. We restrict to establishments employing both men and women at baseline, dropping 15,550 establishments. We further restrict this list to establishments in the geographic coverage of their "baseline CBA", defined as the firm-level agreement closest to the 2015 CUT reform among those signed by the establishment. The reason for this restriction is that, for multiple-establishment firms, the CNPJ listed as the employer counterpart in the CBA need not be covered.[76] Restricting to signing establishments in the geographic coverage of their baseline CBA further drops 8,684 establishments, leaving us with 61,752 establishments.

For each establishment in this list we compute outcomes at the establishment-year level, such as mean log wages or total female employment, either using all job spells registered at that establishment in the year or using workers' "main job spell" in each year. We define the "main job spell"

---

[75]All other restrictions used in the *new contracts* sample apply.

[76]Firm-level CBAs apply to workers at all establishments of the signing firm that are in the geographic coverage specified in the contract. In case of multi-establishment firms, the establishment signing a CBA could be the firm headquarter but the contract might cover only subsidiaries located in other municipalities.

as the employment spell at which the worker worked the longest during the year. In case all job spells have the same duration, we break ties by keeping only one spell at random.

Because the same establishment can negotiate CBAs with more than one union, the final step to construct the *establishment sample* involves determining treatment status at the establishment level. We assign establishments to the treatment group as long as they are part of at least one treated pair. In practice, this decision is innocuous. Because the great majority (93.5%) of establishments always bargain with the same union, treatment assignment is trivially defined for most establishments. There are 4.4% of establishments that sign CBAs with more than one union over the time frame we consider, and all the unions they negotiate with have the same treatment status, e.g. they are all affiliated to CUT (or they are not) in 2012.The remaining 2.1% of establishments negotiate with more than one union over time and these unions have different treatment status. We conservatively assign this last group of establishment to the treatment group, which should run counter to finding effects if some of these establishments are not affected by the CUT reform.

Incumbent workers sample Incumbent workers are defined as those employed at a treated or comparison establishment as of 2014 (based on the *establishment sample*). Their treatment status depends on the treatment status of their baseline (2014) employer, as explained above in the description of the *establishment sample* construction. Leveraging the linked employer-employee feature of RAIS, incumbent workers are tracked across jobs from 2012 to 2017—that is, we are not restricting to job spells at employers in the *establishment sample.* In constructing this sample, we only consider the "main job spell" for each worker in each year.

Union and union central boards For each Brazilian union central, we construct a yearly panel with information on the gender composition of their national board between 2012 and 2019. The raw data contains the full name of all the board members, which allows us to infer their gender. We do so using the R package *genderBR*, which codes a name as female if most people with that name are women in the Brazilian census (and similarly for men).[77] We use this data to check that the introduction of the CUT gender quota had bite.

We similarly construct a yearly panel with information on the gender composition of local union boards, the gender of their presidents and vice-presidents, and their affiliation to union centrals between 2012 and 2019. We use these data 1) to assign treatment status to unions; 2) to understand whether the reform had spillovers on local union boards; and 3) conduct heterogeneity analyses concerning women's representation in unions.

C.2 Construction of variables

Amenities In the analysis we adopt two different ways of classifying clauses as female-centric amenities. The first is guided by intuition to select clause types that are of plausibly of greater value to women than men (intuitive definition). The second definition is data-driven, where we use

---

[77]Developed by Fernando Meireles and posted on GitHub.

lasso to pick clauses that are most predictive of women's value of employment (relative to men) at an establishment in the cross-section. An important advantage of the data-driven approach—compared to the intuitive definition—is that it also identifies clauses that are valued relatively more by men, i.e., male-centric amenities.

We also generate four different outcome margins for clauses at the pair-year level. First, the *intensive margin (number of clauses)* measures the sum of the clause counts from the clause types categorized as either female- or male-centric in the corresponding contract. Second, the *intensive margin (sum of unique clause types)* measures the sum of clause type indicators for those categorized as either female- or male-centric in the corresponding contract. Third, the *extensive margin* simply indicates whether any female (or male) clause exists in the CBA of interest. Finally, we calculate the *share* of the intensive margin (count) relative to the total clause count in the CBA.

1. Intuitive definition: Guided by CUT's "fight plan" and previous work documenting the value women place on flexibility (Goldin and Katz, 2011; Mas and Pallais, 2017; Maestas et al., 2023), we identified 4 themes as female-centric: 1) leaves; 2) maternity and childcare; 3) workplace harassment and discrimination; and 4) flexibility and part-time work. From these themes we restricted ourselves to select 20 clause types. These clauses are listed in Table A1—which includes clauses on maternity leave, childcare assistance, prevention of sexual harassment—all of which are conceivably of greater value to women than men.

2. Data-driven definition: The data-driven definition of amenities selects clauses that are most predictive of gender differences in the value of employment at an establishment, controlling for gender-specific wage premiums.[78] In practice, we estimate the following cross-sectional specification using lasso:

$$V_j^F - V_j^M = \beta_w^F \psi_j^F - \beta_w^M \psi_j^M + \sum_{z \in Z} \beta_z a(z)_j + \epsilon_j$$

where V_j^G is the PageRank value of establishment j for workers of gender G, ψ_j^G is the establishment fixed-effect for workers of gender G at employer j from an AKM regression on wages, and $a(z)_j$ is the average clause count of amenity z (one among the 137 clause types) offered in the CBAs covering workers. We select the 20 clause types with the highest β_z and label them as "female-centric" amenities. Conversely, the 20 clause types with the lowest β_z comprise our "male-centric" amenities. Results are shown in Table 2.

PageRank values. To estimate PageRank values we take job spells of full-time workers, ages 18-54, on open-ended contracts, and earning monthly wages in private sector establishments from RAIS (2009-2016). For each gender, we find the largest strongly connected set of establishments based on worker flows, i.e., a link between two establishments is defined as having at least one inflow and one outflow. We restrict to establishments that have at least 10 hires overall, with at least one of these coming from non-employment. To solve for the vector of PageRank values (see

---

[78]Section 2.2 provides a detailed justification for this approach.

Appendix E), we follow Morchio and Moser (2020) and only consider employment-to-employment flows to be month-to-month job transitions. In addition, we set the damping factor used in finding the fixed point in the linear system of normalized flows to 0.8—one of the standard values in computer science. That is, the "random surfer" moving through the labor market restarts his search at a new establishment with 80% probability. As shown in Sorkin (2018), PageRank values are unique up to an unknown multiplicative factor. Below we discuss robustness to assumptions about the multiplicative factor applying to women versus men to obtain $V_j^F - V_j^M$.

Wage premiums. To estimate the establishment fixed effect from AKM we take job spells of full-time workers, ages 18-54, on open-ended contracts, and earning monthly wages in private sector establishments from RAIS (2009-2016). For each gender, we find the largest strongly connected set of establishments based on worker flows, i.e., a link between two establishments is defined as having at least one inflow and one outflow. We restrict to establishments that have at least 10 workers (on average across years) and are observed at least 4 years in RAIS. Following Gerard et al. (2021), the model includes dummies for individual workers (α_i) and individual establishments (ψ_j), year dummies interacted with five education dummies, and quadratic and cubic terms in age interacted with the education dummies (X_{it})—see Appendix E. For the baseline year, the worker effects are measured as of age 40 to correspond to the approximate peaks of experience profiles. The establishment fixed effects for each gender—i.e., ψ_j^F and ψ_j^M—are normalized relative to the restaurant industry, where rents are assumed to be negligible.

Clause counts. To get a measure of $a(z)_j$ for each establishment, we take a yearly average of the number of clauses in each of the 137 clause groups found in sectoral CBAs negotiated between 2009 and 2016. To assign coverage from sectoral CBAs to establishments, we first need to map the signing employer association to the firms being represented. Using the equivalent of a FOIA request, we obtained the universe of establishments paying dues to employer associations. We then take sectoral CBAs and match them to all establishments paying dues to the signing employer association. The next step is to assign coverage only to establishments located in the geographic region specified in the CBA. Finally, to reduce overlap in CBA coverage, we exploit information on negotiated wage floors to assign a "main CBA" to each establishment-year.[79]

Robustness. We check the robustness of our data-driven method on two dimensions: 1) two different ways of selecting the establishment sample used in the regressions: either a 50% random split-sample (used in our baseline approach) or the full estimation sample of establishments; and 2) three definitions of the gender gap in PageRank values, i.e., $V_j^F - V_j^M$. The first definition (used in our baseline approach) chooses the establishment with the smallest wage premium gap as the normalizing establishment, and then adjusts female values relative to the male values by multiplying the former by the ratio of the female-to-male PageRank values of the normalizing establishment. The second definition simply assumes the multiplicative factor is the same for both genders, i.e., no normalization is needed. The third definition uses a (within-gender) normalized index from 0

---

[79]Specifically, we first define an establishment's "core union" to be the modal union involved in negotiating wage floors that have bite on the wage distribution. Among the CBAs negotiated by the "core union" in a given year, the "main CBA" is the one with the wage floor that has the largest mass of workers.

to 100 of V_j^F and of V_j^M.

Tables A4 and A5 show all the clause types selected by any of the combinations above. These tables also show how many of these 6 different combinations choose a given clause type as either female- or male-centric, as well as those selected under the baseline approach but adding state and industry fixed effects.

Labor market outcomes   We briefly describe how we define the outcomes used for the establishment-level and incumbent worker-level analyses. While for all worker-level outcomes we use the main job spell, some establishment-level outcomes are constructed with all job spells. We first describe establishment-level outcomes derived with all job spells and then those derived using main job spells. Finally, we describe worker-level outcomes.

Establishment level outcomes - all job spells:

- Total employment. The total number of workers employed at an establishment in a given year.

- Share of women in the workforce. Share of women employed in a given establishment-year among all workers.

- Share of women in the probationary workforce. Share of women employed in a given establishment-year with less than 3 months of tenure among all workers with fewer than 3 months of tenure. Brazil's federal labor code allows for at most 3 months of probation, after which employment terminations imply severance payments.

- Absences. Percent of total workdays in a given establishment-year that are not worked due to leaves of absence. The numerator is the number of days taken as leave by workers (excluding maternity leaves and military service) at the establishment throughout the year. The denominator is the number of workers employed at the establishment for the entire year multiplied by 365.

- New hires. Number of workers recently hired by the establishment, defined as the number of workers employed in a given establishment-year with less than 12 months of tenure.

- Share of women among new hires. Share of women employed in a given establishment-year with less than 12 months of tenure among all workers with fewer than 12 months of tenure.

- Share of women among separating workers. Share of women among workers who separate from the establishment in that year. Separating workers are defined as those who are no longer employed at the establishment by the end of the year.

- Establishment exit. A dummy variable indicating whether the establishment does not appear in RAIS in 2017.

Establishment level outcomes - main job spell:

- Mean log wage. For any given worker subgroup, we take the mean of the wage outcome (defined below) in logs across all workers in the subgroup employed at the establishment in that year. This variable is defined for the following worker subgroups: women and men with more than 12 months of tenure, women and men with less than 12 months of tenure.

- Mean gender wage gap. The difference between the mean log wage for women and the mean log wage for men for a given establishment-year.

- Wage bill. The monthly wage bill for the establishment. That is, we sum the wage outcome (defined below) for all workers employed by the establishment in that year.

- Share of women poached in. Share of new female hires that are poached from another firm among all female workers. New hires are defined as workers with less than 12 months of tenure at that establishment in a given year. Poached hires are defined as workers who in the preceding year worked at another firm in RAIS, as opposed to being unemployed or out of the (formal) workforce.

- Age of female workforce. Mean age of female workers employed at an establishment in a given year.

- Tenure of female workforce. Average months of tenure of female workers employed at an establishment in a given year.

- Hours of female workforce. Average contracted hours of work per week of female workers employed at an establishment in a given year. Weekly contracted hours are those agreed upon hiring, and do not include overtime work.

- Education of female workforce. Average years of schooling of female workers employed at an establishment in a given year.

- Share of women among managers. The share of women among workers with an occupation code corresponding to a managerial role. Occupation codes corresponding to manager positions are those starting with 12, 13 or 14 (as per CBO: *Classificação Brasileira de Ocupações*).

- Maternity leave benefits. The share of women taking maternity leaves longer than 120 days among women employed at an establishment that start their maternity leave in a given year. We are able to identify women taking maternity leave thanks to detailed information on both the length and the reason of the three longest leave spells per job spell. We think that it is very unlikely that maternity leaves are not among the three longest leave spells in a year for a woman on maternity leave. For this reason we are confident that we are observing the near universe of maternity leave spells.

- Job protection after maternity. The share of women working at the same employer where they were working at the start of maternity leave by end-of-year for the year when their maternity

leave ends, among women employed at said establishment who start their maternity leave in the same year.

- Injury leave. The share of workers taking leave due to a workplace injury among all workers employed at an establishment during a given year.

Establishment level outcomes - not in RAIS:

- CBA wage adjustments. The largest percentage wage adjustment negotiated among the firm-level CBAs covering an establishment. For years without a wage adjustment clause or without a negotiated CBA, the assigned wage adjustment is zero.

- Profit margin. The mean profit margin (in percentage terms) over 2012-2014 and 2015-2017. The sample is restricted to establishments reporting profit margin information to Orbis in both the pre- and post-reform periods.

Worker level outcomes - main job spell of incumbent workers

- Wages. The average monthly earnings that a worker makes during a job spell in a given year. We always use earnings in real terms by using the December CPI (i.e., the *Índice Nacional de Preços ao Consumidor* reported by IBGE) with 2015 as the base year.

- Retention. A dummy that indicates whether the worker is observed working at the baseline employer in any given year, where the baseline employer is defined as the (main) establishment of employment in 2014.

- Employed in formal sector. A dummy that indicates whether the worker is observed working in the formal sector in that year, i.e., they have a job spell registered in RAIS in that year.

D   Qualitative Information on the CUT Reform

We conducted a systematic search of multimedia sources, archival documents, and structured interviews to better understand the precursors and aftermath of the CUT reform. Given the open-ended nature of the search, this appendix details our approach and the rich variety of sources that inform our analysis.

Union Central Websites

Most union centrals have official websites that allow one to search internal news reports and multimedia describing the activities of the organization and its members. We searched for content using the words *mulher* (woman) and *paridade* (parity) in the years surrounding the reform, since these were the most publicized aspects of the 2015 CUT reform. Some of the most interesting items found in the search include (by union central):

- CUT: CUT administered a training course to over 50 female union leaders whose central objective was to "introduce feminism within CUT so that women leaders understand the struggle of women in all spaces, in all areas, and to further empower the theme of parity that we are going to implement this year"

- CSB: the board of directors and other leaders held a discussion on gender issues (we were unable to find any information on follow-up)

- CTB: a female leader of the national board called for a more feminist agenda (we were unable to find any information on follow-up)

- NCST: published a bulletin on gender issues called *Boletim Observa Gênero*

These items illustrate that many union centrals discuss topics related to women. However, there was no evidence of concrete actions taken to advance women's issues, unlike the 2015 CUT reform we describe in Section 1.2.

A similar but wider search within CUT's official website allowed us to obtain more detailed information on what leaders highlighted about the reform, as well as subsequent actions that the CUT has taken in more recent years.[80] On the former, for example, we found evidence of frustration with the effective power that women leaders gained at the national board of the CUT, which further supports our evidence that raising the voice of existing women was the critical feature of the reform in 2015.[81] On the subsequent actions taken by the CUT to strengthen the female-focused priorities, we find for example that the CUT did not allow any of its state or industry bodies to disband their

---

[80]In terms of precursors to the reform, the search pointed us to the original opinion piece authored by CUT leaders in response to the PT's adoption of gender parity (link), which led to the CUT reform Godinho Delgado (2017).

[81]For example, the head of SNMT in 2023, Junéia Batista, mentioned that the next course of action is gender parity in decision-making positions at CUT (link). Despite this desire for a stronger form of parity, a leader of the teacher's confederation affiliated to CUT notes how discussions on collective agreements without women have become "the exception rather than the rule" (link).

internal collectives or secretariats representing women in response to a dramatic drop in union revenue triggered by the removal of mandatory dues in 2017 (link). We also find that the CUT schools have launched training programs committed to having a class size that is at least 50% women (link).

Archives

To gather information on official actions taken by union centrals during the time of the reform, we searched their archives. This search focused on finding out what happened at their congresses and similar gatherings. The fact that CUT has its own library to manage its archives—known as *Centro de Documentação e Memória Sindical da CUT (Cedoc)*—enabled us to perform a very thorough search.[82] For other union centrals, we were restricted to search within their official websites as well as the *Centro de Memoria Sindical* .

The archives in *Cedoc* were a trove of information for our analysis. Not only were we able to look at documents from the CUT's national gathering of women (*8º Encontro Nacional de Mulheres*) and its national congress from 2015 (*12º CONCUT*) that were central to cementing the reform, but we also obtained resolutions by CUT-affiliated confederations as well as materials produced by the CUT training schools. Below is a list of some of the most important documents that informed our analysis:

- The resolutions from all of CUT's national congresses (or *CONCUTs*)

- Supporting documents for the *12º CONCUT*, including a companion booklet for the matters to be debated at the congress, summarizing the proposals suggested by members to be discussed (984 in total) where each proposal—including the female-friendly fight plan—is linked to the confederations that listed it as a priority

- The resolutions and amendments passed during the *8º Encontro Nacional de Mulheres*

- Resolutions passed by CUT-affiliated confederations: CNM, CONTRACS, and CNTSS[83]

- Archives of specific confederations, with information on the campaigns carried out by year, as well as video recordings of their national congresses[84]

- The courses offered at CUT training schools along with some activity handbooks that included a section focused on "gender clauses"

---

[82]We are indebted to Adalto Carvalho, the librarian who digitized numerous documents for us in the process, and also invited us to virtually join an informative debate on the role of women in the development of CUT unionism between Fátima da Silva and Didice Godinho Delgado (link).

[83]For example, the *pautas* proposed by CNM in 2015 include 1) defend the right to daycare guaranteed for children aged zero to six; 2) reimbursement of daycare assistance of at least 50% of the wage floor; 3) guarantee 180 days of maternity leave; and 4) relaunch the training course for metallurgical women.

[84]For example, in 2016 CONTRACS launched one campaign on daycare for employees and another one on fostering respect to female workers (*#Elasmerecemrespeito*).

The resolutions, fight plans, and supporting documents from national congresses of other union centrals around the time of the CUT reform do not emphasize the need to raise the voice of women. For example, during Força Sindical's national congress in 2013, plenary sessions for women were held and women made up 30% of the board for the first time in their history. The resolutions from CSB's national congress in 2016 only mention the word *mulher* (woman) 7 times. Lastly, the new bylaws drafted in 2013 by NCST merely commit to combating discrimination of all kinds (including gender) and require that the head of the women's division be a woman, which was *de facto* already the case.

We also searched for evidence on how eployers responded to the CUT reform, as well as any news reports on changes to worker satisfaction. Our searched focused on news archives like the *Hemeroteca Digital Brasileira* and the *Acervo - Folha de São Paulo* but did not produce any results worth noting.

Academic works

To hear the voices of people affected by the CUT reform, we searched academic works that conducted structured interviews and surveys with subjects of interest. Our search produced results that were mostly dissertations in fields of social sciences outside economics at universities in Brazil and Portugal.[85] These papers were incredibly valuable since they captured the sentiment regarding women's role in Brazil's unions around the time of the CUT reform. Below are some of the highlights from this search.

Martins (2021) conducts an in-depth study of the banking workers' union in São Paulo from 2000 to 2020, which has been a union at the forefront of women's issues in unionism even prior to the 2015 reform. Most of her interviews are with current female leaders that rose up the ranks of this union. These leaders document in detail the challenges that women face within Brazilian unionism. Some examples include union meetings occurring late in the day that do not provide childcare, leaders disregarding women's demands as not appealing to the base, the importance of the *pautas* in generating change, and the lack of women in discussions surrounding these *pautas*.

Munhoz and Silotto (2019) follows the 3 largest unions affiliated to CUT in the state of São Paulo and asks whether the gender quota had any spillovers to the local unions. Aligned with our causal analysis, their descriptive statistics on these unions show that there were negligible spillovers. From the point of view of the union leaders they interview, the gender quota at the CUT's national board is of little consequence to workers without placing women in positions with decision-making power at local unions. This supports our evidence that raising the voice of existing women was the critical feature of the reform in 2015.

Silva (2021) studies women's involvement in the family agricultural workers' federation in Rio Grande do Sul. One of the events she follows is how this federation—which is affiliated to CUT—

---

[85]We relied on Google Scholar as a search engine, as well as theses repositories from Brazil, e.g., *Biblioteca Digital Brasileira de Teses e Dissertações* and *Biblioteca Digital de Teses e Dissertações da Universidade de São Paulo (USP)*.

restarted its women's collective in 2016. Similarly, Franco Oliveira (2017) followed the women's collective at CUT-Bahia during 2016-2017 and conducted interviews with attendees on the subject of women in unionism after the 2015 reform. She documents that this state branch focused on offering more training courses on women's issues—an initiative similar to those made by the CUT confederations that prioritized the female-friendly fight plan. Moreover, based on the interviews conducted, she reaches the conclusion that even male union leaders have become more attuned to women's issues and their demands for power in the union.[86] As pointed out in her study of feminism within CUT, Recoaro (2022) argues that having a woman in power is not necessary for pushing women's demands forward; the necessary condition is that the person in power (man or woman) is convinced that these demands are a priority. This aligns with our analysis, in that the numerous initiatives to raise the voice of women within CUT shifted the bargaining priorities at local unions.

---

[86]An interview with a male union leader in Guedes de Oliveira (2022) highlights this new progressive stance by male union leaders. In this case, the leader from telemarketers' union invokes an argument made by some feminists in the union movement: that employers are more open to female amenities that reinforce women's role as caregivers rather than workers, e.g., childcare assistance.

E   AKM and PageRank Model

Our data-driven approach to identify female- and male-centric amenities requires establishment-level estimates of gender-specific PageRank values and AKM wage premiums. This appendix presents the model underlying these estimates. For simplicity, we present the model without any reference to gender specificity. We also use establishment and firm interchangeably.

Denote $\tilde{V}_j$ as the common value of employment for any worker i at firm j. Common value means that all workers agree on $\tilde{V}_j$ such that a single job ladder exists ranking firms according to this value. All else equal, workers value higher compensation bundles so that one can write $\tilde{V}_j = h(w_j, a_j)$, where $h(\cdot)$ in strictly increasing in both the wage w_j and the amenity a_j arguments. The utility of workers from employment at the establishment, however, is heterogeneous and given by $u_{ij} = h(w_j, a_j) + \varepsilon_{ij}$, where ε_{ij} captures an individual's idiosyncratic preferences for working at j.

PageRank values

The starting point here is $u_{ij} = \tilde{V}_j + \varepsilon_{ij}$. In a market with only two firms and independently distributed type I Extreme Value ε_{ij} across workers, the probability that a worker prefers firm j over k is given by $\frac{\exp(\tilde{V}_j)}{\exp(\tilde{V}_j)+\exp(\tilde{V}_k)}$. With N workers and letting M_{jk} denote the number of workers choosing firm j over k, the following relation between employment decisions and valuations of firm-specific employment is simply $M_{kj}/M_{jk} = \exp(\tilde{V}_k)/\exp(\tilde{V}_j)$.

In a labor market with multiple firms $j \in \mathcal{J}$, the above condition imposes a restriction on each pair of firms, i.e.,

$$M_{kj} \exp(\tilde{V}_j) = M_{jk} \exp(\tilde{V}_k), \forall j \in \mathcal{J}. \tag{4}$$

Following Sorkin (2018), one can relax this condition by imposing a single restriction per firm that guarantees a consistent valuation of employers (e.g., no Condorcet cycles), as well as a unique set of firm-level values that best explains worker flows across establishments. Summing equation (4) across all employers and rearranging terms gives

$$\frac{\overbrace{\displaystyle\sum_{j\in\mathcal{J}} M_{kj} \exp(\tilde{V}_j)}^{\text{value-weighted entry}}}{\underbrace{\displaystyle\sum_{j\in\mathcal{J}} M_{jk}}_{\text{exits}}} = \underbrace{\exp(\tilde{V}_k)}_{\text{value}}, \tag{5}$$

which implies a single linear restriction per establishment.

The intuition behind equation (5) is that a valuable firm tends to be chosen over other valuable firms and has fewer workers leave it. This recursive definition of $\exp(\tilde{V}_j)$ is closely linked to Google's PageRank algorithm for ranking web-pages in a search. Along these lines, one can solve for $\exp(\tilde{V}_j)$ as a fixed point in a linear system. Moreover, a unique solution exists if the set of employers are

strongly connected, i.e., an establishment has to both hire a worker from and have a worker hired by another establishment in the set.

AKM premiums

The starting point again is $u_{ij} = \tilde{V}_j + \varepsilon_{ij}$ but with the assumption that $\tilde{V}_j = \beta \log(w_j - b) + \eta \log(a_j - q)$. The parameters b and q are the workers' reference wage and amenity levels, and $\epsilon_{i,j}$ refers to the idiosyncratic preferences from working at establishment j. Assuming that the $\{\epsilon_{i,j}\}$ are independent draws from a Type I Extreme Value distribution and the number of establishments $\mathcal{J}$ is very large, workers' choice probabilities are closely approximated by exponential probabilities.[87] Hence, the establishment-specific labor supply functions are approximated by:

$$\log(L_j) = \log(\lambda) + \beta \log(w_j - b) + \eta \log(a_j - q). \tag{6}$$

The employer's problem is to post the wages and amenities that minimize production costs given labor supply in (6). The posted wages and amenities are common to all workers since employers cannot discriminate on the basis of their idiosyncratic preferences $\{\epsilon_{i,j}\}$.[88] The optimal choice is the solution to the following cost-minimization problem:

$$\min_{w,a}(w_j + \xi_j a_j)L(w_j, a_j) \quad \text{s.t.} \quad T_j f(L(w_j, a_j)) \geq \bar{Y}, \tag{7}$$

where ξ_j captures heterogeneity in the marginal cost of amenity provision across employers.

The first order conditions imply that the optimal compensation package is given by:

$$w_j = T_j f'(L_j)\mu_j \left(\frac{e_{wj}^L}{1 + e_{wj}^L + e_{aj}^L} \right) \tag{8}$$

$$a_j = T_j f'(L_j)\mu_j \left(\frac{e_{aj}^L}{\xi_j(1 + e_{wj}^L + e_{aj}^L)} \right). \tag{9}$$

Rearranging equations (8) and (9), one can write wages and amenities as weighted averages of the marginal revenue product of labor and their respective reference values, i.e.,

$$w_j = \left(\frac{\beta}{1 + \beta + e_{aj}^L} \right) T_j f'(L_j)\mu_j + \left(\frac{1 + e_{aj}^L}{1 + \beta + e_{aj}^L} \right) b \tag{10}$$

$$a_j = \left(\frac{\eta}{\xi_j(1 + \eta + e_{wj}^L)} \right) T_j f'(L_j)\mu_j + \left(\frac{1 + e_{wj}^L}{1 + \eta + e_{wj}^L} \right) q. \tag{11}$$

Assume a linear technology $f(L_j) = \theta L_j$ and price-taking employers in the output market

---

[87]The exponential probabilities are $p_j \approx \lambda \exp(\beta \log(w_j - b) + \eta \log(a_j - q))$, where λ is a constant common across all establishments in the market.

[88]This asymmetry in information, rather than labor market concentration, is the source of monopsony power. Recall that $\mathcal{J}$ is large so as to ignore strategic interactions in posting.

to specify the marginal revenue product of labor: $T_j f'(L_j)\mu_j = T_j P_j \theta$. To simplify further, assume that reference wages and amenities are proportional to productivity ($b = \bar{b}\theta$ and $q = \bar{q}\theta$). Rearranging terms and taking logs results in

$$\log(w_j) = \log\left(\frac{\theta\bar{b}(1 + e_{aj}^L)}{1 + \beta + e_{aj}^L}\right) + \log\left(1 + \beta R_j^w\right) \tag{12}$$

$$\log(a_j) = \log\left(\frac{\theta\bar{q}(1 + e_{wj}^L)}{1 + \eta + e_{wj}^L}\right) + \log\left(1 + \eta R_j^a\right), \tag{13}$$

where $R_j^w = T_j P_j / [(1 + e_{aj}^L)\bar{b}]$ and $R_j^a = T_j P_j / [\xi_j(1 + e_{wj}^L)\bar{q}]$. With relatively small values of βR_j^w and ηR_j^a, log wages and log amenities are functions of a fixed worker component and a fixed establishment component as in Abowd et al. (1999)—henceforth AKM. Specifically,

$$\log(w_j) = \log\left(\frac{\bar{b}(1 + e_{aj}^L)}{1 + \beta + e_{aj}^L}\theta\right) + \beta R_j^w \tag{14}$$

$$\log(a_j) = \log\left(\frac{\bar{q}(1 + e_{wj}^L)}{1 + \eta + e_{wj}^L}\theta\right) + \eta R_j^a. \tag{15}$$

In short, equations (14) and (15) imply that the wages and amenities of workers can be written in the form $\log(w_j) = \alpha^w + \psi_j^w$ and $\log(a_j) = \alpha^a + \psi_j^a$, where $\psi^w = \beta R_j^w$ is an establishment-specific wage premium and $\psi^a = \eta R_j^a$ is an establishment-specific amenity premium. To separately identify these premiums from the worker fixed effects, one must focus on a set of firms that are connected through worker flows.

F Welfare Effects of the CUT Reform

The CUT reform increased female-centric amenities and made CUT establishments more valuable to women, as signaled by higher retention rates and job queues. By how much did women's welfare change? What about the reform's impact on men's welfare? We describe our approach to quantify changes in worker welfare here.

F.1 Approach and Intuition

We quantify the CUT reform's effect on worker welfare through a revealed preference approach that (i) relies on a few sufficient statistics that are easily computable in the data; and, thus, (ii) takes no stance on the precise functional form linking amenities to worker utility. In particular, we adapt a framework used to evaluate changes in consumer welfare from introducing new or improved product varieties (Feenstra, 1994; Redding and Weinstein, 2016) to our labor market setting.

For tractability, we assume that workers possess CES preferences over employers, as is common in the consumer setting (Feenstra, 1994; Atkin et al., 2015). As shown in Anderson et al. (1992), a key advantage of CES is that it generates the same labor supply to firms as obtained by aggregating workers' discrete choices over where to work based on where they obtain the highest utility. This is a common way of modeling the labor market (in Card et al. (2018); Sorkin (2018); Berger et al. (2022); Lamadon et al. (2022)). In the next subsection we microfounds CES demand using such discrete choices.

Because of the reform, the quality of CUT-affiliated firms is changing. From a modeling perspective, this is analogous to a situation in which the quality of certain goods is improving or when new, improved, good varieties are introduced in the market. Then, just as gains to consumer welfare from improving product varieties can be measured though changes to the price index—i.e., the change in cost of purchasing one util worth of utility—the gains to worker welfare from improving workplace amenities can be measured through changes to the wage index—i.e., how much more (or less) the representative worker earns to work one disutility-weighted hour.

Under CES preferences, only four sufficient statistics quantify the change in worker welfare, i.e., measure the change in the wage index. First, welfare increases with the share of total labor income found at treated establishments, which captures workers choosing to move to these employers after they improve amenities. Second, the same change in labor income at treated establishments corresponds with a higher increase in welfare if workers are less elastic to begin with, since it takes a larger improvement in amenities to draw them away. Third, welfare is higher if workers are drawn away from non-CUT firms with initially low value, capturing a bigger upgrade in employer quality across regimes. Finally, welfare increases with wages at non-CUT establishments, potentially capturing the pro-competitive spillover effects of the reform.

F.2 Model

In each period, a representative household with CES preferences over employers is willing to work a fixed number of (dis)utility-weighted hours. It chooses labor supply to each firm to maximize total income, subject to this hours constraint:

$$\max_{\{n_{jt}\}} \sum_{j \in \mathcal{J}_t} w_{jt} n_{jt} \quad s.t. \quad \left[\sum_j (b_{jt} n_{jt})^{\frac{1+\eta}{\eta}} \right]^{\frac{\eta}{\eta+1}} = N, \tag{16}$$

where $\mathcal{J}_t$ denotes the set of firms operating at time t, n_j is the number of hours supplied to firm j, w_j is the wage at j, η is the elasticity of substitution across firms, and b_j represents the "taste-shifter" for firm j. b_j captures all non-wage attributes that commonly affect each worker's utility at j. Worse amenities increase this disutility b_j. We assume a utility-posting world without job rationing, where a firm accepts any worker who wishes to work there. For simplicity, since worker welfare only depends on firms' final wage and amenity offers, regardless of how firms arrive at them, we do not model the firm side.

Optimal labor supply to each firm is given by:

$$n_j^* = \left(\frac{w_j}{\tilde{W}} \right)^\eta \frac{1}{b_j^{1+\eta}} N \tag{17}$$

, where $\tilde{W}$ is a book-keeping term called the wage index, defined as:

$$\tilde{W} = \left[\sum_{j \in \mathcal{J}} \left(\frac{w_j}{b_j} \right)^{1+\eta} \right]^{\frac{1}{1+\eta}} \tag{18}$$

.

The wage index measures how much the representative worker is paid to work a disutility-weighted hour, and serves as a measure of welfare.[89]

Any change in the wage index across two periods captures changes to worker welfare, measured by the ratio:

$$\phi_{t-1,t} = \frac{\tilde{W}_t}{\tilde{W}_{t-1}}$$

The CUT reform changes amenities, or taste shifters b_{jt}, at treated establishments. The key challenge in estimating welfare changes is that these $\{b_{jt}\}_{j \in \mathcal{J}_t}$ are unobserved. However, as first

---

[89]This can be seen by taking the envelope condition around the optimal solution to the worker's problem: $\sum_j w_j n_j = \tilde{W} N$. Formally

$$\frac{\partial}{\partial N} \sum_{j \in \mathcal{J}} w_j n_j^*(w_j, w_{-j}) = \tilde{W}$$

. The wage index is to welfare in the labor setting like the price index is to welfare in consumer theory. In consumer theory, the price index captures the cost of purchasing one util of utility. Welfare rises as it gets cheaper to purchase one more util. Here, an increase in $\tilde{W}$ means workers are paid more for providing one additional unit of disutility-weighted labor supply, thereby increasing their welfare.

shown in (Feenstra, 1994), assuming CES preferences allows us to overcome this challenge. Under CES, any welfare change depends only on the *observed* pre- and post-reform wages and employment at CUT and non-CUT employers.[90] Formally:

$$\ln \phi_{t-1,t} = -\frac{1}{1+\eta} \ln \left(\frac{\lambda_t}{\lambda_{t-1}} \right) - \frac{1}{1+\eta} \ln \left(\frac{\overline{S^*}_t}{\overline{S^*}_{t-1}} \right) + \ln \left(\frac{\overline{w^*}_t}{\overline{w^*}_{t-1}} \right) \tag{19}$$

where λ_t is the share of total labor income in t at non-CUT firms, $\overline{S^*}_t$ is a geometric average of the share of labor income at each non-CUT firm in t, and $\overline{w^*}_t$ is a geometric average of period t wages at non-CUT firms. The asterisk * denotes that operations are taken over non-CUT firms.

Changes in welfare depend on three terms, as per Equation (19). The first, the "variety-adjustment" term, depends on the ratio of the share of total labor income at non-CUT firms after relative to before the reform $\frac{\lambda_t}{\lambda_{t-1}}$. This ratio captures welfare changes through a revealed preference logic: workers substitute toward CUT firms once their amenities improve, lowering the share of the labor income at non-CUT firms and increasing welfare. The magnitude of this change depends on the elasticity of substitution across firms. If workers are inelastic (η is low), the same move toward amenity-improving CUT-firms implies a larger welfare increase because it takes a bigger improvement in amenities to draw workers away.

The term $\frac{\overline{S^*}_t}{\overline{S^*}_{t-1}}$ captures the heterogeneity in labor income at non-CUT firms: welfare increases by more if CUT firms draw workers away from less valued non-CUT firms, thereby increasing dispersion in and lowering the geometric mean of their wage bill share. As in the "variety-adjustment" term, the implied effects are larger as workers become more inelastic. The final term $\frac{\overline{w^*}_t}{\overline{w^*}_{t-1}}$ represents a change in wages at non-CUT firms, possibly as a pro-competitive response to the reform. As these "outside" wages increase, so too does welfare.

Derivation of the Welfare Equation   To derive equation (19), note that

$$\lambda_t = \frac{\sum_{j \in \Omega_{t,t-1}} w_j n_j}{\sum_{k \in \mathcal{J}_t} w_k n_k} = \frac{\sum_{j \in \Omega} (\frac{w_j}{b_j})^{1+\eta}}{\sum_k (\frac{w_k}{b_k})^{1+\eta}} = \left[\frac{W_t^*}{W_t} \right]^{-(1+\eta)}$$

where $\Omega_{t,t-1} = \mathcal{J}_t \cap \mathcal{J}_{t-1}$ are firms common to both periods—in our case, non-CUT firms. The asterisk * in W_t^* and W_{t-1}^* denotes that these are wage indices over the common set of firms.

We can thus re-write equation (19) as:

$$\phi_{t-1,t} = \left[\frac{\lambda_t}{\lambda_{t-1}} \right]^{-\frac{1}{1+\eta}} \left[\frac{\sum_{j \in \Omega_{t,t-1}} (\frac{w_{jt}}{b_{jt}})^{1+\eta}}{\sum_{j \in \Omega_{t,t-1}} (\frac{w_{jt-1}}{b_{jt-1}})^{1+\eta}} \right]^{\frac{1}{1+\eta}} = \left[\frac{\lambda_t}{\lambda_{t-1}} \right]^{-\frac{1}{1+\eta}} \frac{\tilde{W}_t^*}{\tilde{W}_{t-1}^*} \tag{20}$$

Finally, λ_t is the share of the wage bill at common firms in t (using wages at t).

To further decompose $\tilde{W}_t^*/\tilde{W}_{t-1}^*$, denote with S_j the share of labor income (the consumer

---

[90]Under CES, the relative (dis)utility of working at an employer is captured by its expenditure share, which depends exclusively on prices and quantities.

expenditure in our consumer problem analogy) at any given firm:

$$S_j = \frac{w_j n_j}{\sum_k w_k n_k} = \frac{(\frac{w_j}{b_j})^{1+\eta}}{\sum_k (\frac{w_k}{b_k})^{1+\eta}} \tag{21}$$

. We then can write:

$$\tilde{W}_t^* = (S_{jt}^*)^{-(1+\eta)} \left(\frac{w_{jt}}{b_{jt}} \right) \quad \forall j \in \Omega_{t,t-1} \tag{22}$$

. Following Redding and Weinstein (2016), we take logs of both sides, difference over time, and sum over all $j \in \Omega_{t,t-1}$ to get

$$\ln \left(\frac{\tilde{W}_t^*}{\tilde{W}_{t-1}^*} \right) = \ln \left(\frac{\bar{w}_t^*}{\bar{w}_{t-1}^*} \right) - \frac{1}{1+\eta} \ln \left(\frac{\bar{S}_t^*}{\bar{S}_{t-1}^*} \right) - \ln \left(\frac{\bar{b}_t^*}{\bar{b}_{t-1}^*} \right) \tag{23}$$

where the bars indicate a geometric average and the last term is zero because we assume quality remains the same for these common firms. Thus, a change in welfare depends only on three terms that are observed in the data and η:

$$\ln \phi_{t-1,t} = -\frac{1}{1+\eta} \ln \left(\frac{\lambda_t}{\lambda_{t-1}} \right) - \frac{1}{1+\eta} \ln \left(\frac{\bar{S}_t^*}{\bar{S}_{t-1}^*} \right) + \ln \left(\frac{\bar{w}_t^*}{\bar{w}_{t-1}^*} \right)$$

Microfoundation of CES demand using discrete choices   Following the CES demand in (Berger et al., 2022), workers' utility for working at a firm has a component that is common across workers, encompassing wages and a common taste for the firm amenities, and an idiosyncratic shock that follows a logit distribution. Firms post utility offers—we don't model the source of firm heterogeneity and assume that they exogenously differ. There is a unit measure of workers indexed by $i \in [0,1]$. Each worker has a disutility for working at firm j:

$$\nu_{ij} = \exp^{-\xi_{ij}} h_{ij} b_j$$

with ξ_{ij} iid across workers and drawn from a multivariate Gumbel distribution with parameter η. Each worker must earn $y \sim F(y)$, where earnings $y_i = w_j h_{ij}$. The worker chooses firm j to minimize disutility:

$$\min_j \{\log h_{ij} + \log b_j - \xi_{ij}\} = \max_j \{\log w_j - \log y_i - \log b_j + \xi_{ij}\}$$

Following McFadden (1973) on logit, the probability that worker i chooses to work at firm j is:

$$p_i(\tilde{w}) = \frac{\tilde{w}_j^{1+\eta}}{\sum_k \tilde{w}_k^{1+\eta}}$$

where $\tilde{w}_j := \frac{w_j}{b_j}$. The aggregate labor supply to firm j is then found by integrating the probability that a worker works at that firm times the hours supplied by that worker, over the mass of all

47

workers:

$$n_j = \int p_i(\tilde{w}) \cdot h_{ij} \cdot dF(y) \quad \text{where} \quad h_{ij} = y_i/w_j$$

$$n_j = \frac{\tilde{w}_j^{1+\eta}}{\sum_k \tilde{w}_k^{1+\eta}} \frac{1}{w_j} \int y_i dF(y)$$

$$= \left(\frac{w_j}{\tilde{W}}\right)^\eta \frac{1}{b_j^{1+\eta}} N$$

This is exactly the aggregate labor supply to firm j as in the representative worker's problem with CES demand. The last line follows from the fact that in equilibrium:

$$Y = \int y_i dF(y) = \sum_{j \in \mathcal{J}} w_j n_j^* = \tilde{W} N$$

F.3 Estimation

We separately estimate Equation (19) for men and women. Our estimates employ the establishment sample from Section 4.3. Years 2012-2014 comprise the pre-reform period $(t-1)$ and 2015-2017 the post-reform period (t). We calibrate an estimate of the cross-firm elasticity of substitution (η) from Felix (2022), but assess robustness to other reasonable values.

We estimate the log change in $\bar{w}^*$ and in $\bar{S}^*$ using average changes across non-CUT establishments between $t-1$ and t, estimated via the following regression:

$$y_{jt} = \alpha + \beta Post_t + \mu_j + \epsilon_{jt} \tag{24}$$

where y_{jt} is either the average log earning at establishment j ($\log w_{jt}$) or the log of the share of labor income among non-CUT establishments at that establishment ($\log s_{jt}$).[91] The specification includes establishment fixed effects μ_j. The coefficient of interest, β, captures the average within-establishment change in the dependent variable between between $t-1$ and t.[92]

To estimate the change in λ we take a first order approximation of λ_t around λ_{t-1}. This allows us to map the market-level change in the share of labor income at CUT establishments (the desired object) to changes in quantities that are estimable through establishment-level regressions as in Equation (24).

---

[91] Note that the difference in the log of the geometric mean of a variable x is equivalent to the average change in $\log(x)$ between t and $t-1$ across units.

[92] As any pre-post strategy, we recognize that this approach might also pick up the effect of any other shock in addition to the CUT reform that might affect wages or employment within establishments over time. Unfortunately, however, we lack the ideal experiment to estimate the causal effect of the CUT reform on these quantities, which would be to randomly shock some labor markets with the reform while leaving other markets unaffected.

Formally:

$$\Delta\lambda_t = \lambda_t - \lambda_{t-1} = \sum_{j \in \mathcal{J}} \frac{\partial \lambda}{\partial w_j} \cdot dw_j + \sum_{j \in \mathcal{J}} \frac{\partial \lambda}{\partial n_i} \cdot dn_j \bigg|_{w_{t-1}, n_{t-1}}$$

$$= \frac{\sum_{j \in (\mathcal{J} \setminus \Omega)} w_{jt-1} n_{jt-1}}{(\sum_{j \in \mathcal{J}} w_{jt-1} n_{jt-1})^2} \left(\sum_{j \in \Omega} n_{jt-1} \cdot dw_j + \sum_{j \in \Omega} w_{jt-1} \cdot dn_j \right)$$

$$- \frac{\sum_{j \in \Omega} w_{jt-1} n_{jt-1}}{(\sum_{j \in \mathcal{J}} w_{jt-1} n_{jt-1})^2} \cdot \left(\sum_{i \in \mathcal{J} \setminus \Omega} n_{jt-1} \cdot dw_j + \sum_{j \in \mathcal{J} \setminus \Omega} w_{jt-1} \cdot dn_j \right)$$

where to simplify notation we use Ω in place of $\Omega_{t,t-1}$ to denote the set of non-CUT firms (of measure N_Ω) and $\mathcal{J} \setminus \Omega$ to denote the set of CUT-affiliated firms (of measure $N_{\mathcal{J} \setminus \Omega}$).

We define $\tilde{s}_{jt} = \frac{w_{jt-1} n_{jt}}{\sum_{k \in \mathcal{J}} w_{kt-1} n_{kt-1}}$ and $\hat{s}_{jt} = \frac{w_{jt} n_{jt-1}}{\sum_{k \in \mathcal{J}} w_{kt-1} n_{kt-1}}$ and re-write the expression above as

$$\Delta\lambda_t = N_\Omega (1 - \lambda_{t-1}) \left(\mathbb{E}[\Delta \tilde{s}_{jt} | j \in \Omega] + \mathbb{E}[\Delta \hat{s}_{jt} | j \in \Omega] \right)$$

$$- N_{\mathcal{J} \setminus \Omega} \lambda_{t-1} \left(\mathbb{E}[\Delta \tilde{s}_{jt} | j \in \mathcal{J} \setminus \Omega] + \mathbb{E}[\Delta \hat{s}_{jt} | j \in \mathcal{J} \setminus \Omega] \right)$$

where $\mathbb{E}[.]$ denotes an average across firms. Finally, because $\log\left(\frac{\lambda_t}{\lambda_{t-1}}\right) = \log\left(\frac{\Delta\lambda_t}{\lambda_{t-1}} + 1\right) \approx \frac{\Delta\lambda_t}{\lambda_{t-1}}$, we can write:

$$\log\left(\frac{\lambda_t}{\lambda_{t-1}}\right) \approx$$
$$N_\Omega \frac{(1 - \lambda_{t-1})}{\lambda_{t-1}} \left(\mathbb{E}[\Delta \tilde{s}_{jt} | j \in \Omega] + \mathbb{E}[\Delta \hat{s}_{jt} | j \in \Omega] \right) - N_{\mathcal{J} \setminus \Omega} \left(\mathbb{E}[\Delta \tilde{s}_{jt} | j \in \mathcal{J} \setminus \Omega] + \mathbb{E}[\Delta \hat{s}_{jt} | j \in \mathcal{J} \setminus \Omega] \right)$$

.

We estimate the average change in $\hat{s}_{jt}$ and $\tilde{s}_{jt}$ with a within-establishment pre-post comparison similar to equation (24).[93]

---

[93] Further simplifying the model to only two firms, one affiliated and one not affiliated to the CUT, allows us to directly use the differences-in-differences estimates of the effect of the reform on employment to estimate the change in λ, instead of using pre-post comparisons. Using w_1 and n_1 for wages and employment in the non-CUT firm and similarly w_2 and n_2 for the CUT-affiliated firm, we can write a first order approximation of the change in λ as:

$$\Delta\lambda_{t,t-1} = \underbrace{\frac{\partial \lambda}{\partial n_1} dn_1 + \frac{\partial \lambda}{\partial n_2} dn_2}_{-r(1-\lambda_{t-1})\lambda_{t-1}} + \underbrace{\frac{\partial \lambda}{\partial w_1} dw_1 + \frac{\partial \lambda}{\partial w_2} dw_2}_{-x(1-\lambda_{t-1})\lambda_{t-1}}$$

where $r = \frac{dn_2}{n_2} - \frac{dn_1}{n_1}$ is the difference in the percentage change in employment between the CUT and non-CUT firm and $x = \frac{dw_2}{w_2} - \frac{dw_1}{w_1}$ is the difference in the percentage change in wages. We can then plug in place of r and x our diff-in-diff estimates of the effect on log wages and log employment. Alternatively, we could use our diff-in-diff estimate on the effect of the reform on retention rates among incumbents as an estimate of r. Changes in retention could better capture change in employment due to voluntary transitions, which in this model entirely explain changes in employment. Plugging in $x \approx 0$ and $r \approx 1.8\%$ and the baseline value of $\lambda_{t-1} \approx 0.65$, we would find a percentage change in λ of approximately: $\frac{\Delta\lambda_{t,t-1}}{\lambda_{t-1}} = -r(1-\lambda_{t-1}) - x(1-\lambda_{t-1}) \approx -1.8 \cdot 0.35\% = -0.63\%$. This figure is consistent in sign with the one in Table F1, although smaller in magnitude. It relies, however, on a heavily stylized model that does not exploit fully the richness of the firm-level data.

Finally, we combine these estimates with λ_{t-1}, N_Ω, and $N_{I\backslash\Omega}$ which are directly computed from the data. To obtain standard errors, we bootstrap the entire estimation exercise 1000 times, each time drawing with replacement a new establishment sample.

F.4 Results

Table F1 reports results. Women's welfare increases by 0.059 log points (or 6.1%), consistent with our reduced form results that women are more likely to remain at, and comprise a larger share of new workers among, CUT establishments.[94] Worker moves following the reform account for over half of the increase in welfare. Women become more likely to work at CUT establishments, accounting for 15% of the welfare gain (a 1.8% rise in the share of CUT wage bill). In addition, the dispersion in the labor income across non-CUT firms rises (i.e., S^* falls), accounting for 48% of the increase in welfare.

The remaining 37% of the welfare gain is accounted for by higher wages among non-CUT employers. To the extent that these wage increases reflect pro-competitive responses to the CUT reform, any change in welfare from them can also be attributed to the reform. We recognize, however, that the increase in real wages at non-CUT employers following 2015 could be driven by a host of factors that are unrelated to the CUT reform. We therefore only view the change in welfare due to worker moves across firms—amounting to a 3.8% increase—as the credible estimate of the reform's welfare impact for women workers. For men, welfare is slightly higher (1.3%), but remains essentially unchanged if one only considers the component due to worker moves across firms (0.2%). Thus, the CUT reform improves women's welfare without reducing men's welfare.

---

[94] As predicted by the model, workers' elasticity of substitution across employers amplifies (or dampens) the welfare effect due to the shifts in employment across firms induced by the reform. For other reasonable values of η in the literature, ranging from 0.1 (Staiger et al., 2010) to 10.9 (Berger et al., 2022), women's welfare increases by between 2.8% and 9.5%.

Table F1: Welfare Estimation

		Women 20-35 (1)	All women (2)	Men 20-35 (3)	All men (4)
$ln\phi_{t-1,t}$		0.044	0.059	-0.005	0.013
		(0.006)	(0.007)	(0.005)	(0.005)
Components breakdown:					
	$ln(\lambda_{t,t-1}) - ln(\lambda_{t-1,t})$	-0.012	-0.018	-0.005	-0.006
	$ln(\bar{S}_t^*) - ln(\bar{S}_{t-1}^*)$	-0.046	-0.058	0.013	0.001
	$ln(\bar{w}_t^*) - ln(\bar{w}_{t-1}^*)$	0.015	0.022	-0.001	0.011
η (calibrated)	1.015				
N establishments		58,417	60,651	59,438	60,651
N establishments in $\Omega_{t,t-1}$		45,331	47,195	46,182	47,195

Notes: Table reports the estimated welfare change for different groups of workers: women between 20 and 35 years old, all women, men between 20 and 35 years old, all men. It also reports estimates of the three components that make the welfare index, namely the Feenstra "new varieties" term $ln(\lambda_{t,t-1}) - ln(\lambda_{t-1,t})$, the change in the geometric average of the labor income shares of non-CUT firms $ln(\bar{S}_t^*) - ln(\bar{S}_{t-1}^*)$, and the change in the geometric average of the wages of non-CUT firms $ln(\bar{w}_t^*) - ln(\bar{w}_{t-1}^*)$. Standard errors in parenthesis come from the bootstrap procedure described in the text.