Outsourcing, Labor Regulations and Profit-Sharing: Evidence from Mexico

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[PRELIMINARY AND INCOMPLETE]

Abstract

This paper studies the use of domestic outsourcing to circumvent labor regulations and its consequences for firms and workers. Drawing on longitudinal plant data and employer-employee data from Mexico, we first provide novel evidence on a phenomenon wherein many firms were outsourcing their entire workforce. These entities operated as empty establishments, with positive production and costs but no legally hired workers. We provide evidence that a central motive for this practice was to avoid mandatory profit-sharing with employees. We then leverage a reform that significantly restricted the use of outsourcing to understand the implications for both firms and workers when this practice is constrained. Using difference in differences design, we find that the reform caused firms to insource their workers and newly incur profit-sharing payments. We find no effect on total employment (composed of outsourced workers + in-house workers). Moreover, we find that treated firms offset the increase in profit sharing by a small decrease in wage growth relative to the control group. This decrease did not fully compensate for increases in profit sharing and total worker compensation for treated workers, i.e. wages + profit sharing, increased by approximately 2%. We provide a theoretical model to show that our results are consistent with a labor market where (i) firms offer workers a compensation bundle of wages and profit sharing (ii) outsourcing all workers allows firms to avoid mandatory profit sharing (iii) workers respond more to differences in wages than to differences in profit sharing when deciding where to work.

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1 Introduction

Domestic outsourcing has seen a significant rise worldwide over the past two decades (ILO, 2016; OECD, 2021)[1]. This practice can lead to increased productivity by lowering matching frictions (Bilal and Lhuillier, 2021; Spitze, 2022) and adjustment costs (Bertrand et al., 2021; Macaluso et al., 2023). However, domestic outsourcing has also been shown to deteriorate working conditions for workers (Goldschmidt and Schmieder, 2017; Drenik et al., 2020; Bertrand et al., 2021) and has contributed to recent increases in wage inequality (Goldschmidt and Schmieder, 2017; Handwerker, 2023).

Additionally, domestic outsourcing has been frequently criticized for allowing employers to disguise working relationships and avoid labor regulations and liabilities (ILO, 2011; European Parliament, 2017; Epstein et al., 2020). Despite its importance, empirical evidence on the use of outsourcing to circumvent labor regulations remains scarce, likely due to the challenges in its measurement and the isolation of this aspect from other outsourcing motives. Consequently, our understanding of this phenomenon remains limited.

In this paper, we draw on plant-level longitudinal data from the manufacturing sector, employer-employee data, and census data on business establishments in Mexico to study the connection between domestic outsourcing and the circumvention of a particular labor regulation - mandatory profit sharing. We document and newly characterize a phenomenon wherein establishments were outsourcing all their workers. We provide evidence that the main motivation of this practice was to avoid profit sharing obligations. Furthermore, we exploit the consequences of a policy change to understand the consequences of heavily restricting this practice.

First, we rely on detailed establishment level data and social security data to present novel evidence showing that a significant proportion of establishments in Mexico outsourced out almost their entire workforce[2]. We identify two distinct groups of establishments characterised by markedly different patterns in outsourcing practices. The first group, representing two-thirds of all plants using outsourcing and 89% of outsourced workers in our sample had been outsourcing practically *all* of their workers. This practice involved the complete outsourcing of their workers to a separate legal entity, frequently created by the parent firm with the sole purpose of legally hiring the workers. These establishments, which we refer to as *full outsourcing establishments*, operated as essentially empty plants, with positive production and costs but no legally hired workers. The second group, referred to as *conventional outsourcing* establishments, had a much lower proportion of outsourced employees (averaging around 20%). Throughout this study, our primary focus lies on the *full outsourcing* establishments, due to their prevalence and distinct outsourcing patterns.

Second, we present evidence supporting the notion that full outsourcing establishments were out-

[1] Throughout this paper, we refer to domestic outsourcing as a practice where a lead firm contracts out a labor need to a contracting firm, and the workers are supervised by and work at the premises of the lead firm, while being officially hired by the contracting firm (OECD, 2021).

[2] The existence of firms outsourcing all their workforce was revealed during inspections conducted by Mexico's Secretary of Labor (STPS, 2021). However, these inspections did not provide information on the prevalence of this practice, as the firms selected were not randomly selected. Additionally, the government did not provide information on the characteristics of the firms engaging in this practice.

sourcing most of their workers to circumvent mandatory profit sharing obligations[3]. We show establishments carrying out this extreme form of outsourcing effectively did not pay any profit sharing, which is mandated by law at 10% of profits for most Mexican firms. By declaring a workforce of zero employees, and outsourcing their workers to firms with zero or lower profits, they effectively circumvented the obligation to provide the mandatory level of this benefit[4]. We show that firms adopting this practice tended to be larger and more profitable, and thus benefited most from profit sharing avoidance. Furthermore, our evidence shows that the outsourcing motives for conventional outsourcing establishments differed from full outsourcing plants and were more closely aligned with those emphasized in past literature. In particular, outsourcing seemed to reduce adjustment costs during temporary changes in activity.

Third, we exploit the effect of a strict restriction on outsourcing to understand how full outsourcing establishments react in a labor market without the possibility to outsource. In April 2021, the Mexican government passed a reform that prohibited outsourcing of core firm activities. We exploit heterogeneity in exposure to the reform depending on whether an establishment was using outsourcing prior to the policy to identify treated and control establishments. We perform a difference-in-differences analysis to estimate the effect of the reform on outsourcing, total employment, wages, profit sharing, and total compensation (wages + profit sharing).

We find that the reform had an immense impact on employment relationships. Most treated plants insourced their employees in-house on the month the reform came into effect. We also find that the reform caused full outsourcing establishments to newly incur profit sharing payments.

Furthermore, we investigate how full outsourcing establishments reacted to this increase in profit sharing costs. We find no effect on total employment (composed of outsourced workers + in-house workers), indicating that they did not downsize as a result of the increased profit sharing costs. Moreover, we find that treated establishments offset the increase in profit sharing by a small decrease in wage growth relative to the control group. We then estimate the effect of the reform on total labor compensation, i.e. wages + profit sharing per employee. We find that average total worker compensation increased by around 2% post reform. This indicates that firms were not able to fully offset the increase in profit sharing costs through lower wages after the reform.

We set up a simple model to interpret the evidence outlined above. Our results are consistent with a labor market in which firms offer workers a compensation 'bundle' of wages and profit sharing. Outsourcing decreases the cost of avoiding mandatory profit sharing payments, allowing firms to freely choose the magnitud of this compensation. We suggest that profit sharing and wages are not perfectly substituable for workers, and workers were less responsive to changes in profit sharing compensation than to wages when deciding where to work. This difference in elasticities prompts firms to lower total compensation disproportionately via the profit sharing margin, as this would have lower effects on their labor supply. This setting can help explain why i) certain firms found it

[3]We argue that the few workers that these establishments did hire in-house were managers or directors, who are not entitled to profit sharing benefits. More detail on this is provided in Section 5.2.1

[4]We present evidence that contracting firms (i.e. firms legally hiring the workers) in this relationship had zero profits, or profits lower than the parent firm.

optimal to incur full outsourcing practices to reduce profit sharing, rather than lowering wages[5] and ii) the restriction of outsourcing increased profit sharing and total worker compensation, without having a negative effect on employment.

We argue that workers' relative inelastic labor supply to profit sharing can be attributed to the fact that workers may have had less information on profit sharing (the right to this benefit, how it was calculated) than on wages, especially prior to the reform. Another reason is that workers are more risk averse than firms, and value the stable income of wages relatively more than profit sharing.

Finally, we provide evidence that the reform had negative consequences for *conventional outsourcing* establishments, which were using outsourcing for motives unrelated to profit sharing avoidance. Following the reform, these firms experienced a decline in their overall employment levels, accompanied by a reduction in employment dynamism.

The rest of the paper is structured as follows. Section 2 describes the contribution to the literature. Section 3 describes institutional context. Section 4.1 presents the data. Section 5 presents descriptive evidence on outsourcing use. In Section 6 we present a theoretical framework. Section 7 describes the effects of the outsourcing reform. Section 8 concludes.

2 Related literature

This paper contributes to three main strands of the literature. We primarily contribute to the literature studying domestic outsourcing. Previous research has identified several motivations for firms to outsource their labor (Abraham and Taylor, 1996). A well documented reason for this practice is reduction in labor costs. Several studies have shown that outsourcing allows firms to reduce workers' wages(Goldschmidt and Schmieder, 2017; Drenik et al., 2020; Felix and Wong, 2021; Bilal and Lhuillier, 2021), particularly for low-wage workers Spitze (2022). This can be the case if firms are constrained on the minimum level of wages they can offer their in-house workers due to efficiency wages or within firm fairness considerations (Goldschmidt and Schmieder, 2017). An additional reason is that outsourcing can help firms adjust to changes in labor demand by reducing adjustment costs (Bertrand et al., 2021; Macaluso et al., 2023). Furthermore, outsourcing can help increase efficiency by helping firms concentrate on their core tasks, allowing for firm specialization and economies of scale (Bilal and Lhuillier, 2021; Abraham and Taylor, 1996).

Additionally, outsourcing has been frequently criticized for enabling firms to disguise employment relationships, and bypass labor regulations and liabilities such as collective bargaining agreements, overtime pay, and non-wage benefits (Epstein et al., 2020; ILO, 2011; Matza, 2018) [6]. Most of these claims come from media and policy discussions around the world (HM Treasury UK, 2023; European

[5] The minimum wage was barely binding for treated firms. We provide more details on this below

[6] This Bloomberg article documents that 'contractors have provided a way for some of America's biggest employers—including Target and Walmart Inc.—to effectively benefit from cheap, undocumented labor without fear of meaningful penalties.' Another controversial example is the use of labor contractors by big farming companies such as Monsanto and Du Pont to evade legal responsibility of labor rights regulations

Parliament, 2017; Reuters, 2008) but empirical evidence on this motive for outsourcing is scarce[7]. Empirically documenting the circumvention of regulations is challenging, as it is something that firms would actively try to conceal. It is also difficult to isolate this outsourcing motive from the other reason posed above. Additionally, this rational for outsourcing only holds if the parent firm and contracting firm face different different regulatory frameworks or or enforcement measures. A few academic studies have have touched upon this motive. Goldschmidt and Schmieder (2017) show that that establishments covered by collective bargaining agreements are more likely to outsource. Daruich et al. (2023) provide suggestive evidence that firms in Italy may use outsourcing to circumvent firing costs, but are not able to isolate this reason from other motivations. Bertrand et al. (2021) show evidence consistent with the fact that large establishments in India use outsourcing is to avoid high firing costs. However, they also show that large establishments may be inclined to outsource workers as a response to generally high labor costs.

In this paper we provide novel evidence on the circumvention of labor regulations as a motive for outsourcing use. Specifically, we show that a significant number of establishments were outsourcing practically *all* of their workforce. This extreme use of outsourcing is inconsistent with concerns about within-firm inequality and with the idea of firm specialisation, as these motives would only justify outsourcing a subset of the establishment's workforce. This practice is also inconsistent with reduction in adjustment costs, unless these establishments undergo periods with zero workforce requirements. Additionally, entities carrying out this practice did not have particularly high volatility in total employment (show this in Section 5.3). Instead, we provide evidence that outsourcing was used as a deliberate strategy to avoid paying workers profit-sharing contributions, which they are entitled to under conventional employment arrangements. Beyond documenting this phenomenon, we use different data sources to study it's implications for both firms and workers. Additionally, we combine our empirical evidence with a model to understand on the firm characteristics and labor market conditions that render this practice optimal to firms and accepted by employees in equilibrium.

We also contribute to the outsourcing literature by addressing measurement challenges. Outsourcing is inherently difficult to measure. As workers are legally hired by a certain firm, but working under the supervision of another firm, it is challenging to identify which workers are outsourced and which firms are using outsourcing. The availability of detailed establishment level data measuring outsourcing use and social security data, in combination with an outsourcing reform allow us to characterize firms and workers in outsourcing relationships. Most work in this area has relied on the identification of outsourcing events (Goldschmidt and Schmieder, 2017; Felix and Wong, 2021; Daruich et al., 2023; Bilal and Lhuillier, 2021) by measuring the flow of workers from one firm to another. The sizable effect of the outsourcing reform allows us to better identify flows related to outsourcing, without having to impose many restrictions on the outsourcing events, as is usually done in the literature (we further develop this point in Section 4.2). Some studies to use a different methodology to measure outsourcing are Bertrand et al. (2021); Micco and Muñoz (2024); Estefan et al. (2024), who observe the number of workers outsourced in firm survey data, and Drenik et al. (2020), who can identify the parent company

[7] In Appendix D we provide more evidence on the use of outsourcing to avoid worker benefits in other countries.

using social security data. However, neither exploits to both comprehensive firm-level and individual-level data, as in this study. Within the outsourcing literature, a contemporaneous paper to ours by Estefan et al. (2024) studies outsourcing in the same context as this paper. We extend the results in this work by delving into the distinctions between full outsourcing and conventional outsourcing practices. In doing so, we show that this distinction is crucial to understand the motives behind outsourcing and the consequences of its regulation. Furthermore, our empirical and theoretical focus on full outsourcing establishments allows us to provide insights on the use of outsourcing to avoid a mandatory labor regulation (profit sharing) and on the motivations behind this practice.

The second strand of literature this project contributes to is the work on firm performance based pay, such as profit sharing employee-ownership plans and performance bonuses (Cahuc and Dormont, 1997; Nimier-David et al., 2023). Most work in this area has focused on the effect on employee performance and firm productivity. Kim and Ouimet (2014) and Fang et al. (2015) find positive effects of such schemes on firm level productivity, particularly concentrated in small firms where workers can internalize their effect on firm performance. The closest study to ours is a recent paper by Nimier-David et al. (2023), who leverage policy reform to study the effect of profit sharing in France on workers. They find no effect on profit sharing on firm productivity. Moreover, they find profit sharing increased total worker compensation for low-skilled workers, while it is compensated by lower wages for high-skilled workers. They attribute these heterogeneous results to a binding minimum wage for low-skilled workers. This project adds to this literature by providing evidence of a practice used by firms to avoid paying profit sharing contributions to workers, namely outsourcing. Additionally, our identification strategy allows us to estimate the effect of increasing profit sharing payments on total employment, which cannot be estimated in Nimier-David et al. (2023), as their identification compares firms around size thresholds. Moreover, we intend to study the firm and labor market specific conditions that can lead to this practice in equilibrium.

Finally, the study contributes to the rising literature on monopsony power and rent-sharing within firms (Manning, 2004). Recent work in this field has studied the implications of monospony for non-wage compensation (Boudreau, 2021; Lagos, 2022; Dube et al., 2022). Additionally, novel work has outlined the role of worker misinformation on the wage distribution in giving rise to monospony power (Roussille, 2022; Jäger et al., 2023). We contribute to this literature by integrating the mechanisms outlined in the research described above. We suggest that differences in workers' knowledge (or attention) about non-wage components relative to wages can lead them to be less responsive to changes in the former when deciding where to work. This can lead firms to decrease total compensation by disproportionately adjusting on these non-wage benefits. This underscores the importance of considering non-wage elements when evaluating monopsonistic labor markets, as a sole focus on wages would lead to underestimate the degree of labor market power.

3 Institutional Setting

3.1 Profit sharing in Mexico

Profit sharing (or PTU for its name in Spanish: *Participación de los trabajadores en las utilidades*) in Mexico is mandated by the Mexican Constitution and Federal Labor Law (*Ley Federal del Trabajo*) (LFT, 2021). Almost all firms with annual profits over 15.000 USD (300.000 Mexican pesos) are obliged to distribute 10% of pre-tax profits with all their permanent employees except directors and managers, and with temporary employees who have worked over 60 days of the fiscal year. Firms above the profit threshold excepted from profit sharing are newly created firms, in their first year of activities[8], newly created firms in the extractive industry, during the exploration period, NGOs, and public institutions (Gobierno de México, 2023).

Within the firm[9], the total amount of profit sharing to be distributed is divided into two parts. 50% is allocated equally across all eligible workers, and 50% is distributed proportionally to the workers' annual wage (Gobierno de México, 2023). Thus, low-paying workers receive lower profit sharing in total, but a higher amount as a proportion of their baseline salaries.

Profit sharing contributions can be deducted from declared profits for corporate tax payments. Additionally, profit sharing income up up to 15 days of the minimum wage is exempted from income taxes for workers, and in most states it is exempted from payroll tax (AMCPDH, 2023).

Similar mandatory profit sharing schemes exist in France (Nimier-David et al., 2023), Peru (Gob Peru, 2023) and Ecuador (EcuadorLegal, 2023). Though with different eligibility rules and amounts[10]

3.2 Outsourcing and the reform

Throughout this paper, we refer to three actors in an outsourcing relationship. The *lead firm* (or parent firm) is the firm which contracts out a labor need to a *contracting firm*, which is a different legal entity. We refer to domestic outsourcing as a practice where a lead firm contracts out a labor need to a contracting firm, and the workers are supervised by and work at the premises of the lead firm, while being officially hired by the contracting firm (OECD, 2021). Figure 1 shows a schematic graph on these three actors and the relationships between them.

Mexico had seen a significant rise in domestic outsourcing in the past 20 years, from 6% of the labor force in 2004 to over 15% in 2019 (Banco de Mexico, 2021). This rise came in hand with increasing concerns that outsourcing had been used as a means for firms to avoid labor regulations and decrease worker benefits (López-Chávez and Velázquez-Orihuela, 2021).

The first proposal for an outsourcing reform was presented in November 2020 by the Lopez Obrador

[8] Up to second year of activity for firms dedicated to the production of a new produce

[9] Profit sharing is distributed at the firm level, not the establishment level

[10] In France, for instance firms with over 50 employees must share 50% of 'excess profits with workers. In Peru, firms above a certain profit threshold, and with over 20 workers must distribute a certain fraction of profits. The proportion varies according to the firms' economic sector. In Ecuador all firms with positive profits must distribute 15% of profits with employees

administration in Mexico. The main motivations for this initiative stated by the government were to stop the precarious labor conditions facilitated by outsourcing. (Secretaría del Trabajo y Previsión Social, 2021) [11][12] .

The final version of reform was approved in April 2021. Firms had until July 2021 to adapt to the main changes [13]. The main changes implemented were (LFT, 2021):

- The outsourcing of workers for core activities[14] of the firm was prohibited.
- The firms outsourcing labor would be legally responsible for any violations of the labor law carried out by the employment agencies
- All employment agencies must register in a new registry of the Ministry of Labor (REPSE), for which they must comply with certain labor regulations.
- Three times per year, employment agencies much send detailed information to the Ministry of Labor on all the outsourcing contracts which took place during that period.
- Strong punishments consisting of high fines and up to three years in prison were introduced for firms not abiding by the new law.

The reform was quite controversially received, particularly due to its potential effect on unemployment and informality, and on it's effect on on small firms who relied on the flexibility given by this type of labor arrangement [15].

4 Data and Measurement

4.1 Main datasets

The main datasets used in this project can be divided into two data blocks. Each data block allows us to measure different firm and worker outcomes and the method to measure outsourcing differs in each block. Importantly, the datasets in each block are accessed through different institutions in Mexico and they cannot be linked using firm nor worker identifiers. Thus, we complement the information available in each type of dataset for our analysis.

Establishment level data. The first block includes two establishment level datasets which were accessed on-site at INEGI's installations in Mexico City. These datasets can be linked together at the establishment level.

[11] See: Forbes Mexico (2020), Infobae (2021), Camacho (2023)

[12] When justifying the outsourcing reform, Mexico's president Andrés Manuel López Obrador stated: 'There are many responsible entrepreneurs, but there are others, and they aren't even entrepreneurs; they are middlemen, influencers who exploit all these mechanisms of hiring workers, and it adversely affects the workers.'

[13] Some fiscal measures came into effect on September 2021

[14] The core activity of a firm was defined as the activities included in the company's objects clause

[15] See: Infobae(2020)Forbes Mexico (2022 , El Economista (2021), El Economista(2021)

Monthly manufacturing establishment survey (EMIM): Our main dataset to measure establishment-level outcomes over time is the monthly survey of manufacturing establishments (Encuesta Mensual de la Industria Manufacturera, or EMIM). This is a monthly plant-level panel dataset from 2017 to beginning of 2023. The data is collected and accessed through Mexico's statistical office (INEGI). It covers monthly information on employment, wage bills, production, revenues, and variable costs. The survey design is primarily deterministic. The same sample of establishments are surveyed each month, so this is a panel dataset. For most sectors, the sampling proceeds by first ranking establishments within each 6-digit industry nationally by revenue. Establishments are then included in order until some threshold level of national revenue—from 60 to 85%, depending on the industry—is captured by the survey. Thus, in practice the survey is similar to a census of large Mexican plants.

Importantly, this surveys includes information on the number of employees hired in-house and the number of employees hired through other firms (*personal suministrado por otra razón social*), allowing us to measure outsourcing at the establishment level. Additionally, establishments report monthly information on wages, social security contributions and profits sharing expenses.

We work with a balanced panel of 8065 establishments, as we cannot distinguish between establishments that exit the survey because they went out of business, and those that exit because they are no longer part of the sample.[16] We show in Appendix B.2 that the exit patterns do not change around the time of the reform.

Economic Census 2019: This is a plant level dataset covering the universe of business establishments in Mexico in 2018[17] which is also provided by INEGI. It provides more detailed information on establishments than the manufacturing survey, including sales, value added, profits, investment, capital, number of workers, salaried workers, social security, firm identifier and other outcomes. This census is carried out every five years starting in 1994.

Both these datasets combined allow us to identify and characterize parent firms in an outsourcing relationships (see Figure 1). However, they do not provide any information on the contracting firm and they do not provide many details on workers, especially outsourced workers. In particular, it is challenging to accurately measure wages of outsourced workers in these datasets, which is a key outcome variable in our analysis (more details on this issue are provided in Section 7.1.2). Thus, to identify and characterize these other actors in outsourcing relationship we rely on our other main data block.

Employer - employee data: Our second data block consists of an administrative social security data from the Mexican Social Security Institute (Instituto Mexicano de Seguridad Social,IMSS). This dataset is accessed through the Econlab at Banco de México. This is an employer-employee dataset containing information on all formal employment relationships in Mexico. For each employer-employee pair, we have information on the establishment, firm, industry and municipality of the employer, and earnings, contract type and gender of the employee.

[16]Unfortunately, the data office in charge of the EMIM was not able to give us information on the reasons why each establishment exited the sample.

[17]The Census is published in 2019 but the data collection is carried out in 2018

The information on earnings in this dataset is given by the worker's daily taxable income (*salario base de cotización*). This can include various forms of compensation such as extra hours, bonuses and commissions. It also includes the 13th salary (*aguinaldo*) and the mandatory vacation bonus (*prima vacacional*). Importantly for our analysis, it does *not* include earnings received from profit sharing benefits. This dataset does not provide information on the number of hours or days worked per month.

Additionally, we use firms' tax records data from 2010-2015 to produce part of the descriptive evidence shown below. The data provides information on each individual firm's declared income, costs, profits and profit sharing, among many other items in the tax declaration. They can be accessed through the national tax office website[18]. Finally, to improve our understanding of our quantitative findings, we have carried out 10 structured interviews with relevant stakeholders such as experts working in the outsourcing industry in Mexico, lawyers and HR Managers from companies affected by the reform.

4.2 Measuring outsourcing pre-reform

Throughout this paper, we refer to three actors in an outsourcing relationship. The *lead firm* (or parent firm) is the firm which contracts out a labor need to a *contracting firm*, which is a different legal entity. The workers are supervised by and work at the premises of the lead firm, while being officially hired by the contracting firm (OECD, 2021). Figure 1 shows a schematic graph on these three actors and the relationships between them.

For our analysis it's important to identify (1) firms using outsourcing before the reform (lead firms) (2) workers who had been outsourced (were legally hired by a contracting firm) and were insourced (by the lead firm) after the reform. The method used to identify these differs in each dataset.

In the case of establishment surveys, identifying establishments that outsourced is relatively straightforward. These surveys inquire about the number of in-house workers and the number of outsourced workers per establishment during the reference month[19]. The outsourcing question specifically pertains to individuals who worked for the establishment but were contractually affiliated with a separate company[20], while performing tasks related to production, marketing, administration, or accounting. Thus, we have access to monthly data that quantifies the number and proportion of outsourced workers per establishment in our sample. However, it is important to note that this dataset lacks worker-level information, and thus, to measure element (2), we rely on social security data.

In contrast, identifying lead firms that utilized outsourcing, contracting firms, and outsourced workers in the social security data poses a greater challenge. By nature, when a worker is outsourced, they appear in the social security data as employees of the contracting firm, with no indication of whether

[18]`http://omawww.sat.gob.mx/cifras_sat/Paginas/inicio.html`

[19]The original question in Spanish is: *Anote el número promedio de personas que dependieron de esta razón social durante el mes de referencia* and *Anote el número promedio de personas que no dependieron de esta razón social que trabajaron en este establecimiento durante el mes de referencia*

[20]Importantly, the contracting company is a separate legal entity. It does not include workers in different establishments of the same firm.

they are truly working for any other firm (i.e., the parent firm in an outsourcing arrangement). Nevertheless, the substantial flux of workers around the time of the reform, as illustrated in Figure 4, allows us to pinpoint insourcing events, where a lead firm absorbed a worker from a contracting firm following the reform. This also enables us to identify all the players involved in the outsourcing relationship.

We classify a movement of workers from establishment A to establishment B as an insourcing event if it meets the following requirements: (i) The flow occured between June and September 2021 (ii) the flow consisted of 20 employees or more *or* (iii) establishment A lost more than 40% of it's workers that month (iv) establishment A and B do not belong to the same firm. This methodology allows us to identify the workers insourced post-reform, the establishments insourcing these workers, and the contracting agencies who were previously holding these workers. Figure 5 shows the number of workers satisfying conditions (ii), (iii) and (iv) in each month of 2021. The shaded area are the worker movements classified as insourcing events with additional condition (i). The figure illustrates a relatively low number of worker movements that met the first two conditions outside of this specified time frame.

Furthermore, approximately 96% of workers involved in an insourcing event were identified under condition (ii), and 70% of these insourced workers in the shaded area were insourced in July 2021. Consequently, the majority of worker transitions during the reform occurred in blocks, with most workers being insourced during the last month in which firms had the opportunity to adapt to the reform.

The following sections show descriptive results on the three actors in the outsourcing relationship.

5 Descriptive results

5.1 Patterns in the use of outsourcing pre-reform

As previously mentioned, our primary method of identification relies on variation in the use of outsourcing among establishments prior to the reform. We find that 30% of establishments in EMIM reported having positive outsourcing in the year before the reform. Figure 2 displays the distribution of the average proportion of workers outsourced by each establishment in the year preceding the reform. Notably, there is a mass of observations with *all* workers outsourced, while there is a smaller mass at lower levels of outsourcing. In particular, we see that 2/3 of establishments using outsourcing were outsourcing more than 95% of their employees. This group covered 89% of outsourced workers pre-reform. In the Economics Census data, which covers all firms in Mexico, we observe that 78% of establishments using outsourcing, accounting for almost 2% of all Mexican establishments were outsourcing over 95% of their workforce. Similarly, in the social security data, we observe that approximately 55% of insourcing establishments were not previously recorded in the social security data before the reform, indicating that they had not reported any employees to social security prior to the reform. Thus, in the three datasets, we identify a considerable number of establishments which had been outsourcing the majority of their workers before the reform.

Given these distinctive patterns in the use of outsourcing, we divide the treated establishments into two groups[21]:

1. *Full outsourcing establishments:* These are establishments that outsourced more than 95% of their workers for at least one month in the year before the reform.
2. *Conventional outsourcing establishments:* These are establishments that had positive outsourcing for at least one month in the year before the reform, but outsourced less than 95% of their workers.

In the subsequent sections, we will present evidence that the motivations for outsourcing differed between these two groups. Given the distinctive patterns of full outsourcing establishments and the significant number of establishments and outsourced workers it represents, we will focus the empirical analysis on this group. We will provide evidence that the institutional context in Mexico provides incentives for firms to outsource all employees to avoid paying certain worker benefits.

We choose the 95% cutoff, rather than 100% because there is a non-negligible mass of firms outsourcing a very high proportion (but not all) of their workers. In addition, we show in Figure 3 that for establishments outsourcing between 95% and 100% of their employees , the relative wages of in-house workers vs outsourced workers are much higher than for the rest of the establishments. This indicates that this group outsourcing above 95% was hiring relatively very high wage workers in-house, which are probably the owners or high-level managers of the company. We show below that the motivations behind this extreme use of outsourcing apply to firms holding only managers and directors. Slightly changing the value this cutoff does not affect our results.

While the histogram in Figure 2 is computed for observations between 2020 and 2021, there is considerable persistence in the outsourcing patterns across time. Table 1 shows a transition matrix for the use of outsourcing between 2017 and 2020, where we aggregate the data at the yearly level. We can see that if an establishment was outsourcing more than 95% of it's workers in a given year, the likelihood that it was doing so in the following year was 97%.

Table 2 presents summary statistics for each group of establishments computed using data from EMIM and the Economic Census. 1629 establishments are classified as *full outsourcing*, 855 as *conventional outsourcing* and 5581 did not use outsourcing, and are classified as control. Full outsourcing firms are larger and have higher levels of productivity, revenues and investment. As can be seen in the last two rows, these establishments have very low costs in profit sharing, and are much less likely to be registered in the social security institution (as most of them have zero employees registered). In the following section we provide descriptive evidence which helps understand the reasons underlying these patterns in the proportion of outsourced employees.

[21] Given that our main dataset is an establishment level survey (EMIM), our main analysis is at the establishment level. Almost all establishments in the survey were classified in the same outsourcing group as other establishments in the sample belonging to the same firm

5.2 Full outsourcing establishments

5.2.1 Profit sharing and full outsourcing

As outlined in Section 3.1, the Mexican Constitution and Federal Labor Law (*Ley Federal del Trabajo*) (LFT, 2021) require that nearly all companies with profits above 15.000 USD share 10% of their profits annually with almost all of their employees, excluding directors and managers. This profit-sharing benefit is typically disbursed once a year, usually in May. The 10% to be shared is fixed. Hence, firms can only avoid this obligation by either having no registered employees (or only managers), while outsourcing their workforce to an entity with either no profits or lower profits than the main establishment. Therefore, the circumvention of profit-sharing is likely to explain why establishments had incentives to outsource a substantial proportion of their workforce. It also clarifies why entities with only 5% of their workers employed in-house had high-wage workers who likely held managerial positions and were exempt from the profit-sharing law. Below, we present various lines of evidence indicating that establishments engaged in full outsourcing to avoid profit sharing contributions they would have to pay under conventional employment relationship.

Figure 6 shows average monthly profit sharing per worker (profit sharing / total workers) (in 1000s of Mexican Pesos) recorded in EMIM for each group of establishments. In May of each year, the month when profit sharing should be distributed by law, both control and conventional outsourcing establishments feature positive profit sharing, while full outsourcing establishments do not pay this contribution. This graph underscores the necessity for outsourcing *all* workers to circumvent profit-sharing contributions, as conventional outsourcing establishments display similar profit-sharing patterns to the control group[22].

Figure 7 presents additional evidence supporting this hypothesis using official firm tax declaration data from 2010 to 2015. The graph illustrates the relationship between firms' profits and the declaration of positive profit sharing contributions. We categorize firms into 10 groups based on their average declared profits over the 5-year period. The blue line in the figure illustrates the proportion of firms in each profit size group that reported zero profit sharing contributions for *some* periods (though not all). As expected, low-profit firms are more likely to report zero profit sharing in some years, as they may fall below the profit threshold for positive profit sharing during those years. However, the patterns for firms that reported zero profit sharing contributions *every* year between 2010 and 2015 (in red) differ notably. The red line in the figure reveals a U-shaped relationship, where both low-profit and high-profit firms are more likely to have consistently reported zero profit sharing. While we cannot directly measure outsourcing using tax data, it is highly likely that these high-profit firms are avoiding profit sharing through the outsourcing practices described earlier. Tax declaration data for employed individuals shows that only 30% of workers received positive profit sharing contributions, while 96% received the 13th salary, and 80% received the mandatory vacation bonus, as required by law.

[22] Importantly, we have consulted with the area at INEGI in charge of carrying out the surveys, and full outsourcing firms are asked on their profit sharing contributions, and technically can report a positive value even if they have all workers outsourced.

Demonstrating that contracting firms exhibited zero or low profits is more challenging because we lack linked firm-to-firm data to establish this directly. Nevertheless, we present evidence to support this notion. In the 2019 Economic Census, firms are asked whether they outsource to a firm in their same corporate group. We find that, 64% of full outsourcing establishments were outsourcing to a firm that was a subsidiary of the leading establishment (albeit a different legal entity). Additionally, social security data indicates that more than 60% of contracting firms exclusively employed workers from a single parent firm and subsequently ceased operations following the implementation of outsourcing reform. Hence, the profits of contracting firms were often determined by the parent company, which had incentives to keep them null or low. Furthermore, any profits accrued by the contracting firms would be included in the outsourcing costs reported in EMIM by the full outsourcing establishments. In Appendix B.3, we use this information to argue that it is highly unlikely that the profits of the contracting firm were nearly as high as those of the parent firm.

Finally, this motive for outsourcing was mentioned frequently in media outlets [23] and was mentioned in all of the interviews we carried out with experts who worked in the outsourcing industry, and HR managers from firms who used outsourcing before the reform.

5.2.2 Alternative reasons for full outsourcing

In this section we explore alternative explanations, apart from profit-sharing avoidance, that could potentially justify full outsourcing. We provide empirical evidence and assess the incentives created by the institutional context to show that these alternative reasons are unlikely to be significant drivers behind firms' decisions to entirely outsource their workforce.

Volatility. Firms could potentially outsource all workers to reduce adjustment costs when facing temporary changes in employment demand. We show that this explanation is not in line with empirical evidence. Table 3 shows that full outsourcing establishments are not more likely to belong to sectors with high seasonality. Similarly, Table 4 indicates that these establishments do not demonstrate significant volatility in total workforce (both outsourced and in-house workers), suggesting that they do not particularly benefit from lower adjustment costs.

Within-firm wage compression. As mentioned above, outsourcing may enable firms to offer lower wages, especially when internal equality concerns exist. However, this motivation would typically justify the outsourcing of only a specific segment of a firm's workforce, rather than all workers.

Specialization. We posit that full outsourcing is unlikely to be driven by an increase in firm specialization and economies of scale. While specialization would justify outsourcing non-core tasks such as IT, cleaning or security, it falls short in rationalizing the outsourcing of an entire plant's workforce.

Avoidance of other mandatory contributions. In the media and policy discussions, it has been suggested that outsourcing allowed firms to decrease other mandatory contributions apart from profit sharing (STPS, 2021). One such contribution is the mandatory labor risk premium in Mexico

[23] See link, link

(INFOAVIT, 2022). Firms in Mexico are required to pay a risk contribution to social security which depends on the risk classification of the firm's economic sector, and on past firm accidents. Thus, it was suggested that firms belonging to sectors with a high risk classification outsourced workers to avoid paying high risk premiums. For this to be a valid reason, it should be the case that high risk firms should outsource their workers to a firm with a lower risk classification than the parent firm. We do find that firms in an activity with a high risk classification are more likely to fully outsource. However, we do not find a consistent trend of outsourcing to lower risk classification firms. Specifically, 67% of fully outsourcing establishments outsourced to entities within the same risk classification as the parent establishment, while 19% outsourced to lower-risk entities, and 13% outsourced to higher-risk ones. Hence, although outsourcing to lower-risk establishments was slightly more common, this doesn't appear to be a prevalent motive in our setting.

Additionally, outsourcing was claimed to help firms underreport wages and avoid 13th salary payments. If these were significant reasons for full outsourcing, we would expect an increase in declared earnings in social security records post-reform when workers are hired in-house. However, as detailed below, we do not find evidence of such an increase in declared earnings for workers insourced by fully outsourcing establishments[24].

Thus, while we cannot definitively reject all alternative explanations for full outsourcing, our evidence suggests that some of the main alternative motivations for this phenomenon were not playing an important role in our setting. Furthermore, in the following section we show evidence consistent with the notion that firms carrying out full outsourcing were those which benefited the most from avoiding profit sharing obligations.

5.2.3 Characteristics of full outsourcing establishments

The most defining features of full outsourcing establishments is that they are large, productive, which high profits. As can be seen in Table 2, full outsourcing establishments tend to have more workers, and are more likely to belong to foreign owned firms. On average full outsourcing establishments have higher profits, higher revenue per worker and value added per worker. Figure 8 displays the relationship between full outsourcing and different size and productivity measures. The graphs show that larger, more productive establishments (measured as either value added over worker or value added per unit of capital) were more likely to incur full outsourcing. These results align with the notion that more productive establishments were likely to have higher profits (and potential profit sharing). Thus, these highly productive establishments benefited relatively more from the cost reduction of evading profit sharing obligations[25]. This is discussed in more detail in Section 6.

Figure B.1 shows the distribution of full outsourcing practices across sectors. Sectors where the practice was particularly frequent include Petroleum and coal product manufacturing, Chemical manufacturing, and Beverage and tobacco product manufacturing. Furthermore, Table A.2 reveals

[24]This could still be a reason for outsourcing in Conventional Outsourcing establishments, which we do not focus on in this paper

[25]Two cases of firms doing this type of practice which were present in the media are Inditex (the clothing business group which includes Zara and other brands), and the bank BBVA

that these establishments are situated in labor markets characterized by higher concentration, where limited outside employment options may facilitate the extraction of rent from workers.

We focus on establishment level outcomes in this paper because in the manufacturing survey we cannot observe outcomes at the firm level. In the social security data, we can identity multi-establishment firms, which we define as establishments which share the same tax-id (*Registro Federal de Contribuyentes, RFC*). 59% of outsourcing establishments belong to single-establishment firms. Moreover, only 6% of firms where one establishment outsourced all workers had an establishment that was not outsourcing all workers before the reform[26]. Therefore, for the vast majority of the cases, one should think of full outsourcing establishments as belonging to full outsourcing firms.

5.3 Conventional outsourcing establishments

While the main focus of the paper is on full outsourcing practices, for completeness we show that the motivations for outsourcing of *conventional outsourcing* establishments seemed to differ from the former. First, note in Figure 6 that these establishments' profit sharing contributions were on average very similar to the non-outsourcing establishments, highlighting the need to outsource the complete workforce to avoid this contribution.

We show three different set of results which strongly suggest that conventional outsourcing establishments seemed to have been using outsourcing to adjust their labor force to temporary changes in activity. First, we find that sectors with more seasonality in employment and revenue before the reform were had a higher proportion of establishments in this group. This can be seen in Table 3, which shows the results of regressing different measures of seasonality at the sector level on the proportion of firms belonging to each group in the sector. Second, as shown in Table 4 we find that once we control for sector, conventional outsourcing establishments tended to have more volatility in employment than non-outsourcing firms. Third, in Table 5 column 1 we show that the elasticity of total workers with respect to short-term changes in revenue was larger for conventional outsourcing establishments prior to the reform. In columns 2-4 we calculate the elasticity different employment types with respect to revenue for the sub-sample of conventional outsourcing establishments. We find that outsourced employment responded more than in-house employment to changes in revenue, suggesting that outsourcing is more frequently used to adjust to short-term changes in economic activity than in-house employment. Figure A.3 in the appendix shows some examples of sectors where this can be clearly seen. Taken together, these results suggest that a decrease in adjustment costs was an important motivation for these establishments to outsource. However, it does not seem to be a relevant motive for full outsourcing establishments.

[26]In 17% of these firms, the establishment not outsourcing had less than 20 employees with exceptionally high wages, likely indicating managerial roles. Among the remaining 83%, non-outsourcing establishments tended to have a notably high proportion of temporary workers (16% on average, compared to the sample average of 5%), who are not eligible for profit-sharing.

6 Theoretical framework

Having documented and characterised full outsourcing practices, we present a very simple theoretical framework to understand the mechanisms behind the existence of this phenomenon. Full outsourcing allows firms to avoid or reduce profit sharing contributions. If wages and profit sharing were perfectly substituable for workers and firms, then this practice should not change total worker compensation. In this case, full outsourcing would only change the composition of total compensation, without changing it's total value. However, it is likely that full outsourcing entails a cost. This cost can include contacting or setting up a different entity to outsource the workers to, performing an extra firm-to-firm transaction, and extra administrative costs (e.g. filing an extra tax declaration each year if the contracting firm is set up by the parent firm). In this case, there must be a benefit for firms of performing this practice for it to exist in equilibrium. Thus, it is likely that this practice allowed firms to reduce total worker compensation, reducing their labor costs.

Full outsourcing would allow firms to reduce total compensation if profit sharing and wages are not perfectly substituable. This can be the case if for firms it is less costly to reduce total compensation via profit sharing than via wages. One reason for this imperfect substituability put forward in Nimier-David et al. (2023) is a binding minimum wage, which sets a limit to how much firms can reduce total compensation via wages. However, this does not seem to be the case in our setting. As can be seen in Table 9 full outsourcing firms paid relatively high wages. Less than 4% of workers at these firms were earning less than 1.2 times the minimum wage, and in more than half of full outsourcing establishments all workers were earning more than 1.2 times the minimum wage. This indicates that downward wage rigidity does not seem to be the main cause for this practice.

Below, we present a very simple theoretical framework that can help explain the reasons behind full outsourcing practices, where the imperfect substituability between wages and profit sharing stems from the labor supply function. The framework is extremely simple, and for now serves the purpose of conveying intuition. The model is static and in partial equilibrium[27]. In our model, a firm with productivity z_j produces a final good in a perfectly competitive product market with a linear technology function in labor n_j. There exists a level of mandatory total profit sharing ($\tilde{PS_j}$) which is a certain proportion ρ of pre-profit sharing payments profits $\hat{\pi}_j$[28]. Thus, mandatory profit sharing can be written as:

$$\tilde{PS_j} = \rho\tilde{\pi}_j = \rho(z_j n_j - w_j n_j) \tag{1}$$

Total profit sharing paid by the firm PS_j results in a certain level of profit sharing per worker ps_j. Thus, total profit sharing can also be written as $PS_j = ps_j n_j$. Firms face a labor supply curve which is increasing in both wages (w_j) and profit sharing per worker (ps_j):

[27] We ignore interactions among firms in this model, which could be playing an important role in our context. We plan to present more complex versions of the model in future versions of the draft

[28] In Mexico, profit sharing is 10% of profits before discounting profit sharing payments

$$n_j^s = (\beta_w w_j + \beta_{ps} ps_j)^\theta \tag{2}$$

β_w and β_{ps} determine the relative elasticity of workers with respect to wages vs profit sharing offered by the firm[29] $\theta > 0$ defines the absolute elasticity faced by the firm. β_w and β_{ps} affect the optimal relative values of wages and profit sharing chosen by the firm. θ does not influence the optimal relationship between wages and profit sharing, but will determine the value of the absolute compensation, and determines the degree of labor market power that the firm has (lower θ implies more inelastic labor supply, hence higher labor market power).

We do not micro-found the labor supply function in this version of the paper. Differences in β_w and β_{ps} could stem from workers' utility function, who might value wages differently to profit sharing due to e.g. risk aversion. Conversely β_w and β_{ps} may differ due to different informational frictions regarding the offered wages and profit sharing distributions (Ouimet and Tate, 2023). In this section, we abstract from the reasons underlying the differences between β_w and β_{ps} but we state that our evidence suggests that β_{ps} must be lower than β_w. We present some hypotheses and descriptive evidence on these reasons in Section 7.3.

Firms can pay a fixed cost k to outsource their workers to a separate entity, avoid the mandatory level of profit sharing and freely choose the optimal level of profit sharing they wish to offer the workers. k includes the fixed costs of outsourcing mentioned in the first paragraph of this section. An outsourcing restriction can be interpreted as an increase in k, as the punishment for carrying out outsourcing would increase. Firms must then decide whether to pay k and outsource their workforce to avoid mandatory profit sharing or not. Then they decide on the optimal wage and, if they decided to avoid the mandatory level, the optimal level profit sharing to maximize their profits. Firm maximize post-profit sharing payments profits π_j:

$$\max_{w_j, ps_j} z_j n_j - w_j n_j - ps_j n_j - k \mathbb{1}_{(ps_j n_j < \tilde{PS}_j)} \tag{3}$$

Note that if $\beta_w > \beta_{ps}$, it would be optimal for firms to offer bundles with zero ps_j absent any mandatory profit sharing regulations.

Also, in equilibrium $ps_j^* n_j^* < \tilde{PS}_j$ if:

$$z_j n_j^* - (w_j^* + ps_j^*) n_j^* - k > z_j n_j^{**} - w_j^{**} n_j^{**} - \tilde{PS}_j \tag{4}$$

Where w_j^* and n_j^* correspond to the optimal levels of wages and labor when profit sharing is avoided and w_j^{**} and n_j^{**} correspond to the optimal levels of wages and labor when total profit sharing is at it's mandatory value.

We solve the model in the Appendix C. We also simulate the model for different values of z_j, β_w, β_{ps} and k. We derive three main predictions which are shown graphically in Figures 9.

[29] $\eta_{n,x} = \frac{\beta_x \theta x}{(\beta_w w_j + \beta_{ps} ps_j)}$ for $x \in \{w, ps\}$. Thus $\frac{\eta_w}{\eta_{ps}} = \frac{\beta_w w_j}{\beta_{ps} ps_j}$

Prediction 1. *More productive firms find it optimal to pay k and reduce profit sharing*

This result can be seen graphically in Figure 9a. In this figure, we plot total profit sharing payments for different values of β_{ps}. The stark downwards jump in profit sharing payments occurs when firms start to find it optimal avoid mandatory profit sharing. We see that there is a threshold value $\tilde{z}$ such that all firms with productivity above this threshold find it optimal to pay the fixed cost and decrease profit sharing payments. 9b and 9c show that once firms decide to avoid profit sharing, they increase wages, but decrease total compensation (wages + profit sharing).

This prediction is in line with the descriptive results in Figures 8, where we show that more productive firms are more likely to outsource all employees. An intuition for result is that the total cost of profit sharing is increasing in z_j, while the cost to avoid it is fixed[30]. Thus, more productive firms find it optimal to pay this fixed cost, which represents a lower proportion of total profits, and avoid mandatory profit sharing.

Prediction 2. *The lower the relative elasticity of workers with respect to profit sharing $\frac{\beta_{ps}}{\beta_w}$ the higher the number of firms avoiding mandatory profit sharing.*

This result can also be seen in Figure 9a. When β_{ps} is lower (for a given β_w), the threshold at which firms choose to evade profit sharing decreases, leading to more firms opting for avoidance. The intuition behind this result is that, if β_{ps} is low, then workers are not very sensitive to this benefit when deciding where to work. Thus, when firms decide to avoid mandatory profit sharing, they do not have to compensate the workers for this loss with much higher wages. In particular, the lower is β_{ps}, the more firms can reduce total worker compensation by avoiding profit sharing through full outsourcing.

It's worth noting that if $\beta_{ps} = \beta_w$, then full outsourcing would not allow firms to decrease total worker compensation. Thus, full outsourcing would only exist if $k \leq 0$. Hence, we suggest that the mere presence of full outsourcing firms strongly suggests that $\beta_{ps} < \beta_w$. The following prediction allows us to provide an additional test on the relationship between β_{ps} and β_w.

Prediction 3. *A sudden increase in k (interpreted as a heavy restriction to outsourcing practices[31]) will decrease the number of firms avoiding profit sharing. For these firms:*

3a. *The effect on total compensation $w_j + ps_j$ will be higher the lower the relative elasticity of workers with respect to profit sharing $\frac{\beta_{ps}}{\beta_w}$.*

This Prediction can be seen in Figure 9d and 9e. Figure 9d shows that an increase in k causes more firms to comply with profit sharing. Panel 9e shows that for the newly complying firms, worker compensation increases, despite wages decreasing (we do not show the results for wages in these figures). The figure also illustrates how the increase in total compensation depends negatively on

[30] This result would also hold if the marginal cost of outsourcing is decreasing in the number of workers outsourced

[31] One can interpret this increase as the getting caught and punished for performing outsourcing even when it is banned

β_{ps}.

The intuition behind this result is that when $\frac{\beta_{ps}}{\beta_w}$, is low, workers are much more reactive to a wage decrease than to a profit sharing increase. Offsetting increases in ps_j via lower wages is relatively costly for the firm, as it has a relatively large negative effect on it's labor supply. Consequently, firms will not fully compensate via lower wages and total compensation will increase.

Under the model current assumptions, there will be no effect on total firm employment, as firms will always decide to adjust on the wage or profit sharing instead of on labor. However, if we assume that there is a fixed cost of staying in business each period, then if mandatory profit sharing, ρ, is sufficiently high, the firm will exit the market[32]. This occurs because the post-profit sharing profits of the firm will not be high enough to compensate for the cost of staying in business.

We now test the predictions of our model leveraging the effects of the outsourcing reform on employment, wages and total compensation. In Section 7.3 we present hypotheses and descriptive analyses which can help explain the imperfect substituability between profit sharing and wages for workers.

7 The causal impact of restricting outsourcing

The purpose of this section is to quantify the causal impacts of constraining outsourcing on both establishment and worker level outcomes. For this purpose, we leverage the effect of the outsourcing reform in Mexico which induced a change in outsourcing use.

7.1 Establishment-level effects

7.1.1 Methodology

In order to evaluate the effects of the reform using establishment survey data, we rely on heterogeneous exposure to reform across different units. The main assumption behind this identification is that, conditional on controls, the outcome variables of establishments using outsourcing and those not using outsourcing would have followed similar trends in the absence of the reform (Saez et al., 2019; Carry, 2022). We perform the following dynamic difference in differences regression:

$$Y_{jsgt} = \sum_{k=Q12017}^{Q12023} \beta_k \mathbb{1}_{t\in k} O_j + \lambda_j + \gamma_{st} + \phi_g t + \xi_{jsgt} \tag{5}$$

Where Y_{jstg} = outcome of establishment j, in sector s, size group g (we divide establishments into 6 groups according to their size pre-reform) at time (month-year) t and $O_j = 1$ if establishment used outsourcing in any month in the year prior to the reform[33]. $\mathbb{1}_{q=k}$ is a variable equal to one is month t falls into quarter q. We include size-group specific linear trends, as large firms are more

[32]Our model is static, thus we cannot provide analytical results on exit, but the intuition can be seen in Equation 22

[33]We prefer to use a dummy, rather than a continuous exposure variable, as continuous exposure measures can be problematic in the presence of heterogeneous treatment effects and non-linearities (Sun and Shapiro, 2022).

likely to outsource, and in Mexico large firms present a higher growth rate. We also include sector (NAICS 4 digits) x time specific fixed effects to account for sector-specific seasonality Predictions and idiosyncratic shocks. We normalize the coefficient for the last quarter of 2020 to zero.

The control group includes establishments which had not used outsourcing in the year prior to the reform. Standard errors are clustered at the establishment level.

7.1.2 Results

Effect on outsourcing use. The reform's impact on outsourcing use for each group of firms is presented in Figure 10. It is clear from the figure that the reform had a significant effect on outsourcing use (panel a) and in particular, on the proportion of firms outsourcing over 95% of workers (panel b). Moreover, Figures A.1 and A.2 in the appendix show the results of estimating Equation 5 with the proportion of outsourced employees and the number of in-house workers as outcome variables. Both figures show a clear decrease in the proportion of outsourced workers following the reform, and an increase in the number of in-house workers.

Utilizing social security data, we examine insourcing events following the reform. We consider an establishment in the IMSS data to belong to be an full outsourcing firm if the firm insourced at least 5 workers around the reform (according to the conditions stated in Section 4.2) and if the establishment was not previously identified in the social security data before the reform[34], or if the firm size increased more than 20-fold following the insourcing event. All other establishments insourcing over 5 workers are classified as conventional outsourcing firms. We restrict the analysis to the manufacturing sector and to firms with more than 20 employees to improve alignment with the EMIM data. 19% of establishments in our sample insourced workers between June and September 2021. 66% of the insourcing plants are classified as full outsourcing. Most of these establishments had *never* appeared in the social security data since 2004 (the earliest year where we have data). These statistics are very much in line with those found with the EMIM data, providing additional evidence on their validity. Figure B.1 in the Appendix shows the sectoral and geographical distribution of full outsourcing firms identified in EMIM and IMSS data. Reassuringly, the results look very similar in each dataset.

Our analysis with the social security data also enables us to identify contracting firms, i.e. establishments from which workers moved out of during and insourcing event. We classify an establishment as a contracting agency if at least 5 of its workers were involved in an insourcing event from that establishment (to another one). We find that that the majority of contracting firms were holding workers from only one parent firm, and were highly likely to exit post-reform. Specifically, 77% of contracting firms associated with full outsourcing firms exited within one year after the reform. Those that did not exit experienced a strong decrease in size, and remained very small (see Figure A.4 in the Appendix). These surviving contracting firms possible held workers which were not part of the parent firms' core activities, and thus still allowed to be outsourced. This evidence suggests that these contracting firms did not engage in any economic activity beyond providing workers to

[34]Firms with no employees obviously do not appear in the social security data because they have no workers to report

lead firms.

Effect of on profit sharing. Panel (a) of Figure 11 shows monthly profit sharing contributions per worker for control and full outsourcing firms. Panel (b) shows the results of a difference in differences regression similar to 5 but estimated at the yearly level, where the outcome variable is yearly profit sharing over total workers[35]. It can clearly be seen from both figures that the reform had a positive effect on profit sharing for the full outsourcing firms. Note that the first year that treated firms paid profit sharing contributions was 2022, not 2021, despite the insourcing events occurring in 2021. This is because profit sharing contributions corresponding to a certain fiscal year are distributed on the following year in May.

Table 6 shows descriptive results on profit sharing amounts for treated and control firms for 2023. We restrict treated firms to the compliers, i.e. firms not outsourcing post-reform for this table. Full outsourcing firms had higher total profit sharing contributions than control firms in both absolute and per worker terms. Average profit sharing represented approximately 1/2 of monthly wages for each group.

Effect on employment. Figure 12 shows the results on the natural logarithm of total employment (total outsourced workers + total in-house workers) for full outsourcing establishments. We do not find differential pre-trends, indicating that, conditional con the controls mentioned above, treatment and control groups has similar trends in employment pre-reform. We find that the reform had no significant effect on total employment for these establishments [36]. The results hold when looking at total and average hours worked at the establishment (see Figure 13a and Figure 13b), indicating that establishments did not adjust by offering workers lower hours of work[37]. As noted in above, the impact on outsourced workers was significant. Thus, on average, full outsourcing establishments insourced all workers after the reform (see Figure A.2), and did not alter their hiring and firing practices post-reform. This result is in line with the predictions in Nimier-David et al. (2023).

Table A.3 shows that the results are robust to alternative specifications of Equation 5. In particular, they are robust to computing the treatment variable using a 2-year time-frame pre reform instead of 1 year (column 1) [38] and estimating the regression using an unbalanced sample of establishments (column 2) and estimating the regression only with single-establishment firms (column 3).

Effect on total labor costs. Estimating the reform's impact on total labor costs presents challenges when working with the establishment-level data. Firms that outsource employees typically

[35] Results also shown in Table 8

[36] It can be noted in that standard errors get smaller for coefficients closer to the left out time period. This is because our outcome variable is measured at the quarterly level and exhibits high serial correlation within establishments. As the coefficients are expressed in *relative* terms with respect to period -1, the residual variation in the outcome variable is lower for periods close to -1, resulting in lower standard errors. We have carried out simulations and a written proof of this result, which are available upon request.

[37] The outlier in the coefficients on hours worked pre-reform is due to the Covid pandemic

[38] The number of observations decreases relative to estimates in Table 7 because with a 2-year pre reform time frame, more establishments are classified as conventional outsourcing, and thus excluded from the estimation sample.

report the total amount paid to the external establishment providing these workers as labor costs. Post-reform, treated firms experience a sharp decline in the reported amount paid to the contracting firm and an increase in reported wages. However, since the reported amount paid to the contracting firm likely encompasses expenses beyond just wages, it's challenging to precisely estimate the cost per employee before the reform for firms utilizing outsourcing. Additional costs potentially included in this figure include expenses related to worker training (mandated by law in Mexico), worker uniforms or equipment, and workers' travel expenses. Unfortunately, the EMIM dataset does not offer precise information on these costs, making it impossible for us to control for these components post-reform. Furthermore, it's plausible that the contracting firm providing workers earned a minor profit (albeit lower than the parent firm's profit to reduce profit sharing contributions, see Section 5.2.1), which would also be incorporated into this sum.

In practice, when we compute the effect of the reform on total and average labor costs, we observe negative coefficients post-reform. Nevertheless, we attribute this to the measurement issue outlined above. Acknowledging these limitations in measuring the reform's impact on labor costs using EMIM data, we turn to the comprehensive information on wages in social security data to estimate the reform's effects on wages. Subsequently, we combine these results with profit-sharing data from EMIM to estimate the overall impact on total compensation (comprising wages and profit sharing).

7.2 Worker-level effects

7.2.1 Methodology

In this section we examine the effect of the insourcing brought about by the reform on worker wages and compensation including wages plus profit sharing contributions.

$$log(wage)_{isrt} = \sum_{k=2017}^{2022} \theta_k \mathbb{1}_{t=k} Insourced_i + \phi_i + \gamma_{st} + \lambda_{rt} + \xi_{isrt} \tag{6}$$

Where, $log(wage)_{isrt}$ denotes the log of the yearly wage of worker i, working in region r, sector s, at year t. $Insourced_i$ is an indicator variable that takes a value of 1 if the worker was insourced between April and September 2021. We perform the regressions at the yearly level because not all treated workers were insourced on the same month, and to abstract from seasonal changes in earnings [39]. Standard errors are clustered at the establishment level.

We consider the control group as all workers who were not insourced during the reform and were working for firms with no insourcing events during the reform. This way we avoid including workers in the control group who may have been indirectly affected by the reform due to within firm rent-sharing (Deibler, 2021). We select a 10% random sample of all workers included in either treatment of control group for our regressions.

[39] IMSS data includes income from extra hours, bonuses and commissions, but not profit sharing income. Thus, an important part of the monthly variation in income comes from these components

Furthermore, we restrict our analysis to workers who remained with the same employer in the 2 years prior to the reform and throughout the post-insourcing period until December 2022. Below we show that results are robust to including workers with different levels of firm tenure pre-reform.

7.2.2 Results

Characteristics of treated and control workers. Table 9 shows summary statistics on the workers in our treatment and control group for the period 2017-2020. We also include a column with descriptive statistics on workers who were not outsourced but worked for firms using outsourcing.

Notably, treated workers earn higher salaries. This wage differential can be attributed to the nature of outsourcing firms, which tend to be larger and more productive, consequently offering higher wage structures on average. Indeed, this wage differential significantly diminishes when we compare treated workers with non-outsourced workers in firms employing outsourcing practices. This characteristic of outsourced workers contrasts with the predominant focus in the outsourcing literature on the outsourcing of workers positioned at the lower end of the wage distribution. In our case, where highly productive firms outsource their entire workforce, this phenomenon primarily affects higher-earning workers, on average.

Additionally, Table 9 shows that treated workers exhibited a slightly higher likelihood of both changing employers and participating in block movements before the reform. This implies that they may have been part of outsourcing events prior to the reform. The last two rows show the average size of the firm that the worker was *legally* hired by (current firm) and the average size of the firm that the worker was insourced by post-reform. In line with our establishment data, treated workers were predominantly associated with larger firms.

Effect of the reform on wages. Figure 14 plots θ_k from estimating Equation 6 and their 95% confidence intervals. We normalize θ_{2020} to zero. Panel (a) restricts the sample to workers with at least 2 years tenure at the firm prior to the reform while Panel (b) further restricts the sample to workers with 4 year tenure. We do not find evidence of significant pre-trends before the reform. In the first full year post-reform, which is 2022 and coincides with the initial disbursement of profit sharing to treated workers, we observe a decrease of approximately 1.6% in the wages of treated workers relative to the control group. Reassuringly, the results in both panels are very similar. This negative effect is driven by a slower rate of wage growth, rather than nominal wage reductions. 2022 witnessed relatively high average nominal wage growth (approximately 13%) driven by elevated inflation rates and substantial increases in the minimum wage.

Figure 15 presents the estimated θ_k values obtained from the estimation of Equation 6 across various sub-groups of workers. The negative effect on treated workers' wages is observable across all groups, albeit with varying magnitudes. In Panel (a), the results are segregated for workers with wages below and above the pre-reform firm median. Workers below the firm median experienced a slightly more pronounced decrease in wages compared to the control group. This result may be attributed to the regulations governing profit-sharing distribution within firms, where lower-wage workers receive higher profit sharing contributions relative to their wage. Panel (b) shows that women seemed to experience a stronger wage decrease relative to men. Panel (c) shows that the effect was slightly more pronounced for firms between 100 and 500 employees, possibly due to these firms having higher profit sharing per worker compared to very large firms, where the large workforce may dilute individual worker profit sharing earnings.

Table 10 shows that the results are robust to alternative specifications. The first three columns show that the results are robust to limiting the sample to workers with 2, 4 and 1 year of tenure pre-reform. In column (4) we change the control group to be the workers that were not outsourced but worked at firms that were using outsourcing pre-reform (i.e. conventional outsourcing firms, which had a significant number of workers hired in-house). In column (5) we include this group of workers, as well as our original control group in the estimation. Column (6) shows that the results also hold when including an unbalanced sample of workers (but restricting the sample to workers employed in at least 3 of the 6 years considered). We can see that the estimated coefficients are very similar across columns.

Thus, our findings suggest that treated firms adjusted wage growth in response to the new profit-sharing obligations they had to meet. Wage measures in social security data encompass additional income components, such as commissions and performance-based bonuses. Consequently, it is possible that firms made adjustments through these aspects of compensation, rather than altering fixed monthly wages[40].

This finding is in contrast to the results from Nimier-David et al. (2023) who find that increases in profit sharing contribution in France are not compensated via lower wages. This is possibly due to the fact that the minimum wage is more binding in France than in Mexico for treated firms. Additionally, 2021 and 2022 were years of high inflation, giving firms more flexibility to allow for real wage decreases. Thus, in our setting, firms may have had more margin to adjust wages downwards.

Effect on total worker compensation. Given the results outlined in the previous section, the implications of the reform for total labor compensation, which encompasses both wages and profit-sharing income are a priori ambiguous. In the event that businesses were able to completely offset profit-sharing increases with reduced wage growth, the overall compensation figure should remain unaffected. Total compensation would increase if wage compensation was less than perfect. Consequently, in this section we estimate the effect of the reform on total compensation.

As mentioned above, social security data does not contain information on profit-sharing income for workers. To circumvent this limitation, we combine information on profit sharing reported in the establishment survey data with the social security data to build a measure of total compensation (wages + profit sharing) for each worker in our social security data. Because we cannot match these two datasets at the firm level, we proceed in three steps. First, we categorize establishments into

[40] Anecdotal evidence suggests that post-reform firms made adjustments to different components of compensation (El Economista (2022)

groups based on their size (divided into four size categories), economic sector (using NAICS 3-digit codes), state location (across 32 states), and their utilization of outsourcing (traditional outsourcing, full outsourcing, and control). Thus, for instance one establishment may belong to the group including establishments in Ciudad de Mexico, in sector 343, which did not use outsourcing pre reform and had between 250 and 750 workers. Subsequently, using information from the establishment survey, we compute profit sharing for the average worker in each group for each year. Second, we categorize workers in the social security data into bins based on the same variables as the clasification in establishment survey (firm size, economic sector, state, and outsourcing use). Third, we merge this aggregated dataset with the social security data at the group level. Consequently, the level of profit sharing attributed to a worker classified in a specific bin in a given year corresponds to the average profit-sharing amount received by workers in that bin during the same year, while the wage remains individual-specific. The total compensation is then calculated as the sum of the individual wage and the estimated profit-sharing income[41].

We then estimate Equation 6 using the natural logarithm of total compensation as the outcome variable[42]. Figure 16a depicts the estimated effect on total compensation, under the assumption that treated workers were receiving zero profit sharing payments pre-reform. We also plot the effect on wages using the sample sample of workers for comparison. Despite the negative effect on worker wages, total compensation increased for treated workers by 2% on average. In other words, firms affected by the reform did not fully offset the rise in profit-sharing payments (as depicted in Figure 11) through decreased wage growth. Thus, the reform caused an overall increase in total labor compensation within full outsourcing firms.

Nonetheless, it is possible that the assumption of zero pre-reform profit-sharing for treated workers might be too stringent. There is a possibility that contracting firms engaged in full outsourcing may have had positive profits. In an extreme scenario, if the profit-sharing payments distributed by the contracting firm equaled those disbursed by the parent firm after insourcing their workers, the effect on total compensation would equate to the effect on wages, and thus, be negative. In Section 5.2.1, we make the case that the profits of contracting firms must have been lower than those of the parent firms for there to be an incentive to carry out full outsourcing. Therefore, we estimate the effect on total compensation under the assumption that the contracting firms' profits were a fraction p of the full outsourcing firms' profits, for $p = \{0.2, 0.33, 0.5\}$. By construction, the higher p, the lower is the estimated effect of the reform on total profit sharing income and consequently on total compensation. The results are shown in Figure 16b. We can see that the estimated positive effects on total compensation hold for $p = 0.2$ ($\theta_{2022} = 1.3\%$) and 0.33 ($\theta_{2022} = 0.8\%$), while for $p = 0.5$ the effect is negligible ($\theta_{2022} = 0.2\%$). Thus, even if contracting firms' profits were up to 1/3 parent firms' post reform profits, we estimate that the reform caused a positive effect on total labor compensation.

[41] We will present more details on this procedure, as well as evidence supporting similarities between EMIM and IMSS sample in the next version of this draft

[42] We restrict this analysis to workers who had been working for the firm since 2017 for a cleaner estimation of pre-reform profit sharing contributions. As shown in Figure 14 the effect on wages did not vary across workers of different tenure, while individual profit sharing contributions do not depend directly on tenure.

Results are robust to a different aggregations of the profit sharing data, such as (sector-outsourcing group -size) and (outsourcing group-size), different methods for distributing profit sharing across workers within a bin, and estimating the results only on bins with few firms.

7.3 Interpretation of the results

In this section, we provide an interpretation of our findings based on the model introduced in Section 6. We find that a considerable number of firms in Mexico were outsourcing all their workers as a means to avoid profit sharing contributions. In Section 5 we show that this phenomenon was predominantly observed among firms characterized by high levels of profitability and productivity. Consistent with Prediction 1, we argue that for these firms incurring the fixed costs associated with outsourcing outweighed the profit sharing expenses. Given that the minimum wage is barely binding for these firms, we argue that there must be a motive for firms to incur these costs to reduce profit sharing to decrease total compensation, rather than simply reduce wages. We argue that this motive is driven by the fact that wages and profit sharing are not perfectly substituable for workers. As stated in Prediction 2, the observed patterns are consistent with workers being less responsive to changes in profit sharing compensation than to wages when deciding where to work. This lower elasticity of labor supply with respect to profit sharing (β_{ps}) prompts firms to disproportionately reduce total compensation through the profit-sharing margin (ps_j^*).

The impact of the outsourcing reform helps understand the determinants influencing firms' decisions to outsource most of their workforce. We find that the reform had strong effects on outsourcing use, leading firms to insource their previously outsourced workforce, and incur profit sharing payments, consistent with an increase in k. The reform had a positive effect on total compensation, again hinting towards a low β_{ps}, as mentioned in Prediction 3a. Additionally, we do not find negative effects on employment, signifying that full outsourcing firms in Mexico possessed sufficient labor market power to absorb the rise in labor costs without reducing their workforce. Table A.2 in the Appendix shows that full outsourcing establishments belonged to local labor markets [43] with higher labor market concentration, suggesting that they have more labor market power (Azar et al., 2022).

We present two hypothesis explaining why workers were possibly less reactive to changes in profit sharing relative to wages. The first hypothesis corresponds to risk aversion. This hypothesis is also discussed in (Nimier-David et al., 2023). Profit sharing tends to be more volatile than wages. Thus, if workers are more risk averse than firms, then they will value each additional peso of uncertain profit sharing less than each additional peso of a stable wage. This will make workers less responsive to profit sharing changes relative to wages.

The second hypothesis focuses on workers' knowledge and awareness of the distribution of offered wages in the labor market relative to profit-sharing payments. Previous literature has highlighted the role of misinformation on influencing workers' propensity to switch employers (H., 1934; Jäger et al., 2023; Roussille, 2022). Ouimet and Tate (2023) mention that wages can relatively more salient than other non-wage job attributes for workers when comparing multiple job offers. We argue

[43] Local labor markets are defined as either municipality x 2 digit sector or municipality x 3 digit sector

that, particularly before the reform, workers were less informed on the distribution of profit sharing benefits (e.g. which firms tend to have positive profit sharing payments, how these benefits are calculated, high are these payments historically) compared to the distribution of offered wages in the labor market. This low salience of this benefit would make workers care less about profit sharing compensation than about wages when deciding where to work. For instance, if a worker does not know of the existence of this benefit, then she or he will tend to underestimate the average total compensation offered by firms in the labor market. This difference in misinformation may come from the fact that profit sharing benefits are less salient than wages for workers. Interviews with stakeholders in Mexico indicate that this is a possible explanation for the avoidance of profit sharing. We present some descriptive evidence in line with this hypothesis. Figure A.5 shows information from Google trends on searches related to profit sharing and other benefits across time. Two patterns stand out (i) searches for profit sharing are much lower than searches for other benefits, and (ii) after the reform, searches for 'profit sharing' and 'right to profit sharing' singificantly increase. While we are cautious not to over-interpret this evidence, these patterns may suggest that interest in profit sharing was lower than that of other benefits, but that awareness possible increase post-reform. Additionally, we scrape vacancies data from computrabajo.com and find that on average, only 10% of posted job listings mention profit sharing. A negligible proportion out of this 10% provide any reference to the expected value of profit sharing offered at the company. We plan to further explore these two hypotheses in the next version of this draft.

7.4 Effects on conventional outsourcing establishments

While the focus of this paper is on full outsourcing, from a policy standpoint it is relevant to understand the effects of the outsourcing reform on conventional outsourcing establishments. Below, we show that the reform negatively affected these establishments by causing them to downsize and reducing employment dynamism. Thus, while the aim of the reform was to end practices more in line with full outsourcing, it caused undesired consequences on this other group.

Total employment. The results for total employment among conventional outsourcing establishments are depicted in Figures 17 and 18. Both illustrate a small decline in total employment and total hours worked after the reform. Establishments with positive outsourcing in the pre-reform period reduced total employment by roughly 3% compared to the control group. Table A.1 in the Appendix indicates that this outcome is caused by a drop in the absolute number of workers among the treatment group relative to the pre-reform period. The likelihood of a decrease in the value of total employment is 5% higher among conventional outsourcing establishments.

Employment dynamism. As discussed above, these establishments were using outsourcing to better adjust to temporary fluctuations in labor demand. As the reform restricted these types of outsourcing practices (because these temporary workers were mainly part of the core activities of the firms), it is natural to ask whether adjustment costs, and consequently employment dynamism was affected by the reform.

We evaluate the effect of the reform on employment fluctuations using a similar methodology to

Bertrand et al. (2021). Specifically, we define an 'action' variable which takes the value of one if an establishment changed it's total production employment by more than a certain percentage p from one month to the next (in absolute value) and we carry out the following regression:

$$Action^p_{jt} = post\_reform_t * FullOuts_j + post\_reform_t * ConvenOuts_j + \lambda_j + \phi_t + u_{it} \tag{7}$$

Where $Action^p_{jt}$ is the action variable for percentage p, Where $FullOuts_j$ and $ConvenOuts_j$ take the value of 1 if the establishment belonged to each respective group and zero otherwise. We perform this regression for different $p = 2\%, 5\%, 10\%$ and 20%. We estimate this equation on the balanced panel of establishments in EMIM. We restrict the post-reform period to the months after October 2021 to avoid the transition period of the reform. The pre-reform period is restricted to January 2017- December 2018 to have a more similar number of periods post and pre-reform.

The results from this estimation are displayed in Table 12. The coefficients for the interaction of Post with $ConvenOuts$ is negative in all specifications, while it is significant for high levels of p. In particular, post-reform, the probability that a conventional outsourcing establishment experienced a change in employment levels of more than 10% decreased by 1 percentage point, or 8% relative to the group's pre-reform mean. Thus, this evidence suggests that the outsourcing restriction increased adjustment costs for firms using outsourcing to adjust to temporary changes in demand, which caused them to decrease their employment dynamism. While we do not evaluate the consequences of this effect in this paper, this decrease in employment volatility can potentially lead to increases in misallocation and slower TFP growth (Hopenhayn and Rogerson, 1993; Decker et al., 2018).

8 Conclusion

This paper provides novel evidence on an understudied incentive behind the utilization of outsourcing, namely its use as a means to evade labor regulations. While this practice has been frequently mentioned in policy and media spheres, it is challenging to measure empirically. In this study, we exploit rich establishment survey data, social security data, and the effects of an outsourcing reform that caused the insourcing on thousands of employees to document, characterize, and explain this practice.

We first newly document and characterize a phenomenon where a significant number of firms were outsourcing almost *all* their workers. We find that 2/3 of firms using outsourcing in Mexico were outsourcing almost all of their employees, operating as empty establishments, with no legally hired workers. We provide compelling evidence that firms carried out this extreme use of outsourcing as a means to avoid labor regulations, particularly mandatory profit sharing with employees. We show that this practice was predominant amongst large, productive and profitable firms, who largely benefits from avoiding profit sharing costs.

We then exploit the effects of a reform which imposed strict restrictions on outsourcing to understand how firms react in a labor market without the possibility to outsource. The reform caused most firms to insource their employees in-house. We also find that the reform caused full outsourcing firms to newly incur profit sharing payments. Firms did not downsize as a result of the increased profit sharing costs, but they offset the increase in profit sharing by a small decrease in wage growth relative to the control group. However, firms did not fully offset the increase in profit sharing costs through lower wages after the reform, and total labor compensation, i.e. wages + profit sharing per employee increased by around 2% post reform.

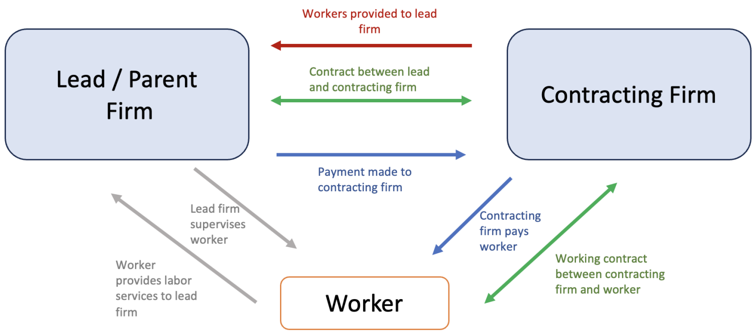
Our results are consistent with a labor market in which profit sharing and wages are not perfectly substituable for workers, and workers were less responsive to changes in profit sharing compensation than to wages when deciding where to work. This difference in elasticities prompts firms to lower total compensation dis-proportionally via the profit sharing margin. This can explain why certain firms found it optimal to incur full outsourcing practices to reduce profit sharing, rather than lowering wages; and why the restriction of outsourcing increased profit sharing and total worker compensation, without having a negative effect on employment.

We argue that workers' relative inelastic labor supply to profit sharing can be attributed to the fact that workers may have had less information on profit sharing (the right to this benefit, how it was calculated) than on wages, especially prior to the reform. Conversely, workers may be more risk averse than firms, and value the stable income of wages relatively more.

Our findings underscore the role of avoidance of labor benefits as a key incentive driving firms to outsource employees in this context. We show that under these incentives, restricting outsourcing can increase the labor share without affecting employment levels.

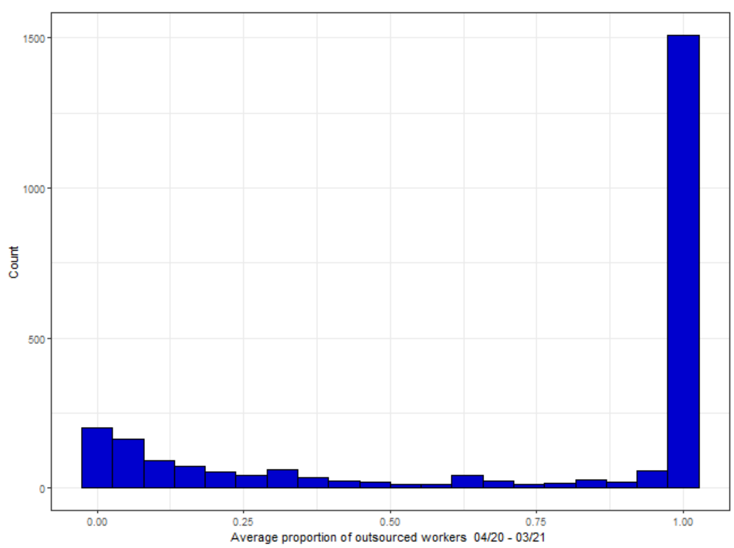
Figures

Figure 1: Schematic graph illustrating outsourcing relationship



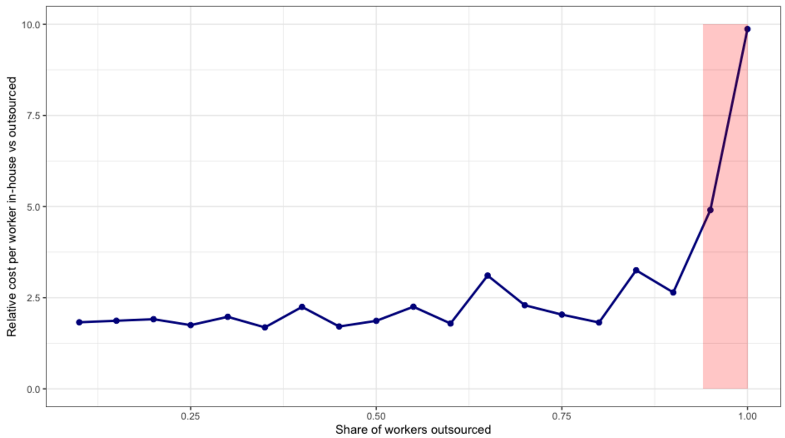
Notes: This figure shows a schematic graph on the actors in an outsourcing relationship. Blue lines indicate a payment from one actor to the other. Green lines indicate the existence of a contract between the two actors.

Figure 2: Distribution in the proportion of outsourced workers pre-reform



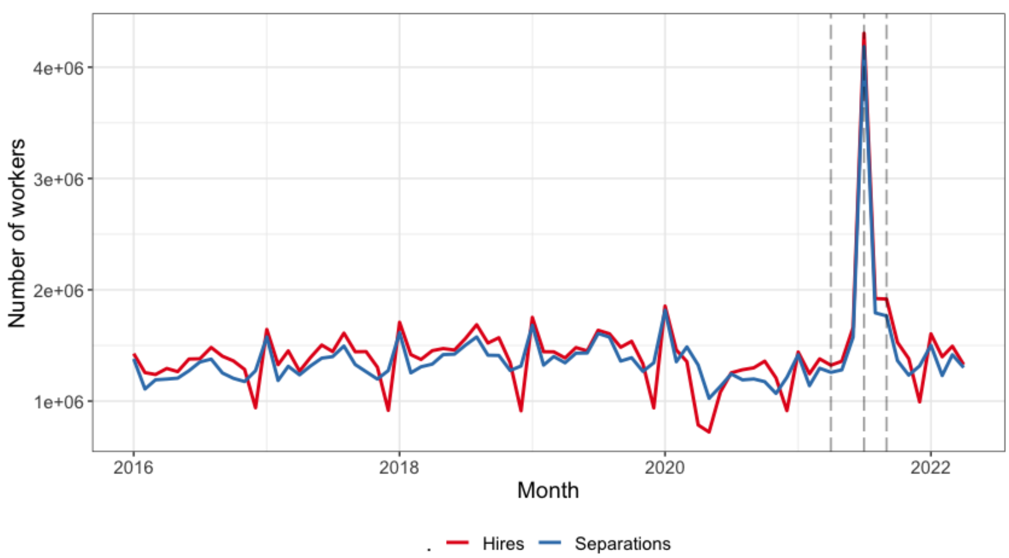
Notes: This figure plots a histogram with the average share of workers outsourced between April 2020 and March 2021 (the year before the outsourcing reform was approved) by each establishment in our EMIM dataset which has positive outsourcing in at least one month on the year prior to the reform

Figure 3: Cost per in-house worker over cost per outsourced worker, by share outsourced



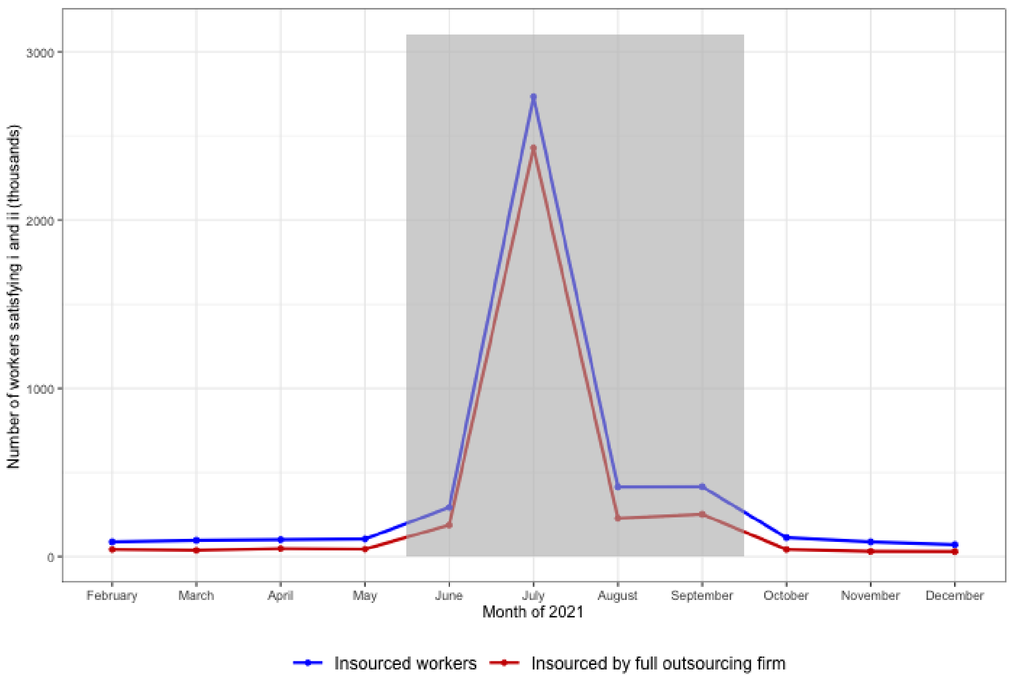
Notes: This figure plots the relationships between the relative costs of in-house workers and outsourcing share. For each observation before 2020, we compute the ratio of the average cost per in-house worker over the average cost per outsourced worker we plot the average of this ratio against the proportion of workers outsourced in each observation, rounded to the nearest 0.05. The shaded red area corresponds to establishments outsourcing over 95% of their workers.

Figure 4: Monthly hires and separations



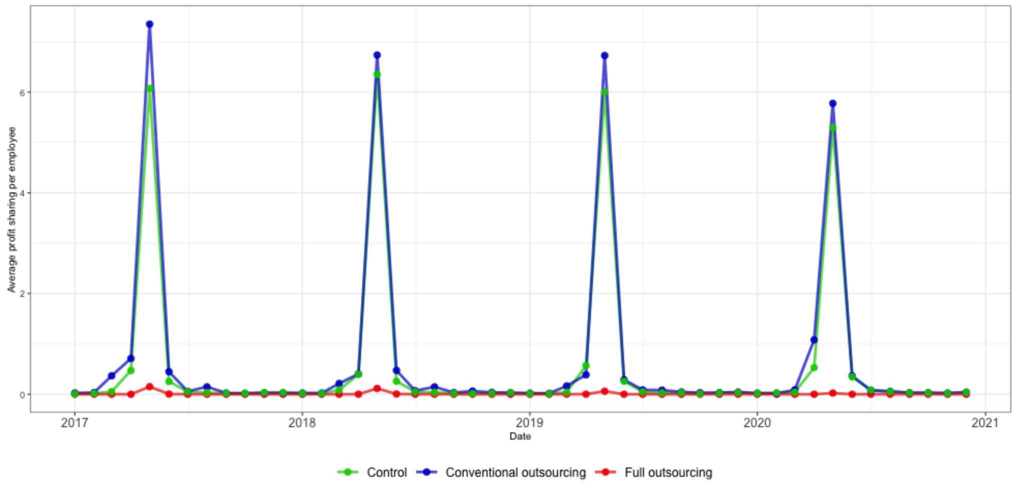
Notes: This figure shows monthly hires and separations using the universe of workers in IMSS data. The dashed lines represent April 2021, when the outsourcing reform was approved; July 2021, the deadline for firms to adapt to the reform; and September 2021, an extended deadline for some firms.

Figure 5: Number of workers satisfying conditions i and ii (thousands)



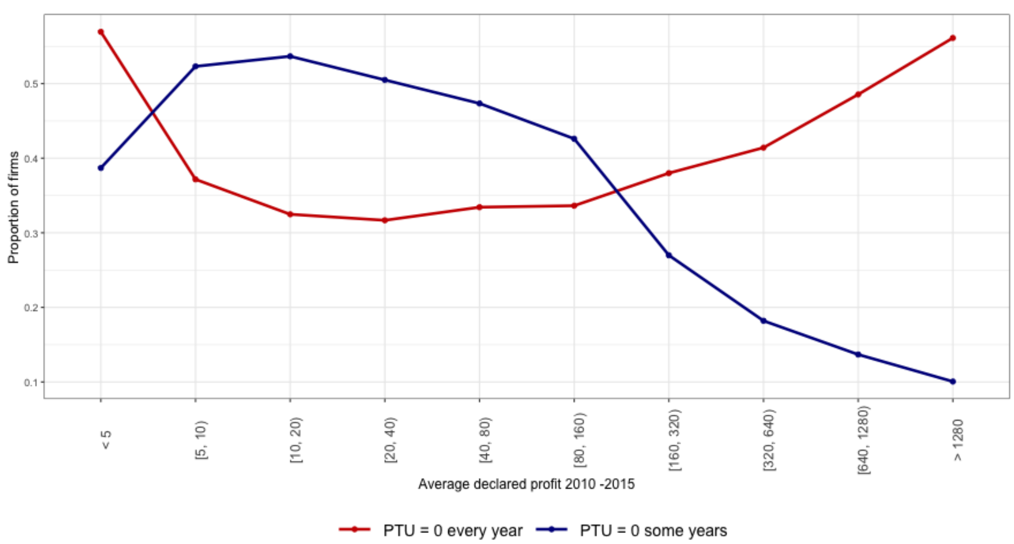
Notes: This figure shows the number of workers amongst all workers in IMSS involved in a movement between establishments where the flow satisfied condition ii) in Section 4.2 on each month between February and December 2021. The shaded area are the worker movements classified as insourcing events with the additional condition i), i.e. that the flow occured between June and September

Figure 6: Monthly profit sharing per worker, pre reform



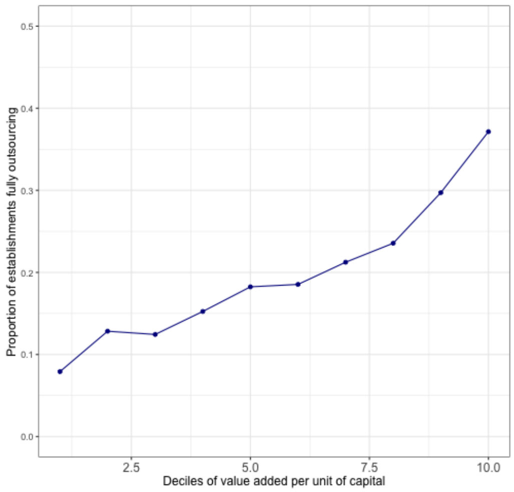
Notes: This figure plots the average monthly profit sharing per worker for each group of establishment. The peaks in each year correspond to May, which is when profit sharing is disbursed in Mexico. The series is built with balanced establishment-level panel dataset from EMIM. Control establishments are those that did not outsource employees in the year prior to the reform, conventional outsourcing establishments have positive outsourcing but less than 95% of their workforce. Full outsourcing are establishments outsourcing more than 95% of their workforce pre reform.

Figure 7: Share of firms with no declared profit sharing by profit size groups

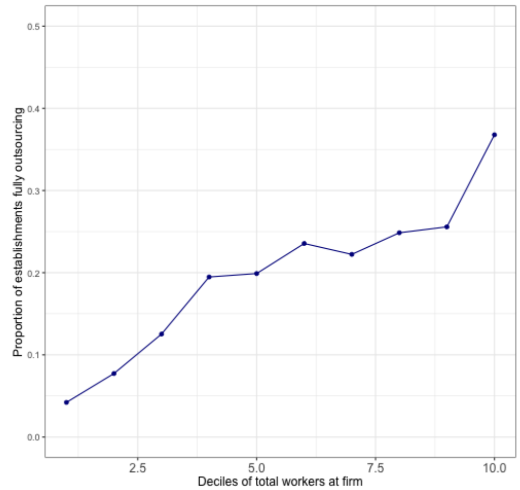


Notes: This figure plots the proportion of firms that declared zero profit sharing on *every* year from 2010 to 2015 (red line), and the proportion of firms that declared zero profit sharing on *some* year, but not every year (blue line), against average declared profit between 2010 and 2015. The series is constructed with data from official corporate tax declarations from the national tax registry (Servicio de Administracion Tributaria)

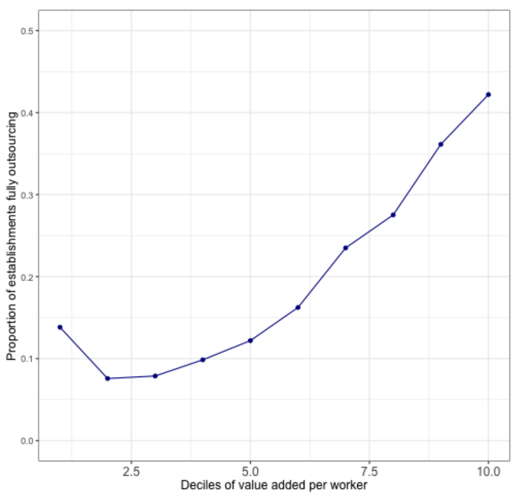
Figure 8: Full outsourcing and productivity measures



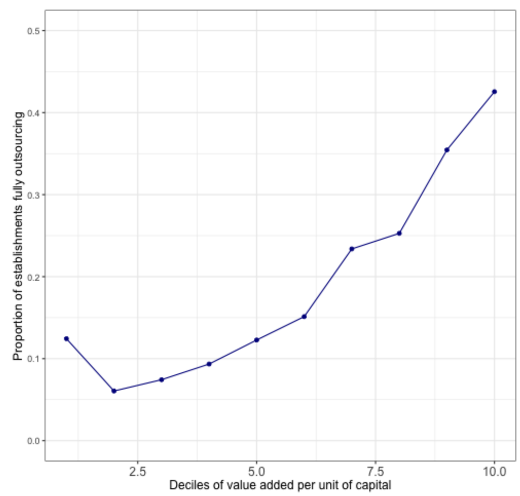
(a) Value added



(b) Firm size



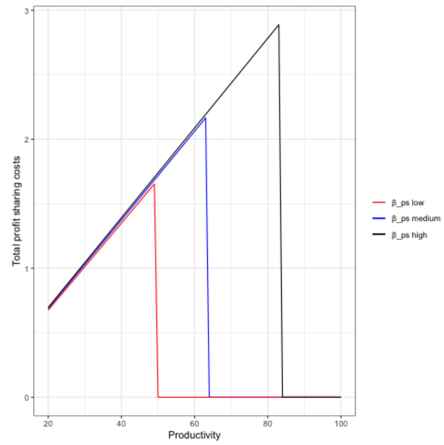
(c) VA per worker



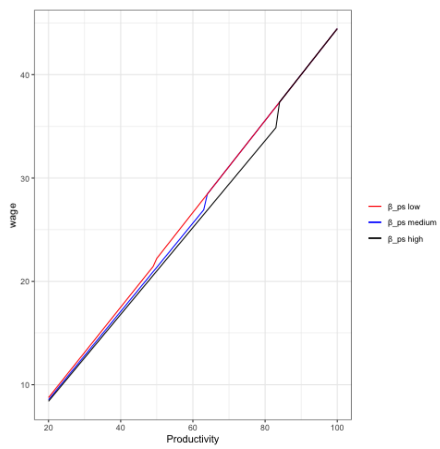
(d) VA per capital

Notes: These figures are built using establishment level data from EMIM and the 2018 Economic Census. They plot the proportion of full outsourcing firms across the deciles of different variables for 2018. The value of the y axis in each graph is the proportion of full outsourcing establishments in a particular decile of the distribution of that variable. Panel (a) plots deciles of value added Panel (b) plots the deciles of firm size, computed as number of workers at the firm (c) plots value added divided by total workers (d) plots value added divided by total machines.

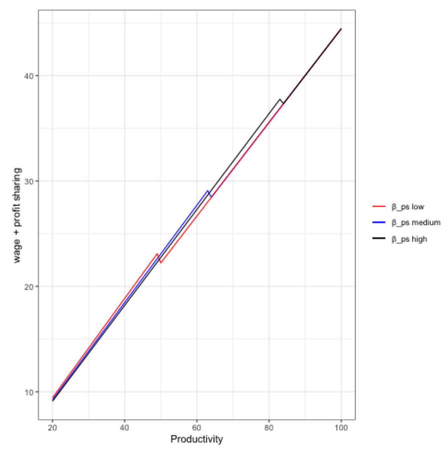
Figure 9: Model simulations - Different values of z, η_a, and k



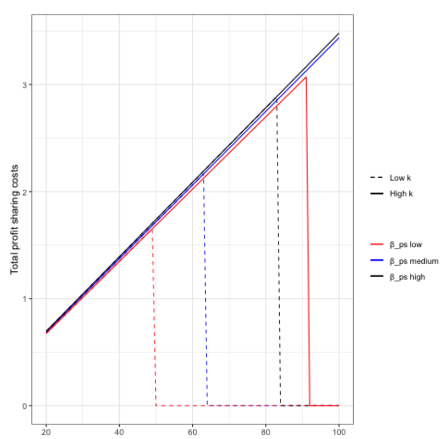
(a) Profit sharing per worker



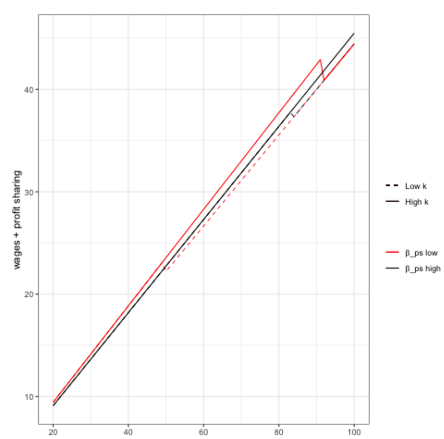
(b) Average wage



(c) Total compensation per worker



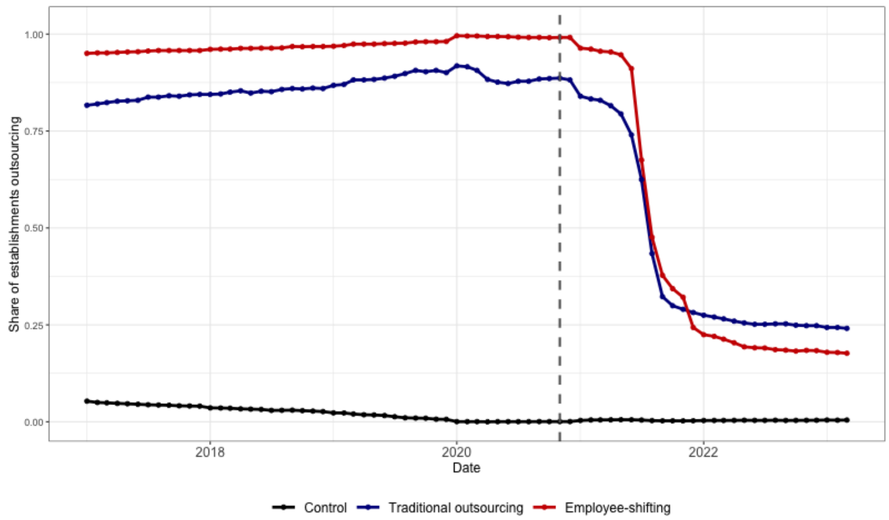
(d) Profit sharing costs, increase in k



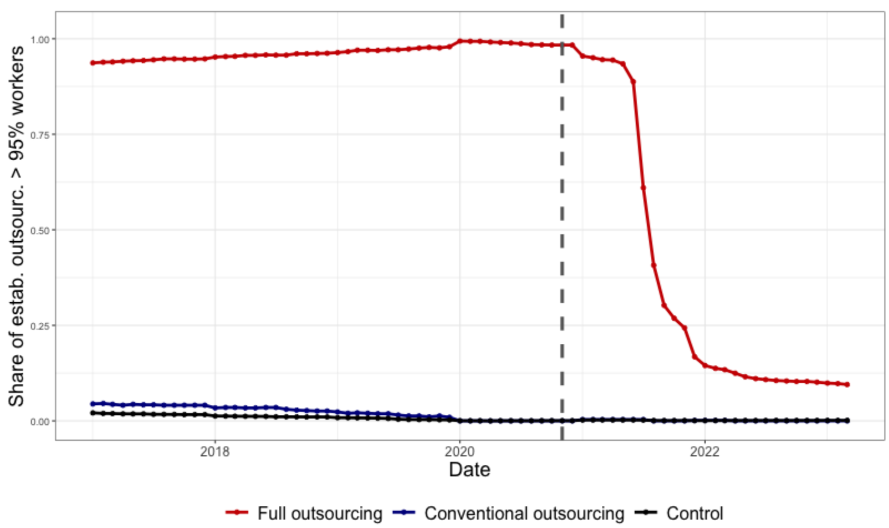
(e) Total compensation per worker, increase in k

Notes: These figures show the results of simulations from the model presented in Section 6. The horizontal axis represents different values of productivity z_j. (a) plots total profit sharing per worker for different values of the elasticity of labor supply wrt profit sharing, β_{ps}. (b) plots the average wage (c) plots total compensation, which is average wage + profit sharing per worker (d) Plots the effect on profit sharing when k increases for different values of z_j and β_{ps}. The dashed lines are identical to panel (a). Solid lines correspond to the profit sharing costs after the increase in k Panel (e) plots the effect on total compensation when k increases for different values of z_j. We only plot the variable β_{ps} low and high in this last panel low for visual purposes.

Figure 10: Effect of the reform on outsourcing



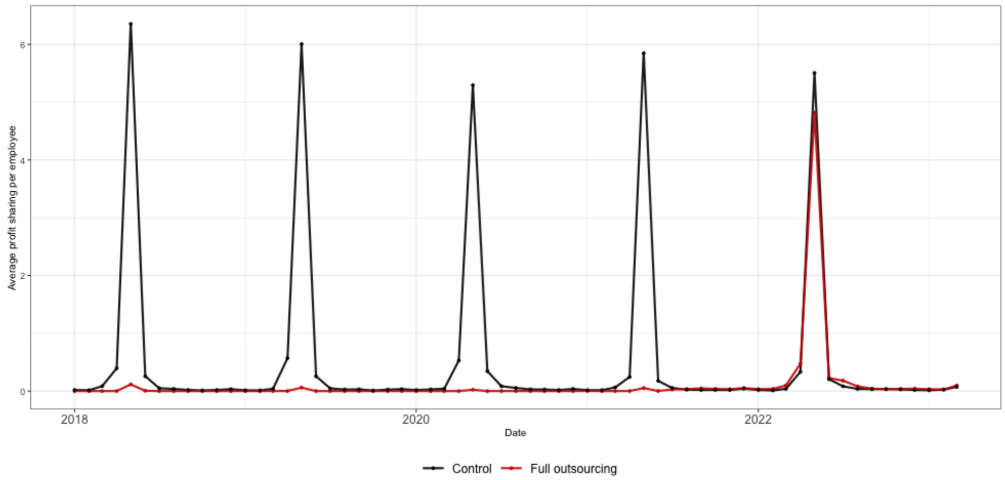
(a) Share of establishments with positive outsourcing



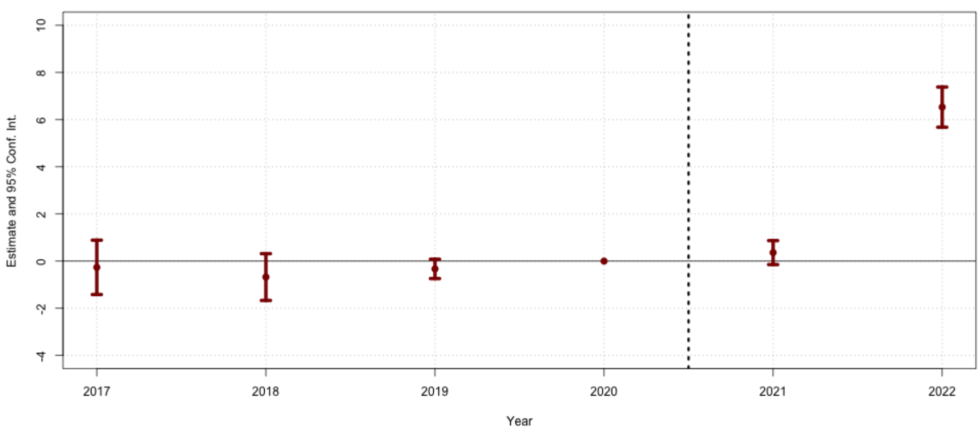
(b) Share of establishments outsourcing more than 95% of workers

Notes: This Figure shows the share of establishments from EMIM with positive outsourcing on each month from January 2017 to November 2022 in each group. Full outsourcing establishments are those outsourcing over 95% of workers in at least one month on the year prior to the outsourcing reform, Conventional outsourcing establishments are those positive outsourcing, but lower than 95%, in at least one month on the year prior to the outsourcing reform. Group 3 are the remaining establishments. The dashed line corresponds to November 2020, when the reform was first suggested.

Figure 11: Effect of the reform on profit sharing



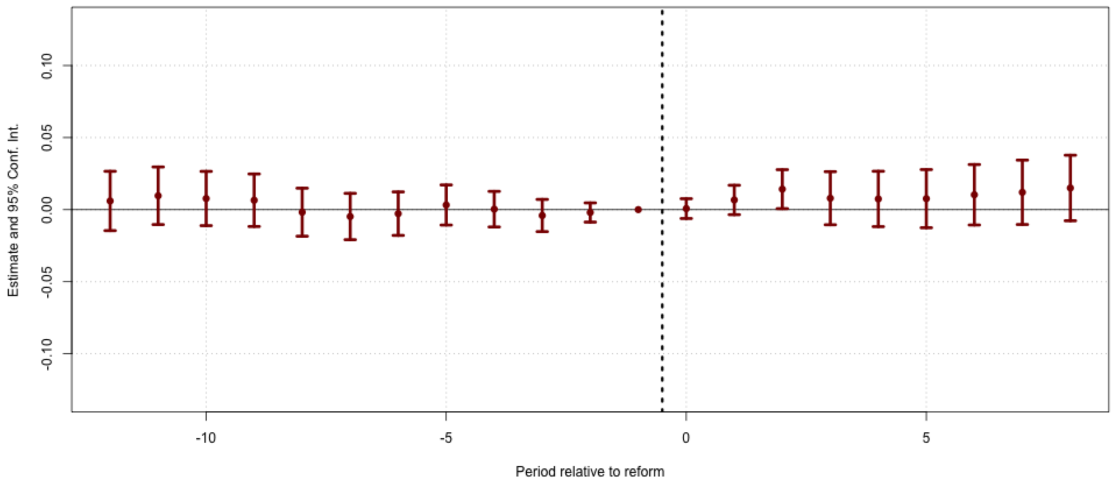
(a) Monthly profit sharing per worker



(b) Diff in diff coefficients - Yearly profit sharing per worker

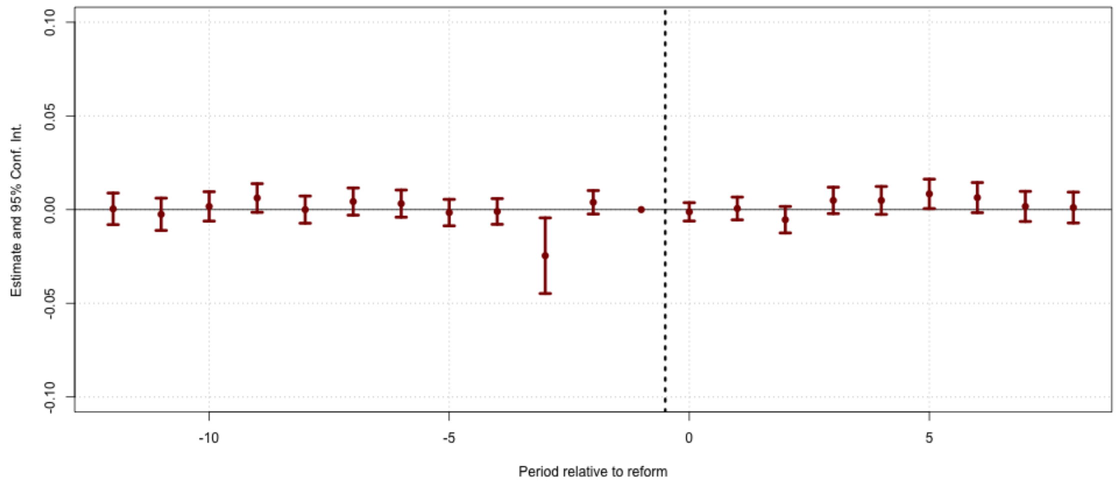
Notes: Panel (a) shows average monthly profit sharing per worker for control establishments and full outsourcing establishments. The series is constructed using a balanced sample of establishments from EMIM. The peaks in each year correspond to may, when profit sharing is typically disbursed. Panel (b) shows the difference in differences coefficients from estimating Equation 5 aggregating establishment data at the yearly level. The treatment group includes establishments outsourcing more than 95% of their workers pre-reform. The control group are establishments not using outsourcing pre-reform. The outcome variable is yearly profit sharing per worker. Standard errors are clustered at the establishment level. Conventional outsourcing establishment, i.e. those with positive outsourcing $<$ 95% pre-reform are excluded from the sample in both figures.

Figure 12: Effect on total employment (outsourced + in-house

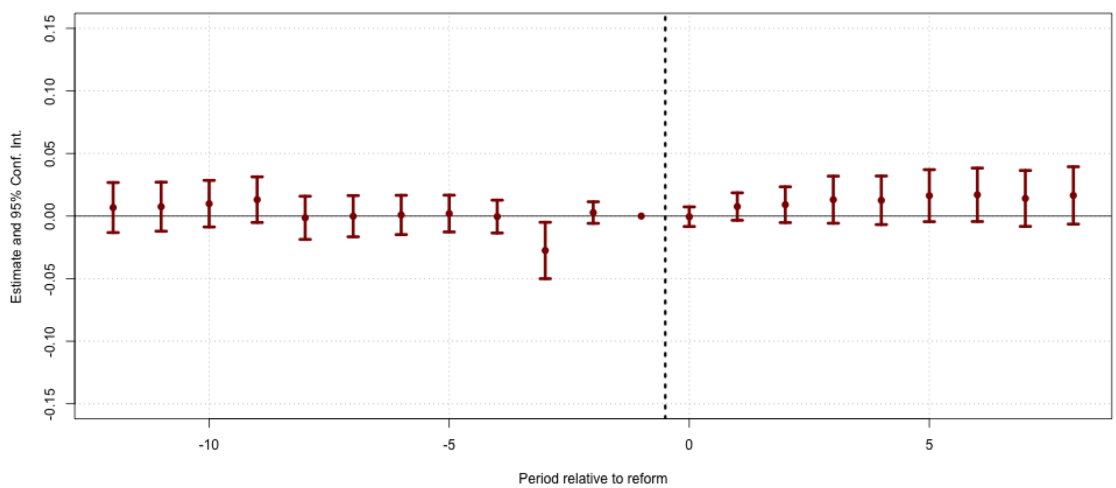


Notes: This figure plots the β_k from Equation 5 and 95% confidence intervals. The estimation is carried out on a balanced panel of establishments from EMIM between 2018 and 2022. Treatment group includes establishments outsourcing over 95% of workers before the reform (full outsourcing). Control group includes establishments with no outsourcing before the reform Establishments with positive outsourcing before the reform, but lower than 95% (conventional outsourcing) are excluded from the estimation. The outcome variable is the log of the total number of workers (outsourced + in-house). β_{Q42020} is normalized to 0. Standard errors are clustered at the establishment level.

Figure 13: Effect on hours worked



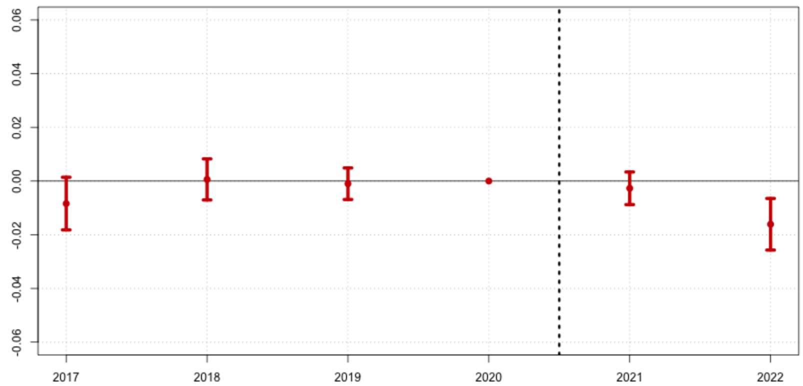
(a) Effect on average hours worked



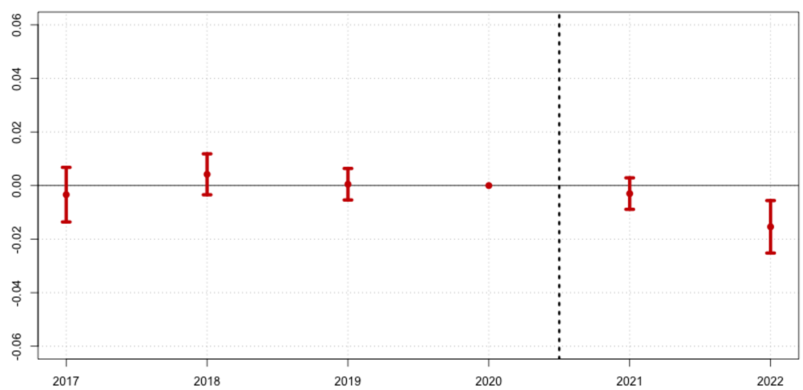
(b) Effect on total hours worked

Notes: This figure plots the β_k from equation 5 and 95% confidence intervals. The estimation is carried out on a balanced panel of establishments from EMIM between 2017 and 2022. Treatment group includes establishments outsourcing over 95% of workers before the reform (full outsourcing). Control group includes establishments with no outsourcing before the reform. Establishments with positive outsourcing before the reform, but lower than 95% (conventional outsourcing) are excluded from the estimation. The outcome variable in panel (a) is the log of the average number of hours worked(by outsourced + in-house workers). The outcome variable in panel (b) is the log of the total number of hours worked. β_{Q42020} is normalized to 0. Standard errors are clustered at the establishment level.

Figure 14: Effect of the reform on yearly wages of insourced workers



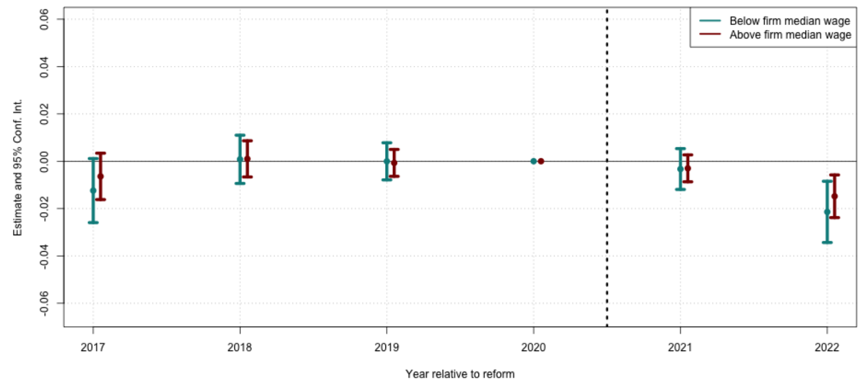
(a) Log yearly wage - 2 year tenure pre-reform



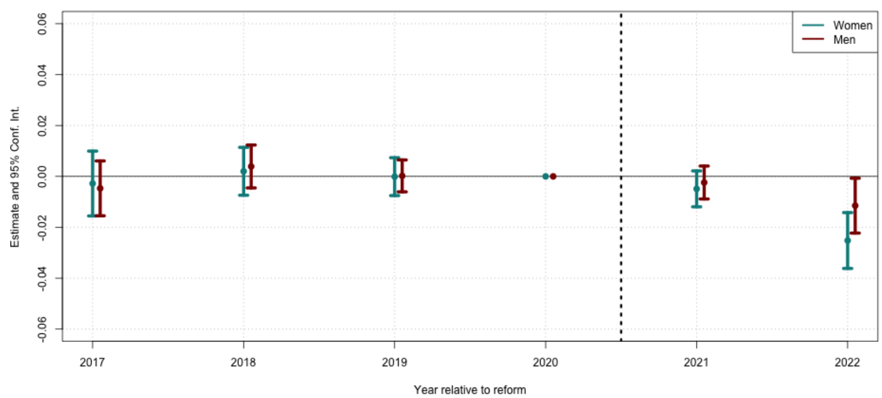
(b) Log yearly wage - 4 year tenure pre-reform

Notes: This figure shows the estimates θ_k and their 95% confidence intervals from estimating Equation 6 on the natural logarithm of average annual worker wages. The estimation is carried out on a balanced 10% random sample of workers from IMSS. Panel (a) limits the sample to workers with at least two years of tenure at the firm before the reform. Panel (b) limits the sample to workers with at least 4 years of tenure at the firm pre-reform. Standard errors are clustered at the establishment level.

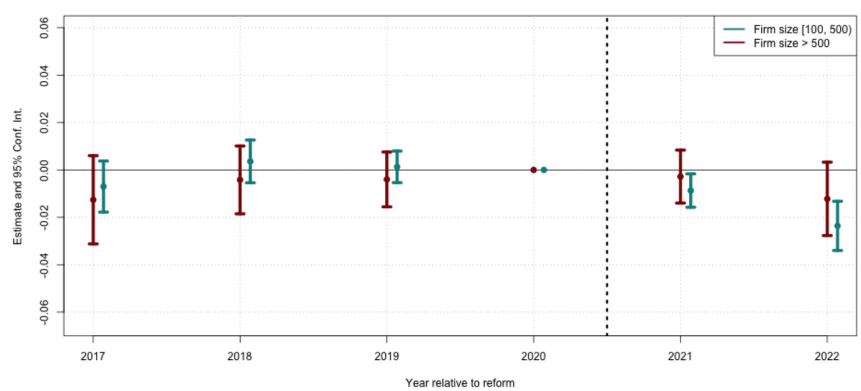
Figure 15: Effect of the reform on salaries of insourced workers by group



(a) Effect on salaries, by pre-reform wage



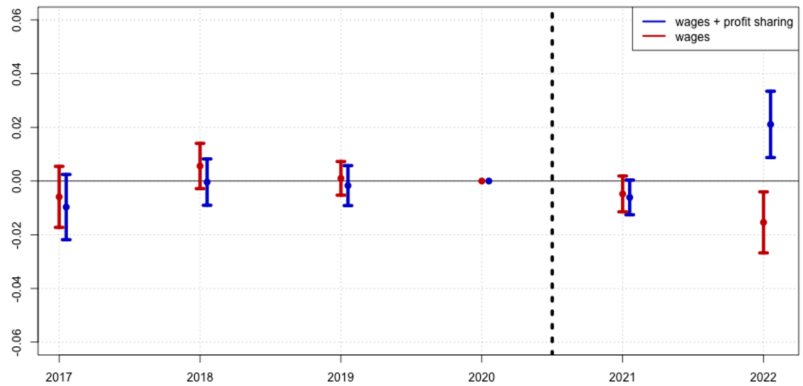
(b) Effect on salaries, by gender



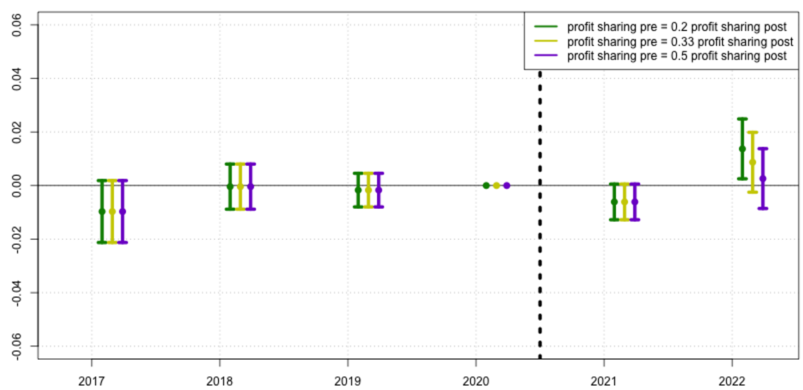
(c) Effect on salaries, by firm size

Notes: This figure shows the estimates θ_k and their 95% confidence intervals from estimating Equation 6 on the natural logarithm of average annual worker wages. For each panel we divide our original sample used to estimate the results in Figure 14 into two groups and estimate the regression separately fore each group Panel (a) divides workers into those whose wage was above and below the firm median pre reform (b) divides by gender (c) divides the sample according to firm size pre-reform. We exclude workers in firms with less than 100 workers in this last estimation. Standard errors are clustered at the establishment level.

Figure 16: Effect of the reform on yearly compensation



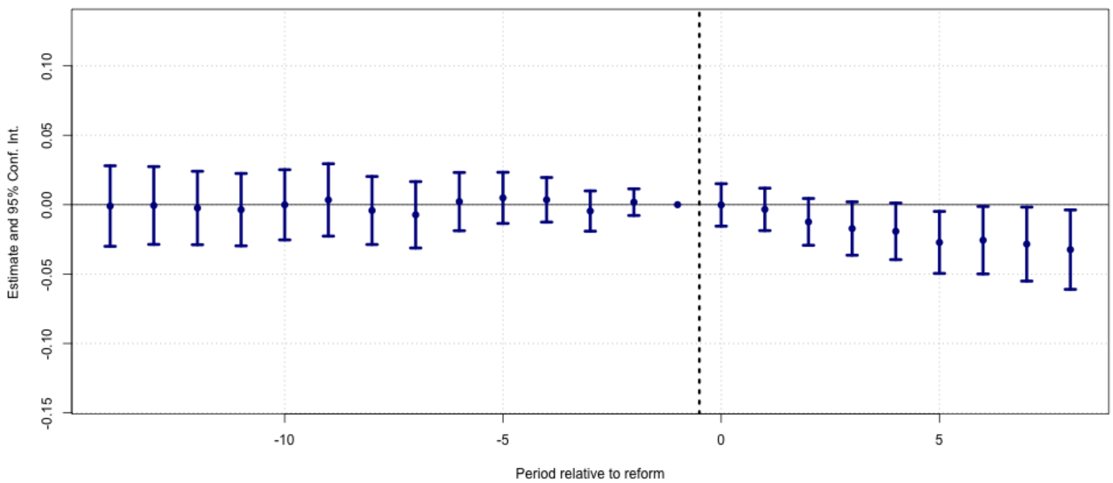
(a) Log total compensation



(b) Log total compensation - Different assumptions on p.s. pre-reform

Notes: This figure shows the estimates θ_k and their 95% confidence intervals from estimating Equation 6 on the natural logarithm of total compensation, i.e. log(yearly wage + profit sharing income). Panel (a) shows the estimates on total compensation and on wages for comparison. In this estimation we assume that profit sharing for treated workers pre-reform was zero. Panel (b) shows the results on total compensation under the assumption that for treated workers their profit sharing income pre-reform was a proportion p of profit sharing post reform, for $p \in \{0.2, 0.33, 0.5\}$. Standard errors are clustered at the establishment level.

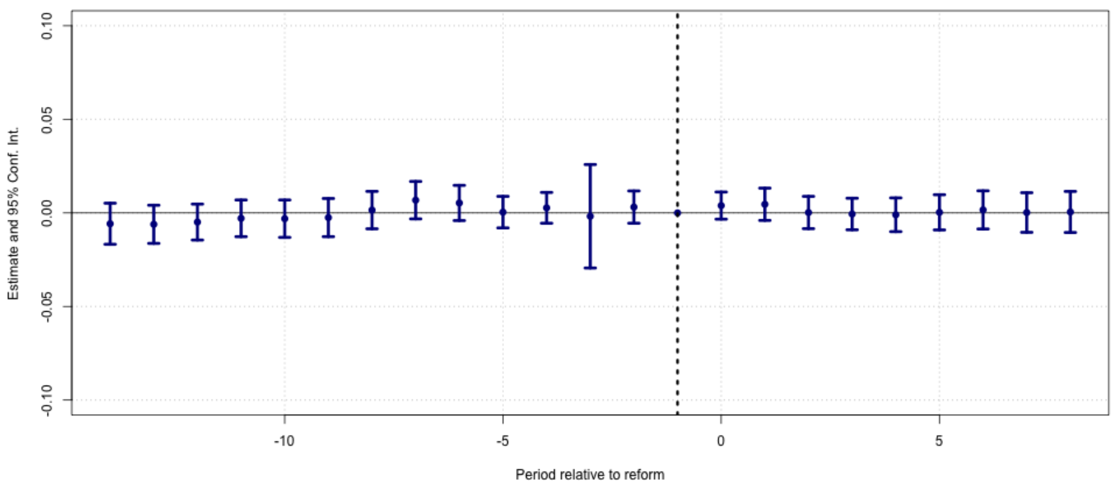
Figure 17: Effect on total employment - Conventional outsourcing



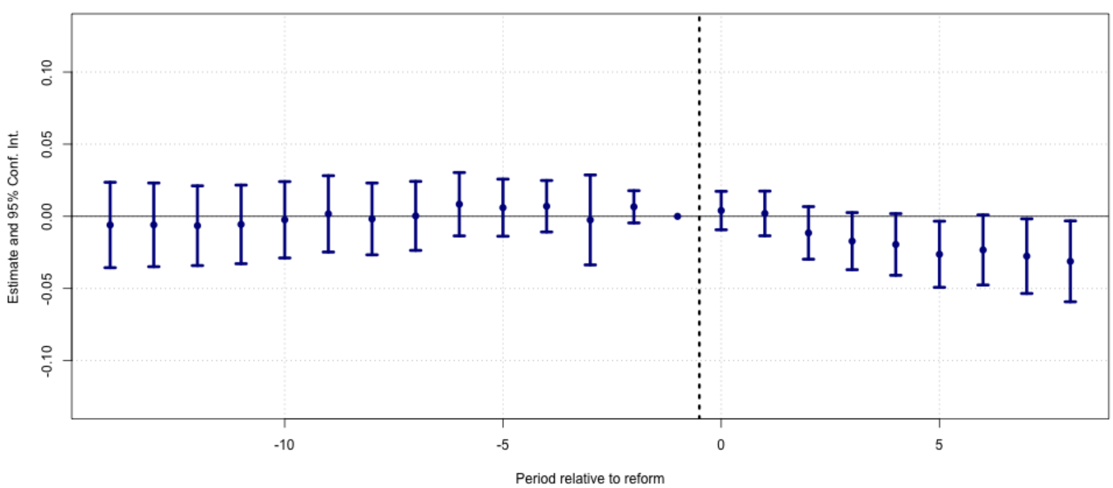
Notes: This figure plots the θ_k from equation 5 and 95% confidence intervals. The estimation is carried out on a balanced panel of establishments from EMIM between 2017 and 2022. Treatment group includes establishments with positive outsourcing before the reform, but lower than 95% (conventional outsourcing). Control group includes establishments with no outsourcing before the reform. Establishments outsourcing over 95% of workers before the reform (full outsourcing) are excluded from the estimation. The outcome variable is the log of the total number of workers (outsourced + in-house). θ_{Q42020} is normalized to 0. Standard errors are clustered at the establishment level.

Figure 18: Effect on hours worked - Conventional outsourcing

(a) Effect on average hours worked



(b) Effect on total hours worked



Notes: This figure plots the θ_k from equation 5 and 95% confidence intervals. The estimation is carried out on a balanced panel of establishments from EMIM between 2017 and 2022. Treatment group includes establishments outsourcing over 95% of workers before the reform (full outsourcing). Control group includes establishments with no outsourcing before the reform Establishments with positive outsourcing before the reform, but lower than 95% (conventional outsourcing) are excluded from the estimation. The outcome variable is the log of the total number of hours worked(by outsourced + in-house workers). θ_{Q42020} is normalized to 0. Standard errors are clustered at the establishment level.

Tables

Table 1: Transition Matrix by establishment type

	Full outsourcing	Conventional Outsourcing	Control
Full outsourcing	0.969	0.022	0.009
Conventional Outsourcing	0.025	0.853	0.122
Control	0.002	0.014	0.984

Notes: This table displays the yearly transition matrix across establishment types. The number in each cell in row r column c corresponds to the proportion of establishments that were classified as r in a certain year that were classified as c in the following year. The proportions are calculated across a balanced sample of establishments in EMIM from 2017 to 2020.

Table 2: Summary Statistics on EMIM establishments by outsourcing use - 2018

Variable	Full Outsourcing	Conventional Outsourcing	Control	All
N	1629	855	5581	8065
Total workers at establishment	410	547	399	417
Prop workers outsourced	0.96	0.23	0.01	0.23
Estab. outsourcing > 95%	0.97	0.03	0.01	0.21
Profit	108335	87746	61794	73946
Revenue per worker	4443	1877	1744	2303
VA per worker	1808	861	816	1021
Investment per worker	65	41	23	34
Foreign	0.42	0.48	0.31	0.35
Prop. women	0.28	0.33	0.34	0.32
Prop white collar	0.27	0.24	0.21	0.23
Profit sharing	46	3855	3036	2519
Training costs	211	5136	1098	1347
Registered in IMSS	0.27	0.93	0.9	0.78

This table displays the average value of different variables across the three different outsourcing groups and for all establishments in EMIM. Figures are computed using EMIM data from 2018 and the INEGI 2019 Economic Census. Nominal variables are in thousands of Mexican Pesos (2018 value).

Table 3: Sector - level regressions on seasonality and outsourcing use

Dep Vbles:	tot workers seasonality	revenue seasonality	blue collar seasonality	white collar seasonality
Intercept	0.008**	0.05***	0.007	0.012***
	(0.003)	(0.007)	(0.004)	(0.002)
Prop Full Outs.	-0.01	-0.02	-0.01	-0.007
	(0.009)	(0.03)	(0.01)	(0.006)
Prop Convent Outs.	0.07*	0.12*	0.11*	-0.007
	(0.04)	(0.07)	(0.06)	(0.02)
Observations	86	86	86	86

Notes: This table contains the results of a sector-level regression where the outcome variables are different measures of sector specific seasonality. The Coefficients of interest in rows 2 and 3 are the proportion of establishments in each sector belonging to each outsourcing group. Seasonality is measured as the the average sectoral seasonal component of employment. Both variables are divided by average sectoral employment. We control for average establishment size in every column. Robust standard errors are in parentheses. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

Table 4: Outsourcing and employment volatility

	Volat Total Workers	Volat Blue Collar
Full Outsourcing	-0.003	-0.003
	(0.0017)	(0.002)
Convent. Outsourcing	0.007**	0.009***
	(0.003)	(0.003)
Observations	290,340	288,408

Notes: This table shows the results of a regression of establishment-level volatility on a binary variable equal to 1 if the establishment is classified as full outsourcing and another equal to 1 if the establishment belongs to the conventional outsourcing group. Volatility is measured as the within-establishment yearly standard deviation of the de-trended employment. All specifications control for establishment size and include 4 digit sector fixed effects

Table 5: Elasticity of total workers with respect to revenue

	(1) log(workers)	(2) log(workers)	(3) log(in-house)	(4) log(outsourced)
log(revenue)	0.0044*** -	-	-	
	(0.0003)	-	-	-
log(revenue) x Conv. Outs.	0.0019**	0.0062***	0.0039***	0.0145***
	(0.0008)	(0.0007)	(0.0012)	(0.0028)
log(revenue) x Full Outs.	-0.0007	-	-	-
	(0.0005)	-	-	-
Observations	165,701	12,583	12,425	11,013
Sample	All	Group 2	Group 2	Group 2
Measure	de-trended	de-trended	de-trended	de-trended

Notes: This table shows the results of regressing the logarithm of de-trended values of total workers, total in-house workers or total outsourced workers on de-trended log revenues and establishment fixed-effects. Estimation on the balanced sample of establishments in EMIM. All regressions are carried out for years 2017 to 2019 to avoid the pandemic period. Estimation in the first columns includes all establishments in the sample and includes two dummies indicating whether establishments were classified as full outsourcing or conventional outsourcing. Estimation in columns (2) to (4) is carried out on the subsample of only conventional outsourcing establishments. De-trended revenue is standardized at the establishment level to make coefficients comparable across columns. All regressions are carried out for years 2017 to 2019 to avoid the pandemic period. Clustered standard errors at the establishment level are in parenthesis.

Table 6: Summary Statistics on profit sharing

	Full Outsourcing	Control
Yearly profit sharing	3205	2666
	(7212)	(6665)
Yearly profit sharing / L	7.95	7.04
	(14.26)	(23.43)
Profit sharing over monthly wage costs 2022	0.51	0.49
	(1.16)	(1.25)
Profit sharing over monthly wage costs 2021	-	0.5
	-	(1.53)
Profit sharing over monthly wage costs 2019	-	0.55
	-	(1.33)

Table 7: Difference in Differences estimates for post-reform period

2*Model	First stage			Employment effects		
	Share outsourced	Any outsource	Outsource > 95%	log(total workers)	log(tot hw)	log(avg hw)
	(1)	(2)	(3)	(4)	(5)	(6)
2021-Q1	-0.0310***	-0.0323***	-0.0332***	0.0007	-0.0005	-0.0012
	(0.0039)	(0.0040)	(0.0041)	(0.0035)	(0.0040)	(0.0025)
2021-Q2	-0.0594***	-0.0584***	-0.0636***	0.0067	0.0076	0.0006
	(0.0051)	(0.0051)	(0.0053)	(0.0052)	(0.0056)	(0.0031)
2021-Q3	-0.5392***	-0.4948***	-0.5574***	0.0142**	0.0091	-0.0054
	(0.0102)	(0.0106)	(0.0104)	(0.0069)	(0.0073)	(0.0036)
2021-Q4	-0.7481***	-0.6974***	-0.7662***	0.0079	0.0131	0.0049
	(0.0100)	(0.0111)	(0.0100)	(0.0094)	(0.0096)	(0.0036)
2022-Q1	-0.8185***	-0.7658***	-0.8382***	0.0074	0.0126	0.0049
	(0.0093)	(0.0106)	(0.0092)	(0.0098)	(0.0099)	(0.0038)
2022-Q2	-0.8422***	-0.7897***	-0.8603***	0.0076	0.0163	0.0084**
	(0.0088)	(0.0103)	(0.0087)	(0.0103)	(0.0106)	(0.0040)
2022-Q3	-0.8532***	-0.7978***	-0.8708***	0.0103	0.0170	0.0064
	(0.0086)	(0.0101)	(0.0085)	(0.0107)	(0.0109)	(0.0041)
2022-Q4	-0.8569***	-0.8007***	-0.8742***	0.0120	0.0141	0.0017
	(0.0085)	(0.0101)	(0.0084)	(0.0114)	(0.0114)	(0.0041)
2023-Q1	-0.8632***	-0.8070***	-0.8803***	0.0150	0.0165	0.0011
	(0.0083)	(0.0100)	(0.0082)	(0.0116)	(0.0117)	(0.0042)
Observations	540,633	540,633	540,633	540,633	537,387	537,387

Note: This table shows the estimated β_k from Equation 5 for the post-reform period. Treatment group includes establishments outsourcing over 95% of workers pre-reform. Control group includes establishments with no outsourcing in the year pre-reform. Outcome for column (1) is share of workers outsourced, for (2) it is a binary variable = 1 if the establishment outsourced (3) is a binary = 1 if the establishment outsourced over 95% of employees (4) is log of total workers (outsourced + in-house) (5) if total hours worked (6) is average hours worked at the establishment. All specifications include establishment fixed effects, sector x date fixed effects and six size-group specific time trends. Standard errors clustered at the establishment level are in parenthesis. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

Table 8: Difference in Differences estimates for profit sharing

	Profit sharing / L	Profit sharing total
	(1)	(2)
2017	-0.2649	142.1
	(0.5882)	(260.9)
2018	-0.6761	-596.5
	(0.5062)	(387.6)
2019	-0.3303	-297.1**
	(0.2093)	(144.9)
2021	0.3612	-37.62
	(0.2595)	(144.0)
2022	6.530***	3,321.9***
	(0.4346)	(605.0)
Observations	43,260	43,260

Table 9: Summary Statistics on workers from IMSS

Variable	Insourced by full outsourcing	Not insourced firm not using outsourcing	Not insourced firm using outsourcing
N	71490	226313	72242
Log wage (daily)	6.09	5.81	6.04
Share women	0.3	0.37	0.38
Age	35.46	36.69	35.64
Proportion changed employer	0.19	0.16	0.17
Proportion experienced block movement	0.07	0.04	0.03
Size. current firm	1453	1023	3373
Size insourcing firm	1704	-	-

Notes: This table shows summary statistics of worker-level characteristics computed using social security data from 2017 to 2020. The statistics are computes on a 10% random sample of workers. The first column represents workers who were insourced by a full outsourcing establishment after the reform. The second column represents workers who were not insourced and were working for firms that were not using outsourcing (control group). The third column represents workers who were not insourced post reform, but were working for firms that did insource other workers, i.e. were using outsourcing pre-reform. Nominal variables are in Mexican pesos (2019 value).

Table 10: Difference in Differences regressions on log wages

	(1) 2-Y Tenure	(2) 4-Y Tenure	(3) 1-Y Tenure	(4) Control Grp 2	(5) Control Grp 1 + 2	(6) Unbalanced Panel
Treat x Year = 2017	-0.0084*	-0.0034	-0.0090*	-0.0089	-0.0059	-0.0101**
	(0.0050)	(0.0052)	(0.0049)	(0.0069)	(0.0051)	(0.0048)
Treat x Year = 2018	0.0006	0.0042	-0.0004	-0.0020	0.0016	-0.0013
	(0.0039)	(0.0039)	(0.0038)	(0.0058)	(0.0040)	(0.0036)
Treat x Year = 2019	-0.0010	0.0005	-0.0020	-0.0021	-0.0010	-0.0020
	(0.0030)	(0.0030)	(0.0030)	(0.0046)	(0.0030)	(0.0029)
Treat x Year = 2021	-0.0027	-0.0030	-0.0017	-0.0048	-0.0030	0.0028
	(0.0031)	(0.0030)	(0.0030)	(0.0049)	(0.0031)	(0.0028)
Treat x Year = 2022	-0.0161***	-0.0154***	-0.0153***	-0.0150**	-0.0146***	-0.0093*
	(0.0049)	(0.0050)	(0.0049)	(0.0074)	(0.0052)	(0.0048)
Observations	736,971	664,627	759,852	369,772	851,763	957,857

Note: This table shows the results of estimating equation 6 on different samples. Column (1) restricts the sample to workers with 2 years of tenure pre-reform, (2) restricts to 4 workers with 4 years of tenure (3) changes the control group to workers who were not outsourced but worked in firms that did do outsourcing pre-reform (4) includes the original control group and workers in (3), (5) restricts the sample to workers with one year of tenure pre-reform, (6) runs the regression for an unbalanced panel, restricting the sample to workers employed at least 3 of the 6 years considered. Standard errors clustered at the firm level are in parenthesis. All specifications include worker fixed effects, year x sector fixed effects and year x state fixed effects Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

Table 11: Difference in Differences regressions on log total compensation

	Dependent variable : log(wages + profit sharing)				
	(1)	(2)	(3)	(4)	(5)
Treat x Year = 2017	-0.0099	-0.0124**	-0.0073	-0.0063	-0.0045
	(0.0061)	(0.0059)	(0.0080)	(0.0053)	(0.0052)
Treat x Year = 2018	-0.0011	-0.0033	-0.0009	-5.44×10^{-5}	0.0008
	(0.0044)	(0.0043)	(0.0053)	(0.0040)	(0.0039)
Treat x Year = 2019	-0.0008	-0.0003	-0.0033	-0.0023	-0.0019
	(0.0038)	(0.0032)	(0.0045)	(0.0030)	(0.0030)
Treat x Year = 2021	-0.0069**	-0.0060*	-0.0057*	-0.0042	-0.0032
	(0.0034)	(0.0034)	(0.0034)	(0.0030)	(0.0030)
Treat x Year = 2022	0.0206***	0.0219***	0.0234***	0.0198***	0.0182***
	(0.0064)	(0.0058)	(0.0066)	(0.0050)	(0.0050)
Observations	537,108	537,108	307,576	662,991	664,627
Group to aggregate profit sharing data	sector-size-state-outsourcing grp	sector-size-state-outsourcing grp	sector-size-state-outsourcing grp	sector-size-outsourcing grp	outsourcing grp

Note: This table shows the results of estimating equation 6 when the logarithm outcome variable is total compensation, i.e. wages + profit sharing, using different specifications In columns (1) to (3), profit sharing is aggregated at the sector x region x firm size group x outsourcing group x year level to get an estimate of profit sharing per worker for each group. Column (1) distributes profit sharing across workers using establishment-level data on information on blue-collar and white-collar wages in EMIM. Column (2) distributes profit sharing across workers using wage information from IMSS. Column (3) is estimated on the subsample of workers belonging to groups with less than 10 establishments. In Column (4) profit sharing is aggregated at the sector x firm size group x outsourcing group x year level. In Column (5) profit sharing is aggregated at the outsourcing group x year level. Standard errors clustered at the group level in the first three columns and at the group level in the last two. Codes: ***: 0.01, **: 0.05, *: 0.1

Table 12: Effect of the reform on employment dynamism

	p = 2%	p = 5%	p = 10%	p = 20%
Post x FullOuts	-0.015	-0.0095	0.0008	-0.0030
	(0.0103)	(0.0097)	(0.0060)	(0.0034)
Post x ConvOuts	-0.014	-0.013	-0.012**	-0.007**
	(0.01)	(0.009)	(0.005)	(0.003)
Observations	320,261	320,261	320,261	320,261
Full Outs. pre-reform mean	0.37	0.18	0.08	0.03
Conv. Outs pre-reform mean	0.45	0.25	0.12	0.04

Notes: This table shows the results of the estimation of 7 for different values of p. Establishment fixed-effects are included in all columns. The estimation sample is a balanced panel of establishment from EMIM. Pre-reform period is restricted to January 2017- December 2018. Post-reform period is restricted to December 2021-November 2022. Clustered standard errors at the 4d sector level are in parenthesis. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

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A Appendix A

Figure A.1: Effect of the reform on the proportion of outsourced employees

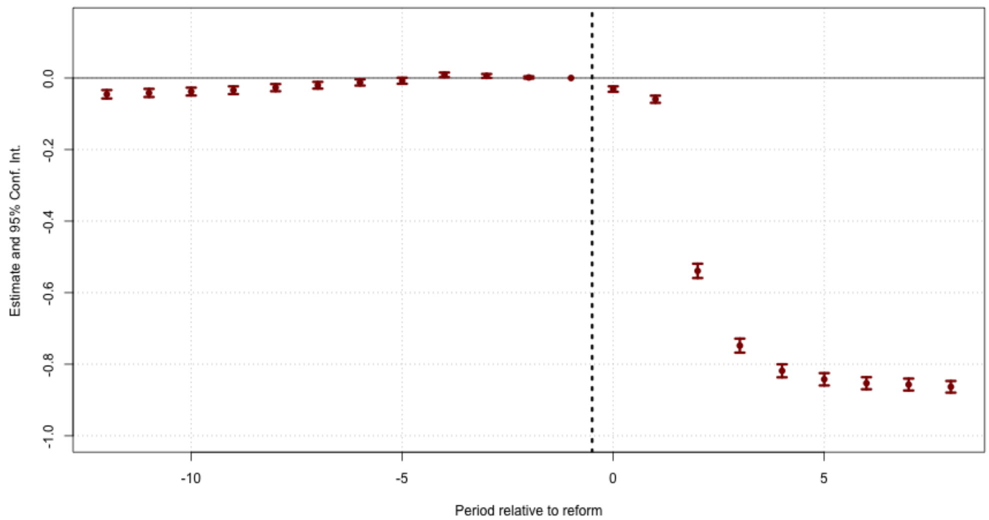


Figure A.2: Effect of the reform on the number of in-house employees

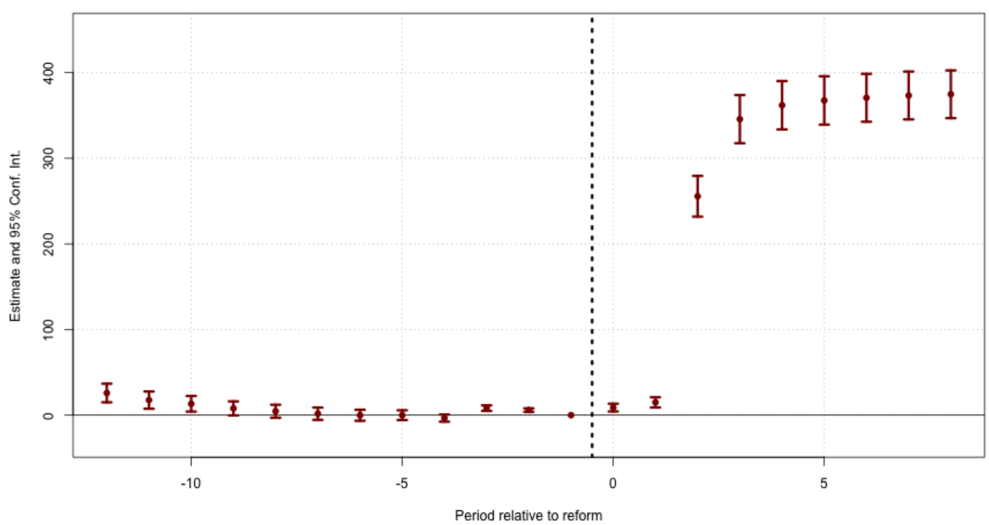


Figure A.3: Total, in-house and outsourced workers in conventional outsourcing establishments - Selected sectors

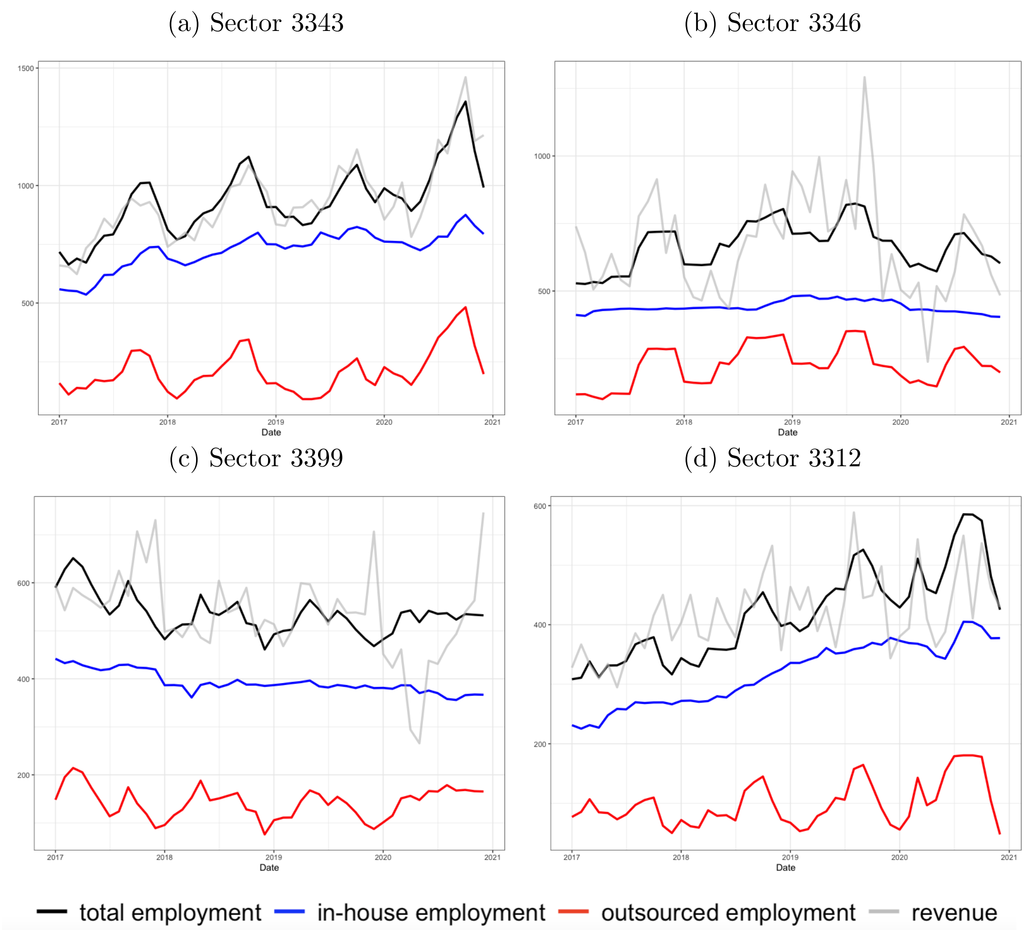


Figure A.4: Evolution of firm size of surviving contracting firms post-reform

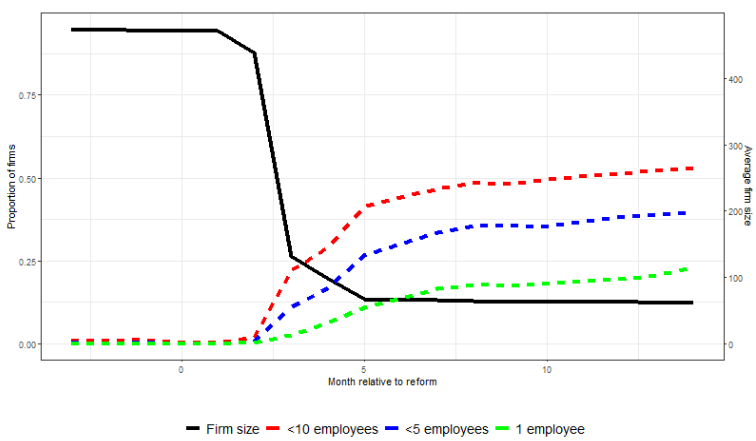
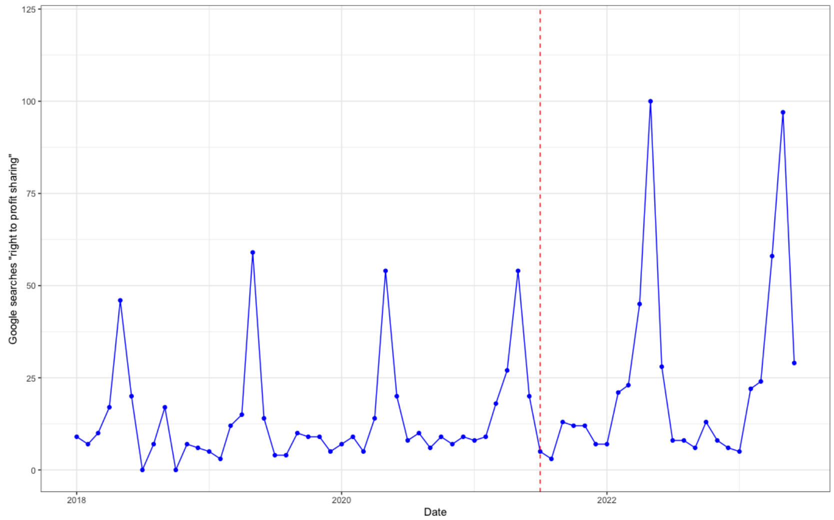
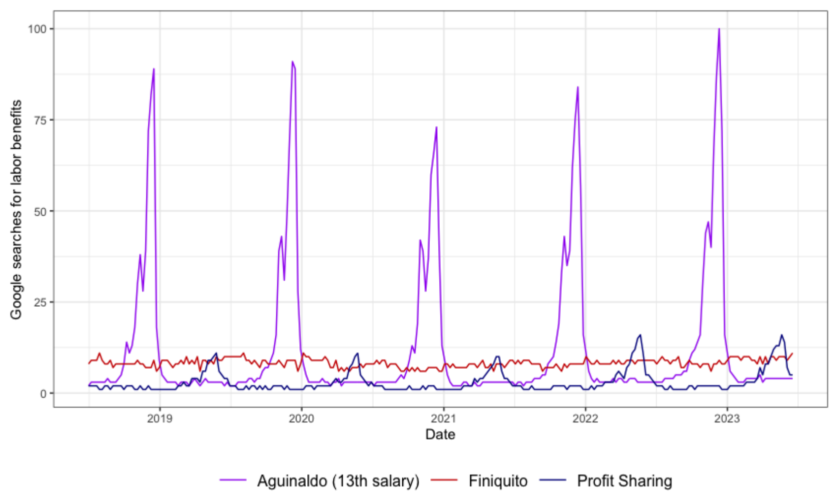


Figure A.5: Google searches for ‘profit sharing‘ and other labor benefits - Google trends

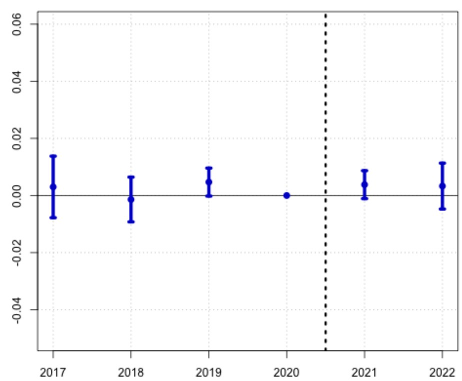


(a) Google searches for ‘right to profit sharing‘

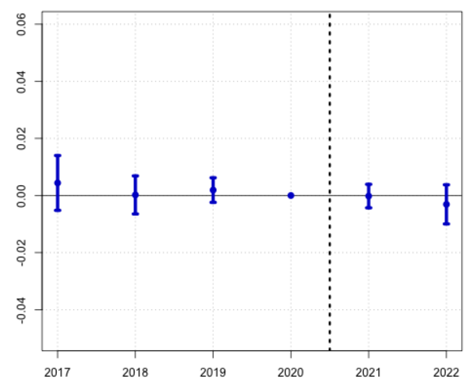


(b) Google searches for ‘profit sharing‘ compared with other benefits

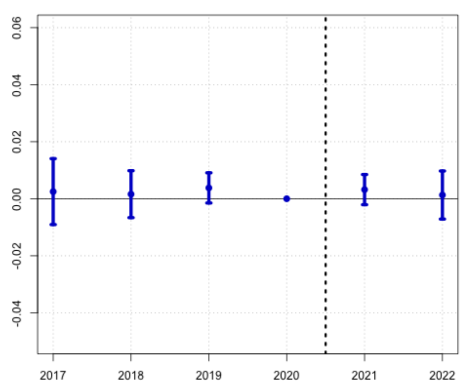
Figure A.6: Change in profit sharing post-reform. Control establishments



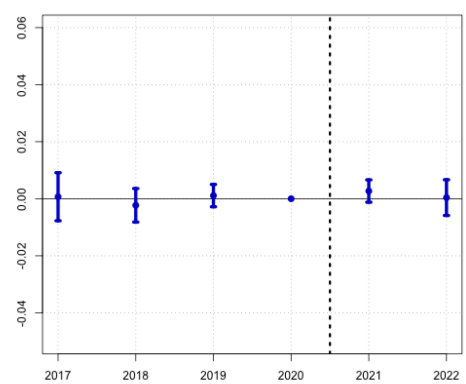
Profit Sharing/Avg wage > 3



Profit Sharing/Avg wage > 4



Profit Sharing/Avg b.c. wage > 3



Profit Sharing/Avg b.c. wage > 4

Table A.1: Employment declines

	tot workers	tot workers	w.collar	w.collar	b.collar	b.collar
Treat	-0.01	0.05**	-0.02	0.06***	-0.01	0.03*
	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
Observations	7,179	6,376	7,179	6,376	7,179	6,376
Treatment group	Full Outs.	Conv. Outs.	Full Outs.	Conv Outs.	Full Outs.	Conv Outs.

Note This table reports the reform's effect on a dummy variable equal to one if an establishment's de-seasonalized employment fell between the period pre-reform and 6 months post-reform. Results are very similar if we consider 12 months post-reform.

Table A.2: Outsourcing and labor market concentration

	Outcome: Indicator = 1 if full outsourcing (1)	(2)	(3)
HHI	0.118***	0.1136**	-
	(0.044)	(0.0460)	-
Labor market share	-	-	0.076**
	-	-	(0.0370)
Observations	6,783	6,783	6,783
Local labor market def	2d sector x munic	3d sector x munic	2d sector x munic

Notes: This table shows the results from an establishment level regression of a binary variable equal to 1 is the establishment is classified as full outsourcing on the Herfindahl-Hirschman index of the local labor market of the establishment in 2018 (columns 1 and 2) and the establishments labor market share (col 3). Local labor market is defined at municipality x 2-digit sector in the first column and municipality x 3-digit sector in the second column. The control group in all columns are establishments with no outsourcing pre-reform. All specifications control of number of workers at the establishment

Table A.3: Difference in Differences estimates for post-reform period - Robustness

	log(total workers) (1)	log(total workers) (2)
2021-Q1	0.0005	-0.0026
	(0.0035)	(0.0055)
2021-Q2	0.0049	0.0066
	(0.0051)	(0.0066)
2021-Q3	0.0119*	0.0142*
	(0.0068)	(0.0078)
2021-Q4	0.0057	0.0057
	(0.0093)	(0.0105)
2022-Q1	0.0054	0.0081
	(0.0097)	(0.0106)
2022-Q2	0.0060	0.0035
	(0.0102)	(0.0112)
2022-Q3	0.0093	0.0061
	(0.0106)	(0.0115)
2022-Q4	0.0107	0.0038
	(0.0113)	(0.0121)
2023-Q1	0.0132	0.0064
	(0.0115)	(0.0123)
Observations	535,458	577,874
Specification	Treatment defined 2 years pre-reform	Unbalanced panel

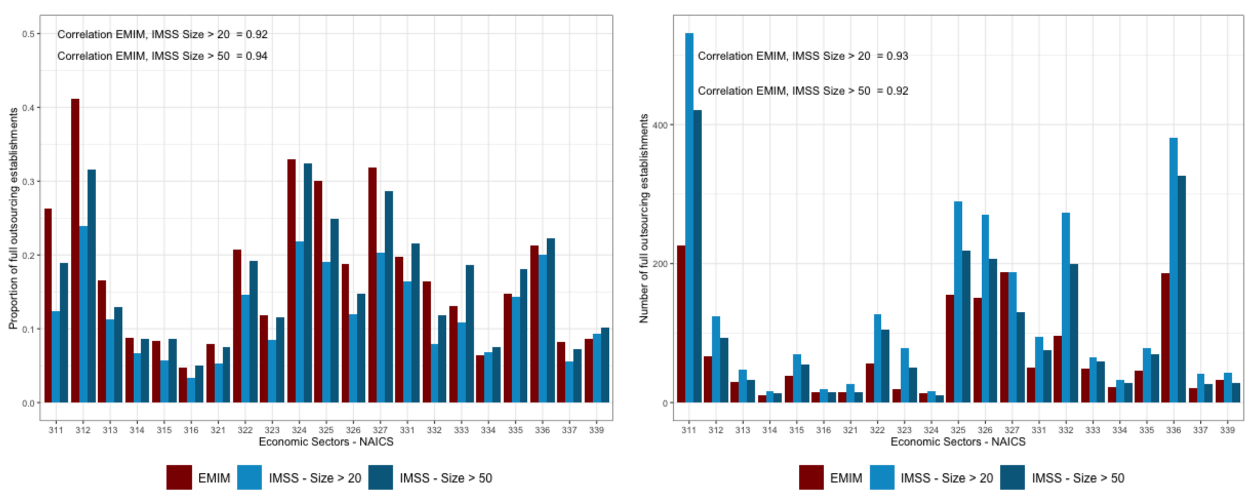
B Appendix B

B.1 Comparing sample in IMSS data and EMIM data

For our results to be valid, it is crucial that the composition of our sample from establishment-level data closely aligns with that of the social security data sample. In other words, it is important that we are observing the same firms and workers in each sample. In this section, we provide evidence supporting the similarity of our samples in each dataset.

We first examine the proportion of full outsourcing establishments in each dataset. The relevant comparison group in EMIM are the full outsourcing establishments that insourced their workers (i.e. the compliers), as we are only able to identify full outsourcing establishments in the social security data if they insourced their workers during the reform. By January 2022, 17.2% of all establishments in EMIM fell into this category. When we restrict the IMSS dataset to establishments with over 20 employees, this proportion is 12%, and it stands at 16.8% when we further narrow the sample to establishments with more than 50 employees (we restrict the IMSS sample to align with EMIM, which strongly overrepresents large establishments in Mexico).

Figure B.1 visually demonstrates the correlation in the distribution of full outsourcing establishments across sectors in the various datasets. Barplots in Panel A depict the proportion, while Panel B illustrates the number of full outsourcing establishments in each 3-digit NAICS economic sector. We calculate these proportions using EMIM data, IMSS data with a sample restriction to establishments with over 20 employees, and IMSS data with a sample restriction to establishments with more than 50 employees. We can see that the distribution of full outsourcing establishments looks very simimlar in both datasets.



(a) Proportion of full outsourcing estab. per sector

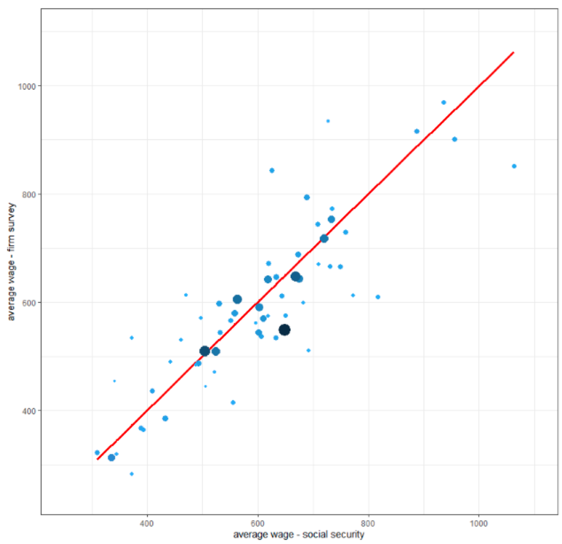
(b) Number of full outsourcing estab. per sector

Figure B.1: Distribution full outsourcing establishments by economic sector. EMIM and IMSS data

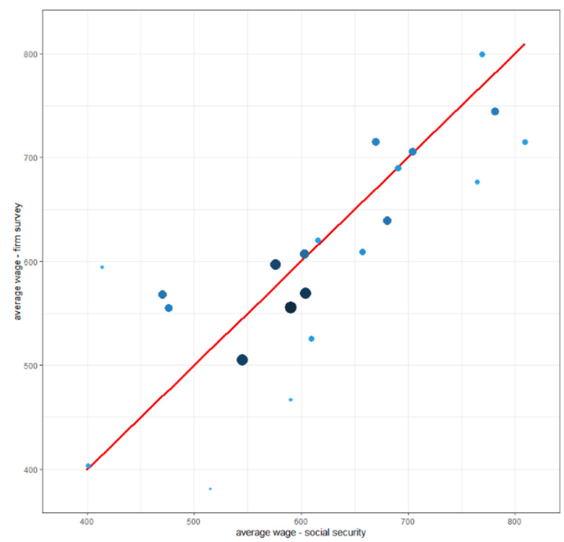
Second, we compare measurements on average wage paid by establishments in each dataset. We divide each dataset into groups and we calculate the average wage paid by establishments using both

IMSS and EMIM data. Figure B.2 shows the relationship between the average wage measured in IMSS and in EMIM when we group establishments by outsourcing use (full outsourcing, conventional outsourcing and no outsourcing) and sector (Panel a), and by outsourcing use and region (Panel b). In each graph, every dot represents a group, with the dot size reflecting the number of workers included in each group. For easy reference, we include the 45-degree line in each graph. Notably, the average wages measured in each dataset are remarkably similar, with a correlation of 0.76 for sector groups and 0.75 for region groups. This underscores the consistency in the measurement of average wages between IMSS and EMIM datasets.

Figure B.2: Average wage by establishment groups - EMIM and IMSS



(a) Groups by sector and outsourcing use



(b) Groups by region and outsourcing use

B.2 Establishment Exit from EMIM

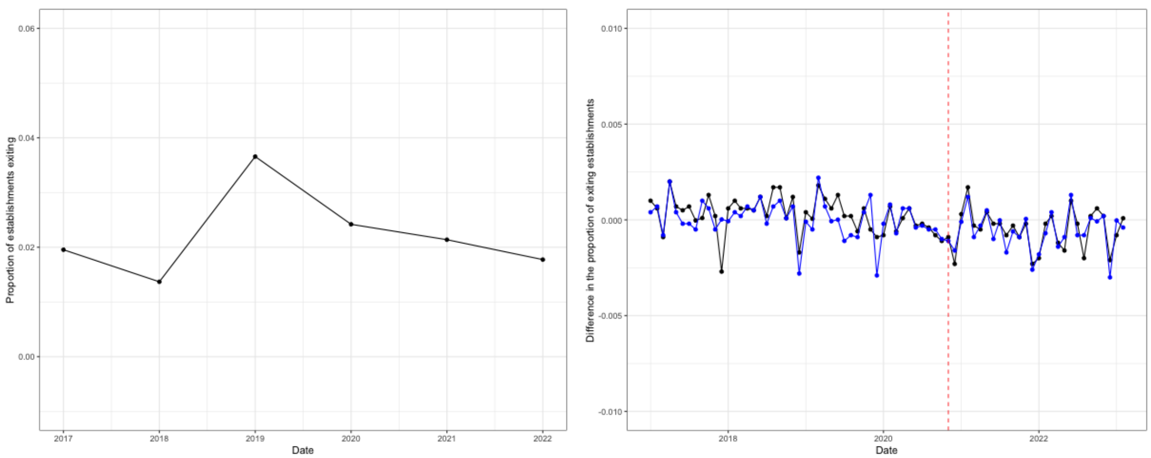
As is mentioned in Section 4.1, the establishment surveys do not provide any information on why an establishment exits the survey sample. An establishment that ceases to appear in or sample may have exited the sample because it suspended it's operations, switched to industries not covered by the survey, merged with other establishments or failed to answer the survey for some other reason (Verhoogen, 2008). Because we are not able to distinguish each of these reasons, and each reason would have a very different economic interpretation, we work with a balanced sample of establishments in our main analysis. In this section, we show that the patterns in exit do not change around the time of the reform. This suggests that the reform did not affect establishments' exit decisions. Thus, using the balanced sample of establishments in our main analysis does *not* condition on an endogenous outcome of the reform (i.e. not exiting).

Panel (a) of Figure B.3 shows the proportion of establishments exiting the EMIM sample in each year from 2017 to 2022. We do not find evidence of particularly high or low exit in the post-reform years 2021 and 2022. In Panel (b) we compare exit rates across time between outsourcing and non outsourcing establishments. The blue line represents the difference in the proportion of establishments exiting in each period between establishments using outsourcing and in 2017 and those not outsourcing any workers. The black line shows this same difference dividing establishments into those outsourcing over 95% of workers and those falling below this threshold. We do not find evidence indicating changes in this differential exit rate following the reform, thereby suggesting the absence of endogenous exit dynamics.

Figure B.3: Yearly establishment exit from EMIM

(a) Yearly exit from EMIM

(b) Differential exit in outsourcing establishments



B.3 Evidence on profits of contracting firms

We argue in Section 5.2.1 that full outsourcing firms were outsourcing all or most of their workers to contracting firms, ensuring that these contracting firms had zero profits, or lower profits than the parent firms, and thus avoiding profit sharing contributions with their workers. Evidence on parent firms having zero profit sharing is clear. Showing that contracting firms had zero or low profit sharing is challenging with our data, which does not allow us to link parent and contracting firms. However, if the contracting firm were to have positive profits sharing payments, it must have had positive profits. These positive profits would be included in the variable registered in EMIM which indicates the amount the parent firm paid to the contracting firm:

$$payments\ to\ contracting\ firm = wages + other\ costs + profit^{44}$$

We can also write this expression as:

$$payments\ to\ contracting\ firm = wages + social\ benefits + other\ costs + \underbrace{0.1 * profit}_{\text{profit sharing}} + 0.9 * profit^{45}$$

[44] In this expression, wages includes social benefits such as social security contributions

[45] These other costs included in the payments to outsourcing can include training costs, employee transport costs,

$$payments\ to\ contracting\ firm = \underbrace{wages + other\ costs + profit\ sharing\ benefits}_{\text{outsourcing labor costs}} + 0.9 * profit$$

$$outsourcing\ labor\ costs = payments\ to\ contracting\ firm - 0.9 * profit$$

$$outsourcing\ labor\ costs = payments\ to\ contracting\ firm - 0.9 * \frac{profit\ sharing\ benefits}{0.1}$$

This last expression allows us to estimate total outsourcing costs under different assumption of profit sharing benefits distributed by the contracting firms pre-reform. We then estimate the effect of the reform on labor costs, under different assumptions for profit sharing benefits pre-reform. Note that the proportional change in measured costs is:

$$\Delta\%costs = \frac{wages_{post} + profit\ sharing\ benefits_{post}}{outsourcing\ labor\ costs_{pre}} - 1$$

Or, using the expression above:

$$\Delta\%costs = \frac{wages_{post} + profit\ sharing\ benefits_{post}}{payments\ to\ contracting\ firm_{pre} - 0.9 * \frac{profit\ sharing\ benefits_{pre}}{0.1}} - 1$$

This expression shows that higher the pre-reform profit sharing benefits assumed, the lower are the payments to the contracting firm which correspond to employment costs, because a higher proportion of payments corresponds profits. Thus, higher assumed profits of contracting firms push down full outsourcing firms' measured costs pre-reform and increase the estimated effect of the reform on total labor costs for treated firms. This also allows us to estimate a lower bound for the effect on wages post reform[46]

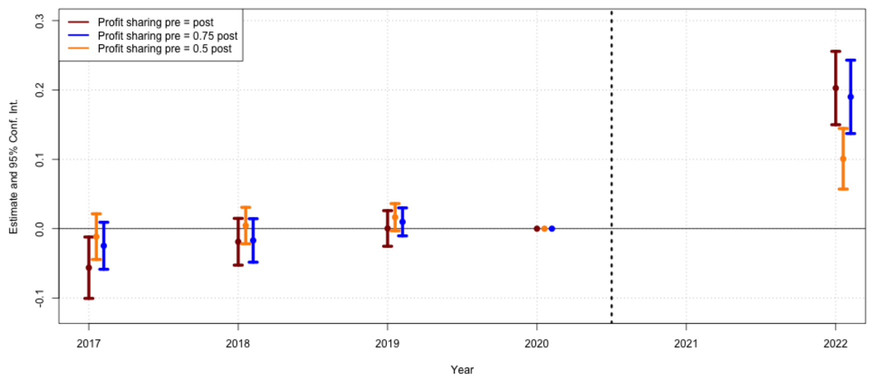
The figure below shows the effect of the reform on total labor costs under three hypothetical scenarios: that profit sharing pre-reform was i) equal to post-reform ii) 75% of post-reform value, and iii) 50% of post reform value.

The results imply that, i) had profits of contracting firms been equal to the parenting firms' profits, then wages post-reform would have had to increase at least around 20% ii) had profit of contracting firms been around 3/4 of parent firms, then wages would have had to increase at least around 17% relative to the control group ii) had profit of contracting firms been around 1/2 of parent firms, then wages would have had to increase at least around 3% post-reform relative to the control group. This is not in-line with the results we find in the social security data. Thus, we conclude that the profit

etc. We discuss the measurement error introduced by the existence of these costs in Section 7

[46]The estimate will be a lower bound due to the existence of the 'other costs' variable

Figure B.4: Hypothetical increase in employment costs under different assumptions of contracting firm profits



Notes:

of contracting firms must have been either zero, or significantly lower than those of full outsourcing firms.

B.4 Potential bias introduced by the cap con profit sharing

When the outsourcing reform was a approved, the Mexican government also introduced a specific limit on the total shared profits per employee. The formulation of this cap was the outcome of negotiations between policymakers and corporate stakeholders conducted before the implementation of the outsourcing reform. This limit was calculated based on the higher of two values: either three times the monthly salary of the employee or the average profit sharing amount received over the past three years. Consequently, if an employee's corresponding profit sharing income in 2022 surpassed *both* three times their monthly salary and the average received in the previous three years, the cap would come into effect. In such instances, the employee would receive the higher amount between these two values. Consequently, control firms that had been distributing profit sharing contributions exceeding three times the monthly wages before the reform might be impacted by this cap, particularly if 2022 turned out to be an exceptionally profitable year. This cap could have reduced employment costs for these control firms, potentially introducing a bias into our results. We provide evidence that any potential effects of the cap on the control group were likely to be minimal.

Unfortunately, we lack precise data on the exact profit sharing amounts received by individual workers in the EMIM dataset. Nevertheless, we estimate the average profit sharing contributions per worker and their relationship with the average wage paid to blue-collar workers. We estimate profit sharing as a proportion of blue-collar wages, as these workers that should receive higher profit sharing as a proportion of their wages. We find that only around 3% of control firms reported profit sharing contributions exceeding three times monthly blue-collar wages between 2017 and 2020. Additionally A.6 in the Appendix, displays the results of an event-study estimation exclusively for the control group. In these regressions, the outcome variable is binary, taking the value of one if profit sharing per employee exceeded 3 or 4 monthly wages that year. The results do not show evidence of the reform having had a negative effect on profit sharing costs for control firms. In summary, the introduction of the profit-sharing cap, is unlikely to significantly impact the results, as the evidence suggests that the majority of control firms did not surpass the cap threshold, and the event-study analysis does not reveal a negative effect on profit-sharing costs.

C Appendix C: Theoretical Model

In this section, we show the analytical solution for the model presented in Section 6. To solve the model, we start by deriving the optimal firm choice of wages, and profit sharing in two scenarios. The first is the scenario in which the firm decides to pay k, avoid mandatory profit sharing and can freely choose w_j and ps_j. In the second scenario the firm decides not to avoid mandatory profit sharing. In this case, ps_j is determined by the firms' pre-profit sharing profits, and the firms decides optimally on w_j. We then compare post-profit sharing profits in both scenarios to derive an optimal decision rule regarding whether to avoid mandatory profit sharing or not.

C.1 Optimal labor and wages for each scenario

Case 1: If firm avoids mandatory profit sharing

If firm decides to avoid mandatory profit sharing, the firm can freely choose w_j and ps_j

Firm maximizes:

$$\max_{w_j, ps_j} \; z_j n_j - w_j n_j - ps_j n_j \tag{8}$$

subject to:

$$n_j = (\beta_w w_j + \beta_{ps} ps_j)^{\theta} \tag{9}$$

Solving the firm's maximization problem, we get:

$$w_j = \begin{cases} z_j \frac{\theta}{\theta+1} & \text{if } \beta_w \geq \beta_{ps} \\ 0 & \text{if } \beta_w < \beta_{ps} \end{cases} \tag{10}$$

$$ps_j = \begin{cases} z_j \frac{\theta}{\theta+1} & \text{if } \beta_{ps} \geq \beta_w \\ 0 & \text{if } \beta_{ps} < \beta_w \end{cases} \tag{11}$$

$$total\ compensation_j = z_j \frac{\theta}{\theta + 1} \tag{12}$$

The resulting labor n_j and profits π_j are:

$$n_j = \left(max\{\beta_w, \beta_{ps}\} * z_j \frac{\theta}{\theta + 1} \right)^{\theta} \tag{13}$$

$$\pi_j = z_j \frac{1}{\theta+1}\left(max\{\beta_w, \beta_{ps}\} * z_j \frac{\theta}{\theta+1}\right)^{\theta} - k \tag{14}$$

Case 2: If firm does not avoid mandatory profit sharing

If firm decides **not** to avoid mandatory profit sharing, then total profit sharing per worker is a proportion of pre-profit sharing profits (profits before paying out profit sharing contributions to workers):

$$ps_j = \rho(z_j - w_j)n_j \tag{15}$$

And profit sharing per worker is:

$$ps_j = \rho(z_j - w_j) \tag{16}$$

The firm's maximization problem is now:

$$\max_{w_j}(1-\rho)(z_j n_j - w_j n_j) \tag{17}$$

subject to:

$$n_j = (\beta_w w_j + \beta_{ps}\rho(z_j - w_j))^{\theta} \tag{18}$$

Where we replaced ps_j by the expression in Equation 16 in the labor supply function.

Solving the firm's maximization problem, we get:

$$w_j = z_j \frac{\theta}{\theta+1} - \frac{\rho z_j \beta_{ps}}{(1+\theta)(\beta_w - \rho\beta_{ps})} \tag{19}$$

Using Equation 16 again, total compensation will be equal to:

$$total\ compensation = \left(z_j \frac{\theta}{\theta+1} - \frac{\rho z_j \beta_{ps}}{(1+\theta)(\beta_w - \rho\beta_{ps})}\right)(1-\rho) + \rho z_j \tag{20}$$

The resulting labor n_j and post-profit sharing profits π_j are:

$$n_j = \left(\beta_w z_j \frac{\theta}{\theta+1}\right)^{\theta} \tag{21}$$

$$\pi_j = \left(\beta_w z_j \frac{\theta}{\theta+1}\right)^\theta * \left(z_j \frac{1}{\theta+1} + \frac{\rho z_j \beta_{ps}}{(1+\theta)(\beta_w - \rho\beta_{ps})}\right)(1-\rho) \tag{22}$$

C.2 Decision on whether to avoid mandatory profit sharing

The firm will decide to avoid profit sharing if the resulting profits of doing so are greater than the profits of not avoiding:

$$\underbrace{z_j \frac{1}{\theta+1}\left(\beta_w z_j \frac{\theta}{\theta+1}\right)^\theta - k}_{\text{profits when avoiding mandatory p.s.}} \geq \underbrace{\left(\beta_w z_j \frac{\theta}{\theta+1}\right)^\theta \left(z_j \frac{1}{\theta+1} + \frac{\rho z_j \beta_{ps}}{(1+\theta)(\beta_w - \rho\beta_{ps})}\right)(1-\rho)}_{\text{profits when paying mandatory p.s.}} \tag{23}$$

$$k \leq \left(\rho z_j \frac{1}{\theta+1} - \left(\frac{\rho z_j \beta_{ps}}{(1+\theta)(\beta_w - \rho\beta_{ps})}\right)(1-\rho)\right)\left(\beta_w z_j \frac{\theta}{\theta+1}\right)^\theta \tag{24}$$

$$k \leq \left(\rho z_j \frac{1}{\theta+1} - \left(\frac{\rho z_j}{(1+\theta)(\frac{\beta_w}{\beta_{ps}} - \rho)}\right)(1-\rho)\right)\left(\beta_w z_j \frac{\theta}{\theta+1}\right)^\theta \tag{25}$$

$$k \leq \left(\frac{\rho z_j(\frac{\beta_w}{\beta_{ps}} - 1)}{(1+\theta)(\frac{\beta_w}{\beta_{ps}} - \rho)}\right)\left(\beta_w z_j \frac{\theta}{\theta+1}\right)^\theta \tag{26}$$

A few things to note from this expression 26:

- If $\beta_w = \beta_{ps}$ the expression above collapses to $k \leq 0$
- The RHS is increasing in z_j
- The RHS is increasing in $\frac{\beta_w}{\beta_{ps}}$

C.3 An increase in k

As can be seen in Equation 26 increase in the cost of full outsourcing k will lead some firms to shift from avoiding profit sharing to not avoiding. Using Equations 20 and 12. We get an expression for the change in total compensation for these firms:

$$\Delta total\ compensation = \frac{z_j \rho}{1+\theta}\left(1 - \frac{1-\rho}{\frac{\beta_w}{\beta_{ps}} - \rho}\right) \tag{27}$$

Which is increasing in $\frac{\beta_w}{\beta_{ps}}$

Finally, using Equations 21 and 18 we see that:

$$\Delta n_j = 0 \tag{28}$$

D Appendix C: Outsourcing and avoidance of labor benefits in other countries

As mentioned in Section 2 The motivation to outsource employees to avoid paying additional benefits is not unique to Mexico. Ecuador and Peru restricted outsourcing in 2008 and 2022 Reuters (2008); DS 001-2022-TR (2022) with the aim of 'ending worker abuse'. In both countries, the evasion of mandatory profit sharing was one of the reasons for the regulations[47]. More generally, the use of outsourcing to disguise working relationships and evade labor regulations and liabilities is a widely discussed problematic around the world (ILO, 2011). In the United States for instance, the so called 'joint employment relationship' have been a frequent source of legal dispute[48] , where large companies have been accused outsourcing to evade liability for employment law violations, and hinder labor organizing efforts (Epstein et al., 2020; NELP, 2020, 2018; Klein and Humowiecki, 2013) [49]. In the UK, Umbrella Companies have been a recent source of concern for worker rights (HM Treasury UK, 2023). Similarly to the Mexican case, in Europe firms have been found to set up letterbox-type companies which are used to sign contracts with workers, and allow firms to circumvent and avoid labour law (European Parliament, 2017; McGauran, 2016).

[47]Both Ecuador and Perú have profit sharing schemes similar to Mexico regarding coverage and the mandatory nature . France has mandatory profit sharing for firms with more than 50 employees

[48]An example of a legal dispute involving outsourcing is the :Browning-Ferris Case

[49]In fact the Fair Labor Standards Act's (FLSA) broad definition of "employee" aims to cover the so called 'joint employment relationships. The Trump administration passed a rule narrowing the definition of a joint employer under the FLSA. This rule was rescinded by the Biden administration, as it was claimed to weaken critical workplace protections (SHRM, 2021)