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

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Abstract: This paper studies the use of domestic outsourcing to circumvent labor benefits and its consequences for firms and workers. Drawing on longitudinal establishment data and employer-employee data from Mexico, we provide evidence that many firms were outsourcing their entire workforce to avoid mandatory profit-sharing. A model shows that the incentive for this practice arises when firms face a labor supply curve that is less elastic to profit-sharing than to wages. We then leverage a reform that restricted outsourcing to assess the model predictions. The reform caused previously-outsourcing establishments to insource their workers and comply with profit-sharing, with no evidence of an effect on total employment. Treated plants partially offset the profit-sharing increase through lower wage growth, yet total worker compensation increased, consistent with our model. Self-collected survey evidence suggests that inelasticity to profit-sharing is partly explained by information frictions among workers, implying that they benefited from the reform.
Keywords: Outsourcing, Profit-sharing, Labor Market, Market Power
JEL Classification: J08, J41, O12, O14

Resumen: Este artículo estudia el uso de la subcontratación para evitar el pago de ciertas prestaciones laborales y sus consecuencias para empresas y trabajadores. Con información longitudinal de empresas y datos empleador-empleado de México, se sugiere que muchas empresas subcontrataban a prácticamente toda su plantilla para evitar el reparto de utilidades (PTU). Un modelo muestra que surgen incentivos a evitar el PTU si las empresas enfrentan una curva de oferta laboral menos elástica al PTU que al salario. Se utiliza una reforma que restringió la subcontratación para evaluar las predicciones del modelo. Tras la reforma, los establecimientos que subcontrataban reincorporaron a sus trabajadores e iniciaron el cumplimiento del PTU, sin evidencia de efectos sobre el empleo total. Las empresas compensaron parcialmente el aumento en el PTU mediante menor crecimiento salarial, pero la remuneración total por trabajador aumentó, como predice el modelo. Información de encuestas sugiere que la inelasticidad al PTU se debe en parte a fricciones de información entre los trabajadores, lo que implica que estos se beneficiaron con la reforma.
Palabras Clave: Subcontratación, Reparto de Utilidades, Mercado Laboral, Poder de Mercado

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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) and adjustment costs (Bertrand et al., 2021; Macaluso et al., 2023). However, domestic outsourcing has also been shown to deteriorate working conditions for workers in some settings (Goldschmidt and Schmieder, 2017; Drenik et al., 2020).

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). Prior work on this issue has frequently suggested that firms use this arrangement to bypass non-wage labor obligations, such as health insurance and pension contributions (Weil, 2014; Goos et al., 2022), firing costs (Bertrand et al., 2021), and profit-sharing (Infobae, 2019). However, systematic empirical evidence on such firm practices is scarce, and several key questions remain open. What motivates certain firms to use outsourcing to circumvent labor benefits? Moreover, what are the consequences of restricting these avoidance practices? Do such restrictions negatively impact employment? And does enforcing non-wage benefits improve worker compensation, or do firms offset these costs by reducing wages?

In this paper, we study the connection between domestic outsourcing and the circumvention of a particular non-wage benefit in Mexico - mandatory profit-sharing. Our analysis draws on panel data on manufacturing plants, census data on business establishments, and employer-employee data covering the near-universe of private formal workers in Mexico. We document and newly characterize a phenomenon wherein establishments practically outsourced their entire workforce, and provide evidence consistent with that this practice was aimed at avoiding profit-sharing obligations. Furthermore, we develop a theoretical model to understand the conditions under which firms have incentives to avoid profit-sharing, rather

[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).

than to decrease their labor cost using other margins of adjustment - in particular offering lower real wages.[2] We then leverage an outsourcing restriction to show that enforcing profit-sharing led to an increase in worker compensation with no evidence of effects on employment. Using our theoretical framework, we show these results are consistent with firms facing a labor supply curve that is less elastic to profit-sharing than to wages. Through primary survey data, we show that insensitivity to profit-sharing is partly driven by information frictions among workers related to this benefit.

Our analysis proceeds in three steps. First, we unveil a stark pattern in outsourcing practices: previous to a labor reform that disallowed outsourcing, many establishments in Mexico outsourced almost their entire workforce.[3] In a large scale survey of over 8000 manufacturing establishments administered by INEGI (*Instituto Nacional de Estadística y Geografía*, the Mexican national statistics institute), we find that 20% of the sample, representing 66% of plants with positive outsourcing, outsourced practically *all* of their workers. These establishments, which we refer to as *full outsourcing establishments*, reported positive revenues and costs but no legally hired workers.[4] The remaining one-third of plants using outsourcing, referred to as *conventional outsourcing* establishments, had a much lower proportion of outsourced workers (averaging around 20%). Throughout this study, our primary focus lies on the *full outsourcing* establishments, as this allows us to focus on these firms' motivation to circumvent labor benefits.

We present evidence consistent with that some establishments had incentives to outsource the totality of their workers to avoid mandatory profit-sharing obligations.[5] Establishments carrying out this extreme form of outsourcing effectively did not pay any profit-sharing,

[2] Average nominal wages in the manufacturing sector during the 10 year preceding the reform increased approximately 5-6% annually. Therefore firms could have adjusted real wages through lower wage *growth*.

[3] 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 were not randomly selected. Additionally, the government did not provide information on the characteristics of the firms engaging in this practice.

[4] We show in Section 4.1 that the vast majority of outsourcing establishments were either single-establishment firms or belonged to firms where all establishments were fully outsourcing. Therefore, one should think of full outsourcing establishments as mostly belonging to full outsourcing firms.

[5] We use the term 'avoid' rather than 'evade' because this practice was legal prior to the outsourcing reform.

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.[6] We show that alternative reasons for outsourcing such as within-firm wage compression (Goldschmidt and Schmieder, 2017) and volatility in labor demand (Macaluso et al., 2023) are inconsistent with full outsourcing or lack empirical support, suggesting that circumventing profit-sharing was the primary aim of this practice. Additionally, our evidence indicates that profit-sharing avoidance was not a motivation for outsourcing among conventional outsourcing establishments.

Second, we set up a stylized model to understand the incentives behind firms' decision to fully outsource. While it might seem evident at first that profit-sharing avoidance allows firms to reduce labor costs, firms could alternatively be substituting profit-sharing with higher (real) wages, consistent with presence of compensating differentials. Additionally, if full outsourcing did enable firms to lower overall compensation, another key question that arises is why firms would choose to avoid profit-sharing rather than simply offer lower wages.[7] In our model, firms are subject to mandatory profit-sharing payments, which they can avoid by paying a cost and outsourcing all workers. Firms offer workers a compensation bundle of wages and profit-sharing, and face a firm-specific labor supply curve, which depends on both forms of compensation. The key insight is that for full-outsourcing to enable a reduction in worker compensation, the elasticity of labor supply with respect to profit-sharing must be lower than that to wages. This difference in elasticities enables firms that avoid profit-sharing to not fully compensate for it with higher wages, thereby reducing total compensation. In this scenario, highly productive firms will opt to bear the cost of full outsourcing to bypass profit-sharing, consistent with our empirical patterns. We derive three predictions on the effects

[6] We show evidence that the few workers that these establishments did hire in-house were likely to be managers or directors, who are not entitled to profit-sharing benefits. More detail on this is provided in Section 4.2. We also 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.

[7] Unlike the results in Nimier-David et al. (2023), downwards wage rigidity is unlikely to explain why firms can't simply offer lower wages to compensate for profit-sharing payments. Full outsourcing establishments were not constrained by a minimum wage, and the share of workers collective bargaining in Mexico is low.

of restricting this avoidance practice: (i) Total firm employment should not decrease. (ii) Total compensation will rise when labor supply is indeed less elastic with respect to profit sharing than to wages, as firms do not fully compensate the increased profit sharing with lower wages. (iii) The effect on the value of total compensation for workers will depend on the factors driving these elasticity differences.

We empirically explore two reasons behind workers' inelasticity to profit sharing. First, it can partly be attributed to the fact that workers are more risk averse than firms, and value the stable income of wages relatively more than profit-sharing (Nimier-David et al., 2023). If risk aversion alone explained this inelasticity, enforcing profit sharing would not necessarily raise their total value of compensation. In this scenario, an increase in compensation would merely compensate workers for the added risk in their earnings. We propose that another important reason contributing this reduced elasticity are information frictions regarding profit-sharing. Recent research has shown that misinformation on job opportunities can decrease the labor supply elasticity (Jäger et al., 2023), and that individuals are more inelastic to economic fundamentals when decisions are complex (Enke et al., 2024; Gabaix and Graeber, 2024). Building on these findings, we collect primary survey data to show that awareness of profit-sharing among workers in Mexico is low, and that there exist information processing frictions related to the complexity of calculating this benefit. We show that these information constraints further reduce workers' sensitivity to profit-sharing.

Third, we leverage the effect of a strict restriction on outsourcing implemented in 2021 to evaluate our model predictions. We perform a difference-in-differences analysis with longitudinal establishment data where 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. The reform caused most full-outsourcing establishments to insource their workers in-house and start incurring profit-sharing payments. We find no effect on total employment (meaning the sum of outsourced and in-house employment), in line with our model predictions. Moreover, using wage information from social security data, we find that treated establishments offset the increase in profit-sharing by a small decrease in wage growth

relative to the control group.[8] However, average total worker compensation, i.e. wages plus profit-sharing per worker, increased by around 3% post reform, indicating that employers were not able to offset the increase in profit-sharing costs through lower wage growth. Finally, we estimate the impact on the value of total compensation for workers, accounting for the increased risk, under different assumptions on workers' risk-aversion. We find positive impacts on this value even under very conservative risk-aversion assumptions, indicating that previously outsourced workers benefited from the reform. Returning to our model, these results suggest that labor supply is indeed more inelastic to profit-sharing than to wages, and that this inelasticity is partially explained by information frictions. This explains why (i) certain establishments found it optimal to engage in full outsourcing to reduce profit-sharing obligations rather than simply offering lower wages, and (ii) the outsourcing restriction led to an increase in total worker compensation without negatively impacting employment.

Finally, we provide evidence on outsourcing use among conventional outsourcing establishments. For this group, an important reason for outsourcing seemed to be to reduce adjustment costs during temporary changes in activity, a motivation emphasized in the outsourcing literature (Bertrand et al., 2021; Macaluso et al., 2023). Following the reform, these firms experienced a decline in their overall employment levels and a reduction in employment dynamism.

Our paper contributes to the growing literature studying the consequences and the motivations behind outsourcing. Recent research in this area has mostly focused on three main motivations introduced in a seminal work by Abraham and Taylor (1996). First, outsourcing can help firms adjust to changes in labor demand by reducing adjustment costs (Bertrand et al., 2021; Macaluso et al., 2023). Second, 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). Third, outsourcing can allow firms to decrease labor costs, relative to an environment where no labor can be outsourced,

[8] Importantly, nominal wages of treated workers increased by around 12% in the post-reform period. Our negative wage results are due to lower nominal wage growth compared to the control. In Mexico, firms cannot decrease the nominal wages of formally employed workers. This result is based on a worker level regression using a balanced panel of workers.

(Dube and Kaplan, 2010; Goldschmidt and Schmieder, 2017; Drenik et al., 2020; Felix and Wong, 2021), due to the presence of within-firm fairness considerations or rent-sharing. In addition to these motivations, outsourcing has been frequently criticized for enabling firms to bypass liabilities and non-wage benefits such as pension contributions, health coverage and health and safety standards (Epstein et al., 2020; ILO, 2011).[9] Most of these claims rely on qualitative evidence or policy discussions (Weil, 2014; OECD, 2021; HM Treasury UK, 2023; European Parliament, 2017) but systematic empirical evidence on this motive for outsourcing is scarce, and little is known on the factors driving firms to engage in such avoidance practices.[10] [11] We contribute to this literature by providing novel evidence on the circumvention of a labor benefit - profit-sharing - as the main motive for outsourcing among many firms in Mexico. Beyond documenting this phenomenon, we combine empirical evidence with a theoretical model to understand why firms decide to avoid a labor benefit, showing that the incentives are not straightforward to understand when firms have the option of offering lower wages. We further examine the effects of restricting this avoidance practice on both firms and workers.

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. Most recent 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

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

[10] In the book *The Fissured Workplace*, Weil (2014) notes: "Subordinate businesses may provide fewer—or no—benefits in the area of insurance or retirement, lowering the costs to the lead businesses that may draw on them." and provides several examples of these avoidance practices. In a descriptive report on outsourcing in Brazil, Druck (2016) notes "In all occupational categories analyzed, outsourced workers receive either no profit share at all or a fixed, quasi-symbolic share, receive no transportation, daycare, or educational benefits (...)"

[11] A few academic studies have have touched upon this motive descriptively, but they do not disentangle it from other outsourcing rationales nor investigate the underlying incentives driving firms to avoid labor benefits. Dube and Kaplan (2010) show that outsourced workers are less likely to have employer-provided health coverage. Goldschmidt and Schmieder (2017) show 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.

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 3.2). In addition, we leverage detailed establishment data, which measures the number of outsourced and in-house workers at the plant level. While a few studies can also measure outsourcing using establishment data (Bertrand et al., 2021; Micco and Muñoz, 2024; Estefan et al., 2024), none exploit both comprehensive firm-level and individual-level data as we do in this study.[12] Among these studies, a contemporaneous study to ours by Estefan et al. (2024) studies the same Mexican outsourcing reform as this paper. The authors show that the outsourcing reform reduced wage markdowns and, as in our paper, find that restricting outsourcing increased worker compensation without negative effects on employment. Our analysis differs from theirs in three main ways. First, we emphasize and delve into the distinctions between full outsourcing and conventional outsourcing practices. We show that this distinction is crucial to understand the motives behind outsourcing and the consequences of its regulation. Second, a central part of our empirical and theoretical analysis investigates why firms choose to avoid a mandatory labor benefit (profit-sharing) despite having the alternative of offering lower wages. We show that workers' lower elasticity to profit-sharing than to wages helps explain these incentives. We further provide empirical evidence highlighting the role of risk aversion and information frictions in driving this differential elasticity. More broadly, our results highlight how differences in workers' responsiveness to wages and non-wage benefits can help explain why firms may seek to avoid labor benefits when they can adjust total compensation through both margins. Third, Estefan et al. (2024) rely solely on establishment-level manufacturing data to estimate the effect of the reform on total compensation. As discussed in Section 6.1.2, this approach presents significant measurement challenges. Thus, we leverage social security data to identify workers who were insourced during the reform and estimate the reform's impact on worker earnings, offering a more accurate measurement of this outcome. Casco et al. (2024) also examine the effect of the outsourcing restriction on worker wages and employment using social security data. Unlike

[12] Bertrand et al. (2021), Micco and Muñoz (2024), and Estefan et al. (2024) observe the number of workers outsourced using firm survey data from India, Chile, and Mexico. Drenik et al. (2020) identifies the parent company using social security data from Argentina.

our approach, they do not incorporate establishment-level surveys, and thus do not measure profit sharing. Thus, their analysis does not explore the relationship between outsourcing and the avoidance of profit-sharing, a central focus of our paper. They also do not distinguish between full-outsourcing and conventional outsourcing.

In emphasizing the role of outsourcing to circumvent profit-sharing obligations, this project also contributes to the work on profit-sharing (Cahuc and Dormont, 1997; Nimier-David et al., 2023). While mandatory profit-sharing is present in France, Peru and Ecuador, several countries such as Canada, Germany and the USA encourage this practice through tax incentives. Nimier-David et al. (2023) study the effect of mandatory profit-sharing in France on firms and workers. They find profit-sharing is compensated by lower wages for high-skilled workers, but increased total worker compensation for low-skilled workers due to a binding minimum wage. We complement their findings by providing evidence of a practice used by firms to avoid paying profit-sharing contributions to workers, namely outsourcing. Moreover, we show that imperfect substitution between profit-sharing and wages can still exist even if the minimum wage is not binding, if the elasticity of labor supply with respect to each of these components differs. Furthermore, 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.

Finally, this study contributes to the literature on monopsony power in labor markets (Manning, 2004), in particular on how monopsonistic firms set non-wage compensation (Boudreau, 2021; Lagos, 2022; Dube et al., 2022) and the role of worker misinformation in giving firms monopsony power (Roussille, 2024; Jäger et al., 2023). We contribute to this literature by integrating the mechanisms outlined in these two strands research. We suggest that differences in information frictions about non-wage components relative to wages can make workers 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. In this setting, enforcement of these benefits can increase total worker

compensation, as firms do not perfectly substitute them with lower wages. While our focus is on profit-sharing, several amenities such as health insurance or pension benefits hold similarities in the sense that they are less salient (Ouimet and Tate, 2023) or more complex to understand (Chetty et al., 2014; Handel and Kolstad, 2015) than wages.

The rest of the paper is structured as follows. Section 2 describes institutional context. Section 3 presents the data and details on measurement. Section 4 presents evidence on the use of outsourcing to avoid profit-sharing. In Section 5 we present a theoretical framework. Section 6 describes the effects of the outsourcing reform. Section 7 focuses on conventional outsourcing establishments. Section 8 concludes.

2 Institutional Setting

2.1 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[13], newly created firms in the extractive industry, during the exploration period, NGOs, and public institutions (Gobierno de México, 2023).

Within the firm, 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

[13]Up to second year of activity for firms dedicated to the production of a new product.

salaries. Profit-sharing contributions can be deducted from declared profits for corporate tax payments. Additionally, profit-sharing income 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.[14] Additionally, many countries including Canada, Germany and the USA have tax incentives to encourage profit-sharing with workers.

2.2 Outsourcing and the reform

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. An important motivation for this initiative stated by the Secretariat of Labor (*Secretaría del Trabajo y Previsión Social*, STPS) was to stop the 'abusive schemes' facilitated by outsourcing (STPS, 2021). The final version of reform was approved in April 2021. Firms had until July 2021 to adapt to the main changes.[15] The main changes implemented were (LFT, 2021):

- The outsourcing of workers for core activities[16] of the firm was prohibited.
- All employment agencies must register in a new registry of the Ministry of Labor (REPSE), for which they must comply with certain labor regulations.

[14] 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.

[15] Some fiscal measures came into effect on September 2021.

[16] The core activity of a firm was defined as the activities included in the company's objects clause (*objeto social*) (LFT (2021), art. 13)

- Three times per year, employment agencies must 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 its effect on on small firms who relied on the flexibility given by this type of labor arrangement.[17]

3 Data and Measurement

3.1 Main datasets

The main datasets used in this project can be divided into two data blocks. Each data block allows us to measure different 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.

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

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

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.[18] We show in Appendix B.3 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[19] 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 relationship (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 6.1.2). Thus, to identify and characterize these other actors in outsourcing relationships we rely on our other main data block.

Employer - employee data. Our second data block consists of an administrative social

[18] 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.

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

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 the private sector. 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.

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.[20] Earnings are bottom coded at the minimum wage, and top coded 25 UMA's (unit of measure and update).[21] This dataset does not provide information on the number of hours or days worked per month. Nominal salaries are deflated using Banco de México's CPI, with 2019 set as the base year.

In addition to the datasets described above, we incorporate three supplementary data sources to address specific aspects of our analysis. First, to investigate the role of information frictions in explaining workers' insensitivity to profit sharing, we collected original survey data among Mexican workers. The first survey focused on assessing workers' awareness of profit-sharing regulations, and the second survey aimed to identify information processing frictions in calculating profit sharing income. We provide more details on these surveys in Section 6.3. Additionally, we use firms' tax records data from 2010-2015 to produce part of the descriptive evidence shown in Section 4.2. This dataset has been anonimized and made publicly available by the national tax office in Mexico (Servicio de Administración tributaria). The data provides information on each juridical person's (*persona moral*) declared income, costs, profits and profit-sharing, deductible costs, and other items in the tax declara-

[20] This was clarified in July 2023 by the Social Security institute, who stated: *'employee profit-sharing (PTU) is not part of the base salary, since according to article 124 of the Federal Labor Law (LFT) it is not part of the integrated salary as stated in article 84 of the LFT'* (Diario Oficial de la Federación, 2023; Deloitte México, 2023). Only the PTU exceeding the legal maximum of 3 months salary is included in the base salary.

[21] https://en.www.inegi.org.mx/temas/uma/

tion. They can be accessed through the national tax office website.[22] 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.

3.2 Measuring outsourcing pre-reform

In this section, we provide details on how we measure outsourcing relationships. 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 is 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.[23] The outsourcing question specifically pertains to individuals who worked for the establishment but were contractually affiliated with a separate company,[24] 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.

[22] http://omawww.sat.gob.mx/cifras_sat/Paginas/inicio.html. More details on the anonimization process and information available in this dataset can be found in the following link http://omawww.sat.gob.mx/cifras_sat/Documents/Lineamientos_artculo19LIF.pdf

[23] 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*.

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

However, this dataset lacks worker-level information, and thus, to measure element (2), we rely on social security data.

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 they are truly working for any other firm (i.e., the parent firm in an outsourcing arrangement). Nevertheless, the substantial flux of workers caused by the reform the reform 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 occurred between June and September 2021 (ii) the flow consisted of 20 employees or more *or* establishment A lost more than 40% of it's workers that month (iii) 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 4 shows the number of workers satisfying conditions (ii) and (iii) 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. 70% of these insourced workers in the shaded area were insourced in July 2021, meaning that most workers were insourced during the last month in which firms had the opportunity to adapt to the reform. Additionally, the majority of worker transitions during the reform occurred in blocks: 96% of workers involved in an insourcing event were insourced in a block of more than 20 workers.

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

4 Uncovering and explaining full outsourcing

4.1 Patterns in the use of outsourcing pre-reform

In this section we provide evidence on the use of outsourcing prior to the reform. 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.[25] 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 classify an establishment as full outsourcing if it insourced at least 5 workers around the reform (according to the conditions stated in Section 3.2) *and* if the establishment was not previously identified in the social security data before the reform,[26] 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 establishments.[27] 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. Figure B.1 in the Appendix shows the sectoral distribution of full outsourcing establishments identified in EMIM and IMSS data. Reassuringly, the results look very similar

[25] While Figure 2 is computed for observations between 2020 and 2021, there is considerable persistence in the outsourcing patterns across time. Table A.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%.

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

[27] We restrict the analysis to the manufacturing sector and to firms with more than 20 employees to improve alignment with the EMIM data.

in each dataset.

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

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.

As shown in Table 1, 1629 establishments are classified as *full outsourcing*, 855 as *conventional outsourcing* and 5581 did not use outsourcing, and are classified as control. 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.[28]

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

[28] Slightly changing the value this cutoff does not affect our results.

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.[29] Therefore, for the vast majority of the cases, one should think of full outsourcing establishments as belonging to full outsourcing firms.

4.2 Profit-sharing and full outsourcing

In this section, we provide evidence consistent with the fact that the main reason behind full-outsourcing practices is the circumvention of mandatory profit sharing. As outlined in Section 2.1, 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 all 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 5 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

[29] 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.

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.[30]

Figure A.1 presents additional evidence supporting this hypothesis using official firm tax declaration data from 2010 to 2015. 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. 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.

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 in a full outsourcing relationship exclusively employed workers from a single parent firm[31] and 77% subsequently ceased operations following the implementation

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

[31]This number was only 39% for contracting firms hiring workers for conventional outsourcing establishments.

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.4, 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[32] 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.

4.3 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 2 presents the results of a regression of establishment-level employment volatility for the pre-reform period on a binary indicator for full outsourcing. The results suggest that these establishments do not exhibit higher volatility in the employment within the year during the pre-reform period.[33] Similarly, Table A.2 shows that full outsourcing establishments are not more likely to belong to sectors with high seasonality.[34]

[32]Examples of articles where this was mentioned are Infobae (2019); Comunicado STPS (2021).

[33]Employment volatility is calculated as the within-year coefficient of variation of de-trended employment. To de-trend variables we carry out an additive time-series decomposition using moving averages, where each variable is decomposed into a trend component, a seasonal component and an irregular component at the establishment level (using the *stats* package in R). De-trended variables are constructed as the original variable minus the trend component.

[34]To compute sector seasonality, we carry out an additive time-series decomposition using moving averages (the same decomposition used for de-trending, but at the sectoral level) and extract the seasonal component of this decomposition. The seasonality for the variable x is calculated as the average absolute value of the seasonal component, divided by the average of x for 2017-19.

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 outsourcing can enable firms to focus on core tasks by delegating non-core activities to external providers, this motive assumes that firms retain direct employment of workers for their core operations which they specialize in (Abraham and Taylor, 1996). In contrast, fully outsourced firms do not hire *any* workers in-house. Thus, while specialization would justify outsourcing non-core tasks such as IT, human resources, 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 (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.

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.

4.4 Characteristics of full outsourcing establishments

The most defining features of full outsourcing establishments are that they are large, productive, with high profits. Table 1 presents descriptive statistics for 2018 for each group of establishments. 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 6 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) and benefited relatively more from the cost reduction of evading profit-sharing obligations. This is discussed in more detail in Section 5. 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.

Table 5 shows summary statistics on the workers outsourced by full outsourcing establishments for the period 2017-2020. Notably, these workers earned higher salaries than those that were not in an outsourcing relationship. 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.

4.5 Does full-outsourcing decrease worker compensation?

While Section 4.2 provides evidence that full outsourcing allows firms to avoid or reduce profit sharing contributions, it is a priori not evident that this practice allows to decrease total worker compensation (wages + profit sharing). If wages and profit sharing were perfectly substitutable for workers and firms, full outsourcing would only change the composition of total compensation, without changing its total value. This would align with the presence of compensating differentials between wages and profit-sharing (Rosen, 1986). Moreover, even if full outsourcing did allow firms to reduce total compensation, it is unclear why firms would choose this approach instead of simply offering lower wages.

Full outsourcing would allow firms to reduce total compensation if profit sharing and wages are not perfectly substitutable. One reason for this imperfect substitutability 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 5 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. The average Kaitz index (minimum wage over median wage) at these establishments was only 0.4 in 2020.[35] This indicates that downward wage

[35]The average Kaitz index post-reform was only 0.5, indicating that even post reform, on average the median worker in these firms earned two times the minimum wage.

rigidity does not seem to be the main cause for this practice.[36]

In the next section, we build a theoretical framework where we state that the imperfect substitutability between wages and profit sharing stems from the labor supply function. In particular, if workers are less sensitive to differences in profit-sharing than differences in wages when making labor supply decisions, firms can reduce total worker compensation by avoiding profit-sharing. In Section 6, we leverage the effect of the outsourcing restriction to demonstrate that this mechanism is consistent with our empirical results.

5 Theoretical framework

In this section, we introduce a simple theoretical framework to help explain the motivations behind profit-sharing avoidance. Our framework follows a static partial equilibrium posting model in the spirit of Card et al. (2018) where monopsonistic firms offer workers bundles of wages and profit-sharing and face a labor supply curve that depends on both forms of compensation.[37] Firms can decide to avoid mandatory profit-sharing or not, and set worker wages in each of these cases. The model is closely related to those in Weitzman (1985); Nimier-David et al. (2023), but extends them in two ways: (i) we assume that firms face an upward-sloping labor supply curve and internalize the effect that their offered profit-sharing has on labor supply, and (ii) we explicitly. We set up the model and solve for firms' choice to avoid profit-sharing, jointly with what wage to offer. The full solution to the model is presented in Appendix C. We derive three predictions regarding the effects of restricting outsourcing, which guide our empirical analysis of the outsourcing reform in the next section.

[36] Only approximately 10% of formal workers in Mexico are coverage by a collective bargaining agreement (in France is is around 98%) (OECD Statistics, 2022), suggesting that wage floors set in CBAs are unlikely to create significant downwards wage rigidity.

[37] Section C.7 shows that the results hold when assuming perfectly competitive labor markets.

5.1 Model setup

We consider a firm with productivity z_j that produces a final good in a perfectly competitive product market with a linear technology function in labor n_j.[38] Productivity is given by $z_j = \hat{z}_j + \xi_j$ where ξ_j is a random variable with $\mathbb{E}(\xi_j) = 0$ and firms are risk-neutral. Labor supply and demand decisions are made before the productivity realization. Thus, expected output for firm j is:

$$\mathbb{E}(y_j) = \mathbb{E}(z_j n_j) = \hat{z}_j n_j \tag{1}$$

There exists a level of mandatory total profit sharing which is a proportion ρ of pre-profit sharing payments profits, $\tilde{\Pi}_j$.

$$mandatory\ profit\ sharing_j = \rho\tilde{\Pi}_j = \rho(z_j n_j - w_j n_j) \tag{2}$$

Firms can pay a fixed cost k and a variable cost c to avoid mandatory profit-sharing. In our empirical setting, this includes the cost of outsourcing their workers to separate entity.[39] Total worker compensation is composed of wages and profit sharing per worker, $w_j + ps_j$, where $ps_j = \frac{\rho(z_j n_j - w_j n_j)}{n_j} = \rho(z_j - w_j)$ when the firm complies with mandatory profit sharing, and $ps_j = 0$ when it avoids it. Importantly, we assume that the firm determines worker wages in both the compliance and avoidance scenarios.[40] For simplicity, we abstract from wage uncertainty and assume wages are set at the beginning of the period, before the realization of ξ_j, while ps_j is set after ξ_j is realized. Therefore, when hiring workers (before ξ_j is realized), firms offer a bundle of wages and expected profit sharing per worker. Firms face a labor

[38] The predictions in this section hold for a more general production function, including when production depends on additional inputs beyond labor, provided that the cost of these inputs is deducted from the profit base used to calculate profit-sharing. For capital, for example, this is consistent with the institutional context, as investment expenses are deducted from the tax base for profit-sharing.

[39] These costs can include the search costs of contacting a contracting firm, the costs of performing an extra firm-to-firm transaction, and any markups charged by the contracting firm. They also include extra administrative costs of setting up a different entity to outsource the workers to and filing an extra tax declaration each year if the contracting firm is set up by the parent firm. In a more general setting, this cost can be interpreted as the expected cost and/or punishment from avoiding a non-wage benefit.

[40] This assumption is supported by empirical evidence indicating that contracting firms in full outsourcing relationships were often fully or largely controlled by their parent firms. Therefore it is very likely that full-outsourcing firms typically set the wages of their outsourced workers.

supply curve which is increasing in both forms of compensation:

$$n_j^s = (w_j + \mu \cdot \alpha \cdot \mathbb{E}[ps_j])^\theta \tag{3}$$

We micro-found this labor supply function in Section C.1. $\theta > 0$ defines the absolute elasticity faced by the firm with respect to the value of the expression inside parenthesis.[41] $\alpha \leq 1$ and $\mu \leq 1$ determine the *relative* elasticity of workers with respect to wages vs profit sharing offered by the firm.[42] The parameter α represents the discount workers apply to profit-sharing due to risk aversion, as profit-sharing is more uncertain than wages (Nimier-David et al., 2023).[43] In Section C.1 we show that α can be expressed as $\frac{CE_{ps}}{\mathbb{E}[ps_j]}$ where CE_{ps} is the certainty equivalent of profit sharing. The parameter μ captures the reduced responsiveness of workers to profit-sharing as a result of information frictions, as in Gabaix (2019).[44] In Section 6.3, we present evidence on two types of information frictions that reduce the labor supply elasticity with respect to profit-sharing: lack of awareness of profit-sharing (Jäger et al., 2023), and information-processing frictions related to understanding and calculating profit-sharing (Enke et al., 2024; Oprea, 2024). Following the literature, we assume that while the information frictions reflected in μ impact labor supply decisions, they are not related to workers' preferences for profit-sharing but rather to constraints that prevent them from valuing it properly when comparing job offers (Enke et al., 2024; Handel and Kolstad, 2015). Conceptually, this differentiates μ from α. The former affects worker choices but not worker welfare once the labor supply decision has been made, while the latter does influence worker welfare once labor supply decisions have been made due to the uncertainty of profit-sharing income. The importance of this distinction will become clear in Prediction 3.

[41] We assume that the firm faces a finite elasticity of labor supply, an assumption supported by a growing body of literature on firm wage-setting power (Manning, 2004), particularly in the context of developing countries (Felix, 2023; Estefan et al., 2024).

[42] $\eta_{n,w} = \frac{\theta w_j}{(w_j + \mu \cdot \alpha \cdot ps_j)}$ and $\eta_{n,ps} = \frac{\mu \cdot \alpha \cdot \theta ps_j}{(w_j + \mu \cdot \alpha \cdot ps_j)}$. Thus $\frac{\eta_w}{\eta_{ps}} = \frac{w_j}{\mu \cdot \alpha \cdot ps_j}$.

[43] In our data, profit-sharing is more volatile than wages. Among control firms with a longer series of profit-sharing payments, the average within-firm, across-time coefficient of variation of profit-sharing is approximately 5 times that of wages.

[44] Our parameter μ is akin to m in Section 2 of Gabaix (2019), with a prior mean of profit-sharing equal to zero.

When firms comply with mandatory profit-sharing, they post wages to maximize expected post-profit-sharing profits:

$$\mathbb{E}\left(\Pi_j^{comply\ ps}\right) = \max_{w_j} \{(1-\rho)(\hat{z}_j - w_j)n_j\} \tag{4}$$

subject to

$$\mathbb{E}[ps_j] = \rho(\hat{z}_j - w_j) \qquad \text{and} \qquad n_j = (w_j + \mu \cdot \alpha \cdot \mathbb{E}[ps_j])^{\theta}$$

When firms avoid the mandatory level of profit-sharing, they pay the cost of avoidance and maximize:

$$\mathbb{E}\left(\Pi_j^{avoid\ ps}\right) = \max_{w_j} \{(z_j - w_j - c)n_j - k\} \tag{5}$$

subject to

$$n_j = (w_j + \mu \cdot \alpha \cdot \mathbb{E}[ps_j])^{\theta}$$

Firms will avoid profit-sharing if $\mathbb{E}\left(\Pi_j^{avoid\ ps}\right) > \mathbb{E}\left(\Pi_j^{comply\ ps}\right)$. In the following subsection we show how this decision depends on model parameters. We then derive three predictions on the effects of restricting outsourcing. The full model solution is provided in Appendix C.

5.2 The decision to avoid profit-sharing

In Appendix C we show that a firms will decide to avoid profit-sharing only if the following condition is met:

$$k \leq \theta^{\theta} \left(\frac{\hat{z}_j}{\theta+1}\right)^{\theta+1} \left[\left(1 - \frac{c}{\hat{z}_j}\right)^{1+\theta} - \left(\frac{1-\rho}{1-\alpha\mu\rho}\right)\right] \tag{6}$$

First, note that that if $\alpha \cdot \mu = 1$ the expression collapses to $k \leq D$ with $D \leq 0$. When labor supply is equally elastic with respect to wages and profit sharing, workers would have to be perfectly compensated by the absence of profit sharing with higher wages. In this case, profit-sharing avoidance would only occur if there are no costs associated with this practice.

The second point to note is that the right-hand side of Equation 6 is increasing in $\hat{z}_j$, as the cost per worker of profit sharing is increasing in $\hat{z}_j$, while the cost per worker to avoid it is decreasing in z. Therefore, if $\mu \cdot \alpha < 1$ (risk aversion and/or information frictions are present), more productive firms find it optimal to avoid mandatory profit sharing. This prediction aligns with Figure 6, which presents bin scatter plots showing that larger, more productive establishments are more likely to fully outsource.

5.3 The impact of restricting profit-sharing avoidance

In this section we use our model to assess the impacts of an increase in k, interpreted as a restriction to profit-sharing avoidance.[45] This raises the left-hand side of the inequality in Equation 6, leading to a decrease in the number of firms avoiding profit sharing. We derive three predictions regarding the impact of this restriction on firms that newly comply with profit-sharing requirements. We test these predictions empirically in the next section.

Prediction 1. *The effect on total firm employment is increasing in c. When $c = 0$, profit-sharing enforcement has no employment effects*

This prediction is derived in Appendix C.6.1. Notably, this result implies that if avoiding involves only a fixed cost ($c = 0$), enforcing profit sharing will not create a distortion in employment levels. This result is a notable aspect of profit-sharing and follows from the fact that, for a class of firm-specific labor supply functions of the form $n^s(w_j, ps_j) = f(A_1 w_j + A_2 ps_j)$, *profit-sharing does not affect the marginal cost of employment at the optimum*, i.e. at the point where marginal profit is zero. The intuition for this result is that profit sharing affects the marginal cost of labor–relative to a setting with no profit sharing—through two offsetting forces: For the marginal worker, the firm can offer a wage that is $\alpha\mu \cdot ps_j$ lower (reducing marginal costs), but also requires raising wages for existing workers to offset the decline in their profit-sharing allocation as employment rises (raising marginal cost). When profits are at their optimum ($\Pi' = 0$), any profit-sharing given to the new worker must be exactly offset by the total reductions in profit-sharing for existing workers, making the net effect

[45] One can interpret this increase as the getting caught and punished for this practice even when it is banned.

on marginal cost zero. Thus, profit sharing does not distort the firm's optimal employment decision. Appendix C.6 provides a detailed derivation and explanation, and Figure C.2 offers a graphical illustration.[46]

The prediction that profit-sharing has no effect on employment was put forward by Weitzman (1985) and more recently by Nimier-David et al. (2023). A distinctive aspect of our result is that it continues to hold even when firms internalize both (i) the effect of wage offers on profits—and thus on the profit-sharing—and (ii) the effect of profit-sharing offered on their firm-specific labor supply.

Prediction 2. *If $\mu \cdot \alpha < 1$ expected total compensation $w_j + ps_j$ will increase. The effect will be decreasing in μ and α.*

In Appendix C.6.2 we show that the change in expected total compensation can be expressed as:

$$\Delta\, \mathbb{E}[total\ compensation] = \frac{\hat{z}_j \rho}{1+\theta}\left(1 - \frac{1-\rho}{\frac{1}{\mu\alpha} - \rho}\right) + c\frac{\theta}{\theta+1} \tag{7}$$

The effect is positive if $\mu \cdot \alpha < 1$, and depends negatively on this term. The intuition for this result is that when workers are more reactive to a wage decrease than to a profit sharing increase ($\mu \cdot \alpha$ is low), offsetting increases in ps_j via lower wages is relatively costly for the firm, as it has a relatively large negative effect on its labor supply. This decreases firms' incentives to reduce w_j to offset increases in profit sharing (Equation 49 in Section C.6), leading to an overall rise in total compensation.

Prediction 3. *If $\mu < 1$ the expected risk-adjusted value of total compensation $w_j + \alpha\, \mathbb{E}[ps_j]$ will increase. The effect is decreasing in μ and increasing in α.*

We define the risk-adjusted value of total compensation as w_j plus the amount of profit sharing workers would accept to avoid uncertainty, i.e. the certainty equivalent of profit-sharing CE^{ps}. In Section C.2 we show that this can be expressed as $w_j + \alpha\, \mathbb{E}[ps_j]$, where $\alpha = \frac{CE^{ps}}{E[ps_j]}$ is the value workers assign to each peso of uncertain profit-sharing relative to a

[46] 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.

guaranteed peso. In Appendix C.6.3, we demonstrate that:

$$\Delta\,\mathbb{E}[value\ total\ compensation] = \frac{\hat{z}_j \rho \alpha}{1+\theta}\left(1 - \frac{1-\alpha\rho}{\frac{1}{\mu}-\alpha\rho}\right) + c\frac{\theta}{\theta+1} \tag{8}$$

This result implies that if the inelasticity of profit-sharing is solely attributed to risk aversion ($\mu = 1$), the value of total compensation for workers may not increase even in the presence of an overall increase in total compensation. In this scenario, an increase in total compensation would solely compensate workers for higher risk without leaving them better off. Conversely if information frictions regarding profit-sharing partly explain this inelasticity, the value of total compensation for workers should increase. This is because $\mu < 1$ reflects a reduced responsiveness to profit-sharing, not due to workers' true preferences, but because of information-related constraints - either a lack of awareness or difficulties in processing the complexity of profit-sharing benefits - which limit their ability to fully respond to this benefit.

Finally, note that the difference between the effect on total compensation and the effect on its risk-adjusted value represents the portion of compensation that compensates workers for the added income risk due to profit-sharing. When $c = 0$ comparing the change in the risk-adjusted value of total compensation with the change in total compensation yields:

$$1 - \frac{\Delta\,\mathbb{E}[value\ total\ compensation]}{\Delta\,\mathbb{E}[total\ compensation]} = \frac{1-\alpha}{1-\mu\alpha} \tag{9}$$

The right-hand side of this expression captures the relationship between the discount workers assign to profit-sharing solely due to risk (numerator) and the total discount arising from both risk and information frictions (denominator). In other words, it represents the reduction in labor supply elasticity to profit-sharing that is attributable to risk aversion alone, relative to the total reduction. Therefore, Equation 9 shows that the portion of the increase in total compensation that serves solely to compensate workers for the additional income risk is exactly equal to the contribution of risk aversion to workers' inelastic response to profit-sharing.

In the following section we study the effect of the outsourcing restriction, focusing on four outcomes that emerge from these predictions: compliance with profit sharing, total employment, total worker compensation, and the risk-adjusted value of total compensation. In Section 6.3 we present empirical evidence on the role of information frictions in explaining workers' low responsiveness to profit-sharing.

6 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.

6.1 Establishment-level effects

6.1.1 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:

$$Y_{jsft} = \sum_{k=Q12018}^{Q12023} \beta_k \mathbb{1}_{t \in k} O_j + \lambda_j + \gamma_{st} + \eta_{ft} + \phi_g t + \xi_{jsft} \tag{10}$$

Where Y_{jstg} is the outcome of establishment j, in sector s, state f, at time (month-year) t and O_j = 1 if establishment used outsourcing in any month in the year prior to the reform.[47]

[47] 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).

$\mathbb{1}_{t \in k}$ is a variable equal to one is month t falls into quarter k. We include size-group specific linear trends $\phi_g t$ (we divide establishments into 6 groups according to their size pre-reform), as large firms are more likely to outsource, and in Mexico large firms present a higher growth rate. We also include 3 digit NAICS sector x time specific fixed effects and state x time specific fixed effects to account for sector and state specific seasonality patterns 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 (Rambachan and Roth, 2022).

6.1.2 Results

Effect on outsourcing use. Figure 7 shows the results of estimating Equation 10 on the proportion of outsourced workers and the number of in-house workers. It is apparent that the reform had a strong negative effect on the proportion of outsourced, and an increase in the number of in-house workers. Nearly 90% of full outsourcing establishments stopped outsourcing over 95% of their workforce post reform, and 80% stopped outsourcing altogether. Figure A.2 shows that these effect are also visible when plotting the raw share of establishments using outsourcing (panel a) and outsourcing over 95% of workers (panel b) for each group of establishments.

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.[48] We find that 77% of contracting establishments associated with full outsourcing establishments exited within one year after the reform. Those that did not exit experienced a strong decrease in size, and remained very small (Figure A.3). These surviving contracting firms possibly 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 lead firms.

[48] 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).

Effect of on profit-sharing. Panel (a) of Figure 8 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 10 but estimated at the yearly level, where the outcome variable is yearly profit-sharing over total workers. Results also shown in Table 4. 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.[49]

Table A.4 shows the average total profit-sharing, profit sharing per worker, and profit sharing per worker as a share of the monthly wage, paid by full-outsourcing and control firms in 2022. Full outsourcing firms had higher total profit-sharing contributions than control firms in both absolute and per worker terms. On average, profit-sharing per worker amounted to approximately half of the monthly wage for both groups.

Effect on employment. We evaluate Prediction 1 of the model by estimating the effect on total firm employment (total outsourced workers + total in-house workers). Figure 9 shows the results on the natural logarithm of total employment for full outsourcing establishments. We do not find differential pre-trends, indicating that, conditional con the controls mentioned above, treatment and control groups had similar trends in employment pre-reform. We find that the reform had no significant effect on total employment for these establishments.[50] Table 3 reports the average treatment effect for the post period. As noted above, the impact on outsourced workers was significant. Thus, on average, full outsourcing establishments insourced all workers after the reform (see Figure 7b), and did not alter their hiring and firing practices post-reform. Through the lens of our model, the lack of significant effects on

[49] Figure A.6 shows no significant effects on either the levels of investment or value added per worker following the reform. This suggests that the increase in profit-sharing did not disincentivize firms from investing, nor did it lead to an improvement in firm productivity. These results are consistent with the findings of Nimier-David et al. (2023).

[50] 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.

employment is indicative of a low marginal cost of outsourcing c as seen in Prediction 1.

Figure A.4 demonstrates that the results are robust across a range of alternative specifications of Equation 10. Specifically, the estimates are robust to (i) restricting the treated group to establishments that complied with the reform, (ii) limiting the sample to single-establishment firms (iii) constructing the treatment variable using a two-year pre-reform window instead of one, and (iv) estimating the regression on an unbalanced panel of establishments.

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 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 payments 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.[51] 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 B.4), which would also be incorporated into this sum.

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.

[51] 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.

6.2 Worker-level effects

6.2.1 Methodology

In this section we examine the effect of the insourcing brought about by the reform on worker wages and total compensation, including wages plus profit-sharing contributions. We estimate the following specification.

$$Y_{isft} = \sum_{k=2018}^{2024} \theta_k \mathbb{1}_{t=k} Insourced_i + \lambda_i + \gamma_{st} + \eta_{ft} + \phi_g t + \xi_{jsft} \tag{11}$$

Where, Y_{isrt} denotes the outcome of worker i in sector s, state f, 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 normalize the coefficient of the pre-reform year (2020) to zero. Analogous to the establishment-level regressions, we include worker fixed effects, 3-digit NAICS sector-by-year fixed effects, state-by-year fixed effects, and firm-size group-specific linear trends $\phi_g t$.[52] 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.

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. We do not include workers that were not insourced, but were working for firms that insourced other workers, as these workers were indirectly affected by the reform due to an increase in the number of workers among which profit-sharing was distributed. This group may have also been affected by the reform due to other forms of within-firm rent sharing (Deibler, 2021). We show that our results on the impact of the reform on wages are robust to including all workers in the control group. 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. Below we show that results are robust to including workers with different levels of firm tenure pre-reform and who changed firms after the reform. Finally, to decrease computational we

[52] Four firm size groups are defined according to the size of the worker's firm in September 2021, once the insourcing events have taken place.

work with a 10% random sample workers who were working in 2021 (the year of the reform). These restrictions yield a balanced sample of 103 703 workers in our main analysis.[53] Standard errors are clustered at the establishment level.[54]

In contrast to the establishment level regression in 10, in our worker level analysis we cannot identify all workers that had been outsourced, but rather only those that were insourced during the reform. Thus, these estimates capture the reform's effect on workers formerly outsourced by full-outsourcing firms that complied with the reform (the compliers). As shown in Figure A.2, compliers constitute the vast majority of the treated group: 90 percent of full-outsourcing firms ceased full-outsourcing during the reform. In terms of internal validity, the inclusion of worker fixed effects, along with industry × year and state × year fixed effects, ensures that our identification is valid so long as insourced workers were not subject to differential, within-industry or within-firm-size time-varying shocks relative to the control group. Although compliance with the reform is an endogenous firm decision, the *timing* of insourcing events is exogenously determined by the policy. This mitigates concerns that firm-level insourcing events were driven by contemporaneous shocks, lending credibility to our identification assumption.

6.2.2 Results

Effect of the reform on wages. We first study the impact of the reform on worker wages, without including profit-sharing income. The red lines in Figure 10 plots θ_k from estimating Equation 11 where the outcome variable is the annual average of employees' daily wages and their 95% confidence intervals. We do not find evidence of significant pre-trends before the reform. Starting in 2022, which the first full year post-reform and coincides with the initial disbursement of profit-sharing to treated workers, we observe a decrease in the real wages of treated workers relative to the control group. Treated worker's average daily real wages de-

[53] This number represents approximately 0.5% of the total IMSS labor force, and approximately 2% of the manufacturing labor force.

[54] As workers are considered treated if they were insourced by a full-outsourcing establishment, treatment is assigned at the establishment level. We follow (Rambachan and Roth, 2022) and cluster at the level at which treatment is determined in our quasi-experimental setting.

creased by 5.3 Mexican Pesos in 2022 and 9.6 Mexican Pesos in 2023 and 12.8 Pesos in 2024 relative to control workers. These changes represent between approximately 1% and 2% of the average (inflation adjusted) daily wage of treated workers in the year prior to reform. This negative effect is driven by a slower rate of wage growth, rather than nominal wage reductions. Indeed, the average nominal wage among treated workers increased approximately 12% per year in the post reform period.[55]

The plotted results can also be seen in Column 1 of Table 6. Columns 2 and 3 shows that we obtain similar results when using utilizing log wages or wages as a share of 2020 wages as the outcome in estimating Equation 11. Columns 1 to 5 of Table 7 show that these wage results are robust to alternative specifications. In particular, the results are robust to including workers with only 1 year of tenure and workers that that did not stay in the same firm after 2021 (Column 1), to extending the control group to include non-insourced workers working in firms that insourced other workers (Column 3). In Column 3 we exclude workers earning less than 1.5 times the average minimum wage in the pre-reform year, to isolate the effect of the strong increases in the Minimum wage between 2019 and 2024 in Mexico, which could impact our results if treated and control workers are differentially exposed to the minimum wage. Results are also robust to this specification. Columns (4) and (5) show that the results are robust to the inclusion of alternative fixed effects.

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.[56] 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

[55] 2022 and 2023 witnessed relatively high average nominal wage growth driven by elevated inflation rates and substantial increases in the minimum wage.

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

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. In this section we evaluate Prediction 2 by estimating the effect of the reform on total compensation, which encompasses both wages and profit-sharing income. Given that after the reform profit-sharing increased, but wages decreased for treated workers, the implications of the reform for total labor compensation are a priori ambiguous. Total compensation would increase if wage compensation was less than perfect. As stated in Prediction 2, an increase in total compensation would be consistent with firms facing a labor supply that is less elastic to profit sharing than to wages.

As mentioned in Section 3.1, social security data does not contain information on profit-sharing income for workers.[57] While the establishment survey data contains information on profit sharing, as mentioned in Section 6.1.2, information on wages of outsourced workers pre-reform is inaccurate. To circumvent these data limitations, we combine information on profit-sharing reported in the establishment survey data with wage information from the social security data to build a measure of total compensation (wages + profit-sharing). Because we cannot match these two datasets at the firm level, we do not have a measure of profit-sharing income for each worker, nor for each firm in the social security data. Thus, we combine these two datasets on broader outsourcing status x sector x state x firm size cells. More specifically, we proceed in three steps.

1. First, we categorize establishments from EMIM into groups based on their size (divided into four size categories), economic sector (using NAICS 3-digit codes), state (across 32 states), and their utilization of outsourcing (conventional outsourcing, full outsourcing, and control). Subsequently, using information from the establishment survey, we compute average profit-sharing income for workers in each group for each year.[58]

2. Second, we categorize workers in the social security data into groups based on the same

[57] This is because profit-sharing does not form part of the base salary (*salario base de cotización)* (Diario Oficial de la Federación, 2023; Deloitte México, 2023).

[58] Weighted of average profit-sharing per worker for establishments in EMIM in group g in year t, where each firm is weighted by the number of workers it hires in that period.

variables (firm size, economic sector, state, and treatment status) and we construct a dataset aggregated at the group x year level. This includes a measure of the average wage across workers in each group g at year t.

3. Third, we merge both these aggregated datasets by group x year, obtaining a dataset with information on average wages and profit-sharing in each group in each year. We then construct a measure of total compensation in a particular cell c corresponding to group g at time t by adding the average wage in cell measured in step 2. plus the average profit-sharing per worker, using the measurement described in in step 1:

$$total\ compensation_{gt} = \overline{wage^{imss}}_{gt} + \overline{profit\ sharing\ per\ worker}^{emim}_{gt}$$

For this procedure to be valid, it is important that the sample of workers covered in the social security data is similar to the sample covered in the establishment data. In Appendix B.1, we demonstrate that the composition of the samples in both datasets are closely aligned. Additionally, we show that the measured average wages across sectors and regions in both datasets align closely, adding validity to our procedure.

When the dependent variable is expressed in levels, Equation 11 holds the following useful property: estimating it with either worker-level data or data aggregated at the group level, employing $wage_t$ as the outcome variable (with each cell weighted by the number of workers) and controlling for group fixed effects (rather than worker fixed effects), yields identical results. Therefore, the coefficients obtained from the cell-level regression can be interpreted in the same manner as those from the worker-level regressions when each cell is appropriately weighted. The comparison can be seen in Columns (4) and (6), and (5) and (7) of Table 6 where we see that the coefficients are indeed identical.[59] However, we lack profit-sharing data, and consequently total compensation data at the worker level. Thus, we estimate Equation 11 for total compensation exclusively at the cell level, using our estimate of average total compensation described above.[60]

[59] Standard errors change due to the higher number of observations and additional within-cell variation in worker level data.

[60] We weight each observation in the regression by the number of workers in that cell.

Figure 10 depicts the estimated effect on total compensation, under the assumption that treated workers were receiving zero profit-sharing payments pre-reform. The results can also be seen in column 5 of Table 6. Despite the negative effect on worker wages, average daily total compensation increased for treated workers by 20 pesos in 2022 (3% of treated workers' average daily compensation in the year pre-reform), 15 pesos in 2023 (2.5%) and 12.6 pesos in 2024 (2.1%) on average.

Table 7 shows that the results are robust to alternative fixed effects and ways of measuring profit-sharing per worker in each cell c. In column 7, we use information from EMIM on the weighted average of total profit-sharing (instead of profit-sharing per worker). We then calculate average profit-sharing per worker for each cell as the average total profit-sharing divided by the average firm size measure with IMSS data. As mentioned in Section 4.2, it is unlikely that contracting firms provided workers with profit-sharing contributions before the reform, justifying our assumption of zero profit-sharing payments for treated workers pre-reform. Nonetheless, in Figure A.5, we show that the results are robust to less stringent assumptions, namely that treated workers' profit-sharing income pre-reform was a fraction p of their post reform profit-sharing.

Referring back to Prediction 2, these findings align with the presence of risk aversion and/or information frictions, that make workers less sensitive to profit-sharing than to wages. As a consequence, firms affected by the reform did not fully offset the rise in profit-sharing payments through decreased wage growth. We next examine the impact on the risk-adjusted value of total compensation to further assess the contribution of these two factors to this observed inelasticity.

Effect on risk-adjusted value of worker compensation. We now evaluate Prediction 3 and estimate the impact of the reform on the risk-adjusted value of worker compensation, defined as $w_j + \alpha\, \mathbb{E}[ps_j]$. As mentioned in Prediction 3, if the rise in total compensation shown in Figure 10 were solely to compensate workers for higher risk, the effect of the reform on the value of total compensation, once accounting for risk, would be significantly lower, or

zero in the case of a low marginal cost of outsourcing c.[61]

In order to estimate the effect on the risk-adjusted value of total compensation, we empirically estimate the average α across workers for different levels of risk aversion following a procedure similar that in Nimier-David et al. (2023). We then use this estimated α to calculate the impact of the reform on the risk-adjusted value of compensation. We describe this procedure in detail in Appendix B.2, and provide a summary here. In particular, we first note that α can be expressed as $\frac{CE_{ps}}{\mathbb{E}[ps_j]}$ where CE_{ps} is the certainty equivalent of profit sharing. Thus, α can be interpreted as the average value of each uncertain peso of profit-sharing, in terms of a certain peso. We use the definition of certainty equivalent and information on the volatility of profit sharing to estimate CE_{ps} and $\frac{CE_{ps}}{\mathbb{E}[ps_j]}$ for each worker under different assumptions risk aversion. We then estimate the average α across workers for these different values of risk aversion. For instance, for a risk aversion of 4,[62] one peso of profit-sharing is worth approximately 87 cents to workers on average. We then use these estimated values α to calculate the risk-adjusted value of total compensation under different risk aversion parameters. The results, shown in Figure 11, indicate a positive effect even for high values of risk aversion. For a high risk aversion of 5, our results indicate that the average risk-adjusted value of daily compensation increased by a significant 13 pesos post-reform, 2% relative to the pre-reform mean. Thus, the reform had a positive impact on the risk-adjusted value of total compensation, which is robust to conservative measures of risk aversion. This evidence suggests that at most one-third of the increase in total compensation post reform can be explained by a compensation of workers for the higher risk involved in profit-sharing. Returning to Prediction 3, this suggests that information frictions related to profit sharing contribute to workers' inelasticity to this benefit. In the following section be provide empirical evidence on these information frictions.

[61] As indicated in section 6.1.2 the null effect on employment is suggestive of a low c.

[62] Brown et al. (2019), using data from the Mexican Family Life Survey, nationally representative of the Mexican population, estimate that the median relative risk aversion in their sample is below 3.8.

6.3 Empirical evidence on information frictions in profit-sharing

In this section we present empirical evidence on the presence of information frictions related to the awareness and understanding of profit sharing. We also present evidence that these frictions further contributed to workers' inelasticity to profit sharing ($\mu < 1$). We categorize these information frictions into two types. First, we show that many workers lack awareness of profit-sharing. Second, we show evidence of information processing frictions related to complexity of profit-sharing calculations can reduce workers' responsiveness to this benefit.

Low awareness of profit-sharing. Previous literature has highlighted the role of misinformation and inattention in shaping workers' decisions to switch employers (Robinson, 1933; Jäger et al., 2023; Roussille, 2024), health insurance plan selection (Handel and Kolstad, 2015), and savings choices (Chetty et al., 2014). These studies show how such information frictions can make workers less responsive to changes in these options due to their lack of awareness or attention. We show that similar frictions, related to low awareness and salience of profit-sharing, are present in our context.

We study workers' knowledge about profit-sharing through a survey of 134 workers in Mexico. Table 9 shows that nearly 25% of respondents reported not knowing what profit-sharing is. Among low-income workers, this figure is 40%, indicating that information frictions are more severe for this group. This complete lack of awareness is likely to affect workers' labor supply decisions, as it is highly unlikely that workers consider profit-sharing when making these decisions if they do not know what this benefit is. We additionally provide evidence of information frictions among workers who were aware of the existence of profit-sharing. Workers were more likely to answer incorrectly when asked about profit-sharing regulations than when asked about the rules for the minimum wage, vacation, or the 13th-month salary (aguinaldo).[63] Furthermore, when asked which job attributes were taken into consideration when choosing their current employer, profit-sharing was chosen with the lowest frequency, especially among workers who had incorrectly answered about profit-sharing

[63]The survey asked workers about: the size of the aguinaldo, the number of mandatory vacation days, the minimum wage in Mexico, the proportion of firm profits distributed as profit-sharing, and which firms are required to distribute profit-sharing.

regulations. Almost half of workers not considering profit-sharing state that the reason was due to lack of information or because they had forgotten about this benefit. This evidence suggests that workers do not place much weight on profit-sharing when making labor supply decisions, and that this attitude is associated with their lack of understanding of the benefit.

A natural question that arises is why workers in Mexico are often misinformed about profit-sharing. One likely explanation is that only a minority of workers in Mexico are employed at firms that pay this benefit. According to data from the Economic Census, in 2018 69% of workers in Mexico were employed at firms that did not provide profit-sharing. Moreover, the average full-outsourcing establishment was located in a local labor market where 77% of workers were employed at firms that also do not pay profit-sharing.[64] The high share of workers excluded from profit-sharing likely contributes to a general lack of awareness about this benefit.

Information processing frictions. Second, we show evidence consistent with the presence of information processing frictions. Recent work in Behavioral Economics by Enke et al. (2024) has shown that people's decisions are less sensitive to changes relevant parameters when these decisions involve some level of complexity. In line with these findings, we argue that the complexity in the calculation of profit-sharing causes workers to assign less weight to this compensation when evaluating job offers. We tested this in our Prolific survey by presenting workers with four different job offers, each specifying wages and profit-sharing amounts. Workers were asked to rank these job offers from the best to the worst offer. Importantly, at the beginning of this exercise, we explained how profit-sharing is calculated and instructed workers to consider it when performing this ranking. To assess the impact of complexity, we varied how the information was presented. In the high-complexity scenario, we provided firm profits, the number of workers, and the wage, such that workers had to calculate profit-sharing income and sum it to the wage.[65] In the low-complexity scenario, we stated the

[64] Local labor market is defined as a municipality × 2-digit NAICS sector cell. These high proportions are not solely the result of avoidance through full-outsourcing, Most firms that do not pay profit-sharing do not outsource and are likely legally exempt from this requirement (see Section 2 for details).

[65] Workers were asked to assume no uncertainty in firm profits and that all workers were eligible for profit-sharing.

profit-sharing amount and wage directly. We performed this exercise for two different sets of four job offers. Workers were assigned randomly to one of these sets. For both exercises, we set up the job offers such that options with the first and second highest compensation had a lower wage than the third highest, but higher profit-sharing, and such that the third best option always had the higher wage. This was done to evaluate whether workers resort to offers with higher wages rather than higher total compensation when complexity increases.

Panel (a) of Figure 12 displays the share of workers who ranked each option first across the two complexity levels. Offers are ordered in the x-axis from highest to lowest total compensation. Two main patterns emerge. First, in the high-complexity scenario, workers are less likely to choose the option with the highest total compensation as their top choice. Second, and more relevant for our setting, those who make mistakes in their first ranking in the high-complexity setting are most likely to rank the third option first, which corresponds to the offer with the highest wage. This pattern suggests that, under higher complexity, workers tend to place greater emphasis on wages relative to profit-sharing. Panel (b) complements this finding by focusing on the subset of workers who ranked the highest-wage option first under high complexity. It shows the distribution of their second-choice rankings across complexity levels. These workers are more likely to rank the second-highest wage option second, despite it being the offer with the lowest total compensation. This reinforces the idea that such workers weight wages over profit-sharing when faced with the complexity of profit-sharing.

Taken together our evidence suggests that there exist frictions in availability and processing of information related to profit-sharing among workers. These frictions seem to affect labor supply decisions, making workers more inelastic to profit-sharing.

7 Conventional outsourcing establishments

While the focus of this paper is on full outsourcing, from a policy standpoint it is relevant to understand the motivations for outsourcing and the impact of the outsourcing reform on conventional outsourcing establishments. In this section, we provide evidence that these

establishments seemed to be using outsourcing to reduce labor adjustment costs, and that negatively impacted their capacity to do so.

7.1 Employment volatility

Our empirical evidence suggests that conventional outsourcing establishments were using outsourcing to adjust their labor force to temporary changes in activity. As shown in Table 2 conventional outsourcing establishments tended to have more volatility in employment than non-outsourcing firms. This is partly explained by these establishments belonging to sectors with higher seasonality (Table A.2), but also holds when controlling for sector fixed effects. Table A.3 presents further evidence of this motive. Column 1 shows that the elasticity of total workers with respect to short-term changes in revenue was larger for conventional outsourcing establishments prior to the reform. Columns 2-4 show 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.7 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.

7.2 Effects of the reform

We show that the outsourcing reform decreased the use of outsourcing on this group as well, and had negative effects on employment dynamism for these establishments. Figure A.2 shows that the reform had strong effects on outsourcing use among conventional outsourcing establishments. After the reform, the share of conventional outsourcing establishments using outsourcing in a given month fell from around 0.88 to 0.25.

Total employment. The results for total employment among conventional outsourcing establishments are depicted in Figures A.8. Establishments with positive outsourcing in the pre-reform period reduced total employment by roughly 3% compared to the control group.

Table A.5 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 its 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:

$$Action^{p}_{jt} = post\_reform_t * FullOuts_j + post\_reform_t * ConvenOuts_j + \lambda_j + \phi_t + u_{it} \quad (12)$$

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 8. 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 sug-

gests 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 avoid labor regulations. Using rich establishment survey data, social security data, we document and characterize a phenomenon where a significant number of firms were outsourcing almost *all* their workers. We provide evidence that firms carried out this extreme use of outsourcing as a means to avoid mandatory profit-sharing with employees. This practice was predominant amongst large, productive and profitable firms, who largely benefited from avoiding profit-sharing costs. We then exploit the effects of a reform which imposed strict restrictions on outsourcing to understand how firms react when these avoidance practices are restricted. The reform caused most firms to insource their employees in-house with no estimated effects on total employment. Full outsourcing establishments newly incurred profit-sharing payments, which they partially offset by a small decrease in wage growth relative to the control group. However, total labor compensation, i.e. wages + profit-sharing per worker, increased by around 3% post reform.

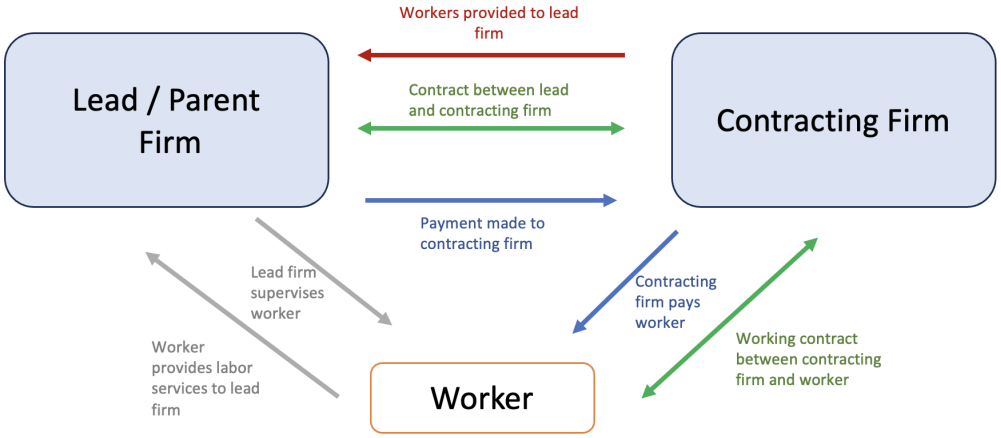
Our results are consistent with a labor market in which profit-sharing and wages are imperfect substitutes. This imperfect substitution stems from the labor supply function: workers are less sensitive to changes in profit-sharing compensation than to wages when making labor supply decisions. This difference in elasticities can explain why certain firms found it optimal to incur in full outsourcing practices to reduce profit-sharing, rather than offering lower real wages; and why the restriction of outsourcing increased profit-sharing and total worker compensation, without having a negative effect on employment. We argue that an impor-

tant reason in explaining this inelasticity is the prevalence of information frictions regarding profit-sharing. We build on results from prior literature and show self-collected survey evidence that this mechanism seems to be present.

Finally, our results can also provide new insights on whether policies targeting avoidance of non-wage benefits are beneficial for workers. While we show that this is indeed the case for profit-sharing avoidance in our context, a better understanding of whether these results extend to the avoidance of other benefits such as health insurance or pension contributions (Ouimet and Tate, 2023; Chetty et al., 2014) is an important avenue for future research. Further, we find evidence that for some firms outsourcing provided a margin of adjustment in response to shocks. This highlights that labor regulation must aim to protect worker rights while also affording flexibility to firms - especially those that depend on having efficient adjustment margins for competitiveness or growth.

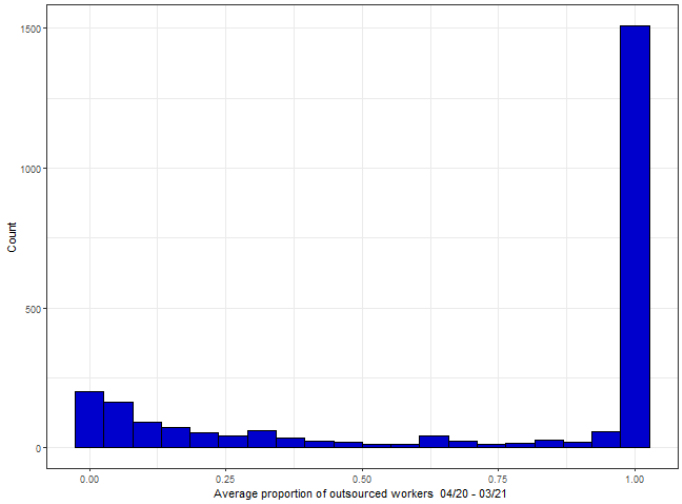
Figures

Figure 1: Schematic graph illustrating outsourcing relationship



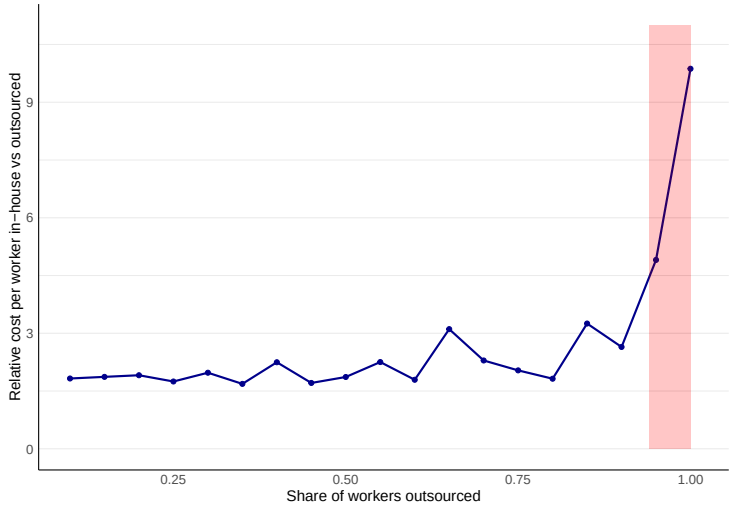
Notes: This figure shows a schematic graph of the actors in an outsourcing relationship. Blue lines indicate a payment from one actor to the other. Green lines indicate the existence of a contract between the two actors.

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



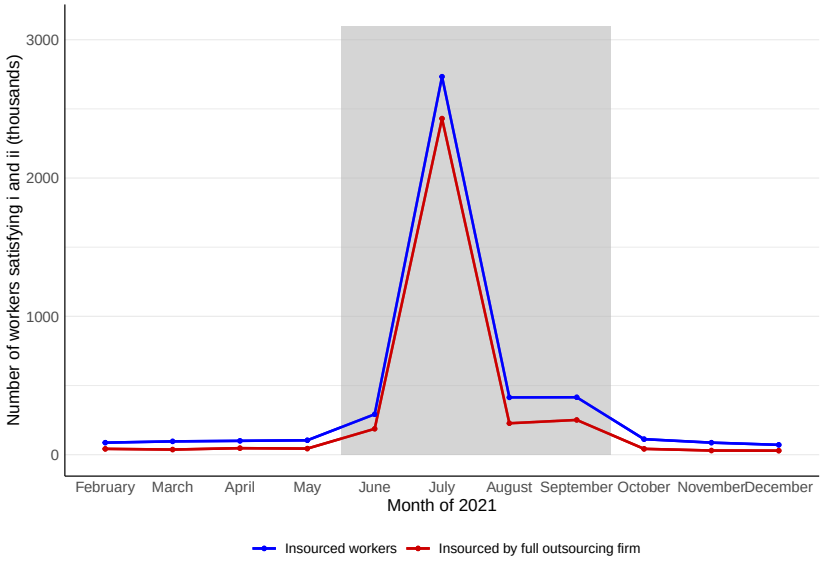
Notes: This figure plots a histogram with the average share of workers outsourced between April 2020 and March 2021 (the 12 months before the outsourcing reform was approved) by each establishment in our EMIM dataset which has positive outsourcing in at least one month on the year prior to the reform.

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



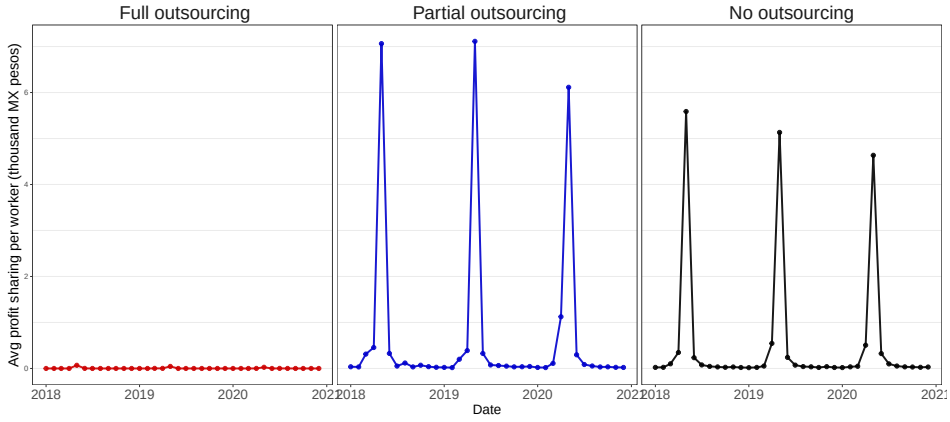
Notes: This figure shows the relationship between the average cost of in-house workers relative to outsourced workers and the share of workers outsourced within an establishment. For each establishment, we compute the ratio of the average cost per in-house worker to the average cost per outsourced worker, using data from EMIM between 2017 and 2019. We then plot the average of this ratio across establishments, by bins of outsourcing share rounded to the nearest 0.05. The shaded red area highlights establishments that outsource more than 95% of their workforce. [Back to Section 4.1]

Figure 4: Number of workers in an insourcing event (thousands)



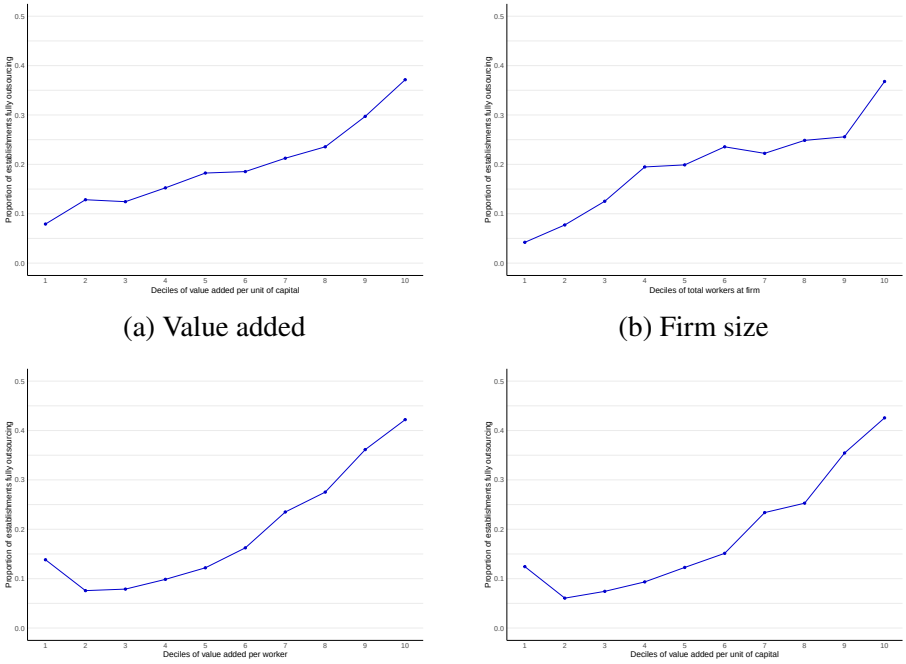
Notes: This figure shows the number of workers amongst all workers in IMSS involved in a movement between establishments (A and B) where the flow consisted of 20 employees or more *or* establishment A lost more than 40% of it's workers that month (condition (ii) in Section 3.2), and establishment A and B do not belong to the same firm (condition (iii) in Section 3.2) on each month between February and December 2021. The shaded area are the worker movements classified as insourcing events with the additional condition that the flow occured between June and September (condition (i) in Section 3.2).

Figure 5: Monthly profit sharing per worker pre reform



Notes: This figure plots the average monthly profit sharing per worker in thousands of Mexican Pesos for each group of establishments. 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. No outsourcing 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. [Back to Section 4.2]

Figure 6: Full outsourcing and productivity measures



(a) Value added

(b) Firm size

(c) VA per worker

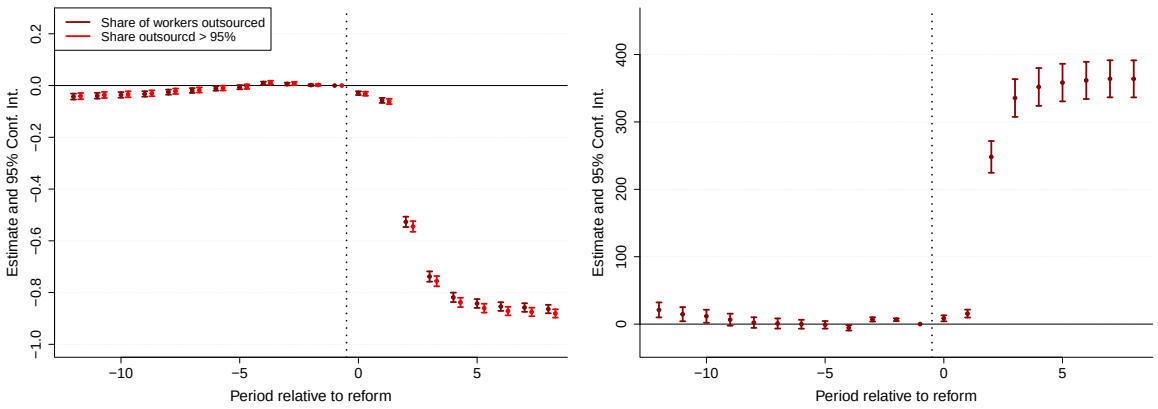
(d) VA per capital

Notes: These figures plot the share of full outsourcing establishments 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. They are built with the sample of establishments from EMIM, and the variables measured in the 2018 Economic Census. 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. [Back to 4.4]

Figure 7: Effect of the reform on outsourcing

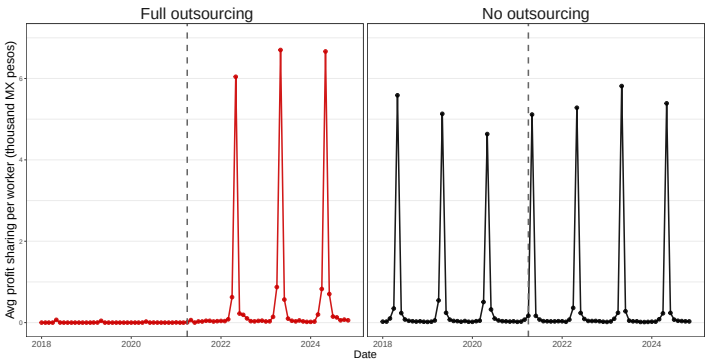
(a) Share of workers outsourced

(b) In-house workers

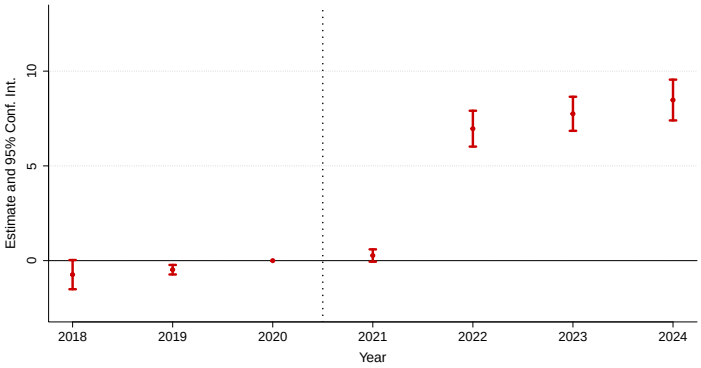


Notes: This figure plots the β_k from Equation 10 and 95% confidence intervals. The estimation is carried out on a balanced panel of establishments from EMIM between 2018 and 2022. Treatment group includes establishments outsourcing over 95% of workers before the reform (full outsourcing). Control group 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 variables in panel a are the share of workers outsourced by the establishment, and a binary variable equal to one if the establishment was outsourcing more than 95% of workers. The outcome variable in panel b is the number of inhouse workers of the establishment. β_{Q42020} is normalized to 0. Standard errors are clustered at the establishment level. [Back to Section 6.1.2]

Figure 8: Effect of the reform on profit sharing



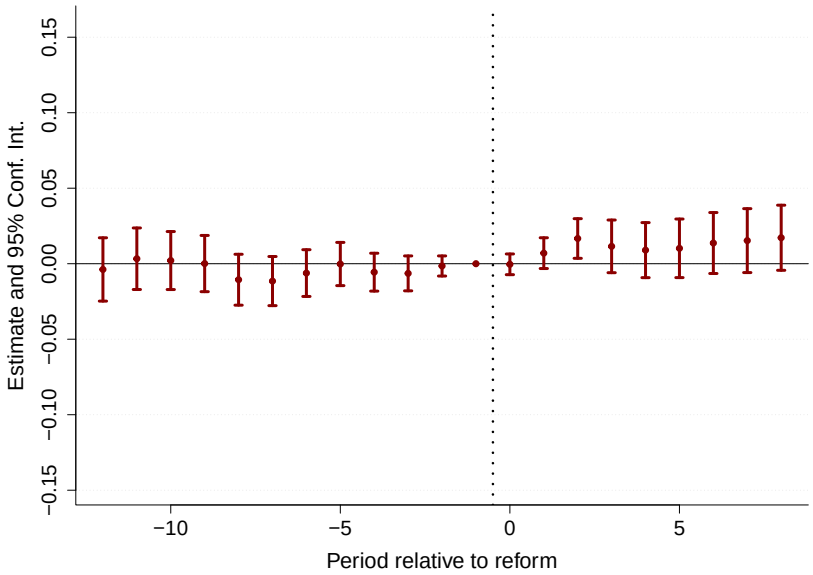
(a) Monthly profit sharing per worker



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

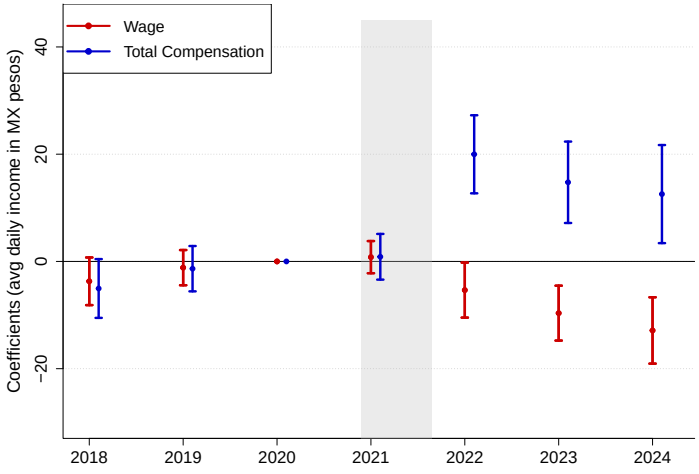
Notes: These figures show the effect of the reform on profit-sharing. Both use a balanced sample of establishments from EMIM between 2018 and 2022. Panel (a) shows average real monthly profit sharing per worker in thousands of Mexican pesos for control establishments and full outsourcing establishments.The peaks in each year correspond to may, when profit sharing is typically disbursed. Panel (b) shows the difference in differences coefficients and 95% confidence intervals from estimating Equation 10 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 real yearly profit sharing per worker in thousands of Mexican pesos. 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. [Back to Section 6.1.2]

Figure 9: Effect on total number of workers



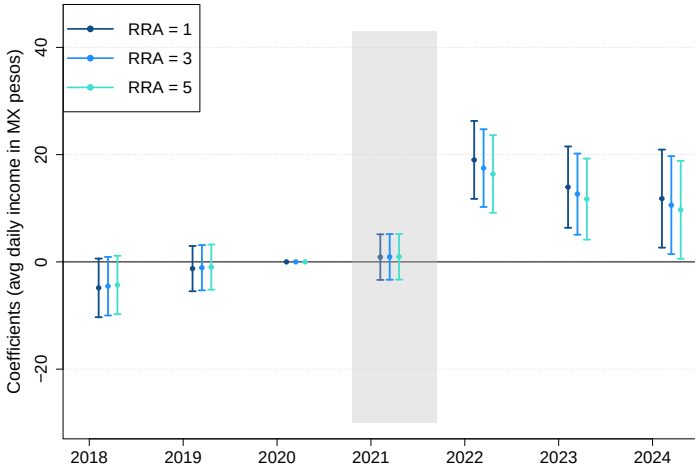
Notes: This figure plots the β_k from Equation 10 and 95% confidence intervals. The outcome variable is the log of the total number of workers (outsourced + in-house). The estimation is carried out on a balanced panel of establishments from EMIM between 2018 and 2022. Treatment group includes establishments 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. β_{Q42020} is normalized to 0. Standard errors are clustered at the establishment level. [Back to Section 6.1.2]

Figure 10: Effect of the reform on yearly wage and total compensation



Notes: This figure plots the β_k from Equation 11 and 95% confidence intervals. The outcome variables are the yearly average of worker daily wages (red) and daily total compensation (wage + profit sharing) (blue). The shaded grey area represents the year in which the outsourcing reform was approved. In this estimation on total compensation we assume that profit sharing for treated workers pre-reform was zero. Regressions are estimated on a balanced sample of workers from IMSS described in Section 6.2. Standard errors are clustered at the establishment level. [Back to Section 6.2.2]

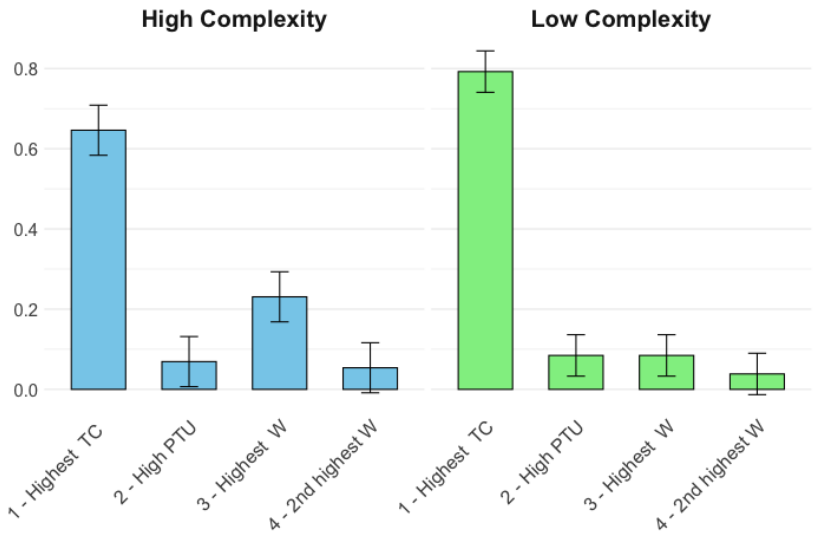
Figure 11: Effect on value of total compensation under different risk aversion values



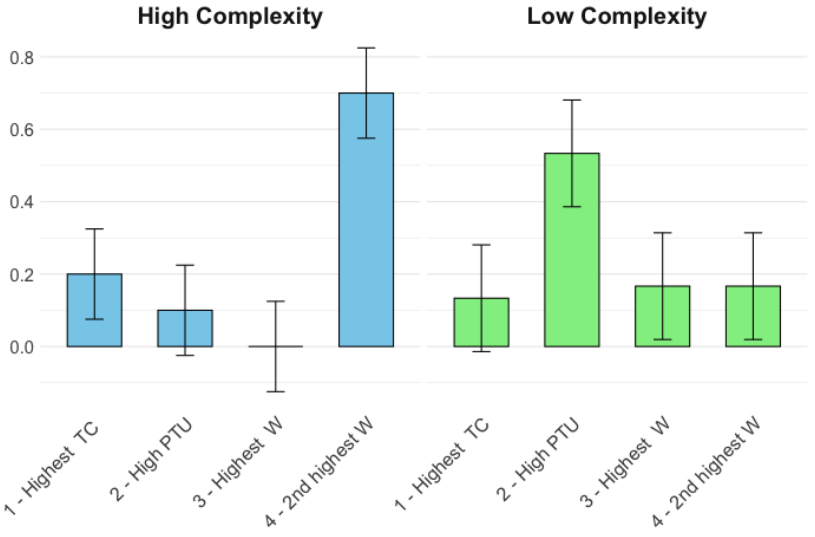
Notes: This figure plots the β_k from Equation 11 and 95% confidence intervals. The outcome variable is the yearly average of the risk-adjusted value of worker daily total compensation, which is defined as $wage + \hat{\alpha} * profit\ sharing\ income$. The coefficients in different shades of blue correspond to different values of $\hat{\alpha}$ from Table B.1 row 1. The shaded grey area represents the year in which the outsourcing reform was approved. Regressions are estimated on a balanced sample of workers from IMSS described in Section 6.2. Standard errors are clustered at the establishment level. [Back to Section 6.2.2]

Figure 12: Ranking of job offers among survey respondents

(a) Share ranking each option 1st



(b) Share ranking each option 2nd - among those ranking highest w first



Notes: This figure was constructed with data from a self-conducted survey on Mexican workers using Prolific (N = 130) in January 2025. Workers were asked to rank four hypothetical job offers with profit-sharing and wages. In the high complexity framing, workers had to calculate the profit-sharing offered in each option. The low complexity framing did not require profit-sharing to be calculated. Offers are ordered in the x-axis from highest to lowest total compensation. Panel (a) shows the share of workers ranking each option first in the two different complexity scenarios. Panel (b) shows the share of workers ranking each option second in the two different complexity scenarios, among the workers ranking the option with the highest wage first in the high complexity scenario. [Back to Section 6.3]

Tables

Table 1: Summary Statistics for 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	407 607	309 614	150 265	216 727
Profit per worker	1099	440	429	566
Value added 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

Notes: 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 2018 data from EMIM and the Economic Census. Nominal variables are in thousands of Mexican Pesos (2018 value). Full outsourcing establishments are those outsourcing more than 95% of their workers in the year pre-reform (2020). Conventional outsourcing establishments are those with positive outsourcing but less than 95% of their workers in the year pre-reform. Control establishments are those not outsourcing in the year pre-reform. [Back to Section 4.4]

Table 2: Outsourcing and employment volatility

	(1) Volatility Total workers	(2) Volatility Total workers	(3) Volatility Blue collar
Full Outsourcing	-0.008^{***}	-0.003	-0.003
	(0.0019)	(0.0017)	(0.002)
Convent. Outsourcing	0.0069^{**}	0.007^{**}	0.009^{***}
	(0.003)	(0.003)	(0.003)
Sector FE	No	Yes	Yes
Observations	290,340	290,340	288,408

Notes: This table shows the results of a regression of establishment-level within-year volatility on a binary variable equal to 1 if the establishment is classified as full outsourcing and another equal to 1 if the establishment is classified as conventional outsourcing. The results are constructed using balanced establishment data from EMIM for the 2017-2020 period. Volatility is measured as the within-establishment yearly coefficient of variation of the de-trended employment from 2017 to 2020. Employment is detrended using an additive time-series decomposition, where we subtract the trend component from the original variable. All specifications control for establishment size. Clustered standard errors at the 4d NAICS sector level are in parenthesis. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1 [Back to Section 4.3]

Table 3: Difference in Differences estimates - Employment

	(1)	(2)	(3)	(4)
Panel A: First Stage	Share outsourced	Any outsource	Outsource $> 95\%$	Number outsourced
Post Reform * Full-outsourcing	-0.5895***	-0.5382***	-0.6063***	-210.0***
	(0.0072)	(0.0082)	(0.0072)	(5.937)
Observations	454,132	454,132	454,132	454,230
Panel B: Employment outcomes	In-house workers	Log(Total workers)	Total workers	Log(Avg hs worked)
Post Reform * Full-outsourcing	256.2***	0.0161*	4.066	0.0016
	(9.869)	(0.0091)	(4.278)	(0.0030)
Observations	454,230	454,132	454,230	450,887

Notes: This table reports the outsourcing reform's treatment effects. Post reform is an indicator equal to 1 from 2021 onwards. Estimation on the balanced sample of establishments in EMIM from 2018 to 2023. Treatment group includes establishments outsourcing over 95% of workers pre-reform. Control group includes establishments with no outsourcing in the year pre-reform. In Panel A the outcomes are (1) share of workers outsourced, (2) a binary variable = 1 if the establishment outsourced (3) is a binary = 1 if the establishment outsourced over 95% of employees (4) The number of workers outsourced. In Panel B the outcomes are (1) number of in-house workers (2) is log of total workers (outsourced + in-house) (3) total workers (4) average hours worked at the establishment. All specifications include establishment fixed effects, 3-digits NAICS sector x date fixed effects, state 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 [Back to Section 6.1.2]

Table 4: Difference in Differences estimates - Profit sharing

	(1) Profit sharing	(2) Profit sharing / L
Pre-reform years		
2018	-98.25	-0.74*
	(60.84)	(0.3927)
2019	-164.3***	-0.48***
	(47.45)	(0.1284)
Post-reform years		
2021	32.60	0.27
	(63.68)	(0.1662)
2022	2,846.3***	6.96***
	(207.2)	(0.4826)
2023	3,107.9***	7.75***
	(219.6)	(0.4587)
2024	3,295.4***	8.47***
	(225.7)	(0.5490)
Observations	47,096	47,093

Notes: This table shows the estimated β_k from Equation 10 at the yearly level. The outcome variable is yearly profit sharing in column (1), and yearly profit sharing over total workers in column (2). Both variables are in thousands of mexican pesos. Estimation on the balanced sample of establishments in EMIM from 2018 to 2024, where we aggregate the data at the yearly level for each establishment. The treatment group includes establishments outsourcing more than 95% of their workers pre-reform. The control group are establishments not using outsourcing pre-reform. Both specifications include establishment fixed effects and year fixed effects. Standard errors clustered at the establishment level are in parenthesis. Signif. Codes: $***$: 0.01, $**$: 0.05, $*$: 0.1 [Back to Section 6.1.2]

Table 5: 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 computed 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). [Back to Section 4.4]

Table 6: Difference in Differences results: wage and total compensation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Worker - level regressions					Cell - level regressions	
Outcome variable:	Wage	Ln Wage	$\frac{Wage}{Wage_{2020}}$	Wage	Total Compensation	Wage	Total Compensation
Treat x Year = 2018	-3.702	0.0025	-0.0011	-1.776	-5.044*	-1.776	-5.044
	(2.266)	(0.0039)	(0.0035)	(2.666)	(2.797)	(2.983)	(3.397)
Treat x Year = 2019	-1.154	0.0014	-0.0010	0.6946	-1.352	0.6946	-1.352
	(1.674)	(0.0029)	(0.0028)	(2.060)	(2.156)	(2.333)	(2.699)
Treat x Year = 2021	0.8023	-0.0007	-0.0022	1.540	0.8680	1.540	0.8680
	(1.530)	(0.0024)	(0.0027)	(2.141)	(2.174)	(2.649)	(2.867)
Treat x Year = 2022	-5.346**	-0.0172***	-0.0175***	-3.584	19.98***	-3.584	19.98***
	(2.618)	(0.0043)	(0.0054)	(3.170)	(3.713)	(4.233)	(4.473)
Treat x Year = 2023	-9.641***	-0.0331***	-0.0399***	-8.908***	14.76***	-8.908**	14.76***
	(2.611)	(0.0044)	(0.0058)	(3.403)	(3.873)	(4.439)	(4.588)
Treat x Year = 2024	-12.87***	-0.0450***	-0.0602***	-11.99***	12.56***	-11.99**	12.56**
	(3.157)	(0.0054)	(0.0076)	(4.039)	(4.667)	(4.856)	(5.514)
θ_{2023} as proportion of mean outcome of treated in 2020	-1.6%	-	-	-1.5%	2.5%	-1.5%	2.5%
Worker FE	Yes	Yes	Yes	No	No	No	No
Stratum FE	No	No	No	Yes	Yes	Yes	Yes
Observations	725,921	725,921	725,921	725,921	647,867	14,629	13,030

Notes: This table shows the results of estimating Equation 11 using data on wages from Mexican Social Security (IMSS) and data on profit sharing from the monthly manufacturing survey (EMIM). Treated workers are those insourced after the reform. Columns (1) to (5) estimate the regression using worker level sample described in Section 6.2.2. The outcome variables are: Column (1): the average real daily wage in year t (in MX pesos). Column (2): the natural logarithm of $wage_t$. Column (3): the wage as a proportion of the wage in 2020. Column (4) is the same regression as (1), replacing worker FE by stratum (sector x firms size category x state x treatment status) FE. Column (5): total compensation $(wage_t + profit\ sharing_t)$ and includes group FE. Columns (6) to (7) estimate Equation 11 using data aggregated at the state x sector x size group x year level (described in Section 6.2.2) and weighting observations by the number of workers in the cell. The outcome variables are: Column (6): is $wage_t$. Column (7): $(wage_t + profit\ sharing_t)$ and the sample is restricted to the cells that could be merged with profit sharing data from INEGI. All specifications include sector x year FE, state x year FE and pre-reform firm size specific linear trends. Standard errors for columns (1) to (5) are clustered at the firm level and at the stratum level for Columns (6) and (7). Signif. Codes: ***: 0.01, **: 0.05, *: 0.1 [Back to Section 6.2.2]

Table 7: Difference in Differences results: wage and total compensation - robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Outcome variable:	Wage					Total compensation	
Specification:	Extended Sample I	Extended control grp	Excluding very low wage	Pre-period salary FE	2-digit Sector FE	2-digit Sector FE	Alternative P.S, Measure
Treat x Year = 2018	-5.129**	-4.424*	-2.978	-2.556	-3.077	-5.589*	-4.544
	(2.165)	(2.300)	(2.313)	(3.370)	(2.768)	(2.995)	(2.793)
Treat x Year = 2019	-1.923	-1.960	-1.302	1.240	-0.0520	-2.473	-1.201
	(1.583)	(1.731)	(1.710)	(2.788)	(2.159)	(2.364)	(2.162)
Treat x Year = 2021	1.114	0.6901	0.6228	-0.7685	1.484	1.252	0.6112
	(1.449)	(1.581)	(1.565)	(2.628)	(2.108)	(2.119)	(2.178)
Treat x Year = 2022	-5.126**	-4.571	-5.514**	-6.274*	-4.267	18.95***	20.49***
	(2.490)	(2.800)	(2.649)	(3.482)	(3.395)	(3.558)	(3.738)
Treat x Year = 2023	-9.180***	-7.060**	-10.03***	-10.89***	-9.289***	14.88***	15.00***
	(2.525)	(3.188)	(2.638)	(3.481)	(3.447)	(3.725)	(3.896)
Treat x Year = 2024	-12.12***	-8.374**	-13.29***	-13.07***	-12.07***	14.21***	12.77***
	(3.039)	(4.049)	(3.202)	(4.042)	(4.028)	(4.540)	(4.691)
Year x NAICS sector FE	3-digit	3-digit	3-digit	3-digit	2-digit	2-digit	3-digit
Year x pre-reform salary FE	No	No	No	Yes	No	No	No
Firm-size linear trends	Yes	Yes	Yes	No	Yes	Yes	Yes
Worker FE	Yes	Yes	Yes	Yes	Yes	No	No
Stratum FE	No	No	No	No	No	Yes	Yes
Observations	802,599	895,685	693,504	725,921	725,921	616,638	647,867

Notes: This table shows the results of estimating Equation 11 using different specifications. Column (1) extends the original sample to workers that changed firm before 2020, or after 2022. Column (2) extends the the control group to include both the original control group and workers who were not outsourced but worked in firms that did do outsourcing pre-reform. Column (3) excludes workers which were earning less than 1.5 times the average minimum wage in the pre-reform period. Column (4) replaces the firm size linear trends by pre-reform wage quintile x time FE. Column (5) and (6) replace 3d NAICS sector FE by 2-digit NAICS sector FE. Columns (7) uses a different methodology to calculate average profit sharing per worker. Standard errors are clustered at the firm level. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1 [Back to Section 6.2.2]

Table 8: Effect of the reform on employment dynamism

	(1) p = 2%	(2) p = 5%	(3) p = 10%	(4) p = 20%
Post-reform x FullOuts	-0.015	-0.0095	0.0008	-0.0030
	(0.0103)	(0.0097)	(0.0060)	(0.0034)
Post-reform 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 Equation 12. The outcome is a binary variable equal to 1 if total production employment of an establishment changed by more than a certain percentage p from one month to the next. We estimate the regression $p \in \{2, 5, 10, 20\}$. 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 01/2017-12/2018. Post-reform period is restricted to 12/2021-11/2022. Clustered standard errors at the 4d NAICS sector level are in parenthesis. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1 [Back to Section 7]

Table 9: Worker knowledge on profit-sharing

	Below 10k	Above 10k	All
Does not know about profit sharing	0.4	0.13	0.24
Correct response:			
Total profit sharing as % of profits	0.2	0.38	0.33
Minimum wage	0.62	0.67	0.65
Mandatory vacation days	0.48	0.61	0.57
Aguinaldo	0.62	0.89	0.79
When choosing where to work considered:			
Salary	0.62	0.83	0.75
Vacation	0.18	0.28	0.25
Personal growth opportunities	0.32	0.48	0.43
Profit-sharing	0.02	0.19	0.13
Did not consider because lack of info or forgot	0.53	0.37	0.44
Firm gave no info on profit-sharing	0.36	0.52	0.46
Observations	50	75	134

Notes: This table provide summary statistics on worker's knowledge about profit-sharing and other benefits by monthly wage group (above and below 10000 MXN), and was constructed with data from a self-conducted survey on Mexican workers using Prolific (N = 134) in January 2025. The first row reports the share of workers who do not know what profit sharing is. The second panel shows the share of respondents who correctly answered: the share of profits distributed as profit-sharing, the level of the minimum wage, the number of mandatory vacation days, and the amount of days received as 'aguinaldo' in Mexico. The third panel reports the share of workers who considered various factors when choosing their current job. The last row in the panel shows the share of workers, among those who did not select profit-sharing, due to lack of information or omission. The last row shows the share of workers stating that the firm did not provide any information on profit-sharing during the hiring process. [Back to Section 6.3]

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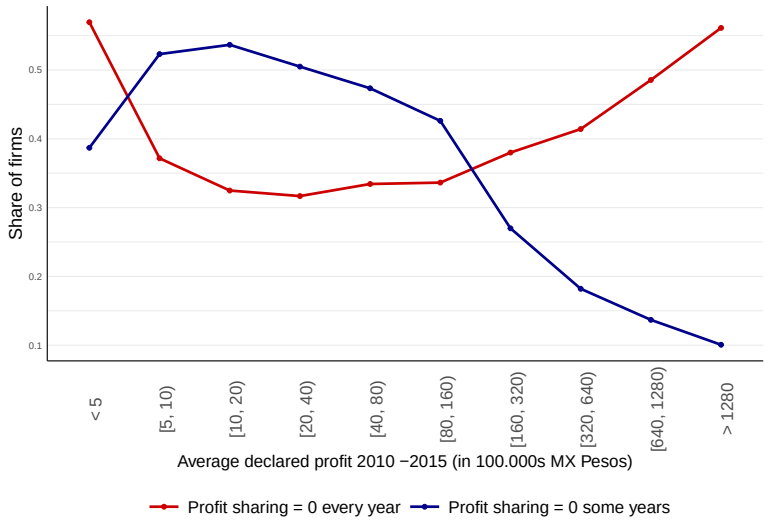
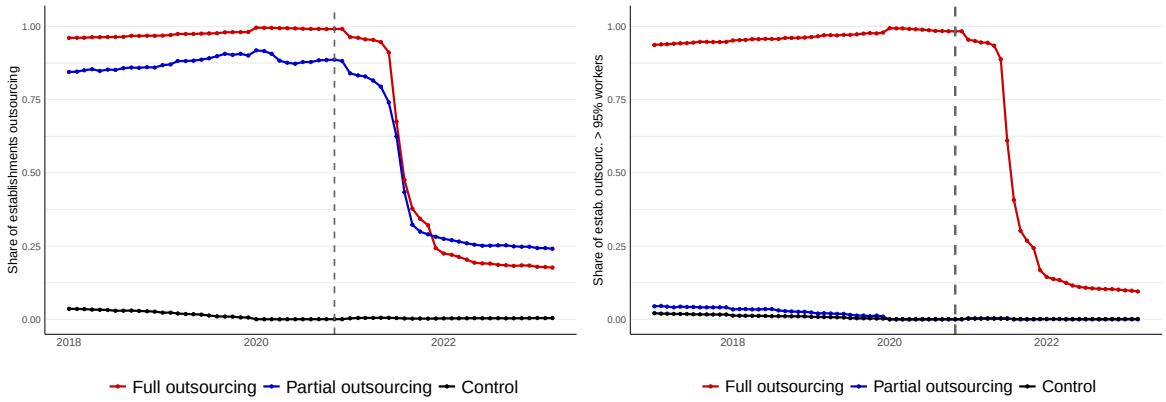
A Appendix A: Additional Tables and Figures

Figure A.1: 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). [Back to Section 4.2]

Figure A.2: Effect of the reform on outsourcing

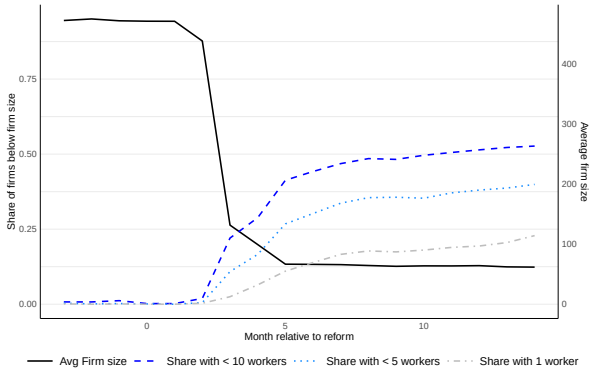


(a) Any outsourcing

(b) Outsourcing more than 95% of workers

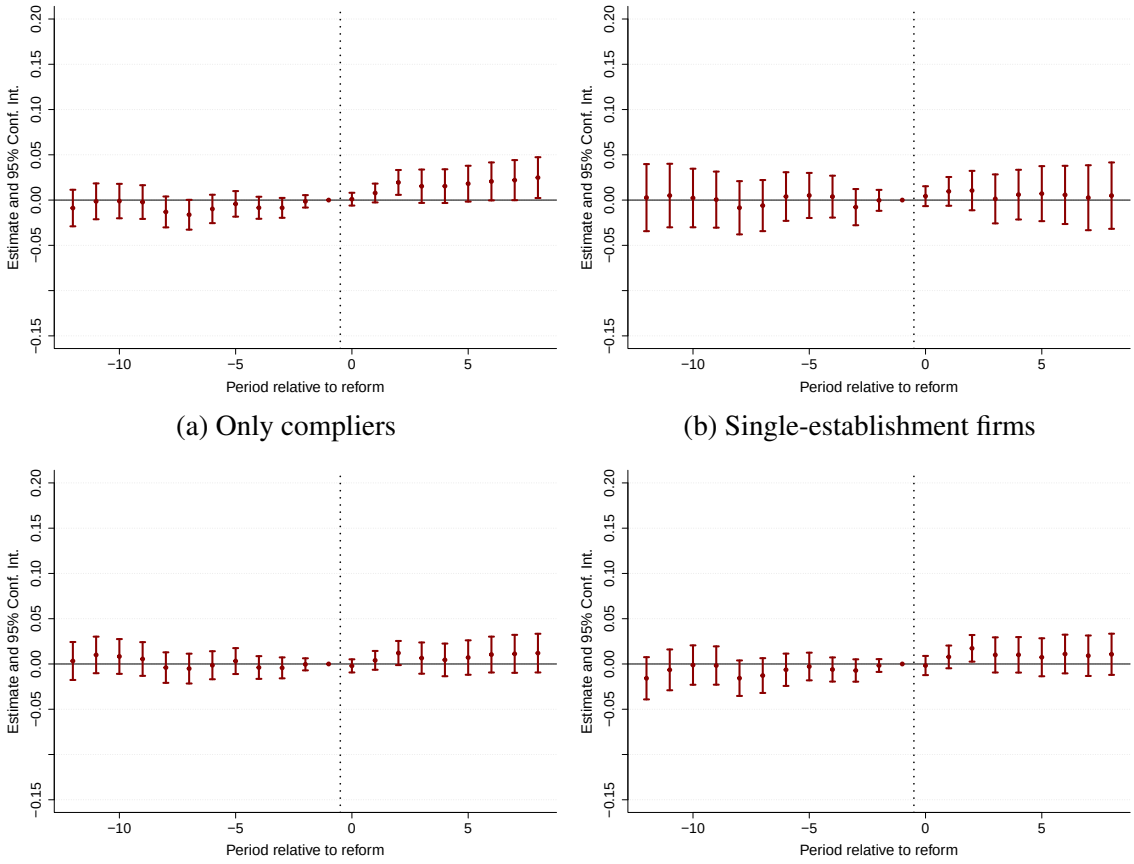
Notes: This Figure shows the share of establishments with positive outsourcing on each month from January 2017 to November 2022 in each group. Results are constructed using a balanced sample of establishments from EMIM. Full outsourcing establishments are those outsourcing over 95% of workers in at least one month on the year prior to the outsourcing reform, partial outsourcing establishments are those positive outsourcing, but lower than 95%, in at least one month on the year prior to the outsourcing reform. Control group includes establishments not outsourcing before the reform. The dashed line corresponds to November 2020, when the reform was first presented.

Figure A.3: Evolution of firm size of surviving contracting firms post-reform



Notes: The figure shows the evolution of contracting firms after the reform, among the contracting firms that survived post-reform. The figure is constructed using data from social security (IMSS). The black line represents the average firm size over time. The dotted lines show the share of surviving contracting firms with less than 10 employees (red), less than 5 employees (blue), and with 1 employee (green). Time is measured relative to the reform date.

Figure A.4: Effect on total employment - robustness



(a) Only compliers

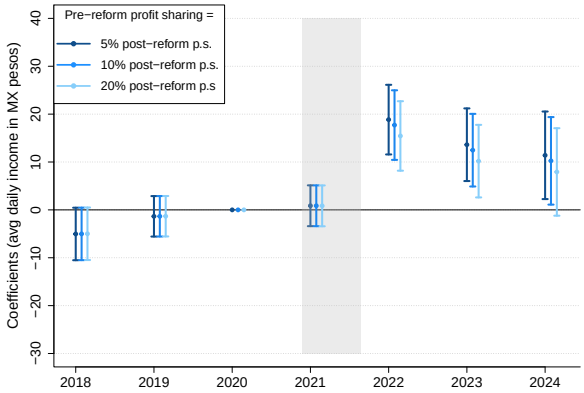
(b) Single-establishment firms

(c) Treatment defined 2y pre-reform

(d) Unbalanced panel

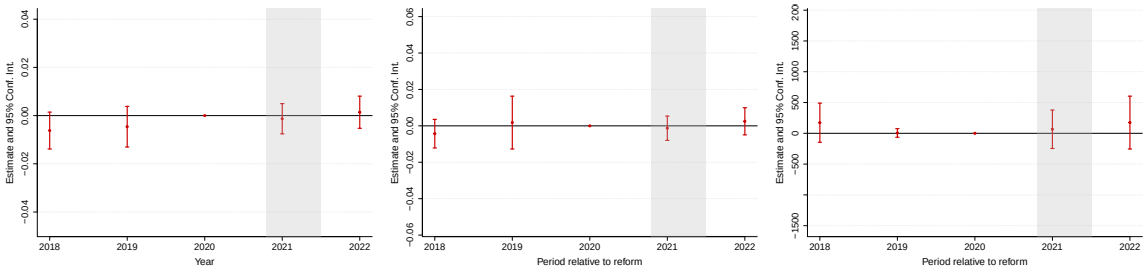
Notes: This figure plots the β_k from Equation 10 and 95% confidence intervals. The estimation is carried out on different sub-samples of establishments from EMIM between 2018 and 2023. Outcome for all columns is the natural logarithm of total workers (outsourced + in-house). Treatment group includes establishments outsourcing over 95% of workers pre-reform. Control group includes establishments with no outsourcing in the year pre-reform. In Panel (a) the treatment group is restricted to the compliers defined as the establishments that were not full outsourcing two years post-reform. Panel (b) includes only establishments belonging to single-establishment firms. In panel (c) the treatment group is defined as establishments outsourcing over 95% of workers in the two years pre-reform (instead of 1 year in the original specification). Panel (d) estimates the regression on an unbalanced panel of establishments. Standard errors are clustered at the establishment level.

Figure A.5: Effect of the reform on yearly compensation - different assumptions on profit sharing pre-reform



Notes: This figure plots the β_k from Equation 11 and 95% confidence intervals. The outcome variable is the yearly average of daily total compensation (wage + profit sharing). The shaded grey area represents the year in which the outsourcing reform was approved. Each specification corresponds to the effects of the reform 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 $p \in \{0.05, 0.1, 0.2\}$. Regressions are estimated on a balanced sample of workers from IMSS described in Section 6.2. Standard errors are clustered at the establishment level.

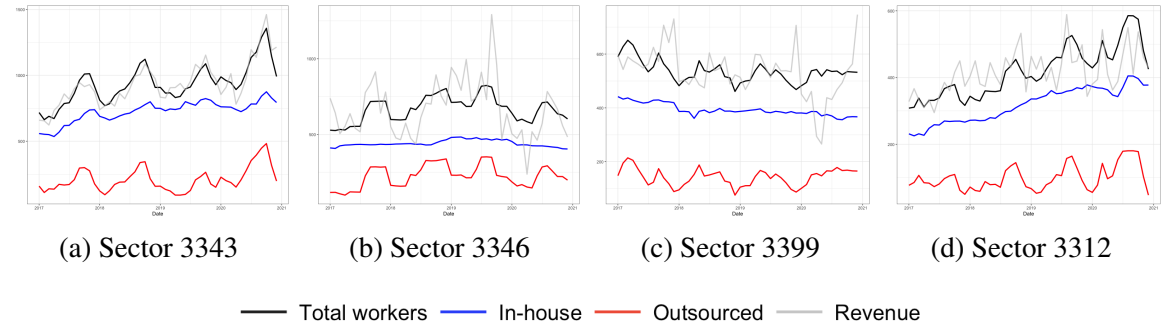
Figure A.6: Effects of reform on investment and value added per worker



(a) Gross investment rate (b) Net investment rate (c) Value added per worker

Notes: This figure shows the difference in differences coefficients and 95% confidence intervals from estimating Equation 10 at the yearly level using the annual manufacturing establishment survey. 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 in panel (a) is gross investment rate, measured as expenditure in tangible assets divided by the value of tangible assets. The outcome in panel (b) is net investment rate, measured as expenditure in tangible assets minus depreciation of tangible assets, divided by the value of tangible assets. The outcome in panel (c) value added over total workers. Standard errors are clustered at the establishment level. Partial outsourcing establishments, i.e. those with positive outsourcing $< 95\%$ pre-reform are excluded from the sample.

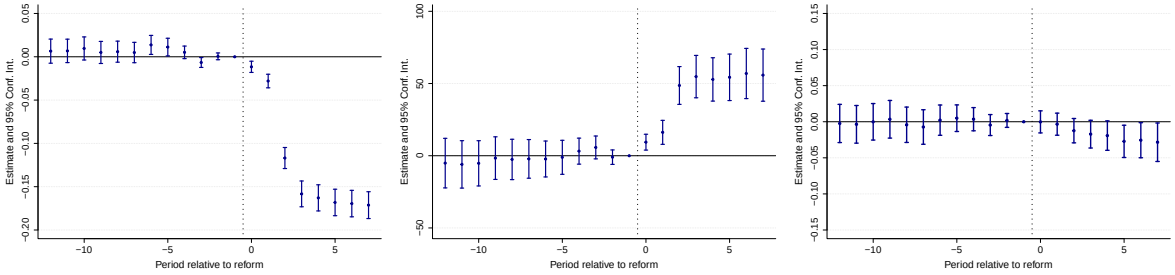
Figure A.7: Total, in-house and outsourced workers in conventional outsourcing establishments - Selected sectors



(a) Sector 3343 (b) Sector 3346 (c) Sector 3399 (d) Sector 3312

Notes: The figure shows trends in total employment, in-house employment, outsourced employment, and revenue across four selected sectors (NAICS codes 3343, 3346, 3399, and 3312) for conventional outsourcing establishments (establishments with positive outsourcing, but less than 95% of total workforce). Employment is divided between in-house workers (blue line) and outsourced workers (red line), while total employment (black line) combines both groups. Revenue is plotted in grey. Revenue numbers are standardized such that the mean equals that of total workers. The figures are constructed using establishment survey data from EMIM from 2017 to 2021.

Figure A.8: Effect on outsourcing and employment - Conventional outsourcing



(a) Effect on outsourcing (b) Effect on in-house workers (c) Effect on total employment

Notes: This figure plots the θ_k from Equation 10 and 95% confidence intervals. The estimation is carried out on a balanced panel of establishments from EMIM between 2017 and 2022. Treatment group includes 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 variables are: panel a: share of workers outsourced; panel b: number of in-house workers; panel c: log total workers. θ_{Q42020} is normalized to 0. Standard errors are clustered at the establishment level. [Back to Section 7]

Table A.1: Transition Matrix by establishment type

	Full outsourcing	Conventional outsourcing	No outsourcing
Full outsourcing	0.969	0.022	0.009
Conventional outsourcing	0.025	0.853	0.122
No outsourcing	0.002	0.014	0.984

Notes: This table displays the yearly transition matrix across establishment types. Full outsourcing are establishments outsourcing more than 95% of workers on average in the year. Conventional outsourcing are establishments with positive outsourcing in the year, but less than 95% of their workers on average. No outsourcing are establishment with zero outsourced workers in the year. 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 table is built using a balanced sample of establishments in EMIM from 2017 to 2020.

Table A.2: Sector - level regressions on seasonality and outsourcing use

Dep Vbles:	(1) tot workers seasonality	(2) revenue seasonality	(3) blue collar seasonality	(4) 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 results are constructed using establishment data from EMIM for the period 2017-2019. The Coefficients of interest in rows 2 and 3 are the proportion of establishments in each sector belonging to each outsourcing group. Sector seasonality for variable x is computed as the average absolute value of the seasonal component from an additive moving-average decomposition of x, divided by the average of x over the period. We control for average establishment size in every column. Robust standard errors are in parentheses. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

Table A.3: Elasticity of total workers with respect to revenue

	(1) log(total workers)	(2) log(total 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	Conv. Outs.	Conv. Outs.	Conv. Outs.

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. Variables are de-trended using an additive time-series decomposition, where we subtract the trend component from the original variable. 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. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

Table A.4: Summary Statistics on profit sharing 2022

	Full Outsourcing	Control
Total profit sharing	3205	2666
	(7212)	(6665)
Profit sharing / L	7.95	7.04
	(14.26)	(23.43)
Profit sharing over monthly wage	0.51	0.49
	(1.16)	(1.25)

Notes: This table presents the mean and standard deviation of profit-sharing statistics for full outsourcing establishments and control establishments, using 2022 data from EMIM. Full outsourcing establishments are those that were outsourcing more than 95% of workers pre-reform. Control are establishments not outsourcing pre-reform. We restrict the sample to full outsourcing establishment that were not fully outsourcing post-reform (compliers). The first two rows display the average total profit-sharing costs and profit-sharing per worker, both measured in thousands of Mexican Pesos, for each group of establishments. The last row shows the average ratio of yearly profit-sharing to total monthly wages across establishments, which is equivalent to yearly profit-sharing income per worker divided by the average monthly wage.

Table A.5: Employment declines

	(1) tot workers	(2) tot workers	(3) w.collar	(4) w.collar	(5) b.collar	(6) 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 grp	Full Outs.	Conv. Outs.	Full Outs.	Conv Outs.	Full Outs.	Conv Outs.

Notes: This table reports the reform's effect on a dummy variable equal to one if an establishment's deseasonalized employment fell between the period pre-reform and 6 months post-reform. Results are built using establishment data from EMIM. . Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

B Appendix B: Additional empirical results

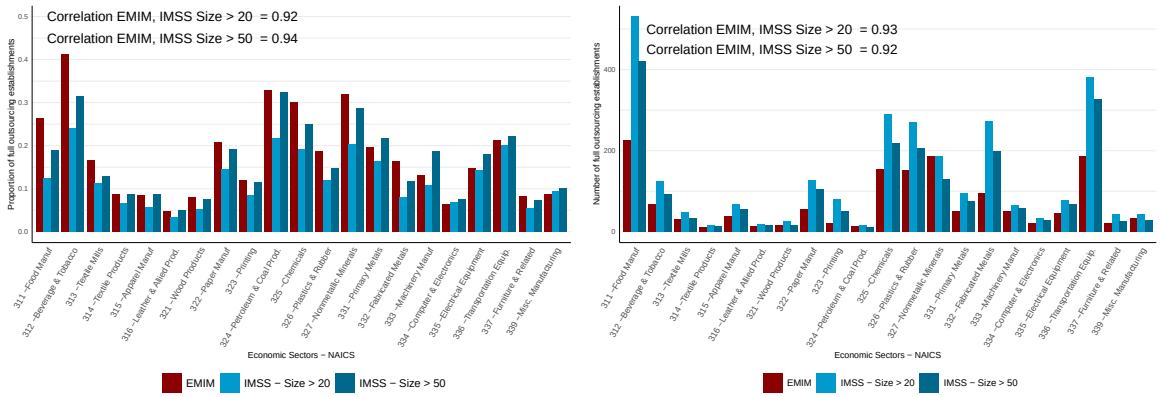
B.1 Comparing sample in IMSS data and EMIM data

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.

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

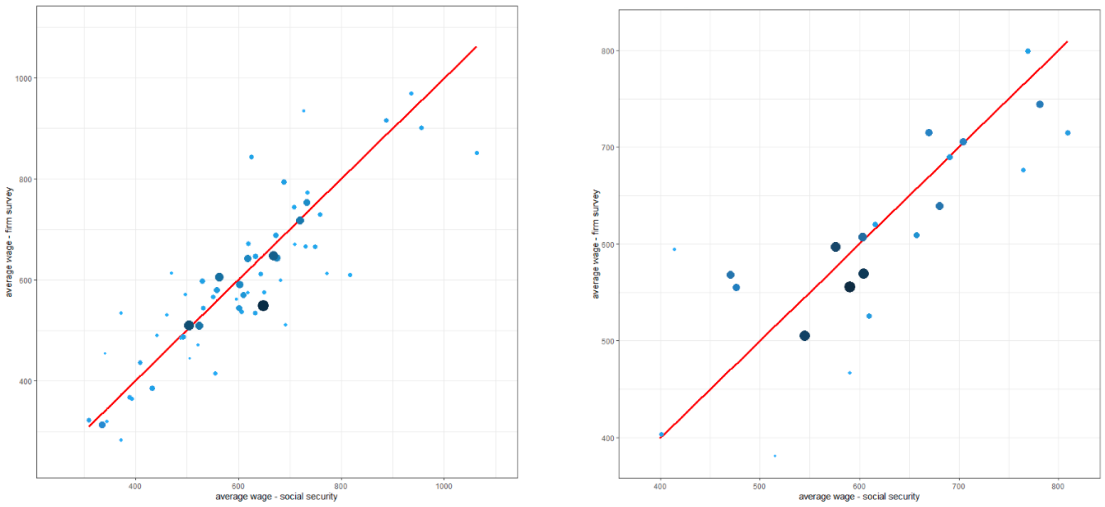


(a) Proportion of full outsourcing estab. per sector (b) Number of full outsourcing estab. per sector

Notes:This figure shows the distribution of full outsourcing establishments across 3-digit NAICS sectors. Panel (a) plots the share of all establishments in the sector that are classified as full outsourcing. Panel (b) plots the number of establishments in the sector that are classified as full outsourcing. These statistics are computed using different datasets for comparison. The dark red bars use EMIM data. The light blue bars use data from IMSS, restricting establishments to those with over 20 employees on 10/2021, and belonging to the manufacturing sector. The light dark bars use data from IMSS, restricting establishments to those with over 50 employees on 10/2021, and belonging to the manufacturing sector.

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

Notes: This figure plots the relationship between the measured 2022 average daily wage using social security data (IMSS) and firm survey data (EMIM). The values in the X and Y axis correspond to the average daily wage for all workers corresponding to a particular group calculated using either IMSS (x-axis) or EMIM (y-axis). In panel (a) each point corresponds to a NAICS 3-digit sector x outsourcing status (employed by firm that had been full-outsourcing pre-reform, and employed by a firm that had not been outsourcing) group. In panel (a) each point corresponds to a region x outsourcing status groups. Average daily wage for workers in each group using IMSS is calculated as the average base salary across all workers in the group. Average daily wage for workers in each group in EMIM is calculated as the weighted average of the average wage across establishments, with weights equal to number of in-house workers in the establishment. The size and color intensity of each point vary based on the number of workers in each group. The red lines in each graph correspond to the 45-degree line.

B.2 Estimation of certainty equivalent and risk-adjusted value of total compensation

The risk-adjusted value of total compensation, defined in 5, is composed of the wage plus profit-sharing, where profit-sharing is discounted by a factor α due to worker risk aversion: $wage + \alpha \cdot profit\ sharing$. As noted in Section C.1, α, can be expressed as the ratio of the certainty equivalent of profit-sharing to its expected value: $\frac{CE^{ps}}{\mathbb{E}[ps]}$. In this section, we outline the methodology used to compute three key variables that allow us to obtain an estimate of

the effect of the reform on the risk-adjusted value of total compensation: (i) the certainty equivalent of mandated profit-sharing in the sample, (ii) the parameter α, and (iii) the risk-adjusted value of total compensation. Our approach closely follows that detailed in Nimier-David et al. (2023).

Our procedure follows three steps. First, we calculate the certainty equivalent of profit-sharing for each worker in the control group under alternative levels of risk aversion. Second, we compare this certainty equivalent to the average profit-sharing actually received by the worker. This provides us with an estimate of the average value of each uncertain peso of profit sharing, in terms of a certain peso (α_i). We then average α_i across workers to obtain a single estimate of the risk-adjusted value of profit-sharing, $\hat{\alpha}$. We then use the estimated $\hat{\alpha}$ to assess the effect of the reform on the risk-discounted value of total compensation: $wage + \alpha \cdot profit\ sharing$. The remainder of this section describes each step of the estimation in detail.

Step 1: Estimation of certainty equivalent of profit-sharing. The certainty equivalent of profit sharing for worker i is defined as:

$$\mathbb{E}[u(w_i + CE_i^{ps})] = \mathbb{E}[u(w_i + ps_i)]$$

Where w_i is the yearly wage, ps_i is the yearly amount of profit sharing the worker receives and CE_i^{ps} is the certainty equivalent of profit sharing. As in the micro-foundation of the labor supply function in Section C.1, we assume CRRA utility with relative risk aversion parameter γ:

$$\mathbb{E}\left(\frac{(w_i + CE_i^{ps})^{1-\gamma}}{1-\gamma}\right) = \mathbb{E}\left(\frac{(w_i + ps_i)^{1-\gamma}}{1-\gamma}\right) \tag{13}$$

Given the absence of a closed-form expression for CE_i^{ps}, we solve numerically for CE_i^{ps} for each worker. We focus on the sample of workers in the control group (i.e. working for firms not doing any outsourcing), because for this group we have a longer time period with positive profit-sharing income (7 years), while treated workers only have three years with positive profit-sharing. For each worker, we compute $u(w_i + ps_i)$ for each year between 2018

and 2024.[66] We then average these values of the utility function over 2018-2024 for each worker to approximate the expected utility over this period, i.e. the expression on the right hand side of Equation 13. Subsequently, we numerically solve for CE_i^{ps} using the equality in Equation 13 for each worker, plugging in the estimated expected utility on the right-hand size, and using information on worker wages from 2018 to 2024 on the left hand side:[67]

$$\frac{1}{7}\sum_{t=2018}^{2024}\frac{(w_{it}+\widehat{CE_i^{ps}})^{1-\gamma}}{1-\gamma}=\frac{1}{7}\sum_{t=2018}^{2024}\frac{(w_{it}+ps_{it})^{1-\gamma}}{1-\gamma} \tag{14}$$

Intuitively, we search for the guaranteed amount of profit sharing (CE_i^{ps}) that makes the worker indifferent to the risky stream they actually face. This process is repeated for different values of the relative risk aversion coefficient $\gamma \in \{1,2,3,4,5\}$. For $\gamma = 1$, the utility function corresponds to log utility. This provides us with an estimated value $\widehat{CE_i^{ps}}$ for each worker, for each risk aversion parameter.

Step 2: Estimation of $\hat{\alpha}$. We then compare the certainty equivalent to the average value of profit sharing for the 2018-2024 period. We define the relative risk premium:

$$\pi_i^R = 1 - \frac{CE_i^{ps}}{\mathbb{E}(ps_i)}$$

which indicates how much workers are willing to pay to avoid risk for each peso of expected profit sharing. Conversely, $\frac{CE_i^{ps}}{\mathbb{E}(ps_i)}$ represents the value workers place on each peso of uncertain profit sharing in terms of a certain peso. Note that this is the expression for α in the risk discounted value of total compensation defined in Prediction 3 of Section 5:

[66] As mentioned in Section 6.2.2, we do not have information on profit-sharing income at the firm level. We have this information aggregated at the stratum x year level, where each stratum is defined by sector x state x size group x outsourcing use group level. If we were to assign each worker a value of ps_t equal to the average profit sharing per worker in their stratum, we would likely underestimate the variance in ps_t across time for each worker. Thus, in order to compute ps_t for each worker we take a random draw from a gamma distribution, with the mean equal to the average ps_t in the stratum the worker belongs to for that year, and the variance equal to the size-weighted average within-firm, across time variance of ps_t for firms in that stratum.

[67] We verify our numerical solution by computing the equality with our CE_i^{ps} values, demonstrating the accuracy of the solution method.

$$\alpha_i = 1 - \pi_i^R = \frac{CE_i^{ps}}{\mathbb{E}(ps_i)}$$

We estimate α_i for each worker using the estimated certainty equivalent, and approximating the expected value in the denominator using the average profit sharing received during the 2018-2024 period.

$$\hat{\alpha}_i = \frac{\widehat{CE_i^{ps}}}{\overline{ps_i}} \tag{15}$$

We then take the average value of α_i across workers to obtain a single estimated value of $\hat{\alpha}$ for each risk aversion parameter.

$$\hat{\alpha} = \frac{1}{n} \sum_i \hat{\alpha}_i \tag{16}$$

The results are presented in row 1 of Table B.1. For a relative risk aversion of 2, one peso of profit sharing is valued at 92 cents on average by workers. As risk aversion increases, the value per peso of profit-sharing decreases, reflecting a stronger discounting of risk. For a high risk aversion value of 5, workers value one peso of profit sharing at 85 cents. Rows 2 and 3 show the values of α_i at the median and the 25 percentile of the distribution. Row 4 shows the average certainty equivalent over the average profit-sharing value (as used in Nimier-David et al. (2023)).

Step 3: Estimation of risk-adjusted value of total compensation. Using the estimated $\hat{\alpha}$, we construct the risk-adjusted value of total compensation, defined as:

$$risk\ adj.\ value\ total\ compensation_{it} = wage_{it} + \hat{\alpha} \cdot profit\ sharing_{it}$$

This outcome variable captures how much workers discount profit-sharing due to risk, on average, treating one peso of profit-sharing as worth only $\hat{\alpha}$ pesos of wage income on average. We construct this outcome for different values of relative risk aversion, using the values of $\hat{\alpha}$ from the first row of Table B.1.

Table B.1: Certainty equivalent over profit sharing for different values of relative risk aversion

	Relative risk aversion parameter				
	1	2	3	4	5
$\hat{\alpha}$ = mean $\hat{\alpha}_i$	0.96	0.92	0.89	0.87	0.85
50^{th} percentile $\hat{\alpha}_i$	0.98	0.95	0.92	0.90	0.87
25^{th} percentile $\hat{\alpha}_i$	0.93	0.85	0.79	0.72	0.67
$\frac{Average\ \widehat{CE_i^{ps}}}{Average\ \overline{ps_i}}$	0.94	0.90	0.86	0.83	0.81

Notes: This table shows the relationship between the calculated certainty equivalent and average profit sharing received by workers in our sample. The certainty equivalent is calculated on the sample of control workers from 2018 to 2024, assuming a CRRA utility function, for different values of relative risk aversion. The first row reports $\hat{\alpha}$ defined in Equation 16 as the average $\hat{\alpha}_i$ across workers. The second and third rows report the value at the 50th and 25th percentile of the distribution of $\hat{\alpha}_i$. The fourth row reports the ratio between the average certainty equivalent and the average profit sharing received by workers in our sample $\frac{\frac{1}{n}\sum_i \widehat{CE_i^{ps}}}{\frac{1}{n}\sum_i \overline{ps_i}}$.

We then estimate the effect of the reform using Equation 11 on the risk adjusted value of total compensation across different risk aversion parameters. The results for $RRA \in \{1, 3, 5\}$ are presented in Figure 11. We can see that even for a very high relative risk aversion of 5, the value of total compensation increases for workers after the reform, although the increase is approximately 20% lower than the rise in total compensation when risk discounting is not considered. The results are discussed in Section 6.2.2.

A natural question that arises from these results is why the estimated discount for risk is so low. We argue that an important reason is that profit sharing constitutes a small proportion of total worker compensation. If we abstract from wage uncertainty and apply a first-order Taylor approximation to the left-hand side of Equation 13, along with a second-order Taylor approximation to the right-hand side around $\mathbb{E}(ps_i)$, we derive the following expression:

$$\pi_i^R = 1 - \frac{CE_i^{ps}}{\mathbb{E}(ps_i)} \approx \frac{1}{2} \cdot \gamma \cdot \sigma^2 \cdot \frac{\mathbb{E}(ps_i)}{w_i + \mathbb{E}(ps_i)} \tag{17}$$

Where σ^2 is the variance of $\frac{ps_i}{\mathbb{E}(ps_i)}$ and γ is the relative risk aversion parameter. In our setting, profit sharing represents only about 4% of total annual income. Consequently, the

last term on the right-hand side of the equation is small. This indicates that for workers to significantly discount risk, the variance of profit sharing would need to be much higher than what we observe in our sample.

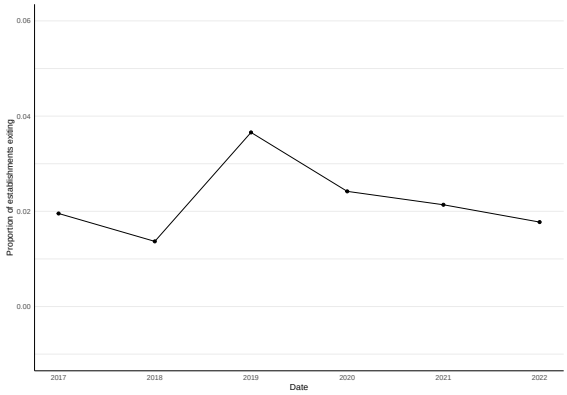
B.3 Establishment Exit from EMIM

As is mentioned in Section 3.1, 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 its 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).

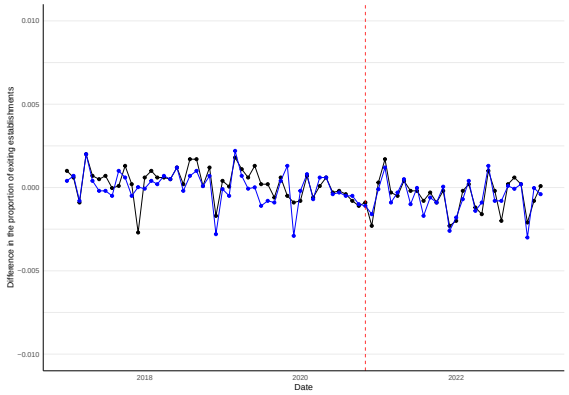
Panel (a) of Figure B.3 shows the proportion of establishments exiting the EMIM sample in each year from 2017 to 2022. We do not find evidence of particularly high or low exit in the post-reform years 2021 and 2022. In Panel (b) we compare exit rates across time between outsourcing and non outsourcing 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: Establishment exit from EMIM

(a) Yearly exit from EMIM



(b) Differential exit in outsourcing estab.



Notes: This figure shows the evolution in establishment exit in EMIM from 2017 to 2022. Panel (a) plots the share of establishments that exited in each year. Panel (b) plots the coefficients from a regression where we regress a binary variable equal to 1 if the establishment exited between date t and $t+1$ on date dummies interacted with a binary variable equal to 1 if the establishment was outsourcing more than 95% of workers on date t, controlling for date fixed effects. For the coefficients in blue, we eliminate establishments with positive outsourcing, but less than 95% from the sample.

B.4 Evidence on profits of contracting firms

We argue in Section 4.2 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 a contracting firm had positive profit-sharing payments, it must have had positive profits. These profits would be embedded in the payments made by the parent firm to the contracting firm, a variable recorded in EMIM. We can express this relationship as:

$$payments\ to\ contracting\ firm = wages + other\ costs + profit \tag{18}$$

Here, wages include social security contributions, while other costs may encompass overhead, training, and employee transportation. The measurement error introduced by these

costs is discussed in Section 6. Since total profit-sharing is given by $0.1 \cdot$ profits, we can rewrite the equation as:

$$payments\ to\ contracting\ firm = wages + other\ costs + \frac{profit\ sharing}{0.1}$$

Rearranging, we obtain an upper bound for outsourced workers' wages:

$$wages \leq payments\ to\ contracting\ firm - \frac{profit\ sharing}{0.1} \tag{19}$$

Since we can directly observe the $payments\ to\ contracting\ firm$ in EMIM, we estimate an upper bound for outsourced workers' pre-reform wages under different assumptions about contracting firms' profit-sharing.[68] This estimate serves as an upper bound due to the presence of other costs in the equation. The change in worker wages after the reform can then be expressed as:

$$\Delta log(wages) \geq \underbrace{log\left(wages_{post}\right)}_{\text{observed in EMIM}} - log\left(\underbrace{payments\ to\ contracting\ firm_{pre}}_{\text{observed in EMIM}} - \underbrace{\frac{profit\ sharing_{pre}}{0.1}}_{\text{assumed}}\right) \tag{20}$$

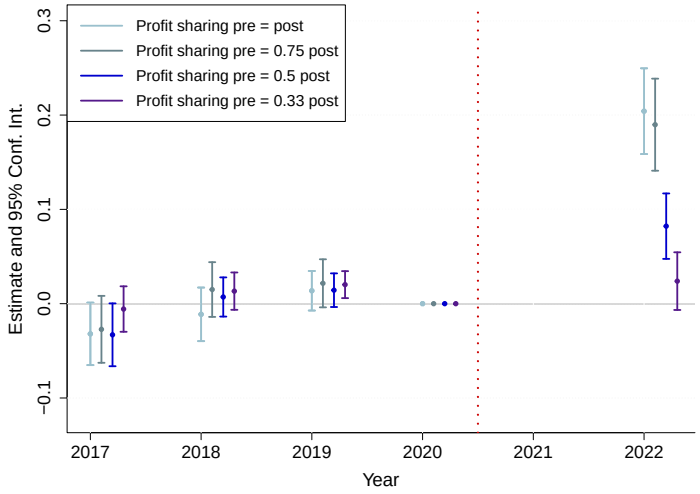
This equation provides a lower bound for the reform's impact on wages. Equation 20 also highlights that the higher the assumed pre-reform profit-sharing, the lower the employment-related payments to the contracting firm, as a greater portion of payments is attributed to profits. Consequently, assuming higher contracting firm profits results in lower estimated pre-reform wages and a larger estimated wage increase due to the reform.

Figure B.4 illustrates the estimated impact of the reform on average worker wages under four hypothetical scenarios for pre-reform profit-sharing: (i) equal to post-reform levels, (ii) 75% of post-reform levels, (iii) 50% of post-reform levels, and (iv) one-third of pre-reform levels. We eliminate the year 2021 for the estimation, as this was the transition year

[68] In this exercise, we assume firm employment remains constant, consistent with our empirical finding that the reform did not affect total employment.

when worker insourcing took place. The results suggest that if contracting firms' profits had matched those of parent firms, wages would have needed to increase by at least 20% relative to the control group post-reform. If contracting firm profits were 75% of parent firm profits, wages would have needed to rise by at least 19%, and if contracting firm profits were 50% or one-third of parent firm profits, wages would have had to increase by at least 8% and 2%, respectively. These findings are inconsistent with results from social security data - where we accurately measure wage - leading us to conclude that contracting firms' profits were either zero or significantly lower than those of fully outsourced firms.

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



Notes: This figure shows the difference in differences coefficients and 95% confidence intervals from estimating Equation 10 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 hypothetical log yearly average wage under different assumptions of the profits of contracting firms pre-reform. Wages for full outsourcing establishments pre-reform are calculated using the expression in the RHS of Equation 19. 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.

B.5 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 B.5 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.

Figure B.5: Change in profit sharing post-reform. Control establishments

(a) Profit Sharing/Avg wage > 3 (b) Profit Sharing/Avg wage > 4

(c) Profit Sharing/Avg b.c. wage > 3 (d) Profit Sharing/Avg b.c. wage > 4

Notes:This figure shows the results of an event-study regression using the sub-sample of establishments from EMIM that were not using outsourcing before the reform. The data is aggregated at the yearly level from 2017 to 2022. The outcome is a binary variable, taking the value of one in panels (a) and (b) if profit-sharing per worker exceeded 3 or 4 times the monthly average wages that year; and equal to one in panels (c) and (d) if profit-sharing per worker exceeded 3 or 4 times the monthly average wages of blue-collar workers that year. The dashed lines in each graph mark the date the outsourcing reform was passed.

C Appendix C: Theoretical Model

In this section, we solve the model presented in Section 5. We first micro-found the firm specific labor supply curve presented in Equation (3). We then derive the analytical solution for the model and the results in Predictions 1 to 3.

C.1 Micro-foundation of labor supply function

In this section we micro-found the firm specific labor supply function

$$n_j = (w_j + \mu \cdot \alpha \cdot E[ps_j])^{\theta} \tag{21}$$

Presented in Section 5, where w_j represents the wage offered by firm j and $E[ps_j]$ denotes the expected profit-sharing per worker offered. We use a static discrete choice framework where workers have heterogeneous preferences for firms, as is common in the monopsony literature (Card et al., 2018; Berger et al., 2022). As mentioned in Section 5, labor supply and demand decisions are made before the realization of z_j, when there is no uncertainty on w_j but there is uncertainty on ps_j. Thus, to model workers' labor supply decision we consider the expected utility from working in a firm j from the worker's perspective. This value includes information frictions which may prevent the worker from correctly estimating her true expected utility. The indirect ex-ante utility of worker i for working in firm j is:[69]

$$\mathbb{E}_{ps}[U_i(w_j, ps_j)] = \mathbb{E}_{ps}\left(\frac{(w_j + \widetilde{ps}_{ij})^{1-\gamma}}{1-\gamma}\right) \cdot \epsilon_{ij} \tag{22}$$

Where ϵ_{ij} is an idiosyncratic preference shock of working at firm j which follows a Fréchet distribution with shape parameter $\frac{1}{\theta}$. We define $\widetilde{ps}_{ij} = \mu_i \cdot ps_j$ as the worker's perceived profit-sharing, which may be different from the true profit sharing offered by the

[69] Our utility specification follows the framework of Dube et al. (2022), but we focus on a single non-wage attribute—profit-sharing and assume perfect substitution between wages and profit-sharing, as both are monetary forms of compensation. In addition, we place greater emphasis on understanding the parameters that govern the relative importance of wages and profit-sharing in the utility function.

firm. The parameter $\mu_i \leq 1$ is a measure of the information frictions present when evaluating profit sharing. A low μ_i can indicate that profit sharing is not very salient for workers, or that they are not well informed about this benefit. This decreases the importance of profit sharing in workers' expected utility because they put less weight on this factor. A low μ can also reflect that the complexity of profit-sharing leads workers to assign less weight to this benefit.[70] Using the expression for $\widetilde{ps}_{ij}$ and the definition of the certainty equivalent of profit sharing CE_{ps},[71] the right hand side of (22) can also be expressed as:

$$\mathbb{E}_{ps}[U_i(w_j, ps_j)] = \frac{(w_j + \mu_i \cdot \alpha_j E[ps_j])^{1-\gamma}}{1-\gamma} \cdot \epsilon_{ij} \tag{23}$$

Where $\alpha_j = \frac{CE_{ps}}{E[ps_j]} \leq 1$ is a measure of how much the workers discount risk associated to profit sharing. Importantly, α_j will affect workers' labor supply decision through worker preferences. If $\alpha_j < 1$ workers will value each unit of profit sharing less than each unit of wages, due to the additional risk associated with profit sharing. However, while the information frictions reflected in μ_i impact labor supply decisions, they do not affect utility once the worker is employed by a particular firm. In other words, these frictions are not related to workers' preferences for profit sharing but rather to constraints that prevent them from valuing it properly ex-ante.

We assume all workers have the same awareness of profit sharing $\mu_i = \mu$, and $\alpha_j = \alpha \; \forall \; j$, the likelihood of choosing employer j is:

$$p_j = \frac{(w_j + \mu \cdot \alpha E[ps_j])^{\theta}}{\sum_{k \in \{1 \ldots J\}} (w_k + \mu \cdot \alpha E[ps_k])^{\theta}} \tag{24}$$

Where $\theta = (1-\gamma)\tilde{\theta}$. For simplicity, we assume that the number of firms is sufficiently large, and that there are no strategic interactions between firms, such that Equation (24) can be approximated by $p_j = \lambda(w_j + \mu \cdot \alpha E[ps_j])^{\theta}$. Aggregating across workers, yields the firm specific upward-sloping labor supply curve:

[70] For this second type of information frictions, μ_i can be expressed in terms of a 'simplicity equivalent': the simply described amounts individuals consider equally valuable to the complex benefit (Oprea, 2024).

[71] $u(w + CE_{ps}) = \mathbb{E}[u(w + ps)]$

$$n_j^s(w_j, E[ps_j]) = N\lambda(w_j + \mu \cdot \alpha \cdot E[ps_j])^\theta \tag{25}$$

If we normalize the size of the labor force N to $\frac{1}{\lambda}$ we obtain the labor supply function in 21.

C.2 Definition of risk-adjusted value of total compensation

We now define the risk-adjusted value of total compensation, which is introduced in Prediction 3. Total expected compensation is given by $w_j + \mathbb{E}[ps_j]$. However, worker' valuation of this total compensation is affected by their risk-aversion and the uncertainty surrounding profit-sharing. To account for this, we introduce the concept of the risk-adjusted value of total compensation, which is the risk-free amount of total compensation that workers would value equally to the risky total compensation, absent any information frictions.

$$U(risk\ adj\ value\ total\ comp) = \mathbb{E}\left(U(w + ps_j)|\mu = 1\right)$$

Note that this value can also be thought of as the certainty equivalent of total compensation.[72]

$$\frac{(risk\ adj\ value\ total\ comp)^{1-\gamma}}{1-\gamma} = \mathbb{E}\left(\frac{(w_j + ps_j)^{1-\gamma}}{1-\gamma}\right) \cdot \epsilon_{ij}$$

Under the assumption of no uncertainty in wages, and using the definition of the certainty equivalent of profit-sharing introduced in C.1 we can re-write the expression as:

$$risk\ adjusted\ value\ of\ total\ comp_j = w_j + CE^{ps} = w_j + \alpha_j \cdot \mathbb{E}[ps_j]$$

This value is relevant when considering the effect of enforcing profit-sharing on workers, as an increase in total compensation may not necessarily reflect an increase in the value

[72] Throughout the paper, we focus on uncertainty in profit-sharing payments and abstract from wage uncertainty

of total compensation when accounting for workers' risk preferences and the uncertainty associated with profit-sharing.

C.3 Heterogeneous information frictions μ_i

Section 6.3 presents empirical evidence consistent with the presence of information constraints related to profit-sharing. Among the findings, we demonstrate that some workers are entirely unaware of the existence of profit-sharing in Mexico. These workers likely exhibit $\mu = 0$ as they are unlikely to factor in this benefit at all when making labor supply decisions if they are unaware of it. Furthermore, we show that the information processing constraints present in understanding and calculating profit-sharing reduce the weight workers assign to this benefit, suggesting a $\mu \in (0, 1)$ for some workers. Conversely, some workers are well-informed about profit-sharing and fully incorporate this benefit into their labor supply decisions, indicating a $\mu = 1$. Together, this evidence supports the existence of heterogeneous μ values across workers. Consequently, we extend the model to assume that workers have varying levels of misinformation about profit sharing, but that firms cannot discriminate between these different types. We demonstrate that even if *some* workers are well-informed about profit sharing ($\mu_i = 1$ for some i), the firm's overall elasticity of labor supply with respect to profit sharing will be affected if the average level of awareness is lower than that for wages ($\exists\ i$ s.t. $\mu_i < 1$). Thus, the lack of awareness of profit sharing in some workers will have effect on the average total compensation for all workers in the labor market, under the assumption that the firm cannot offer workers of the same labor market different amounts of total compensation. In other words, under the assumption that the firm cannot perfectly price discriminate in the labor market, as is commonly assumed in monopsony models (Card et al., 2018).

We assume $\mu_i \in [0, 1]$ has discrete probability $P(\mu_i = \mu_g) = p_g$. Then the likelihood of choosing employer j for a worker with awareness parameter μ_g is:

$$P(\max_{k \in \{1,...J\}} \{U_k\} = U_j \mid \mu_g) = \lambda_g (w_j + \mu_g \cdot \alpha E[ps_j])^{\theta} \tag{26}$$

If we assume that firms cannot discriminate between workers of different μ_g, then using the rules of conditional probability,[73] we obtain that the likelihood of any given worker choosing employer j is:

$$P(\max_{k\in\{1,...J\}}\{U_k\} = U_j) = \sum_{g\in G} p_g \lambda_g (w_j + \mu_g \cdot \alpha E[ps_j])^\theta \tag{27}$$

Then, the labor supply curve faced by the firm is:

$$n(w_j, E[ps_j]) = N \sum_{g\in G} p_g \lambda_g (w_j + \mu_g \cdot \alpha \cdot E[ps_j])^\theta \tag{28}$$

We can see that the elasticity of the labor supply curve with respect to profit sharing depends on the distribution of the level of awareness of workers in the labor market, $\bar{p} = \{p_1...p_G\}$ and $\bar{\mu} = \{\mu_1...\mu_G\}$. This implies that if firms cannot offer different amounts of total compensation to different types g, the level of awareness of profit sharing among some workers affects the total compensation for all workers.[74]

For $\theta = 1$ Equation (28) can be expressed in a form identical to Equation (21). For $\theta \neq 1$ this is not possible. However, both hold the property that if workers are risk averse $(\alpha < 1)$ *or* at least one group of workers has information friction ($\exists\ g$ s.t. $\mu_g < 1$), the partial derivative of labor supply with respect to w_j will be greater than the partial derivative with respect to ps_j for all values of w_j, ps_j.[75] This implies that avoiding profit sharing allows firms to decrease total worker compensation. In the following section, we present the analytical solution to the model for the case of homogeneous μ_i For the case of heterogeneous μ_i, we solve the model numerically under different parameter values and provide evidence illustration our predictions for specific parameter values in Figures C.1 and C.3.

[73] $P(A) = \sum_n P(A \mid B_n)P(B_n)$.

[74] The intuition behind this result is similar to the argument for the micro-foundation of monopsony through differentiation across firms. In this scenario, differential preferences for firms across workers affect the wage received by all workers if firms cannot perfectly discriminate.

[75] $\frac{\partial n_j^s}{\partial w_j} - \frac{\partial n_j^s}{\partial E[ps_j]} > 0\ \forall\ w_j, ps_j$.

C.4 Analytical solution to the model

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 fixed cost k and marginal cost c, avoids mandatory profit sharing and chooses w_j. In the second scenario the firm decides not to avoid mandatory profit sharing. In this case, $E[ps_j]$ is determined by the firms' expected pre-profit-sharing profits,[76] and the firm decides optimally on w_j. We then compare expected post-profit-sharing profits in both scenarios to derive an optimal decision rule regarding whether to avoid mandatory profit sharing or not.

Case 1: If firm avoids mandatory profit sharing

If firm the decides to avoid mandatory profit sharing, it pays the marginal cost c and fixed cost k of avoidance, and chooses w_j to maximize profits. Under the assumption that the firm is risk neutral, the firm maximizes:

$$\max_{w_j} \mathbb{E}(z_j n_j - w_j n_j - c \cdot n_j) = \hat{z}_j n_j - w_j n_j - c \cdot n_j \tag{29}$$

subject to:

$$n_j = (w_j + \mu \cdot \alpha \cdot \mathbb{E}[ps_j])^{\theta}$$

which can be written as $n_j = (w_j)^{\theta}$ since $\mathbb{E}[ps_j] = 0$.

In the equality of Equation (29) we use the fact that productivity z_j follows a random process $z_j = \hat{z_j} + \xi_j$ where $\mathbb{E}(\xi_j) = 0$, and that w_j and n_j are set before the productivity shock is drawn. Solving the firm's maximization problem, we obtain the following expressions for wages and total compensation:

$$w_j = (\hat{z}_j - c)\frac{\theta}{\theta + 1} \tag{30}$$

[76] We refer to pre-profit-sharing profits as the firm profits before distributing profit-sharing, and post-profit-sharing profits as the firm profits after distributing profit-sharing.

$$\mathbb{E}[total\ compensation_j] = (\hat{z}_j - c)\frac{\theta}{\theta+1} \tag{31}$$

The resulting labor n_j and expected profits $_j$ are:

$$n_j = \left((\hat{z}_j - c)\frac{\theta}{\theta+1}\right)^{\theta} \tag{32}$$

$$\mathbb{E}(\Pi_j) = (\hat{z}_j - c)\frac{1}{\theta+1}\left((\hat{z}_j - c)\frac{\theta}{\theta+1}\right)^{\theta} - k \tag{33}$$

Case 2: If firm does not avoid mandatory profit sharing

If firm decides **not** to avoid mandatory profit sharing, then total profit sharing, PS_j is a proportion of pre-profit sharing profits:

$$PS_j = \rho(z_j - w_j)n_j \tag{34}$$

And expected profit sharing per worker is:

$$\mathbb{E}[ps_j] = \rho(\hat{z}_j - w_j) \tag{35}$$

The firm's maximization problem is now:

$$\max_{w_j} \mathbb{E}[(1-\rho)(z_j n_j - w_j n_j)] = (1-\rho)(\hat{z}_j n_j - w_j n_j) \tag{36}$$

subject to:

$$n_j = (w_j + \mu \cdot \alpha \cdot \rho(\hat{z}_j - w_j))^{\theta}$$

Where in Equation (36) we again use the fact that $\mathbb{E}[z_j] = \hat{z}_j$ and that wages and labor are determined before the realization of z_j, and we replace $\mathbb{E}[ps_j]$ by the expression in Equation (35) in the labor supply function. Solving the firm's maximization problem, we obtain:

$$w_j = \hat{z}_j \frac{\theta}{\theta+1} - \frac{\rho\mu\alpha \cdot \hat{z}_j}{(1+\theta)(1-\rho\mu\alpha)} \tag{37}$$

Using Equation (35) again, expected total compensation is equal to:

$$\mathbb{E}[total\ compensation_j] = \left(\hat{z}_j \frac{\theta}{\theta+1} - \frac{\rho\mu\alpha \cdot \hat{z}_j}{(1+\theta)(1-\rho\mu\alpha)} \right)(1-\rho) + \rho\hat{z}_j \tag{38}$$

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

$$n_j = \left(\hat{z}_j \frac{\theta}{\theta+1} \right)^{\theta} \tag{39}$$

$$\mathbb{E}(\Pi_j) = \left(\hat{z}_j \frac{\theta}{\theta+1} \right)^{\theta} \cdot \left(\frac{\hat{z}_j}{(1+\theta)(1-\rho\mu\alpha)} \right)(1-\rho) \tag{40}$$

Expected profit-sharing per worker is:

$$\mathbb{E}[ps_j] = \left(\frac{\rho\hat{z}_j}{(1+\theta)(1-\rho\mu\alpha)} \right) \tag{41}$$

C.5 Decision on whether to avoid mandatory profit sharing

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

$$\underbrace{(\hat{z}_j - c)\frac{1}{\theta+1}\left((\hat{z}_j - c)\frac{\theta}{\theta+1}\right)^{\theta} - k}_{\text{expected profits when avoiding mandatory p.s.}} \geq \underbrace{\left(\hat{z}_j \frac{\theta}{\theta+1}\right)^{\theta}\left(\frac{\hat{z}_j}{(1+\theta)(1-\rho\mu\cdot\alpha)}\right)(1-\rho)}_{\text{expected profits when paying mandatory p.s.}} \tag{42}$$

By re-arranging the terms, we arrive at the inequality (6) in Section 5.2.

$$k \leq \frac{\hat{z}_j}{1+\theta}\left(\hat{z}_j\frac{\theta}{\theta+1}\right)^{\theta}\left[\left(1-\frac{c}{\hat{z}_j}\right)^{1+\theta}-\left(\frac{1-\rho}{1-\mu\alpha\rho}\right)\right] \tag{43}$$

A few things to note from Equation (43):

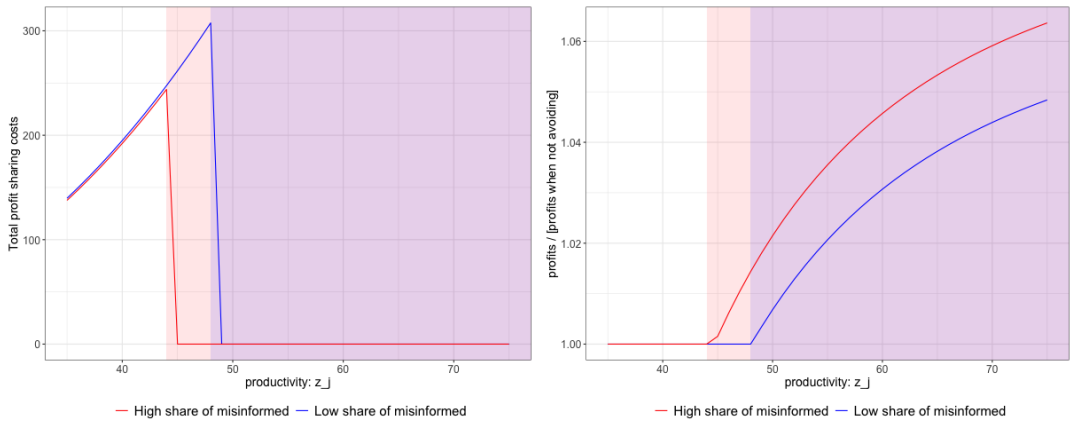
- If $\mu \cdot \alpha = 1$ the expression collapses to $k \leq D$ with $D < 0$, i.e. the cost of avoidance has to be negative for the firm to avoid profit-sharing. If $\mu \cdot \alpha = 1$ and $c = 0$ the expression collapses to $k \leq 0$.
- The right hand side of the inequality is increasing in ρ and z_j, such that higher profit sharing requirements and higher levels of productivity will lead firms to avoid profit-sharing.
- The right hand side of the inequality is decreasing in c and $\mu \cdot \alpha$, such that lower avoidance costs and lower elasticity of labor supply with respect to profit-sharing will incentivize profit-sharing avoidance.

Figure C.1 illustrates this result for heterogenous μ_i with simulations. The red (blue) lines correspond to simulations where there is a high (low) share of misinformed workers (i.e. workers with low μ_g). The shaded areas indicate the firms that choose to avoid profit-sharing in each simulation. Panel (a) displays total profit-sharing costs across different productivity levels z_j, showing that higher-productivity firms are more likely to avoid profit-sharing. Additionally, the proportion of firms opting to avoid profit-sharing is greater in the scenario with a higher share of misinformed workers. Panel (b) depicts firm profits as a fraction of what profits would be if firms did not avoid profit-sharing. When firms do not avoid profit-sharing, this ratio equals 1. As firms begin to avoid, the ratio exceeds 1, indicating that avoiding profit-sharing yields higher profits than complying with it.

C.6 An increase in k

As can be seen in Equation (43) increase in the cost avoiding profit-sharing k will lead some firms to shift from avoiding profit-sharing, to complying with profit-sharing. We proceed to

Figure C.1: Model simulations for heterogenous μ_g: decision to avoid profit-sharing



(a) Total profit sharing

(b) $\frac{Profits}{Profits\ not\ avoiding}$

Notes: This figure shows the results of simulations of the model for different productivity levels $z_j \in [35:75]$ and different shares of misinformed workers. Panel (a) shows total profit-sharing costs as a function of z_j. Panel (b) depicts total profits, as a share of total profits if profit-sharing avoidance was not possible. For all simulations $\bar{\mu} \in \{0, 0.5, 1\}$. For the results in red (high share misinformed), $\bar{p} = \{0.5, 0.4, 0.1\}$. For the results in blue (low share misinformed), $\bar{p} = \{\frac{1}{3}, \frac{1}{3}, \frac{1}{3}\}$. The shaded regions indicate the firms that opt to avoid profit-sharing under each parametrization of $\bar{p}$. The parameters for the simulations are $\theta = 1.5$, $c = 0$, $k = 200$, $\alpha = 0.7$, $\rho = 0.1$.

prove the Predictions for the effects of an increase in compliance stated in Section 5.

C.6.1 Proof of Prediction 1: Effect on employment

Using Equations (39) and (32), we derive the result presented in Prediction 1, which states that the effect on firm employment will be:

$$\Delta n_j = c \cdot \left(\frac{\theta}{\theta + 1} \right)^{\theta} \tag{44}$$

Note that if $c = 0$, the effect on employment will be zero. The reason behind this results is that profit sharing does not distort the marginal cost of employment at the point where marginal profits are zero, i.e. where profits are maximized. We proceed to derive this result, for a general class of labor supply functions of the form $n^s = g(w_j + \alpha\mu ps_j)$, which includes our labor supply function in Equation (21). The labor supply curves and inverse labor supply curves when the firm avoids, and when the firm complies with profit-sharing can be expressed

as:

$$n_j^{avoid} = g(w_j) \qquad n_j^{comply} = g(w_j + \alpha\mu ps_j)$$
$$w(n_j)^{avoid} = g^{-1}(n_j) \qquad w(n_j)^{comply} = g^{-1}(n_j) - \alpha\mu \cdot ps_j$$

Thus, the marginal cost of employment when the firm avoids, and when the firm complies with profit-sharing are:

$$MC_n^{avoid} = w(n_j)^{avoid} + \frac{\partial w(n_j)^{avoid}}{\partial n_j} n_j = \underbrace{g^{-1}(n_j)}_{w(n_j)^{avoid}} + \frac{\partial g^{-1}(n_j)}{\partial n_j} n_j \tag{45}$$

$$MC_n^{comply} = w(n_j)^{comply} + \frac{\partial w(n_j)^{comply}}{\partial n_j} n_j = \underbrace{g^{-1}(n_j) - \alpha\mu \cdot ps_j}_{w(n_j)^{comply}} + \left(\frac{\partial g^{-1}(n_j)}{\partial n_j} - \alpha\mu \frac{\partial ps_j}{\partial n_j} \right) n_j \tag{46}$$

Which can be expressed as:

$$MC_n^{comply} = \underbrace{g^{-1}(n_j) + \frac{\partial g^{-1}(n_j)}{\partial n_j} n_j}_{MC_n^{avoid}} - \alpha\mu \left(\underbrace{ps_j}_{*} + \underbrace{\frac{\partial ps_j}{\partial n_j} n_j}_{**} \right) \tag{47}$$

Where:

$$\frac{\partial ps_j}{\partial n_j} = \frac{\partial \frac{\rho\Pi}{n_j}}{\partial n_j} = \rho \frac{\Pi' n_j - \Pi}{n_j^2} \tag{48}$$

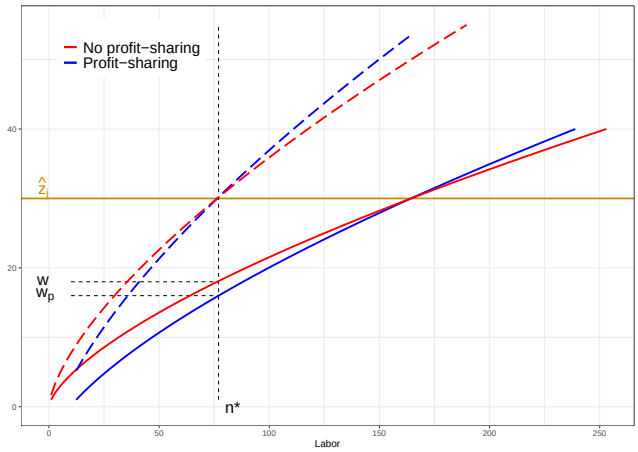
Notice that when $\Pi' = 0$, we have $\frac{\partial ps_j}{\partial n_j} = \frac{-ps_j}{n_j}$, causing the second term in Equation (46) to collapse to zero. Thus, at the optimal level of labor, where profits are maximized, the marginal cost of employment with profit-sharing is identical to the marginal cost of employment without profit sharing. Importantly, this result holds without imposing any specific revenue function, and applies to any labor supply function $g(\cdot)$ of the form

$n^s(w_j, ps_j) = g(A_1 w_j + A_2 ps_j)$. The result also holds if additional production factors are included, as long as the cost of these production factors is discounted from the profit base used to calculate profit-sharing. This result is notable as it implies that profit sharing does not distort labor decisions, even if we take into account the fact that it affects labor supply.

The intuition behind this result lies in the two effects of profit sharing on the marginal cost of labor. First, for a given level of employment, the firm can offer a wage that is $\alpha\mu \cdot ps_j$ lower, thereby reducing the first term after the first equality sign in the marginal cost expression in (46), this is term $(*)$ in Equation (47). Second, an increase in the number of workers reduces the profit-sharing amount allocated to each worker (for a concave profit function, the numerator in Equation (48) is always negative), requiring an upward wage adjustment for every worker to compensate for this decline, equal to $\alpha\mu|\frac{\partial ps_j}{\partial n_j}|$. This adjustment raises the second term of the marginal cost and is in term $(**)$ in Equation (47). At the optimal level of employment, profits do not change at the margin ($\Pi' = 0$). **Thus, any profit-sharing given to the new worker must be exactly offset by the total reductions in profit-sharing for existing workers.** Consequently, the initial wage savings from offering the new worker profit sharing is perfectly canceled out by the wage increases needed to compensate the existing workforce. As a result profit sharing does not alter marginal costs at the optimal employment level.

A graphical representation of this result for a linear production function is shown in Figure C.2. The labor supply curves when complying with profit-sharing in this case is $n_j = ((1 - \rho\alpha\mu)w_j + \rho\alpha\mu\hat{z}_j)^\theta$. These two curves intersect when $w = \hat{z}_j$. The marginal cost curves also intersect at $MC = MPL$, the point that determines optimal employment. Consequently, employment is identical in both scenarios. This is illustrated with a dashed vertical black line in Figure C.2, which also shows that while employment levels are the same, wages are higher in the avoiding scenario than in the non-avoiding scenario.

Figure C.2: Graphical illustration of optimal w_j and n_j



Notes: This figure provides a graphical illustration of the firm's optimal choices for w_j (wage) and n_j (employment) under two scenarios: when the firm does **not** provide profit-sharing (red), and when it provides profit-sharing (blue). The solid lines represent the labor supply curves: $n_j = w_j^{\theta}$ in the avoidance scenario and $((1-\rho\mu\alpha)w_j + \rho\mu\alpha\hat{z}_j)^{\theta}$ in the compliance scenario. The dashed lines depict the marginal cost in each case. The horizontal dark orange line indicates the marginal revenue product of labor, $\hat{z}_j$, and the dashed vertical black line marks the optimal employment level where $MCL = MPL$. w_p is the optimal wage with profit-sharing, and w is the optimal wage with **no** profit-sharing. The figure is generated with parameters $\theta = 1.5$, $\rho = 0.3$, $\rho\mu = 0.5$, and $\hat{z}_j = 30$. The fact that n_j^* is equal in both scenarios illustrates Prediction 1.

C.6.2 Proof of Prediction 2: Effect on total compensation

Notice that for $c = 0$—consistent with our empirical results in Section **??**—Prediction 2 follows from Prediction 1. If total employment does change, it must be that the effect on $w_j + \alpha\mu ps_j$ is zero. If $\alpha\mu < 1$, it must then hold that $w_j + ps_j$ increases. As with Prediction 1, this result holds for any production function $f(n_j)$ and any labor supply of the form $n^s(w_j, ps_j) = g(A_1 w_j + A_2 ps_j)$. We derive the analytical result for a linear production function and labor supply defined in Equation (21). Using Equations (30), (37), (31) and (38) we obtain the following expressions for the change in wages, profit sharing per worker, and total compensation for these firms. This last result is stated in Prediction 2.

$$\Delta wage = c\frac{\theta}{\theta+1} - \frac{\hat{z}_j \rho\mu\alpha}{(1+\theta)(1-\rho\mu\alpha)} \tag{49}$$

$$\Delta\,\mathbb{E}[ps_j] = \frac{\hat{z}_j\rho}{1+\theta}\left(1 - \frac{\rho\mu\alpha}{1-\rho\mu\alpha}\right) \tag{50}$$

$$\Delta\,\mathbb{E}[total\ compensation] = \frac{\hat{z}_j\rho}{1+\theta}\left(1 - \frac{1-\rho}{\frac{1}{\mu\cdot\alpha} - \rho}\right) + c\frac{\theta}{\theta+1} \tag{51}$$

The expression in Equation (51) is increasing $\frac{1}{\mu\cdot\alpha}$, indicating that when labor supply is highly inelastic with respect to profit sharing, restrictions on profit-sharing avoidance lead to a larger rise in total compensation. In Section C.8 we show that the same result is obtained if wages are set via Nash bargaining, rather than wage posting.

C.6.3 Proof of Prediction 3: Effect on risk-adjusted value of total compensation

We derive the effect of a profit-sharing enforcement on the risk-adjusted value of total compensation, stated in Prediction 3. As explained in Section C.2, we define the risk-adjusted value of total compensation for workers as $(w_j + \alpha\,\mathbb{E}[ps_j])$. This represents the value of total compensation for workers, accounting for the additional risk involved in profit sharing, absent any information frictions.

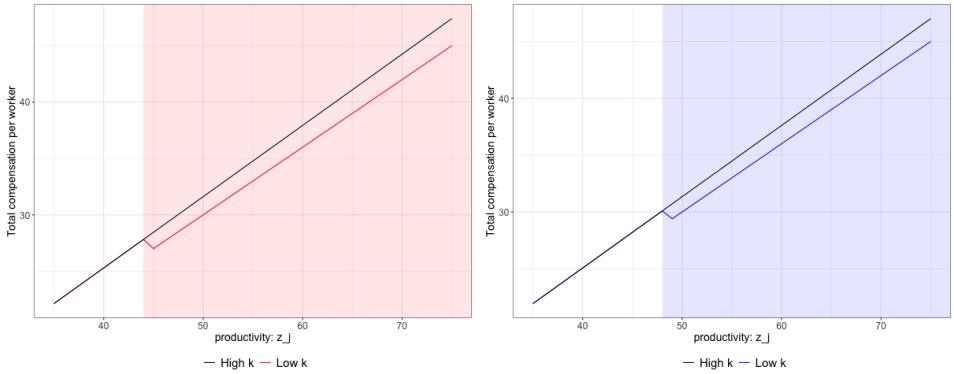
As with Prediction 2, for $c = 0$ Prediction 3 follows from Prediction 1. If total employment does change, it must be that the effect on $w_j + \alpha\mu ps_j$ is zero. If $\mu < 1$, it must then hold that $w_j + \alpha \cdot ps_j$ increases. This result holds for any production function $f(n_j)$ and any labor supply of the form $n^s(w_j, ps_j) = g(A_1 w_j + A_2 ps_j)$. The analytical result for the effect of an increase in k on $\Delta(w_j + \alpha\,\mathbb{E}[ps_j])$ for a linear production function and labor supply defined in Equation (21) is:

$$\Delta\,\mathbb{E}[value\ total\ compensation] = \frac{\hat{z}_j\rho\alpha}{1+\theta}\left(1 - \frac{1-\alpha\rho}{\frac{1}{\mu} - \alpha\rho}\right) + c\frac{\theta}{\theta+1} \tag{52}$$

Figure C.3 illustrates simulations for the effect of an increase in k on total compensation (panels a,b) and the risk-adjusted value of total compensation (panels c,d) for heterogenous μ_i. Panel (a) and (c) plot the results when there is a high share of misinformed workers, while

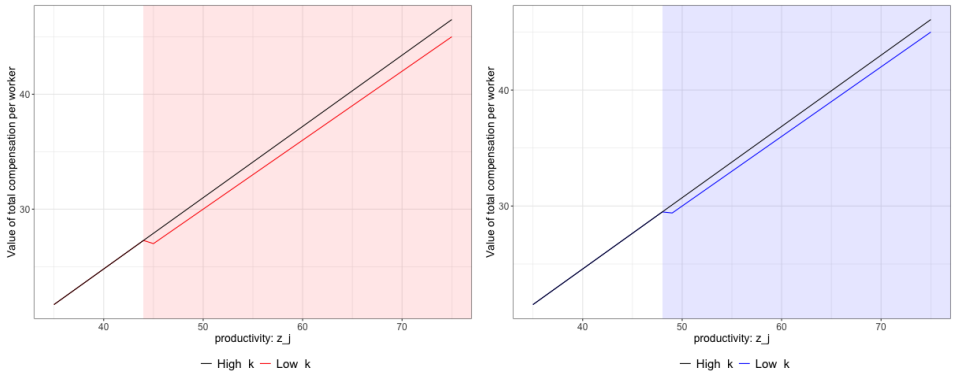
panel (b) and (d) plot the results when there is a lower share of misinformed workers.The black line in each graph represents the effect on the outcome variable when k increases, leading firms that were previously avoiding profit-sharing to start complying with it. As shown in the figures, the effect on both total compensation and the risk-adjusted value of total compensation is positive, and it is higher in the scenario with a larger share of misinformed workers.

Figure C.3: Model simulations for heterogenous μ_g: increase in k



(a) Total comp., High misinf.

(b) Total comp., Low misinf.



(c) Risk-adj value total comp., High misinf.

(d) Risk-adj value total comp., Low misinf.

Notes:This figure shows the results of simulations of the model for different productivity levels $z_j \in [35 : 75]$ and different shares of misinformed workers. Panels (a) and (b) show total compensation ($w + \mathbb{E}[ps]$). Panels (c) and (d) show the risk-adjusted value total compensation ($w + \alpha\,\mathbb{E}[ps]$). For all simulations $\bar{\mu} \in \{0, 0.5, 1\}$. In Panels (a) and (c) (high share misinformed), $\bar{p} = \{0.5, 0.4, 0.1\}$. For Panels (b) and (d) (low share misinformed), $\bar{p} = \{\frac{1}{3}, \frac{1}{3}, \frac{1}{3}\}$. The shaded regions indicate the firms that opt to avoid profit-sharing under low k the black dotted lines in each graph depict the effect of an increase in the cost of avoiding profit-sharing, k. The parameters for the simulations are $\theta = 1.5$, $c = 0$, $k_{low} = 200$, $k_{high} = 1e^{10}$ $\alpha = 0.7$.

C.7 Alternative setup: Perfectly competitive labor markets

In this section, we solve the model under the assumption of a perfectly competitive labor market, where firms take the value of total compensation $w + \alpha\mu \cdot ps$ as given. The firm's production function is $f(n_j)$ with $f' > 0$ and $f'' < 0$. For simplicity, we set $c = 0$ and $k > 0$.

Avoiding Profit-Sharing. When avoiding profit-sharing, the firm solves:

$$\max_n \ \Pi_j = zf(n) - w_j n - k \qquad \text{s.t.} \quad w = \widetilde{W}. \tag{53}$$

The first-order condition (FOC) is:

$$zf'(n) = \widetilde{W}. \tag{54}$$

Thus, the total compensation when avoiding profit-sharing is:

$$tc^{avoid} = \widetilde{W}. \tag{55}$$

Complying with Profit-Sharing Under compliance, total compensation must satisfy:

$$w + \alpha\mu\rho\left(z\frac{f(n)}{n} - w\right) = \widetilde{W} \quad \Longrightarrow \quad w = \frac{\widetilde{W} - \alpha\mu\rho z\frac{f(n)}{n}}{1 - \alpha\mu\rho}. \tag{56}$$

The firm's maximization problem can then be expressed as:

$$\max_n \ \left[zf(n) - \widetilde{W}n\right]\frac{1-\rho}{1-\alpha\mu\rho}. \tag{57}$$

Proof of Prediction 1 Since the FOC under compliance is identical to the avoidance case, we have:

$$n^{comply} = n^{avoid}. \tag{58}$$

Hence, in a perfectly competitive labor market, profit-sharing does not affect the marginal

cost of employment.

Intuition. With profit-sharing, firms maximize $(1-\rho)$ times pre–profit-sharing profits: $\Pi^{pre-ps} = zf(n) - wn$. In this setting, as total compensation is wage plus profit sharing per workers, firms can provide a wage that is $\alpha\mu ps_j$ lower. Because profit-sharing depends directly on pre-profit sharing profits, the decrease in total wage costs is proportional to pre-profit-sharing profits. We can write:

$$\Pi^{pre-ps} = zf(n) - wn + \rho\Pi^{pre-ps} \quad \Rightarrow \quad \Pi^{pre-ps} = \frac{zf(n) - wn}{1-\rho}, \tag{59}$$

which leaves marginal costs unchanged.

Proof of Prediction 2 and Prediction 3 In a perfectly competitive labor market, it must hold that:

$$w^{avoid} = w^{comply} + \alpha\mu \cdot ps^{comply} = \widetilde{W}. \tag{60}$$

If $\alpha\mu < 1$, then total compensation under compliance, $w^{comply} + ps^{comply}$, must exceed total compensation under avoidance for equality 60 to hold. The increase in total compensation is decreasing in $\alpha\mu$. Moreover, if $\mu < 1$,

$$w^{comply} + \alpha \cdot ps^{comply} > w^{avoid} \tag{61}$$

must hold for the above equality 60 to be satisfied.

C.8 Alternative setup: Wage setting under Nash Bargaining

In this section, we show that the result in Prediction 2 also holds when wages are determined through Nash bargaining.[77] When the firm **complies with profit-sharing**, the firm's value of a filled and unfilled vacancy is:

[77] For simplicity we assume $c = 0$ in this section. The results also hold if $c > 0$, as this would decrease the value of total compensation under avoidance.

$$J = (1-p)(z-w), \qquad V = 0$$

The value of a being employed and unemployed for workers is the following, where we define:

$$TC = w + \alpha\mu \cdot p(z-w), \qquad U = b$$

Here, TC represents the value of total compensation to the worker, accounting for the fact that workers discount profit-sharing due to risk aversion (α) and information frictions (μ). The actual total compensation received is $tc = w + p(z-w)$. Workers and firms bargain over the value of total compensation for workers through Nash bargaining, solving:

$$\max_{TC} (TC - U)^{\Psi}(J - V)^{1-\Psi}$$

The first-order condition implies:

$$(TC - U)(1-\Psi) = (J - V)(\Psi)$$

Substituting in the expressions for TC, U, J, and V, and rearranging terms, we derive the wage and total compensation under profit-sharing compliance:

$$w^{comply} = \frac{(1-p)\Psi z - \alpha\mu p z(1-\Psi) + b(1-\Psi)}{(1-\Psi)(1-\alpha\mu p) + (1-p)\Psi}$$

$$tc^{comply} = w^{comply} + p(z - w^{comply}) = (1-p) \cdot \frac{(1-p)\Psi z - \alpha\mu p z(1-\Psi) + b(1-\Psi)}{(1-\Psi)(1-\alpha\mu p) + (1-p)\Psi} + pz$$

When the firm **avoids profit-sharing**, the bargaining is over the wage alone, leading to the standard Nash bargaining outcome

$$tc^{avoid} = \Psi z + (1-\Psi)b$$

We compare total compensation when the firm avoids and when the firm complies with profit-sharing to assess the impact of compliance on total compensation:

$$\Delta[total\ comp] = \underbrace{(1-p)\cdot\frac{(1-p)\Psi z - \alpha\mu p z(1-\Psi) + b(1-\Psi)}{(1-\Psi)(1-\alpha\mu p)+(1-p)\Psi} + pz}_{\text{total compensation when complying with profit sharing}} - \underbrace{\Psi z + (1-\Psi)b}_{\text{total compensation when avoiding p.s.}}$$

This simplifies to:

$$p(1-\Psi)^2(1-\alpha\mu)(z-b)$$

which is greater than zero as long as $\alpha\mu < 1$. When $\alpha\mu = 1$, $tc^{avoid} = tc^{comply}$. This reproduces the result in Prediction 2.

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

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.[78] More generally, the use of outsourcing to disguise working relationships and circumvent 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,[79] where large companies have been accused outsourcing to avoid liability for employment law violations, and hinder labor organizing efforts (Epstein et al., 2020; NELP,

[78] Both Ecuador and Perú have profit-sharing schemes similar to Mexico regarding coverage and the mandatory nature.

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

2020, 2018; Klein and Humowiecki, 2013).[80] 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).

[80] 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).