

# Work, law, and labor market structure: insights from regulatory changes in Brazil

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## Abstract

Evolving production methods have substantially reshaped labor market dynamics, prompting a shift toward more fragmented and decentralized employment models characterized by the gig economy and an increasing reliance on independent contractors. This study examines changes in employment patterns following Brazil's 2017 labor reform and outsourcing laws, specifically focusing on the transition from formal employment (registered with RAIS) to more flexible independent work structures, such as Individual Microenterprises. The results indicate that the regulatory changes accelerated the establishment of individual businesses, doubling their growth rate after 2017. Although firm growth is observed across all industries, responses to regulatory changes vary markedly, and significant regional disparities are also evident. This study also documents an important trend in Brazil's formal business landscape, characterized by the rapid expansion of individually operated firms and the consolidation of a dual labor market structure, where a small group of large firms concentrates the most formal employment, while an increasing number of firms operate without employees. These trends have significant implications for the dynamics of the labor market. Although they may promote greater flexibility and efficiency, they also raise concerns about employment stability and the adequacy and long-term sustainability of traditional social protection systems.

*Keywords:*

Labor Regulation, Outsourcing, Labor Reform

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## 1. Introduction

Employment relationships are being reshaped by the rise of the gig economy, the proliferation of remote work, and the evolving dynamics of contemporary labor markets. [Appelbaum et al. \(2014\)](#) and [Stansbury and Summers \(2020\)](#) claim that the increase in shareholder power and shareholder activism has led to pressure on companies to cut labor costs, resulting in wage reductions within firms and the “fissuring” of the workplace,

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as companies increasingly outsource and subcontract labor, engage in franchising, and rely more on independent contracting and the gig economy. In line with these trends, and central to the present study, individual firms (sole proprietorships) and independent contracting have emerged as key forms of self-employment. In such arrangements, workers operate their own businesses and offer services without the traditional employer-employee relationship.

Individuals or companies that perform outsourced work for major companies are subject to strict standards and strong incentives to ensure that they meet core objectives. According to [Weil \(2019\)](#), this is operationalized through detailed subcontracting and supply chain requirements, franchise agreements, and most recently the highly calibrated incentive systems created by platform algorithms. The author explains that these arrangements allow companies to benefit from work that aligns with corporate objectives while avoiding the responsibilities associated with direct employment. In the same line, [Dieese \(2007\)](#) highlights that outsourcing helps companies reduce labor related expenses and manage various aspects of human resources more efficiently, including personnel selection, hiring, and dismissal, managing vacations, absences, illnesses, leave of personnel, bonuses, and overtime, thus reducing the burden of labor management. In addition, by outsourcing, companies can minimize union issues, negotiations, and strikes, as well as reduce the likelihood of judicial issues with personnel.

Although increasing market flexibility and efficiency, this trend has introduced new risks, such as job insecurity, income volatility, and the erosion of worker protections, particularly for those engaged in non-standard employment arrangements, such as individual firm contractors. These evolving work patterns contribute to a long-standing dilemma that predates modern technological innovation. Emerging economies have long struggled with similar challenges, as persistent informality continues to pose significant obstacles to inclusive labor market development. As noted by [WorldBank \(2018\)](#), *“Because recent technological developments are blurring the divide between formal and informal work, there is something of a convergence - most of the challenges faced by short-term or temporary workers, even in advanced economies, are the same as those faced by workers in the informal sector. This type of convergence is not what was expected in the 21st century. Traditionally, economic development has been synonymous with formalization.”*

A deeper understanding of this phenomenon and its impacts is increasingly important for both developing and developed economies. Brazil serves as a compelling case study, as it has implemented a comprehensive legal strategy to tackle these challenges. On the one hand, the country pursued the flexibilization of the labor market through a major reform in 2017, aimed at modernizing labor laws by allowing greater flexibility in employment contracts, lowering hiring barriers, and allowing outsourcing of core activities. On the other hand, Brazil has progressively strengthened its legal framework to promote the formalization of micro- and individual entrepreneurs, granting them access to essential social

protections, including retirement, maternity leave, and paid health leave, via simplified registration processes.

This study contributes to the academic literature by examining the consequences of labor law flexibilization following Brazil’s 2017 Labor Reform on labor market dynamics. Expanding upon existing research, this study delves into the reform’s implication for labor outsourcing, with a focus on how it has influenced worker transitions from traditional formal employment (RAIS-registered) toward more flexible and independent work arrangements like Individual Microenterprises. Furthermore, by analyzing sectoral and regional heterogeneity, the study sheds light on how industry type and local economic factors shape the adoption of outsourcing practices. This nuanced approach provides a deeper understanding of how national labor reforms intersect with local and sectoral conditions to influence labor market outcomes, offering valuable insight into the broader implications of deregulation for labor protections and employment structures.

This research makes an additional contribution by integrating two administrative datasets: the Annual Social Information Report (RAIS) and the Business Registration Records, which cover all active firms registered in the country linked to owner identification data. This integration captures both formal employment trends and entrepreneurial activity across the full spectrum of Brazilian businesses, including MEIs and other non-employing firms. By combining employment and firm-level data, the analysis enables a detailed tracking of transitions between formal employment and entrepreneurship, providing insights into labor market restructuring and the expanding role of small and micro-enterprises in the Brazilian economy.

The results reveal that although individual firm creation was already a growing trend, the 2017 outsourcing law significantly accelerated this process by further encouraging workers to transition from traditional employment relationships to more flexible and lower-cost contractual arrangements. Regression results by occupation show a consistent post-2017 increase in firm creation across sectors, with particularly strong growth among sellers and beauty service providers. The labor reforms and liberalization of outsourcing appear to have been particularly influential in industries such as food services and construction. These patterns highlight that the impact of labor reforms is shaped by sector-specific dynamics, as uniform policies yield heterogeneous outcomes. Regionally, firm creation expanded throughout the country, but growth was more pronounced in the Southeast and South after 2017, indicating that federal reforms interacted with local economic and institutional contexts to produce varied regional effects.

Finally, the analysis of changes in the RAIS composition along with the evolving distribution of workers (both employees and the self-employed) and firms points to a disproportionate growth of individually operated formal firms and the consolidation of a dual structure within the formal labor market: a large and expanding base of firms without employees and a relatively small group of large firms that continue to account

for most formal employment. The coexistence of these two poles may reflect persistent barriers to firm growth, regulatory rigidities, and strategic segmentation within the labor market.

The paper is structured as follows: in Section 2 we provide a brief introduction to the literature, in Section 3 we discuss the context and motivation of the research, and in Section 4 we draw the hypothesis considered. In Section 5 we present the data sources and descriptive analysis, and in Section 6 we describe the methodology applied and the variables used in our analysis. Section 7 presents the main results found and Section 8 concludes.

## 2. Literature review

### 2.1. *Transaction costs, uncertainty and incentives: classical insights on Labor Market and Firm Dynamics perspectives*

Why do we need firms? Key factors such as transaction costs, uncertainty, and incentives have long been considered to be central to understanding firm equilibrium in the classical literature. These elements remain highly relevant, offering valuable insight into the ongoing evolution of firm structures and how it shapes employment dynamics.

In *The Nature of the Firm* (1937), Coase investigates the reasons behind the existence of firms within an economy primarily governed by the price mechanism. He posits that firms emerge because of the high costs associated with relying on the market — such as discovering prices, gathering information, negotiating contracts, protecting trade secrets, and enforcing agreements. These transaction costs are especially pronounced in industries dealing with services, labor, or complex transactions that require a high degree of flexibility and coordination.

Expanding on this perspective, Alchian and Demsetz conceptualize the firm as a system of incentives in which individual contributions are monitored and compensated, except in the case of the owner. The owner is not subject to monitoring, but instead incentivized by a residual claim on the firm’s profits (Holmstrom, 1999). This framework highlights the central role of monitoring within the firm, echoing Maurice Dobb’s analysis of coordination and supervision costs. *“It is the essence of serfdom that the price mechanism is not allowed to operate. Therefore, there has to be direction from some organizer. When, however, the serfdom passed, the price mechanism was allowed to operate. It was not until the introduction of power machinery after 1846 drawing workers into one locality that it paid to supersede the price mechanism and the firm again emerged”* (Maurice Dobb, Russian Economic Development, apud (Coase, 1937)).

Approaching the issue from another perspective, Knight (1921) emphasizes the uncertainty as central to the function of the firm. He argues that entrepreneurs assume the risks associated with uncertain outcomes, guaranteeing fixed/regular payments to employees while bearing the residual profits or losses. This mode of payment distinguishes

entrepreneurs from wage workers and underpins the structure of an industrial organization.

Finally, Coase (1937) anticipated that technological advancements that improve managerial techniques and reduce spatial distribution tend to increase the size of the company. However, he noted that most inventions affect both organizational costs and the costs of using the price mechanism. Whether a firm grows or shrinks would depend on which set of costs is reduced more. If new technologies lower the costs of using the price mechanism more than they reduce organizational costs, they will lead to smaller firms.

## *2.2. The changing nature of the firm and impacts on work.*

As technology advances, firms increasingly adopt new production methods and rely on digital tools to improve capital efficiency, reduce information asymmetries, outsource tasks, and drive innovation. Digital technologies not only facilitate automation and the substitution of labor with machines, but also accelerate organizational transformation. As anticipated by Coase (1937), these technological changes are reshaping production processes and challenging traditional firm boundaries. Firms have become less vertically integrated, with managers outsourcing a growing number of activities to external providers (WorldBank, 2018).

### *2.2.1. Impacts bargaining power and on wages*

There is increasing evidence that outsourced workers receive wage penalties and that this is related to a loss of rents. Studying tendencies in the US economy, Stansbury and Summers (2020) argue that ‘fissuring’ of the employment relationship has decreased the ability of workers to organize. Workers employed as independent contractors or employees in franchises often have their terms of employment to some extent dictated by the end employer or franchise (respectively) but lack the legal ability to collectively bargain with that end employer. The authors also highlight that increased competition for labor from technology or from low-wage countries has increased the elasticity of demand for US labor. As a result, over recent decades, the bargaining power of workers and labor rents have been reduced, particularly for lower wage workers.<sup>1</sup>

In the same line, examining the relationship between labor market slackness indicators and real wages in Brazil, Guillén and Leão (2023) show a notable decline in real wages despite the labor market being relatively tight after the pandemic outbreak. Their analysis reveals that the real wages of more educated workers experienced the sharpest declines post-pandemic and have exhibited a slower pace of recovery compared to other groups.

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<sup>1</sup>Stansbury and Summers (2020) argue that the decline in worker power aligns with another notable aspect of macroeconomic trends in recent decades: the significant reduction in both average unemployment and inflation. They conclude that the decline in worker power offers a coherent explanation for various macroeconomic phenomena, including changes in labor and capital income shares, increased profitability, and changes in the NAIRU.

Another important aspect of the restructuring of labor demand driven by technological advancement is what [Autor and Dorn \(2009\)](#) describes as labor market polarization. According to the authors, routine tasks - those governed by explicit and codifiable procedures - are increasingly subject to automation or offshoring. This shift has led to a reallocation of labor demand toward non-routine tasks, in which human workers maintain a comparative advantage over technology. These tasks are broadly divided into two categories: high-skill “abstract” tasks that involve problem solving, creativity, and complex social interactions (e.g., attorneys, scientists, and managers), and low-skill “manual” tasks that require physical adaptability, visual and language recognition, and face-to-face interaction, but little formal education (e.g., janitors, home health aides, and motor vehicle operators). While both types are classified as non-routine, they differ significantly in terms of skill level and compensation.

### *2.2.2. Impacts on firm hierarchy and composition*

The dynamics of the labor market has been transformed by the interplay of automation, digitalization, and the dissemination of Internet technologies, whose impacts remain ambiguous due to their dual role as information and communication technologies (ICT). As an information technology, the Internet reduces the costs of acquiring and processing information, fostering knowledge accumulation, enhancing worker autonomy, and encouraging decentralized organizational structures. In contrast, as a communication technology, it facilitates closer interactions between managers and workers, often promoting centralized decision-making and reduced autonomy.

[Barbosa et al. \(2021\)](#) examine the impact of the fast internet on the occupational and educational structures of firms in Brazil and find that access to the fast internet leads to job losses across all organizational layers, reducing overall employment, although displacements are less severe for higher-level positions<sup>2</sup>. The educational composition of the workforce also changes, with an increase in highly educated and low-educated employees, accompanied by a reduction in medium-educated roles. In general, the wage bill declines, reflecting reductions in both total payroll and average wages, although the total hours worked remain unchanged. These findings suggest that broadband adoption induces efficiency-driven labor restructuring, reshaping internal hierarchies, and lowering wage expenditures. According to the authors, such organizational adjustments help firms reduce labor costs and improve short-term performance, ultimately contributing to lower firm exit rates.

[Barbosa et al. \(2021\)](#) finds align with [Autor and Dorn \(2009\)](#)’s framework on educational polarization, showing growth in the shares of highly and low-educated workers alongside a decline in medium-educated workers across sectors. However, the results of

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<sup>2</sup>According to the authors, fast internet increases the share of management roles by 11%, driven entirely by growth in middle management, while the share of top managers declines.

occupational polarization do not fully conform, as only the share of management positions consistently increases, while other high-skill occupations, such as professionals, associate professionals, and technicians, either decline or remain unchanged.

One possible explanation for this divergence is the growing reliance on outsourcing and individual contractors, which may be increasingly seen as viable alternatives for fulfilling professional tasks outside the firm’s internal hierarchy. In this line, [Besanko et al. \(2009\)](#) argue that advances in technology and mechanization have reduced the need for physical worker concentration in many industries. This shift reduces the requirement for direct oversight, as automation and technological tools enable a more decentralized and flexible labor organization. In this context, price mechanisms may become more efficient, particularly for tasks that are well defined and/or easily routinized.

### *2.3. How institutions and industries shape firm structure*

#### *2.3.1. The role of economic and regulatory environment*

State efficiency is crucial for firm operations, and businesses rely on it for licenses, permissions, and the overall improvement of the business climate. Regulatory costs may arise from poorly designed regulations or inefficiencies in their implementation. Enhancing the business environment allows productive companies to emerge and grow ([WorldBank, 2018](#)).

An intriguing dimension of the local variance in the business environment arises from the judicial system. Considering the random assignment of judges to cases, [Corbi et al. \(2022\)](#) examine the role of labor courts in shaping labor market outcomes in Brazil. They find that small firms that face a more pro-worker judge hire less, experience greater financial distress, and exhibit lower survival rates. Simulating the changes brought about by the outsourcing law, they concluded that the law had significant positive effects on employment and aggregate output by improving legal clarity, stability, and predictability in legal text and also in the application of law. They conclude that changes in labor law can play a fundamental role in investment decisions, positively impacting entrepreneurship and stimulating job creation.<sup>3</sup>

A similar picture emerges when examining local variation in labor regulation enforcement. Analyzing municipal differences in enforcement levels in 2000, [Almeida and Carneiro \(2012\)](#) examine the impact of labor inspections on labor market outcomes in Brazil, revealing that while increased inspections promote higher formal employment and reduced informal employment, they also result in higher unemployment, lower wages at the upper end of the formal wage distribution, and higher wages in the informal sector.

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<sup>3</sup>The potential costs for formal firms associated with labor court disputes—arising when a worker is terminated and chooses to file a lawsuit—represent a significant operational burden in the formal sector, especially for smaller businesses. According to [Araujo et al. \(2012\)](#), the judges decide in favor of the workers in almost 80% of the cases.



Regional differences in formalization and labor practices are closely related to economic and regulatory dynamics. Regions where economic activities generate higher productivity and stronger enforcement capacities typically see higher levels of formalization, both in terms of firm registration (extensive margin) and adherence to labor laws (intensive margin). Additionally, the extent to which minimum wage policies are “binding” across regions can influence firm behavior. In regions where businesses struggle to comply with formal wage requirements, informality remains an attractive option for all but the most productive firms. In contrast, minimum wage policies are less likely to drive formalization as local economies expand, creating environments where formal compliance becomes increasingly viable (Saltiel and Urzúa, 2022; Lemos, 2004; Corbi et al., 2021).

### *2.3.2. Industry-Specific influencing factors*

The characteristics of the industry and the companies are also relevant. Sectors with high competition and low entry barriers, such as retail and services, are more likely to experience a pronounced shift to individual contracting, as firms in these industries are forced to reduce labor costs and increase operational flexibility (Weil, 2019). The challenges of coordination and monitoring are also dependent on the specific characteristics of industries. Using a database of Brazilian startups, Lawrence and Poliquin (2023) show that a greater variety of knowledge used in a firm is associated with the expansion of hierarchy. Their results show the importance of knowledge for organizational structure and suggest that teams with shared experience reduce coordination challenges.<sup>4</sup>

In sectors such as retail and services, tasks are often more standardized, with less diversity in the types of work performed (and knowledge involved) within each firm. These sectors would benefit from the simplified hierarchical structures necessary to coordinate labor. In addition, the reduced scope of activities carried out makes it easier to be clearly specified in contracts, making the transition to outsourced labor more straightforward.

In contrast, industries such as construction and manufacturing, which rely heavily on specialized tasks and skilled labor and are subject to stringent regulatory requirements, tend to respond differently to labor law reforms. These sectors face more complex workforce coordination and management challenges and frequent need for on-the-job training alongside stricter safety standards. Furthermore, the need for flexibility and real-time adjustments in production processes complicates the creation of detailed labor contracts. Finally, the nature of on-site work and the physical concentration of workers in the construction and manufacturing industries allow easier government enforcement of labor regulation, making the transition to individual contracting more challenging and more dependent on the regulatory framework.

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<sup>4</sup>See also Barbosa et al. (2021); Acemoglu et al. (2007); Autor and Dorn (2013) for discussions on changes in the firm structure in response to technological changes and managerial issues.



### 3. Context

Balancing labor law with current market changes presents significant challenges. Stringent employer requirements, while aimed at protecting workers, can have unintended consequences. When regulations are too rigid, they may discourage hiring and, in some cases, exacerbate inequities by increasing the proportion of workers who are unemployed or pushed into the informal sector. This is particularly concerning in economies where a substantial share of the workforce operates outside formal structures. In such cases, financing pensions and other social protections through payroll taxes on formal employees becomes inefficient, raising concerns about the sustainability and relevance of current labor laws ([WorldBank, 2018](#)).

At the same time, while the shift toward a more decentralized and technology-driven labor market offers benefits, such as increased efficiency and flexibility, it also presents significant risks. With decentralized and gig-based work, traditional labor protections may erode, leading to less job security, fewer benefits, and weaker bargaining power for workers, leaving workers more vulnerable to economic fluctuations. This evolving landscape intensifies the challenges of protecting workers while adapting labor laws to reflect these changes, ensuring that both employers and workers can thrive in this new environment.

To address these challenges, Brazil has implemented a comprehensive legal strategy that makes it a particularly compelling case study. On the one hand, the country pursued labor market flexibilization through labor regulatory changes passed in 2017. The reforms aimed to modernize labor laws by allowing greater flexibility in employment contracts, reducing barriers to hiring, and promoting a more adaptable labor market. On the other hand, Brazil has also been improving the legal framework in order to foster formalization of micro- and individual entrepreneurs, providing them with access to basic social protections, such as retirement and health paid leave, through simplified registration processes.

Together, these policies offer a unique blend of labor flexibility and social protection, making Brazil an important case for examining how legal reforms can simultaneously promote economic dynamism and worker security in the face of global technological and labor market changes.

#### *3.1. Entrepreneurship as a way to formal job: The SIMPLES/MEI Law Experience*

Implementing policies that promote fair labor practices and protect workers in transitional or precarious employment is essential to reducing inequality and ensuring that the benefits of labor market transformations are broadly shared. One common approach adopted by governments to promote formal job creation is what [Peters and Zilibotti \(2021\)](#) refers to as the “*traditional view strategy*”, which focuses on stimulating employment through financial support and policies that encourage small business development, including the formalization of solo entrepreneurs.

In Brazil, this approach materialized with the enactment of Supplementary Law No. 128/2008, commonly known as the MEI Law, which came into effect on July 1, 2009, and formally established the Individual Microentrepreneur (Microempreendedor Individual, or MEI) as a recognized legal entity.<sup>5</sup> MEI is defined as a person who works for herself and is legalized as a small business owner.<sup>6</sup> They can only have one employee working for the minimum wage or the category's floor and they must operate in one of the approximately 490 activities permitted for the segment. The MEI framework aims to facilitate the formalization of self-employed individuals and small business owners, with the ultimate objective of enhancing contributions to the social security system and providing access to social security benefits (Alvarez, 2023). Designed to simplify the formalization process for self-employed workers, the MEI law offers a reduced tax burden and a streamlined registration process while granting access to social security benefits. By targeting low-income entrepreneurs operating in informal sectors, the MEI aims to promote inclusive economic participation and expand the scope of labor protections to previously unregulated forms of work.

In addition to the creation of the MEI Law, subsequent legislative changes were made. Law 147/2014, which came into effect in January 2015, was one of them and extended the tax benefits of MEI to a wider range of sectors, including animal caregivers, housekeepers, security professionals and transportation professionals. Furthermore, the law eased the regulatory requirements for companies that hire MEI firms by eliminating the 20% employer's social security contribution and registration requirements.<sup>7</sup> However, the law explicitly excluded certain categories of MEI such as those providing services in the construction industry (plumbers, electricians, painters, masons, and carpenters), as well as vehicle maintenance or repair, which were not eligible for the same hiring benefits.<sup>8</sup>

### *3.1.1. Informality, outsourcing and Entrepreneurship*

Independent contractors are connected to three key concepts—outsourcing, informality, and entrepreneurship—in distinct ways.

The individual contractor status allows individuals to officially establish and operate a small business, serving as a crucial tool to foster entrepreneurship in Brazil. By simplifying bureaucratic procedures and reducing financial barriers, it encourages more people

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<sup>5</sup>The law amended the General Law for Micro and Small Companies (Complementary Law 123/06), commonly known as the SIMPLES Law, enacted in Brazil on December 14, 2006, to simplify the tax regime for micro and small firms, aiming to promote the formalization of small businesses.

<sup>6</sup>As defined by Complementary Law No. 155, dated October 27, 2016, they can earn a maximum of R\$81,000 and cannot have partisanship in any other enterprise.

<sup>7</sup>In comparison, according to Law 10.666 of May 8, 2003, which regulated the individual taxpayer providing services to a company or equivalent legal entities, the contribution of 11% of the individual taxpayer's remuneration, up to the contribution salary ceiling should be deducted from the MEI's by hiring company which was responsible for the tax payment, along with its monthly contribution, by the 20th of the month following the service provision (Honorato, 2022).

<sup>8</sup>The rationale for this exclusion is not explicitly addressed in the law.

to start their own businesses. This status is specifically designed to help self-employed entrepreneurs formalize their work, enabling them to manage their businesses independently, expand in their fields, and access benefits such as credit, public tenders, and basic social security protections.

However, individual contractors can also function as a mechanism for outsourcing, allowing firms to hire them for specific tasks or services while classifying them as independent entities. This arrangement enables companies to offload responsibilities to external workers rather than hiring them directly, thereby reducing labor costs. As noted in [Alvarez \(2023\)](#), one of the main benefits of hiring independent contractors lies in the lower costs for employers, as these workers are not entitled to the same obligations as formal employees, including severance pay, the 13th salary, social security contributions and paid vacation. Moreover, employers are not required to contribute to the unemployment insurance fund or the severance indemnity fund.<sup>9</sup> On the worker's side, many opt for individual contracting because it offers more flexible working hours<sup>10</sup> and often reduces the tax burden. However, this comes at the cost of forfeiting labor rights and bearing full responsibility for compliance with social protection regulations, including contributions to social security, health insurance, and other benefits typically covered by employers, as well as managing all taxes associated with their business.

Although individual contractors are legally classified as entrepreneurs, they often operate in sectors historically linked to informal employment, such as small-scale commerce and personal services. These dynamics are particularly evident among workers in occupations with low entry barriers and high turnover, including food and beauty service providers, construction laborers, delivery personnel, and sellers. Predominantly low-income earners, a significant share of these workers operate in a regulatory gray area, frequently falling short of full compliance with tax and social security obligations. As a result, the boundary between formal entrepreneurship and informality becomes blurred.

### *3.2. The Evolution of Labor Laws in Brazil*

The persistence of informality is frequently attributed to burdensome regulations, high tax burdens, and rigid social protection schemes that discourage business growth and formal hiring ([Dabla-Norris and Inchauste, 2008](#); [Ulyssea, 2020](#); [Djankov and Ramalho, 2009](#)). In addition to implementing initiatives aimed at reducing informality through simplified formalization processes, Brazil has also enacted legislation to flexibilize hiring, in order to lower barriers to formal employment.

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<sup>9</sup>[Almeida and Carneiro \(2012\)](#) provides more detailed information on labor regulation and worker rights in Brazil.

<sup>10</sup>Studies like [Guillén and Leão \(2023\)](#) indicates that workers are increasingly valuing labor flexibility.

### *3.2.1. Outsourcing Law*

Outsourcing is a process in which a company transfers certain tasks or services, previously performed by its own employees, to another company or to an individual contractor. This process can involve either stopping the internal production of goods/services and buying them from another company or hiring external firms to perform tasks within the contracting company. This second form of outsourcing can refer to both core activities and support activities, such as cleaning, security, and catering (Dieese, 2007).

The regulation of outsourcing in Brazil began with Decree 200/1967, which allowed the public administration to hire companies for tasks of planning, coordination, supervision, and control. Another key development came in 1993 with a decision by the Superior Labor Court (TST), which established the “Súmula” 331. This ruling restricted outsourcing to non-core activities, prohibiting the outsourcing of essential business functions while allowing it for support services such as cleaning, security, and maintenance.<sup>11</sup> “Súmula” 331 also reinforced the subsidiary liability of the contracting company, which means that if the outsourced company failed to meet its labor obligations, the hiring firm could be held responsible.

This judicial interpretation remained the main legal framework governing outsourcing in Brazil until 2017, when strong lobbying efforts by employer associations revived and expedited Bill 4.302/1998, previously archived and inactive since 2008. Originally aimed at expanding the scope of temporary employment contracts, the bill was subsequently amended to include provisions regulating firms that mediate the hiring of temporary workers. In a notably swift legislative process, the Chamber of Deputies approved the bill on March 23, 2017, and by March 31 it was enacted as Law No. 13.429/2017, the “Outsourcing Law”, significantly broadening the legal scope for outsourcing by allowing companies to hire outsourced employees for their core activities.

According to the terms of the sanctioned law, the third party company is a private legal entity that provides specific services to third parties. This definition enables the so-called “pejotization,” which means the provision of services by a single-person company (Article 4 and, even more evidently, in the second paragraph of Article 4-A). The contracting company is defined as the individual or legal entity that enters into a contract with a company that provides specific services (Article 5).(die, 2017)

### *3.2.2. Labor Law Reform*

Soon after the approval of the Outsourcing Law, Brazil enacted Law No. 13.467, commonly known as the Labor Reform Law, in July 2017, introducing substantial changes

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<sup>11</sup>The main functions of a company, or core activities, are those central to its strategy, revenue generation, and typically require specialized expertise. These functions vary by industry; for example, a hospital’s core activities include providing medical care and performing surgeries, while a tech company focuses on software development and customer support.

to the country's labor law. As summarized by Carbonai (2019), the reform incorporated key legal instruments to increase the flexibility of the labor market. These include the authorization of freelance and intermittent work arrangements (Articles 442–443), the formal introduction of remote work (Article 75-A), revisions to part-time work regulations (Article 58-A), and increased flexibility regarding vacation scheduling (Article 134). The reform also improved firm-level flexibility in labor relations (Article 444) and simplified layoff procedures (Article 477).<sup>12</sup>

Importantly, the reform expanded the role of collective bargaining by granting greater autonomy to employees in negotiations with employers and recognizing the primacy of union-negotiated collective agreements over statutory provisions in several areas, such as working hours, breaks, career plans, incentive compensation, and profit-sharing schemes (Article 611-A). Furthermore, it eliminated mandatory union dues, moving to a voluntary contribution model and significantly altering the dynamics of collective bargaining in Brazil.<sup>13</sup>

Fundamental labor rights guaranteed by the Brazilian Constitution, such as the minimum wage, the 13th salary (Christmas bonus), paid weekly rest, and annual vacation, have been preserved.

### 3.3. Implications of these changes for the labor market in Brazil

Figure 1 summarizes key milestones in Brazil's recent labor law reforms.

Figure 1: Timeline of Labor Law Changes in Brazil: Key Milestones



*Source: Author's elaboration.*

Collectively, these legislative changes represent a substantial reconfiguration of labor relations in the country and have sparked ongoing debates regarding their long-term implications for workers and the broader economy. The proponents argued that these reforms

<sup>12</sup>Specifically, it introduced a new form of mutual termination agreement, which allowed both the employer and employee to agree on ending the contract. In this scenario, the employer is required to pay half of the notice period compensation and half of the fine on the worker's severance fund (FGTS). This mechanism provided an alternative to the traditional dismissal process, which often led to disputes and higher costs for employers. Furthermore, the reform established clearer guidelines on termination procedures, limiting the potential for litigation by reducing ambiguities about employers' obligations in severance payments and dismissal justifications

<sup>13</sup>Until 2017, the Brazilian government directly subsidized sindicatos through mechanisms like the imposto sindical, a mandatory deduction of one day's wages per year from all workers, regardless of union membership (Carbonai, 2019).

would modernize Brazil’s labor market, reduce informality, and encourage job creation. However, critics contended that the changes disproportionately favored employers, potentially undermining workers’ rights and job security, while fostering precarious work arrangements and increasing income inequality. This raises a central question: How have these reforms effectively influenced the labor market?

One of the most significant changes brought about by the reform concerns legal certainty. At the time of the approval of the law, firms frequently cited legal uncertainty as one of the main obstacles to outsourcing decisions (Campos, 2018). A central issue was the absence of clear legal definitions distinguishing core from auxiliary activities, which contributed to approximately 20,000 ongoing labor lawsuits challenging outsourcing practices. Prior to the reform, Súmula No. 331 served only as a general guideline, leaving ample room for varied judicial interpretations. The new law addressed this ambiguity by explicitly legalizing all forms of outsourcing, including those that involve core business activities, thus significantly reducing legal uncertainty. It also established the principle of minimal judicial intervention in the review of collective agreements, thus limiting the discretion of labor courts to adjudicate essential labor rights.<sup>14</sup>

The impact on union financing and operations has been significant. However, studies such as Stansbury and Summers (2020) document a decline in the share of unionized workers, along with a reduction in wage differentials between unionized and non-unionized employees in the United States and other countries. These patterns suggest that the weakening of unions may reflect a broader global trend, particularly in the context of increasing labor market fragmentation.

Finally, by broadening the definition of temporary employment, extending the durations of contracts, and authorizing its use for core and support activities, the reform aims to improve the flexibility of labor arrangements (Dieese, 2007). However, despite these efforts, the participation of temporary workers in Brazil’s formal labor market remains limited, indicating that this form of employment continues to play a relatively minor role compared to other contracting modalities.

### *3.3.1. Worker Rights Under Different Employment Models*

In light of the regulatory changes discussed, Table 1 presents a comparison of worker rights and protections across three contracting arrangements: direct employment, outsourced work, and independent contracting.

It should be noted that MEI - and other forms of individual enterprises - occupies a unique position in Brazil’s labor market, functioning simultaneously as a legal business

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<sup>14</sup>Some legal scholars argue, however, that a strict application of the new provisions may constrain judicial discretion. They emphasize the need for labor judges to retain the ability to interpret contracts in light of constitutional principles, ensuring a balanced approach to labor protections and contractual freedom (Carbonai, 2019).



Table 1: Labor rights and costs for different working arrangements

<b>Labor Rights</b>	<b>Employee</b>	<b>Outsourced worker</b>	<b>Independent contractor (IC/MEI)</b>
Christmas bonus salary	✓	✓	x
Remunerated weekly rest	✓	✓	x
Annual vacation and one-third vacation bonus	✓	✓	x
FGTS (Severance Indemnity Fund)	✓	✓	x
INSS protections <sup>[a]</sup>	✓	✓	✓ (Worker is responsible for own contributions)
Payroll taxes and contributions - Employer	INSS (20% of the payroll); FGTS (8% of the employee's salary); other <sup>[b]</sup>	INSS (20% of the payroll); FGTS (8% of the employee's salary); other <sup>[b]</sup>	x <sup>[c]</sup>
Taxes and contributions - Employee (deducted from payroll)	INSS (7.5% to 14%); Withholding Income Tax (IRRF) (up to 27.5%).	INSS (7.5% to 14%); Withholding Income Tax (IRRF) (up to 27.5% ).	INSS (5% of the minimum wage)
Legal Obligations	Direct Liability	Subsidiary Liability	x <sup>[d]</sup>
Main activities	70% Brazil's employed population <sup>[e]</sup>	About 30% work in maintenance, cleaning, and telemarketing activities. <sup>[f]</sup>	MEI: Food services, beauty, construction and sellers.

<sup>a</sup> The INSS (National Social Security Institute) in Brazil provides social protection benefits such as retirement, sickness benefits for temporary work incapacity, maternity pay, and family support through death pensions or benefits for dependents of incarcerated workers.

<sup>b</sup> Depending on the sector, the employer may have to pay additional rates, such as RAT (Work Accident Risk) and contributions to the "Sistema S" (SESI, SENAI, etc.).

<sup>c</sup> If an MEI hires an employee, they are responsible for contributing 3% of the employee's salary to INSS, 8% to FGTS, and for withholding and remitting the employee's INSS contribution (ranging from 7.5% to 14%) to the government.

<sup>d</sup> When a company hires a MEI (Microempreendedor Individual) or a IC (individual contractor), it is generally not responsible for the labor rights. However, subsidiary responsibility may apply in cases where there is fraudulent use of the MEI/IC status to avoid legal obligations or if the contractor work shows signs of subordination, suggesting an employment relationship.

<sup>e</sup> According to [IBGE \(2024\)](#), in the third quarter of 2024, Brazil's employed population reached 103.0 million people, comprising 69.9% employees (including domestic workers), 4.2% employers, 24.6% self-employed individuals, and 1.3% unpaid family workers.

<sup>f</sup> [Rebelo et al. \(2018\)](#).



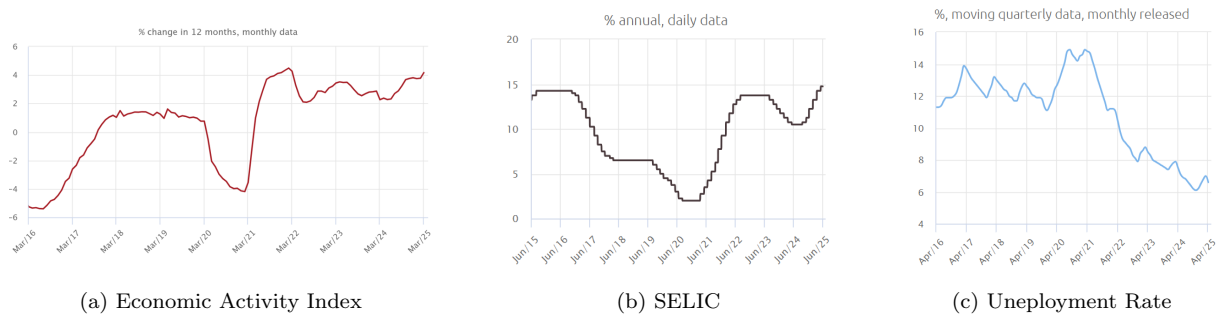
entity and, in many cases, a de facto employee. As formally registered firms, these individual entities allow companies to outsource tasks while shifting labor obligations to a third-party arrangement. However, many of these contractors work under conditions that closely mirror traditional employment, including fixed hours, direct supervision, and exclusive service to a single client. This dual character raises important questions about the boundaries between genuine entrepreneurship and disguised employment.

### 3.4. Political and economic context

In 2017, Brazil was navigating a period of intense political turbulence and institutional uncertainty. The country was still grappling with the aftermath of the impeachment of President Dilma Rousseff in 2016, which had deeply polarized the political landscape. Her successor, President Michel Temer, faced historically low approval ratings and was implicated in corruption scandals. Despite these challenges, the Temer administration pursued an ambitious reform agenda aimed at restoring fiscal stability and improving investor confidence.

In economic terms, 2017 marked a turning point for the Brazilian economy, following one of the most severe recessions in the country's history. After contracting by more than 7% in 2015-2016, the Brazilian economy showed modest signs of recovery, with GDP growing by approximately 1% in 2017 and a continuing trend of recovery of economic activity (Figure 2a). This recovery was accompanied by declining inflation and a gradual reduction in interest rates (Figure 2b), stimulating investment and consumption.

Figure 2: Economic Variables



Source: Central Bank of Brazil

However, the labor market remained fragile, characterized by high unemployment (Figure 2c) and slow job creation in the formal sector. In this context, the government implemented a broad labor reform intended to modernize labor relations by increasing contractual flexibility, reducing the regulatory burden on firms, and stimulating job growth. These changes were introduced amid ongoing political instability and fiscal constraints, which further shaped the economic environment and influenced how firms and workers responded to the new regulatory landscape.

## 4. Hypothesis

Incentives for individual firms have been in place since 2009, and the 2017 outsourcing law has further shaped entrepreneurial behavior and firm dynamics by allowing firms to outsource labor and services, including core activities. The initial hypothesis under investigation is that the flexibilization of labor laws promoted by the 2017 Labor Reform had a significant impact on labor outsourcing. This would appear in the administrative data as workers moving from formal job positions (registered in RAIS) to independent workers (registered as Individual Microenterprises - MEI or similar type of micro enterprises).

Should our initial hypothesis hold true, our subsequent inquiry will focus on investigating whether the relevance of the incentives is heterogeneous among different economic sectors. As mentioned, sectors with high competition and low entry barriers, such as retail and services, are more prone to adopting individual contracting due to the need to reduce labor costs and enhance flexibility. These industries benefit from standardized tasks and simplified hierarchical structures, which make workforce coordination easier and labor contracts more straightforward. In contrast, industries such as construction and manufacturing, characterized by specialized tasks, skilled labor, and stringent regulatory requirements, face greater challenges in transitioning to individual contracting. Their complexity in workforce management and the need for on-the-job training make this change more challenging. Furthermore, the on-site nature of work and the physical concentration of workers facilitate government oversight and enforcement, further tying the transition to individual contracting to the prevailing regulatory framework. Based on this, the second hypothesis poses that the effect of regulatory changes varies according to the type of economic activity carried out.

We also investigate whether the effects are heterogeneous across regions. In Brazil, the juxtaposition between a unified legal framework and regionally variable outcomes provides fertile ground to examine the nuanced interplay of geography, governance, and economic development (Naritomi et al., 2012).<sup>15</sup> Corbi et al. (2022) and Almeida and Carneiro (2012) results reveal that the business environment can be influenced by factors such as judicial discretion or institutional capacity, which can shape the enforcement of labor regulations and consequently the broader economic landscape. As a result, the business environment can vary significantly both between and within countries, influencing the concentration and dynamics of entrepreneurial activity.

Our third hypothesis is that the characteristics of the regional labor market, such as the degree of economic and institutional development, the industrial composition, and the prevalence of informal labor, may influence the extent to which firms adopt outsourcing practices. If formalization is the main driver for registering as an individual firm, regions with higher levels of informality are expected to be the most affected. Conversely, if

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<sup>15</sup>See also Acemoglu et al. (2001); Aghion et al. (2005); Goldberg et al. (2008).

outsourcing is the main factor, regions with stronger industrial bases or more formal labor markets may experience greater effects from law changes, as firms take advantage of labor flexibilization to shift away from directly employing workers.

Combining these analyses allows us to explore the role of local economic conditions, labor market rigidities, and economic sector characteristics in shaping outsourcing strategies. In doing so, it will provide a more nuanced understanding of how national labor reforms interact with sectoral and regional dynamics to influence labor market outcomes.

Finally, we explore how firms have responded to these regulatory changes. Specifically, we investigate whether the increased flexibility introduced by the 2017 outsourcing law has led to observable shifts in the distribution of firm sizes. The fourth research hypothesis posits that if firms increasingly rely on outsourced labor, we should observe a decline in average firm size, reflecting a move away from large internal workforces toward contracted services. At the same time, if the reform fosters entrepreneurial formalization, we would expect a notable rise in the number of micro- and small enterprises. Together, these trends would suggest a broader reconfiguration of the labor market, with individual entrepreneurs and small firms playing an increasingly central role in service provision across sectors.

## 5. Descriptive Analysis

### 5.1. Individual Firms Evolution

In December 2023 Brazil had almost 21 million active companies. Of this total, approximately 12 million (56%) were MEI, reaching almost 70% if other individual firms are considered (see Table 5.1).<sup>16</sup>

Table 2: Companies type Distribution - December,2023

Companies Type	Number of Firms	(%)
<b>Total</b>	<b>20,798,291</b>	<b>100%</b>
Individual Microentrepreneur Firm (MEI)	11,682,765	56.2%
Other Individual Firm	2,250,666	10.8%
Limited Liability Companies	6,558,126	31.5%
Others [a]	110,830	1.4%

<sup>a</sup> This list includes records of Corporations (Sociedade Anônima), Cooperatives, Consortiums, , State-Owned Enterprises, Foreign Companies, Binational Companies, Business Groups.

Source: (MDIC, 2024)

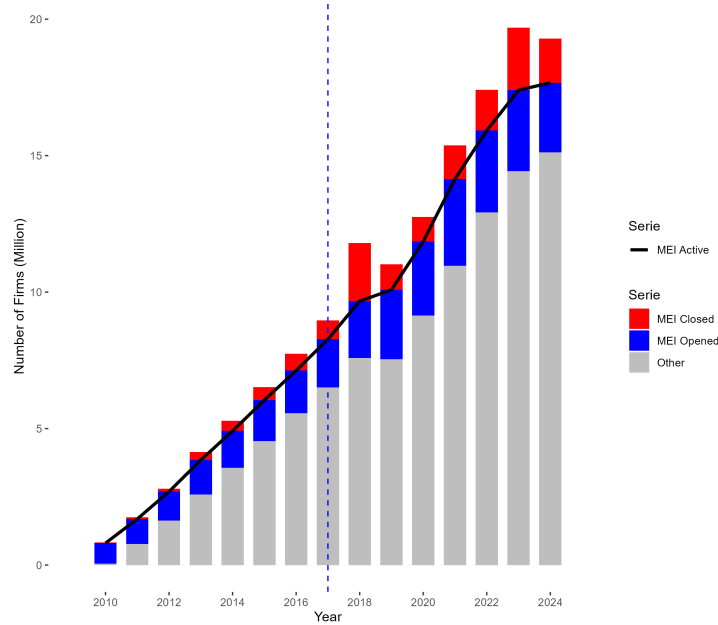
As shown in Figure 3, the number of individual firms has grown consistently at an

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<sup>16</sup>The key distinctions between a MEI and an Individual Firm (Empresário Individual) involve revenue limits, number of employees, and the range of permissible business activities. However, since this study focuses solely on individual firms, these differences are not pertinent. Therefore, terms such as 'individual entrepreneur,' 'non-employer business,' and 'one-person firms' are used interchangeably to refer to both types of firms throughout the study.

average rate of 21% per year<sup>17</sup>. Even in 2020, in the middle of the Covid-19 pandemic, when the labor market experienced a 5.7% reduction in the workforce, the number of individual firms continued to grow (BCB, 2021).

Figure 3: Active MEI Firms Evolution



Source: author's elaboration using National Registry of Legal Entities data.

Note: This graph shows the evolution of active Individual Firms. The black line indicates the total number of firms, while the bars break down this total into surviving, exiting, and entering firms.

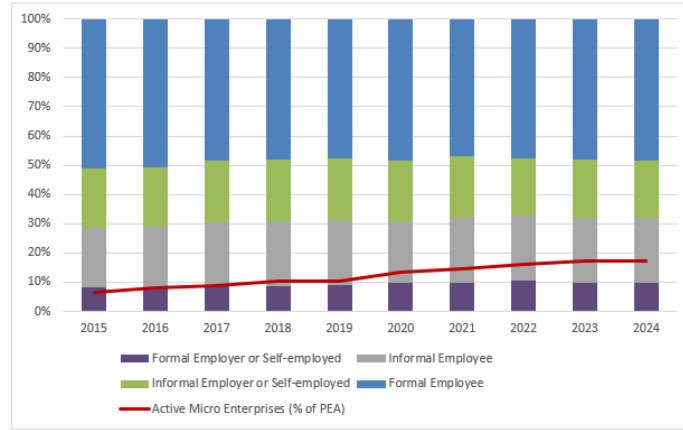
Individual firms, as self-employed microentrepreneurs, function simultaneously as both businesses and workers.<sup>18</sup> Figure 4 compares the number of individual firms and the data on the employed population estimated by PNAD (IBGE, 2024).<sup>19</sup> At the end of 2023, the individual entrepreneur made up 17% of Brazil's employed workforce.

<sup>17</sup>The year 2018 is excluded from this calculation due to negligible growth, which resulted from the removal of records classified as inactive. On January 29, 2018, the Committee for the Management of the National Network for Simplifying Business Registration and Legalization (CGSIM) issued Resolution No. 44, allowing the Federal Government to terminate (cancel) the registration of Individual Microentrepreneurs (MEIs) who were either delinquent or had failed to submit their annual declarations for the previous two fiscal years.

<sup>18</sup>Self-employed persons include employers and own-account workers. It is important to note that self-employed workers are not necessarily synonymous with entrepreneurs, as they are a diverse group with varying activities and motivations. Despite these limitations, equating self-employed workers with entrepreneurs is commonly used in research due to data availability (Barros and Pereira, 2008). Both terms will also be used as synonyms in the present study.

<sup>19</sup>PNAD is the acronym for Pesquisa Nacional por Amostra de Domicílios, which freely translates to Brazilian National Household Sample Survey. It is a survey conducted annually by the Brazilian Institute of Geography and Statistics (IBGE) that provides information on several aspects of the population, such as household composition, education, labor, income, and fertility. It also aims to fill in gaps in information about the Brazilian population between censuses and to study topics that are not sufficiently covered by the decennial censuses.

Figure 4: Individual Entrepreneurs x Employed Population



Source: author's elaboration using PNAD/IBGE data.

Note: This graph displays the distribution of the employed population across various work categories. The red line represents the ratio of individual firms to the employed labor force (PEA), serving as a proxy for the percentage of the employed population working as formal self-employed individuals.

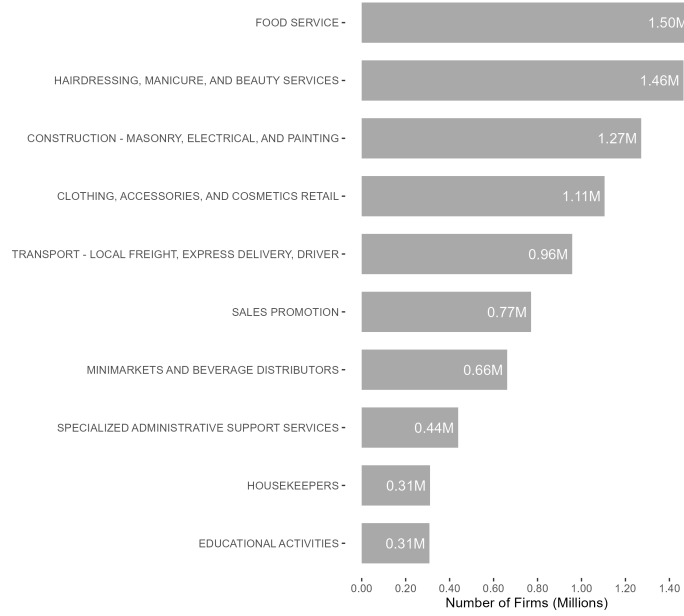
## 5.2. The Distribution of Individual Firms Across Economic Sectors

The economic activities of the firms are identified by a CNAE (National Atividades Econômicas Classification) code, a standardized classification system used in Brazil to categorize and classify business activities. Among the activities carried out by individual companies, there is a predominance of activities related to the tertiary sector (trade and services) in the Brazilian economic scenario. Ten activities areas represent half of the active firms in December 2023, as shown in Figure 5. A detailed list of the professional activities considered and their respective CNAE codes is presented in [Appendix A](#).

The most common sectors for individual microentrepreneurs are commerce and services, including activities such as retail, food services, and beauty services, that is, sectors with low growth potential. Private companies often compete directly with self-employment in the same sectors and may have advantages such as better management, more financial resources, and higher efficiency of economies of scale. However, fiscal and financial incentives directed towards MEIs can harm the competitiveness of small businesses and have a negative impact on the growth dynamics of firms. In Brazil, considering the total number of companies, these low-entry-cost activities represent 81.5% of the operating companies ([IBGE, 2024](#)).

The data align with the argument that self-employed individuals are predominantly concentrated in non-tradable service sectors, while formal salaried workers are more likely to be employed in higher-productivity tradable industries. [Maloney \(2004\)](#) explains that productivity in the self-employed sector, which predominantly operates within the service industry, tends to grow more slowly. However, equalization of wages across sectors enables self-employed workers to indirectly benefit from productivity gains in the industrial sector

Figure 5: Firms Distribution Across Economic Sectors



Source: author's elaboration using National Registry of Legal Entities data for December 2023.

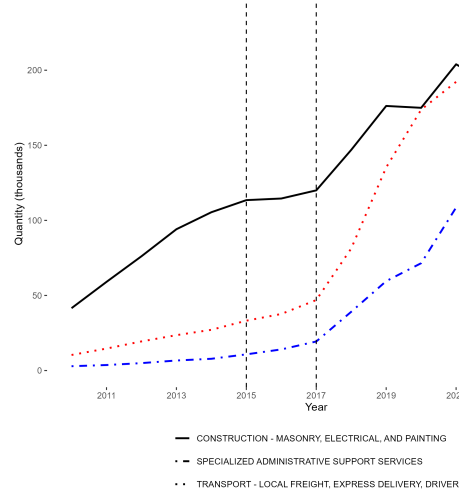
through reduced labor supply and increased service prices. Consequently, non-tradeable services—such as haircuts, gardening, and domestic work, employ a greater share of the workforce and remain more affordable in developing countries, where industrial development and productivity levels are relatively low<sup>20</sup>.

#### 5.2.1. Growth Trend by Economic Sector

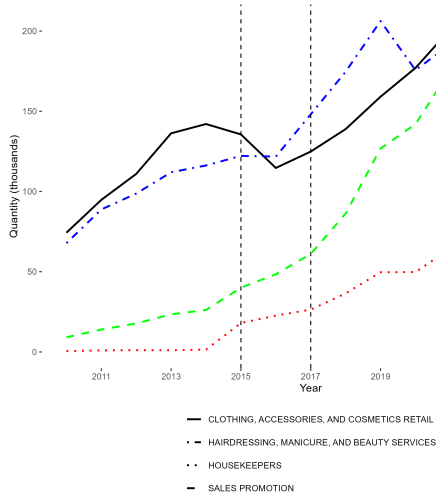
Examining growth trends in company formations in the 10 most relevant economic activities, we can identify three distinct groups: 1) those where an inflection in growth appears, specifically starting in 2017 (Figure 6a); 2) those where the growth curve shows an inflection before 2017 (Figure 6b); and 3) those exhibiting a more organic growth pattern, without notable inflections in the curve up to 2017 (Figure 6c).

<sup>20</sup>The data also echo those of Li and Zhao (2011) in the Chinese context, where self-employment is concentrated in sectors characterized by low entry barriers and high competition, resulting in lower returns for self-employed individuals. In addition, the study highlights a substitution effect between self-employment and private enterprises, with both tending to cluster in the same low-productivity sectors, further emphasizing the competitive pressures in these markets.

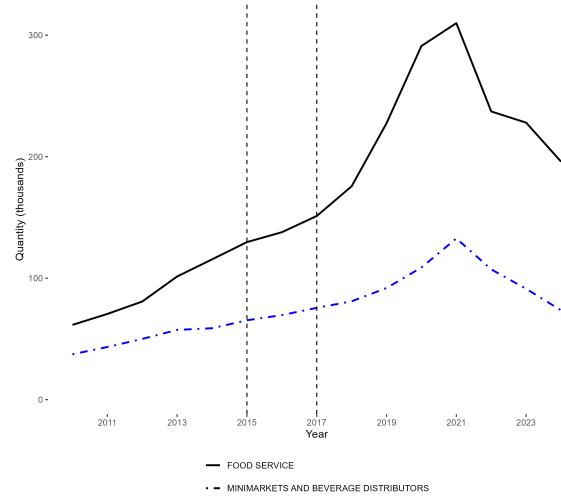
Figure 6: Comparative Growth Inflection Analysis Across Groups



(a) Group 1: Growth Inflection in 2017



(b) Group 2: Growth Inflection before 2017



(c) Group 3: No Growth Inflection by 2017

The graphs show trends in MEI firm creation across different economic activities, as defined by firms' CNAE codes.

Source: Author's elaboration based on data from the National Registry of Legal Entities.

It should be noted that the growth inflections in Groups 1 and 2, which comprise sectors more closely related to labor contracting, align closely with the changes in labor laws described in Section 3. In contrast, sectors such as minimarkets and food retailers (Group 3) lack inflections in their growth curve until 2017, indicating that they are less affected by fluctuations in labor market regulations, although they remain influenced by economic cycles. This distinction highlights the different motivations and challenges faced by various economic sectors. Although some economic activities are significantly influenced by evolving labor regulations, others show a more stable trajectory, indicating a reduced response to such changes.

As mentioned above, Law 147/2014, enacted in January 2015, simplified the require-



ments for companies hiring MEIs (Individual Microentrepreneurs), including easing registration processes and abolishing the 20% employer’s contribution typically required when hiring employees. However, the changes explicitly excluded certain categories, such as MEIs providing services in the construction industry (plumbing, electrical work, painting, masonry, and carpentry). This exclusion probably explains the delayed increase in individual firm registrations within the construction sector, which only began to increase significantly after the enactment of the 2017 Outsourcing Law. Furthermore, prior to the 2017 labor reform in Brazil, delivery services were generally classified as a core activity in businesses where they constituted a primary operation—such as logistics companies or retail businesses reliant on direct-to-consumer deliveries—thereby restricting their legal outsourcing.<sup>21</sup>

### 5.3. *Individual Firms Regional Distribution*

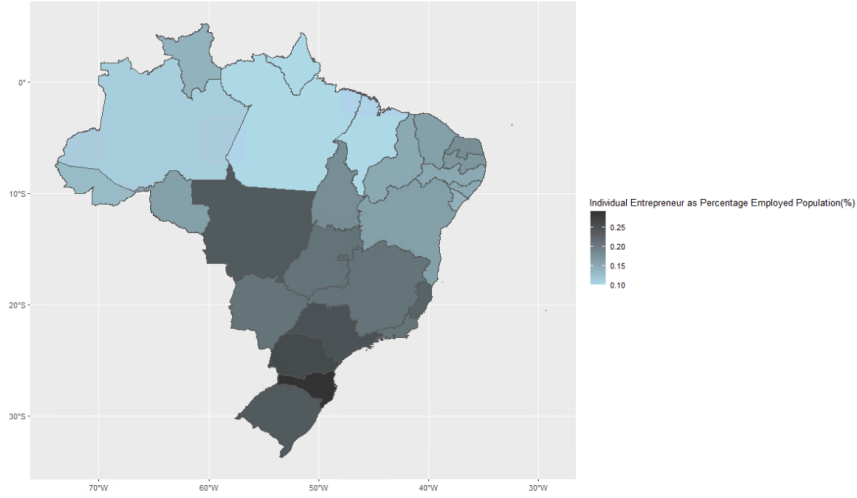
According to the database of the National Registry of Legal Entities (CNPJ), as of December 31, 2023 53% active micro-entrepreneurs were concentrated in the southeast region of Brazil. This percentage increases to 71% when considering the South region. Among these, the state of Sao Paulo stood out significantly, accounting for almost one third (28%) of the country’s active individual firms, a proportion closely aligned with its share of the national population.

As shown in Figure 7, comparing the percentage of self-employed workers registered as individual entrepreneurs with the economic active population estimated by the PNAD/IBGE, we find that approximately 17% of the Brazilian Employed Population was registered as MEI as of December 2023. However, this percentage varies widely across different states, ranging from 29% in Santa Catarina to 10% in states like Para, Amapa and Maranhao.

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<sup>21</sup>However, they could be outsourced when classified as a support activity. The 2017 reform removed this distinction, permitting the outsourcing of both core and support activities, including delivery services integral to a company’s operations.

Figure 7: Percentage of Employed Population Registered as Individual Firms



*The map displays the share of MEI registrants relative to the employed population in each Brazilian state. Source: Author's elaboration based on the National Registry of Legal Entities and PNAD/IBGE.*

It is interesting to note that there is considerable variation in these percentages even among municipalities within the same state. The Brazilian Service of Support for Micro and Small Enterprises (Sebrae) found that MEIs (Individual Microentrepreneurs) are predominantly located in urban areas and larger cities, reinforcing a strong connection between this form of entrepreneurship and the economic dynamism of these regions. Similarly, [Morais et al. \(2022\)](#) compare 853 municipalities in the state of Minas Gerais and find that individual micro-entrepreneurs are more prevalent in regions with higher economic activity, larger urban centers, and among populations with greater income levels and formal education.

#### *5.4. A new dataset on firms and workers: leveraging administrative data to track labor market trends*

As previously mentioned, a contribution of this study is the integration of two administrative datasets: the Annual Social Information Report (RAIS) and the Business Registration Records, which encompass all active firms registered in the country, linked to owner identification information.<sup>22</sup> The data compiled, summarized in Table 3, capture both formal employment trends and entrepreneurial activity across the full spectrum of Brazilian firms, including MEIs and other individually operated businesses.<sup>23</sup>

The distribution of firms and workers by firm size in Brazil between 2015 and 2023

<sup>22</sup>The database includes only individuals identified as legally responsible for the company, not the entire group of partners or shareholders.

<sup>23</sup>The number of companies reported in this data set differs slightly from the figures published by [MDIC \(2024\)](#) (see Table 5.1). This discrepancy may be due to differences in database updates, as only firms active in each calendar year are considered. In this analysis, we include only companies that were active as of December 31 of each year.

Table 3: Firm and Worker Totals by Year (in millions)

<b>Year</b>	<b>Firms</b>	<b>Employees</b>	<b>Workers</b>
2015	17.38	57.90	68.73
2016	18.60	55.03	67.15
2017	19.93	53.78	66.06
2018	17.52	53.81	64.73
2019	18.79	53.88	65.83
2020	21.00	53.43	67.11
2021	20.49	55.43	68.59
2022	21.35	58.82	72.11
2023	21.98	59.92	73.61

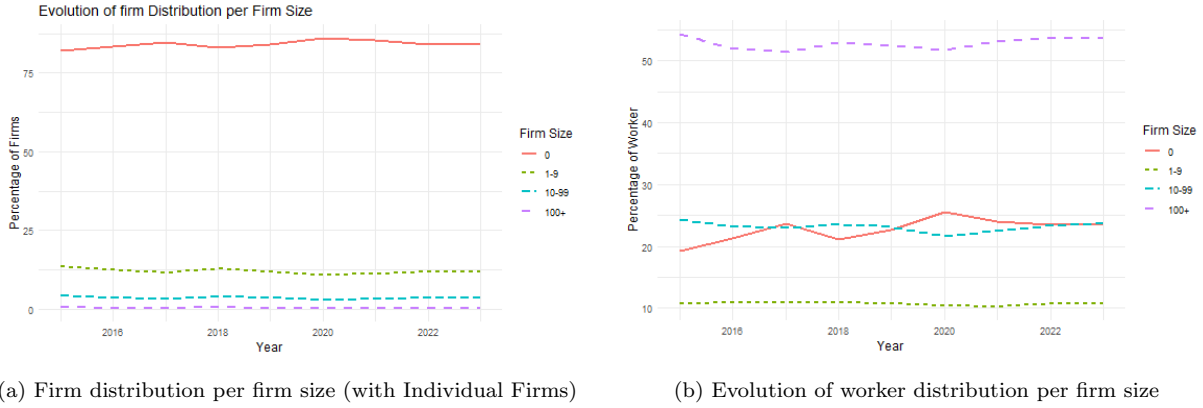
*Note:* The category of workers is defined as the sum of formal employees (recorded in RAIS) and business owners registered in the Federal Revenue Service database. Only unique CPF identifiers are considered. Since some individuals may simultaneously appear as formal employees in RAIS and as registered business owners, the total number of workers may differ from the simple sum of the two categories.

reveals a persistent dual structure in the formal labor market.<sup>24</sup> Large firms, representing less than 1% of all establishments, consistently accounted for more than half of total formal employment, highlighting their dominant role in job creation. In contrast, individual firms, with no registered employees (size 0), experienced substantial growth, increasing from 14.3 million in 2015 to 18.5 million in 2023, an increase of almost 30%. In terms of worker participation, they rose from 19.2% to 23.7% of all workers. This expansion likely reflects the proliferation of sole proprietorships and the rise of the MEI regime, signaling a trend toward individual formalization without employer-employee ties. Small firms (1 to 9 employees) and medium firms (10 to 99 employees) maintained relatively stable employment shares, around 10 - 11% and 22 - 24%, respectively, throughout the period.

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<sup>24</sup>Firm size was calculated based on the number of workers effectively registered in RAIS by a firm for each year. In addition, the employee figures include all individuals formally employed at any time of the year.

Figure 8: Firms and labor market composition trends



(a) Firm distribution per firm size (with Individual Firms)

(b) Evolution of worker distribution per firm size

Firm size is defined by the number of employees. The number of workers includes both formal employees (as recorded in RAIS) and business owners registered in the Federal Revenue Service database.

Source: Author's elaboration based on RAIS and CNPJ data.

It should be noted that the 18.5 million companies without employees in 2023 exceed the 13.8 million formally registered as individual companies, according to MDIC (2024). This finding is consistent with data from IBGE (2022), which show that a significant share (over 50% in 2020) of non-individual firms operate without wage employees.<sup>25</sup> This suggests that legal constraints or classification rules may prompt some individuals to register as conventional firms, even if they do not employ any worker.

The post-pandemic years (2021–2023) show signs of employment recovery in medium and large firms, suggesting a partial reorganization of productive structures. At the same time, the number of individual firms, particularly those without registered employees, continued to grow, indicating a sustained trend toward solo formalization through simplified regimes.

By combining employment and firm records, the analysis enables detailed tracking of transitions between formal employment and entrepreneurship, offering insights into labor market restructuring and the expanding role of small and microenterprises in the Brazilian economy. The integrated data set includes approximately 70.3 million workers in 2023, representing approximately 70% of the estimated employed population of IBGE (2024) and captures 100% of firms formally registered in the country, providing a comprehensive view of Brazil's formal labor and entrepreneurial landscape.

## 6. Regression Analysis

### 6.1. Regression Models

First, I assess whether the probability of an initially formal worker becoming an entrepreneur (MEI or similar individual firms) changes significantly after the Outsourcing

<sup>25</sup>These statistics are based on administrative records from the Special Secretariat for Social Security and Labor (Cempre); individual firms are not required to submit this information.

Law in 2017. Specifically, I estimate the linear regression model as defined in Equation 1:

$$Y_i = \alpha + \sum_{t=2014}^{2019} \beta_t \times D_{i,t} + X' \Gamma + \epsilon_i \quad (1)$$

Where  $Y_i$  is a binary variable that takes the value of 1 if the worker registers as an entrepreneur after separation from a formal job, and 0 in all other cases, such as when the worker does not register as an individual firm, registers before separation, or registers at any different period of time. The summation  $\sum_{t=2014}^{2019} \beta_t \times D_{i,t}$  captures the annual treatment effect, where  $\beta_t$  represents the coefficient of effect for each year, and  $D_{i,t}$  is a binary indicator that denotes the year in which worker  $i$ 's dismissal was recorded in the RAIS database. The year 2013 is the omitted (baseline) year in the regression. Specifically,  $D_{i,t} = 1$  if the dismissal occurred in year  $t$  and  $D_{i,t} = 0$  otherwise. The control variables ( $X'$ ) are education, gender, age and region. The error term is denoted  $\epsilon_{i,t}$ . As the dependent variable, we consider three scenarios: the first focus on individual firm openings restricted to one year after separation; the second extend the focus to individual firm openings restricted to two years after separation; and the third maintains the two-year restriction but includes all types of firm, not just individual ones.

I estimate a similar regression model segmented by occupational groups, as defined by the Brazilian Occupation Code (CBO), and by geographic regions. In addition, I estimate a unified model that incorporates the interaction terms for occupation, as specified in Equation 2. These analyses focus exclusively on the third scenario, all types of firm creation within two years after the separation of the job.

$$Y_i = \alpha + \sum_{t=2014}^{2019} \beta_t \cdot D_{i,t} + \sum_{r=2}^5 \gamma_r \cdot K_i + \sum_{t=2014}^{2019} \sum_{r=2}^5 \delta_{tr} \cdot (D_{i,t} \times K_i) + \varepsilon_i \quad (2)$$

Where  $Y_{it}$  is a binary indicator equal to 1 if individual  $i$  created a firm within two years after job separation in year  $t$ ;  $D_t$  are dummy variables for calendar years 2014 to 2019, with 2013 serving as the omitted reference category, and  $K_i$  are dummy variables for occupational groups and region (North = 1 (reference), Northeast = 2, Southeast = 3, South = 4, Central-West = 5). The  $D_{i,t} \times K_i$  are interaction terms that capture region/occupation-specific deviations in the time trend.  $\varepsilon_{it}$  is the error term. This interactive specification allows us to assess how the effects of the reform varied across occupational categories and geographic areas within a unified estimation framework.

To assess the statistical significance of the changes in the distribution of firms and workers across firm size categories over time, we estimate a linear temporal trend, controlling for firm size, as defined in Equation 3.

$$Y_{st} = \alpha + \beta \cdot \text{Year}_t + \sum_{s \neq \text{ref}} \gamma_s \cdot \text{Size}_s + \sum_{s \neq \text{ref}} \delta_s \cdot (\text{Year}_t \times \text{Size}_s) + \varepsilon_{st} \quad (3)$$

Where:  $Y_{it}$  is the percentage of firms (or workers) in the firm size category  $s$  in year  $t$ .  $\alpha$  is the intercept, representing the expected value for the reference group (firms without employees) in 2015;  $\beta$  is the linear time trend for the reference group and  $Year_t$  is a continuous variable for the years 2016 to 2023 with 2015 as the reference.  $\gamma_s$  captures the average difference between the size category  $s$  and the reference group, and  $Size_s$  are firm size dummies based on the number of employees (1-9, 10-19, 100+), the omitted category being firms without employees (size 0).  $\gamma_s \times Year_t \times Size_s$  are the interaction terms that capture how time trends differ between size categories.  $\varepsilon_{it}$  is the error term.

## 6.2. Data

Our analysis benefits from the Annual Social Information Report (RAIS), a comprehensive administrative database maintained by the Ministry of Labor and Employment. RAIS is designed to collect and store information on formal employment trends, workforce characteristics, and labor market dynamics in Brazil. It gathers data from employers about their employees, including details about their wages, job positions, working hours, and other employment-related information. Submitting RAIS is a mandatory requirement for almost all Brazilian companies, with exceptions for companies without employees, inactive companies, individual micro-entrepreneurs without employees, and domestic employers.<sup>26</sup>

The RAIS data are enriched with Business Registration Records, which include all active firms registered in the country. These firms are identified by their CNPJ (Cadastro Nacional da Pessoa Jurídica), a unique business registration number linked to the owner's tax identification number (Cadastro de Pessoa Física - CPF)<sup>27</sup>. This integrated dataset, maintained by the Federal Revenue Service, offers a comprehensive view of the formal business landscape. It also allows for the identification of active Individual Microentrepreneurs (MEIs), who are similarly linked to their respective CPF.

The study is based on workers registered in the RAIS database from 2013 to 2019 who have a recorded termination within this period. Given that the study aims to evaluate labor market dynamics, individuals who remained with the same employer throughout the entire analysis period are not included.<sup>28</sup> Additionally, since the study's objective is to assess labor market trends, approximately 900,000 workers who left work due to

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<sup>26</sup>While providing the employee information remains a critical obligation for companies, the RAIS is currently being replaced by the eSocial reporting system which is a digital platform that unifies the reporting of employee information to various government agencies aiming to streamline and simplify the administrative processes for companies, reducing redundancy and improving compliance.

<sup>27</sup>A CPF number is the Tax ID issued once you have been registered into the Cadastro de Pessoas Físicas (Natural Persons Register). It is an 11-digit number issued by the Brazilian Individual Taxpayer Registry. It is often used as an identifier and is required for many things such as opening a bank account, starting a company, getting utility services, buying online, and being able to enter in contracts drafted in Brazil, among others.

<sup>28</sup>For workers with more than one employment record at the same company, the most recent employment record in RAIS was considered, except for the hiring date, where the earliest record was used.

retirement or death are not considered. Public sector employees are also excluded due to their low termination rates and because many public sector job categories have legal restrictions on starting businesses.

As a result, the study is based on a dataset of 9.13 million records, including 8.9 million employees and 1.6 million hiring firms.<sup>29</sup>

Table 4: Descriptive Statistics

	RAIS 2013 a 2019
<b>Employees (millions)<sup>a</sup></b>	<b>8.91</b>
<b>Hiring Firms (millions)</b>	<b>1.6</b>
Average Age <sup>b</sup>	32.9
Men	58%
Black	43%
Average Wage <sup>b</sup>	R\$1,986.31
<b>Opening Individual Firms (million)</b>	<b>0.6</b>

<sup>a</sup> Considers only workers with at least one dismissal recorded during the period.

<sup>b</sup> Age and average wage at the dismissal date.

Of this sample, the dismissed workers have opened 0.63 million individual firms, 0.55 million of them (87%) registered as individual firms.

## 7. Results

### 7.1. The impact of Labor Reform on outsourcing

We posit that the establishment of a solo entrepreneur firm shortly after dismissal may serve as a proxy for labor outsourcing, particularly if the frequency of such occurrences increases significantly after 2017. This trend would suggest that workers increasingly perceive contracting opportunities as more available and/or more advantageous than traditional employment, indicating that the labor market is shifting from formal employment relationships to individual contractors, thus signaling a wider move toward outsourced labor.<sup>30</sup> By focusing on workers previously employed in formal positions, we can filter for individuals who possess the necessary physical capabilities and qualifications to enter the formal labor market.

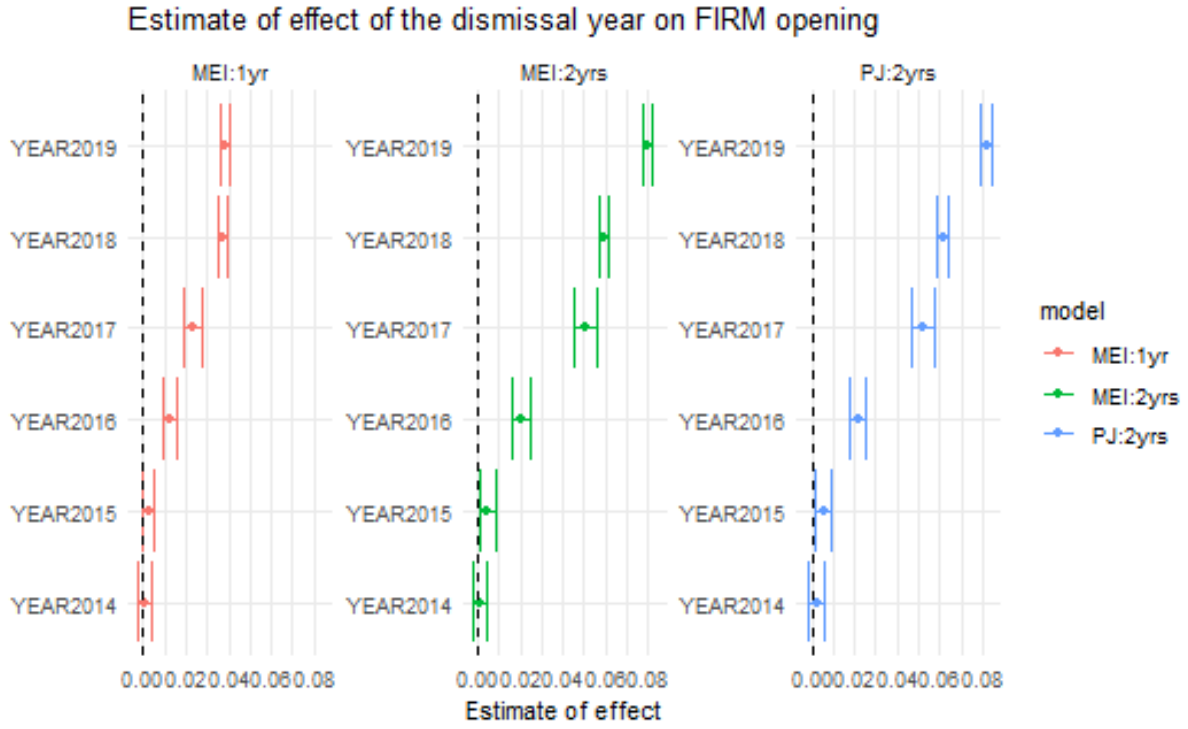
Applying the data to the proposed model, we find that becoming a solo entrepreneur is a consistent trend, and in any year considered, this probability is significantly higher than in 2013 (baseline). However, the magnitude of the impact increases substantially after 2017, as shown in Figure 9. The detailed regression results are presented in Appendix B.

<sup>29</sup>Employees with ties to more than one company were retained in the dataset, accounting for the difference between the number of records and workers.

<sup>30</sup>Studies like Felix and Wong (2023) indicate that this shift from employee to contractor does not necessarily occur within the same worker-firm relationship. However, it would be valuable to explore whether the new individual firms are providing services to the same companies that previously employed these workers within the RAIS framework.



Figure 9: Regression Result



Note: Dots show OLS estimates of the regression coefficients  $\beta_{2014}$  to  $\beta_{2019}$  from Equation (1) with year 2013 as reference. The dependent variable is a binary indicator equal to 1 if the worker registers a firm under one of three scenarios: (i) left graph – as an individual entrepreneur within one year of separation; (ii) middle graph – as an individual entrepreneur within two years of separation; and (iii) right graph – any type of firm within two years. Bars represent 95% confidence intervals.

As discussed, we consider three scenarios for the dependent variable: MEI openings within one year after separation; and MEI openings within two years after separation. Although the results are significant for the one-year interval, they become more pronounced for the two-year interval. This is expected because dismissed workers are entitled to up to six months of unemployment insurance and may also receive severance pay. Consequently, many do not reenter formal employment until after this period has passed. Considering that most of the individual firms are registered as MEI, there is no significant change in the results when including different types of individual firms (third scenario considered). The results remain consistent even after controlling for region and worker characteristics (education, race, age), as shown in [Appendix D](#).

These findings substantiate our initial hypothesis. Although the establishment of individual businesses was an ongoing trend prior to legislative changes, the enactment of the 2017 Outsourcing Law significantly accelerated this process. By facilitating the replacement of traditional employee relationships with individual contractors, the law has encouraged a shift toward more flexible labor arrangements, allowing businesses to minimize expenses related to social security, benefits, and other labor protections mandated for formal workers.

## 7.2. Heterogeneous effects across Occupation

In Section 5.2.1, I presented trends in firm creation across occupational groups, as classified by CNAE codes. Building on that analysis, I now investigate the occupational profiles of workers who are more likely to transition to individual entrepreneurship after the termination of formal employment. Occupational categories for employees are defined by the Brazilian Classification of Occupations (CBO) and are recorded in the RAIS database. Although there is no direct correspondence between the CNAE codes (firm activity classification) and the CBO codes (employee occupation classification), a close alignment can be established for analytical purposes.<sup>31</sup> The correspondence developed for this analysis is detailed in Appendix E.

By examining overall firm creation trends segmented by workers' previous occupations, this analysis aims to offer a more nuanced understanding of outsourcing trends, providing valuable insights into how workers from different occupational backgrounds may be more or less inclined to engage with outsourcing firms.

Sector-specific regressions are a valuable analytical tool, as they highlight the internal dynamics within each occupational group and provide clear, intuitive insights. As shown in Table 5, the results of the sector-specific regression confirm a consistent trend of increased individual firm creation in all occupations, with a marked increase in magnitude from 2017 onward. They also reveal significant heterogeneity in the effects of the 2017 Labor Law Reform across occupational categories, underscoring distinct labor market dynamics.

Table 5: Regression Results by Occupation Category

	Dependent variable: Firm within 2 years					
	Food Service	Construction	Transport	Beauty	Clerck / Adm.Services	Sellers
YEAR2014	-0.002 (0.003)	0.002 (0.005)	-0.004 (0.004)	0.083* (0.047)	0.005** (0.002)	0.006** (0.003)
YEAR2015	0.006 (0.004)	0.002 (0.005)	0.001 (0.005)	0.143* (0.080)	0.011*** (0.003)	0.013*** (0.004)
YEAR2016	0.007 (0.004)	0.010* (0.005)	0.025*** (0.007)	0.167** (0.079)	0.035*** (0.005)	0.037*** (0.006)
YEAR2017	0.045*** (0.008)	0.040*** (0.015)	0.033*** (0.008)	0.562*** (0.132)	0.069*** (0.009)	0.055*** (0.008)
YEAR2018	0.049*** (0.003)	0.062*** (0.003)	0.061*** (0.003)	0.321*** (0.004)	0.064*** (0.001)	0.069*** (0.002)
YEAR2019	0.067*** (0.004)	0.077*** (0.006)	0.079*** (0.005)	0.285*** (0.030)	0.094*** (0.003)	0.086*** (0.003)
Constant	0.006** (0.003)	0.009*** (0.003)	0.014*** (0.003)	0.000	0.010*** (0.001)	0.008*** (0.002)
Observations	526,544	137,175	309,590	8,687	1,271,958	1,417,488

Note: Coefficient estimates are from sector-specific regression models (Equation 1). The dependent variable is a binary indicator equal to 1 if worker registers a firm within two years after job separation, with the year 2013 as the time reference.

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

<sup>31</sup>The Sales Promotion and Clothing, Accessories, and Cosmetics Retail sectors are grouped under "Sellers." Since housekeepers are typically employed by individuals who are not required to report under RAIS, it is not possible to replicate the analysis for this group.

Consistent with the individual firm opening trend shown in Figure 6b, the sellers and beauty services groups show a pronounced and consistent growth in firm openings after dismissals throughout the observed period. For the seller, this trend likely reflects the growing prevalence of independent or commission-based opportunities, fueled in part by the expansion of digital commerce and e-Commerce platforms.

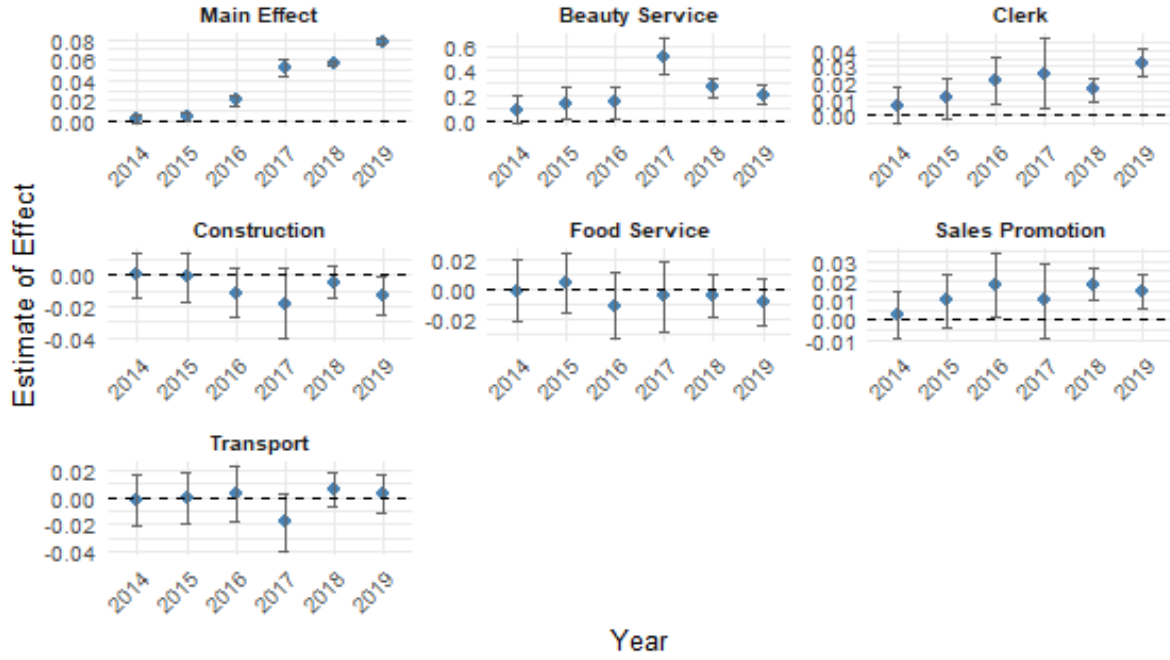
In contrast, the Food Services and Construction sectors exhibit statistically significant increases in firm creation primarily after 2017, with these trends intensifying in subsequent years. The marked inflection point specifically in 2017 for these sectors suggests that labor regulatory changes played a key role in driving firm creation after dismissal, particularly by liberalizing outsourcing practices. This may be related to the fact that these industries typically employ workers in occupations closely tied to core firm activities, which were historically constrained by labor legislation limiting outsourcing.

Interestingly, while the general trend of individual firm openings (see Figure 6c) does not show a clear inflection point in 2017, the firm creation after the dismissal of food services workers actually shows a notable change around that year. This divergence suggests that, while the increased prevalence of outsourcing post-reform likely contributed to the trend, the broader increase in firm creation within the Food Services sector may be more closely linked to formalization processes than solely to changes in outsourcing regulations.

Finally, closely aligned with the trend for individual firm openings, the findings for former workers in the clerical and administrative services industry reveal steady growth after 2017, with significant effects appearing even earlier. The transport industry also exhibits an upward trend, with statistically significant increases after 2016. Similarly to the food services industry, the steady growth observed after 2017 for the transport and administrative services industries (see Figure 6a) may be partially attributed to a broader formalization process.

This analysis can be complemented by a unified model with sector interactions, which enables formal statistical comparisons across groups, controls for shared time trends, and provides a clearer view of sector-specific deviations. Using “all other occupations” as the reference category, the model shown in Figure 10 captures how different occupational groups compare to the general trend of the labor market in firm registration (regression results are presented in C.12). The main year effects indicate a consistent and statistically significant increase in the likelihood of registering a firm within two years: for example, the coefficients for 2017 (0.052), 2018 (0.056), and 2019 (0.078) confirm a strong and widespread upward trend in individual formalization. This indicates that, regardless of the occupation, formalization through entrepreneurship has become increasingly common over time.

Figure 10: Coefficient Estimates by Year and Occupational Group



Note: Dots represent OLS estimates from the iterative model (Equation 2). The dependent variable is a binary indicator equal to 1 if the worker registers a firm within two years following job separation. The reference categories are the year 2013 and the occupational group 'Other,' serving as a proxy for general labor market conditions. Vertical bars indicate 95% confidence intervals.

The interaction terms refine this picture by showing important heterogeneity over time and how specific occupational groups deviate from this general tendency. For example, Beauty Service workers experienced much stronger gains, with interaction effects of 0.510 in 2017 and 0.207 in 2019, suggesting that they were among the groups most responsive to changes in the policy or institutional environment. Clerk occupations also show modest but positive interaction effects over time. In contrast, construction workers show negative interaction effects in 2017 ( $-0.018$ ) and 2019 ( $-0.013$ ). However, it is important to note that these values must be interpreted in the context of strong positive effects from the baseline, and negative interaction coefficients do not signal declines in formalization but reflect lower growth relative to an already expanding baseline. In other words, construction workers were still more likely to formalize in these years than in the baseline period (2013), but their increase was slightly below the average for all other occupations combined.

Sales promotion workers are noticed for exhibiting early signs of increased formalization, even before the major regulatory change of 2017. In 2015, the interaction term for this group is already positive and statistically significant (0.010), indicating a faster transition to entrepreneurship relative to the broader labor market. This early movement may reflect sector-specific factors, such as the prevalence of commission-based sales, informal commercial arrangements, or flexible contracting practices that preceded and anticipated

later legal reforms. The trend persists in subsequent years, with coefficients of 0.018 in 2016 and 0.014 in 2019, reinforcing the notion that Sales Promotion occupations were among the early adopters of the MEI regime or similar formalization strategies. In contrast, sectors like Construction and Food Service show a slower relative uptake, despite sharing in the general upward trend. Taken together, the results indicate that formalization is a broad-based trend across the labor market, but with variation in intensity.

In summary, these findings highlight two key insights: while outsourcing remains a dominant trend, it is shaped and moderated by regulatory frameworks and their enforcement. The observed nuanced patterns emphasize the industry-specific drivers and trajectories of firm creation, revealing that uniform policies often lead to varied results across sectors, as their influence is mediated by sectoral characteristics and the nature of work performed. This underscores the need to adopt customized approaches to effectively address unique challenges and opportunities within each industry.

### 7.3. Heterogeneous effects across regions

In line with the previous analysis of trends in the creation of firms in occupational groups, now I examine the likelihood that employees will establish a company within two years after separation of the job in the five regions of Brazil between 2014 and 2019, using 2013 as the reference year. As shown in Table 6, the probability of firm creation consistently increased across all regions over time.

Table 6: Regression Results by Region

	<i>Dependent variable: Firm opened within 2 years</i>				
	North	Northeast	Southeast	South	Central-West
YEAR2014	0.009*** (0.003)	0.002 (0.002)	0.002* (0.001)	0.001 (0.002)	-0.002 (0.004)
YEAR2015	0.010*** (0.004)	0.007*** (0.002)	0.004*** (0.001)	0.008*** (0.002)	0.007 (0.005)
YEAR2016	0.020*** (0.005)	0.023*** (0.003)	0.018*** (0.002)	0.027*** (0.003)	0.026*** (0.006)
YEAR2017	0.029*** (0.007)	0.052*** (0.006)	0.058*** (0.004)	0.051*** (0.007)	0.045*** (0.008)
YEAR2018	0.044*** (0.002)	0.044*** (0.001)	0.066*** (0.001)	0.070*** (0.001)	0.053*** (0.003)
YEAR2019	0.059*** (0.003)	0.062*** (0.002)	0.085*** (0.001)	0.096*** (0.002)	0.076*** (0.004)
Constant	0.008*** (0.002)	0.009*** (0.001)	0.009*** (0.001)	0.007*** (0.001)	0.014*** (0.003)
Number of Observations	408,490	1,348,579	4,816,544	1,782,270	777,781

Note: Coefficient estimates are from region-specific regression models (Equation 1), with the year 2013 as the time reference.

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

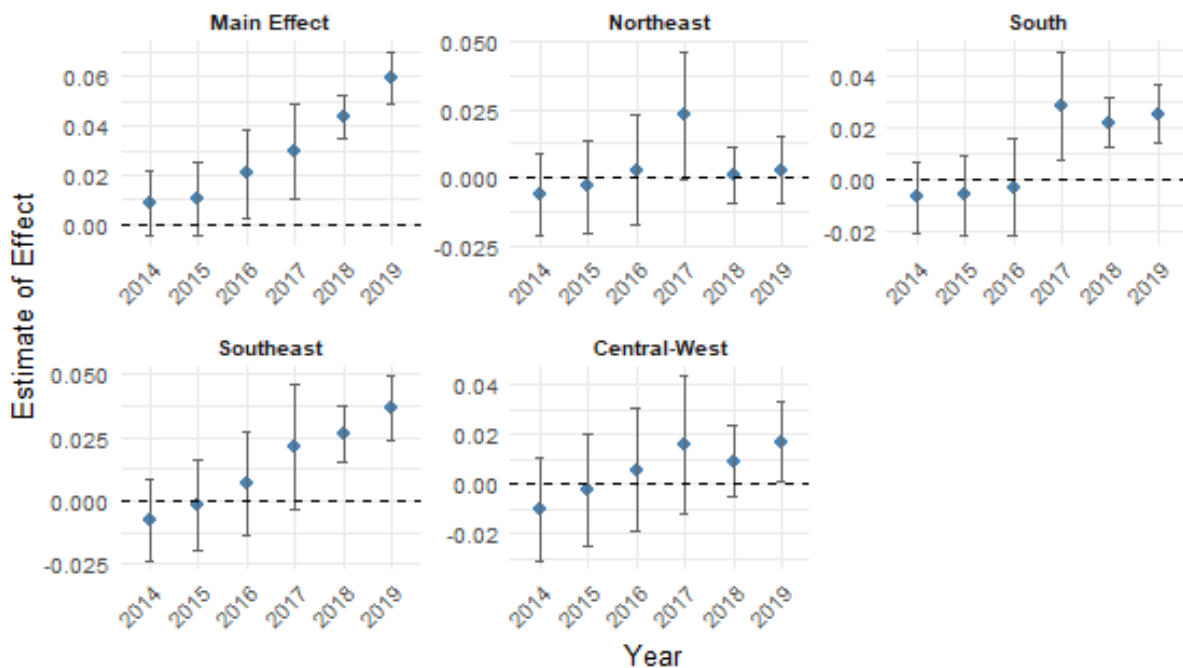
Firm creation in the North has shown significant growth since 2014, with a notable acceleration from 2018 onward. The Northeast follows a similar trend, but exhibits a more pronounced growth inflection starting in 2017. The South and Southeast, Brazil's most economically developed regions, follow comparable patterns. Both regions start with modest gains in 2014 and 2015 expanding to substantial growth by 2017. By 2019, the

South displays the highest probability of firm creation, closely followed by the Southeast, reflecting a pronounced upward trend in firm openings relative to other regions. The Central-West shows a similar trend, although slightly lower in magnitude.

It is interesting to note that until 2015, the North region had the highest probability of individual entrepreneur registration among all regions, surpassing the South and Southeast regions. One possible explanation for this trend is the relatively limited enforcement capacity of the North, which may have fostered outsourcing growth prior to 2017. Weaker regulatory oversight likely made individual contracting more feasible in the region, encouraging more registrations as individual entrepreneurs.

Similarly to occupational analysis, the results of the interactive regression model complement the region-specific regressions and confirm a clear and consistent upward trend in the probability of firm creation within two years throughout the entire sample period (see Table C.13 for detailed regression results). As presented in Figure 11, the analysis also confirms substantial variation in both the baseline likelihood of formalization and the rate at which different regions adopted this trend over time.

Figure 11: Coefficient Estimates by Year and Region



Note: Dots show OLS estimates of the regression coefficients relative to the reference categories: year = 2013 and occupation group = "North Region". The vertical indicate 95% confidence intervals.

The interaction terms between region and year reveal that certain regions—particularly the South (S) and Southeast (SE)—lagged behind the North (N), the reference category, in terms of formalization prior to 2017. However, following the changes in labor law, these regions exhibited more substantial increases in the probability of firm creation, suggesting a stronger response to institutional change.

These results suggest that although broader institutional or regulatory changes (such as the 2017 labor reform and outsourcing law) had nationwide effects, their impact was not uniform across the country. Instead, the adoption of formal entrepreneurial status was shaped by region-specific dynamics, possibly related to differences in labor market structure, enforcement capacity, and access to information or support services.

The evidence underscores that the regional context plays a key role in mediating the effects of national labor policy and that understanding these variations is essential to design more targeted and effective formalization strategies.

#### 7.4. Impact on RAIS Composition

The findings of the previous sections demonstrate a clear and sustained increase in the probability of individual firm creation within two years, indicating that workers are progressively shifting toward more flexible forms of labor participation. This trend prompts a critical question: how is this shift shaping the composition of formal employees and, more broadly, what are its implications for the evolving structure of Brazil’s formal labor market?

A first step in addressing this question is to examine the average evolution of key labor market indicators. In general, the data do not point to major disruptions in the formal labor market but rather to incremental adjustments. As shown in Table 7, the evolution of key indicators of the labor market between 2015 and 2023 suggests a stable scenario, with modest structural changes.

On the one hand, the number of formal workers decreased slightly after 2015 but recovered by 2021, suggesting that labor reform had limited effectiveness in increasing overall job creation. The workforce has aged gradually, and educational attainment has improved modestly, probably reflecting broader demographic trends. On the other hand, the average number of employees per firm and average wages (in terms of minimum wages) have remained largely stable, offering limited evidence to support the hypothesis of a significant rise in outsourcing or subcontracting. Despite labor reforms, there has been no significant increase in the use of flexible contractual forms, as intermittent and part-time contracts remain below 1% of formal employment.

Table 7: RAIS Descriptive Statistics by Year

Year	Links (M)	Employees (M)	Firms (M)	Age	Education	Wage (MW)	Intermit./Part-time	Tenure	Managers	Employee/Firm
2015	72,11	59,72	3,13	35,73	6,63	2,78	–	4,12	0,070	19
2016	67,07	56,78	3,09	36,37	6,72	2,71	–	4,48	0,072	18
2017	65,59	55,49	3,07	36,70	6,79	2,72	0,003	4,65	0,073	18
2018	66,15	55,65	3,05	36,83	6,84	2,73	0,005	4,65	0,074	18
2019	66,56	55,55	3,02	37,02	6,87	2,63	0,012	4,95	0,074	18
2020	65,85	55,00	2,97	37,24	6,89	2,46	0,013	5,08	0,072	18
2021	70,47	56,99	3,06	37,06	6,93	2,44	0,014	4,61	0,072	18
2022	78,44	61,30	3,78	37,09	6,94	2,78	0,015	4,33	0,071	16
2023	81,46	62,41	3,62	38,73	6,93		0,017	4,19	0,069	17

Notes: The data include all registered employees at any time during the year, not only those active on December 31. This explains why the number of employment records is slightly higher than the official figures reported by the Ministry of Labor and Employment.

Firm counts are based on root-level identifiers (CNPJ-8) rather than establishment-level identifiers (CNPJ-14). Note that A single CNPJ-8 can be associated with multiple CNPJ-14s, meaning one firm with multiple physical locations (establishments).

The data on managers include individuals classified under CBO codes starting with '1' (managers) as well as supervisors, identified by three-digit CBO codes: 111, 114, 121, 122, 123, 131, 141, 142, 410, 420, 510, 520, 620, 630, 710, 720, 730, 740, 750, 760, 770, 780, 810, 820, 830, 840, 860, and 910.

Source: Authors elaboration using RAIS data.



However, relying solely on mean values may obscure underlying distributional changes in the RAIS composition. When disaggregating key indicators into categorical ranges, more substantial shifts begin to emerge, revealing trends in the structure of the formal labor market that are not apparent from aggregated statistics alone.

As shown in Figure 12a, the participation of workers aged 25 to 34 years has declined over time, offset by an increase in the age group 35 to 44 years. Although this change may partially reflect broader demographic changes, it is noteworthy that the share of workers aged 45-59 and 60+ remained relatively stable throughout the period. The variation in the age group of under-25 appears to be consistent with the greater vulnerability of younger workers during periods of economic downturn. A similar pattern is observed in the distribution of educational attainment (Figure 12c): There has been a noticeable increase in the share of workers with secondary education and a corresponding decline in those with only primary education, which may also reflect demographic trends. However, the share of workers with tertiary education, despite increasing until 2018, has almost returned to its level of 2015 at the end of the period.

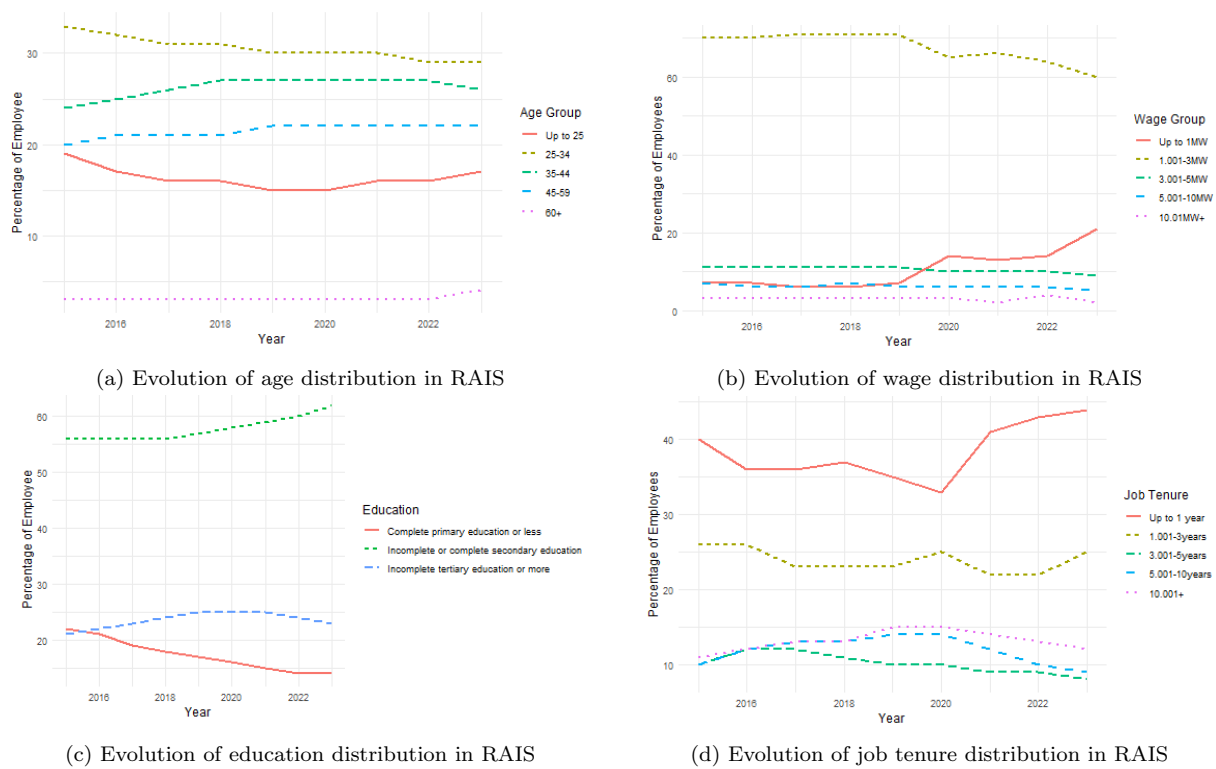


Figure 12: RAIS composition trends

Source: Authors elaboration using RAIS data.

The distribution of worker tenure has a consistently high share of short-term employment relationships. As shown in Figure 12d, the proportion of workers with less than a year of service has ranged from 33% in 2020 to a peak 44% in 2023, which may be related to the dismissal and post-recovery of the COVID-19 pandemic. The share of workers with medium tenure (1–10 years) shows more modest fluctuations, with a slight decline in the 3

to 5 year and 5 to 10 year categories after 2016. Interestingly, the proportion of long-term workers (more than 10 years) gradually increases until 2020, stabilizing around 12–15% thereafter. This pattern suggests a high labor turnover that may reflect both structural labor market rigidities and dynamic firm-level practices, such as outsourcing, that limit long-term employment relationships.

Regarding wage (Figure 12b), the distribution over the period 2015-2023 indicates a notable trend toward increased wage polarization. The share of workers earning between 1.001 and 3 minimum wages remained relatively stable around 70% from 2015 to 2019. However, starting in 2020, this group began to decline, reaching 60% in 2023. In contrast, the proportion of workers earning up to one minimum wage increased significantly - from 6 to 7% before 2020 to 21% in 2023. This shift likely reflects the impact of the COVID-19 crisis and subsequent labor market disruptions. Meanwhile, the higher wage brackets (above 3 minimum wages) remained relatively stable or experienced a slight decline, with the top bracket (above 10 minimum wages) consistently representing only 2 to 4% of the workers. These patterns suggest a growing concentration of workers in lower wage categories, raising concerns about the quality of employment and the potential erosion of earnings in the formal labor market.

Despite the documented increase in the creation of individual firms and the growing trend toward self-employment highlighted in previous sections, the distribution of formal firms by size remained strikingly stable between 2015 and 2023, as shown in Figure 13a. Firms with up to five employees consistently accounted for more than half of all formal firms, rising slightly from 55.3% in 2015 to 56.7% in 2023. Small firms (5 to 19 employees) maintained a share of approximately 31 to 32%, while medium firms (20 to 99 employees) hovered around 9 to 10%. Large firms (100 or more employees) represented a very small fraction of the total, remaining close to 2% throughout the period.

Despite substantial labor reforms aimed at increasing labor market flexibility and potentially encouraging firm growth through outsourcing mechanisms, the RAIS data do not indicate significant changes in the overall distribution of formal firm sizes. This persistent structure suggests that the observed expansion in firm creation, largely driven by solo entrepreneurs, has not translated into a broader reconfiguration of the formal firm size distribution.

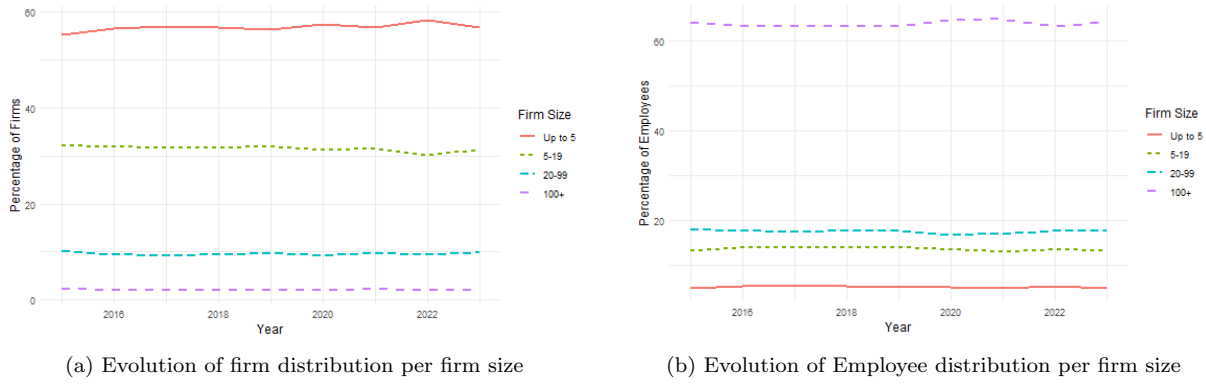


Figure 13: RAIS composition trends

Source: Authors elaboration using RAIS data.

Although most formal firms in Brazil are micro-enterprises with up to five employees, they represent a disproportionately small share of total formal employment (see Figure 13b). In contrast, large firms, although they represent only about 2% of the total number of firms, typically employ a significantly larger portion of the workforce (more than 60%). This asymmetry reflects the concentration of employment in medium and large enterprises, which remain central to job creation and labor absorption in the formal sector.

#### 7.5. Firm Dynamics and Labor Market Composition: analysis of the data on the workers and firms

RAIS data are limited to firms with at least one registered employee, as MEI and individual firms are not required to report.<sup>32</sup> Building on the integrated RAIS–CNPJ dataset introduced in Section 5.4, this section complements the RAIS-based analysis by assessing the statistical significance of changes in the distribution of firms and workers in the full spectrum of size categories of firms over time. To evaluate these trends, we estimate a linear-time trend model with controls for the firm size, as specified in Equation 3.

As shown in Table 8, for the worker distribution, the regression results provide strong evidence of divergent trends in the distribution of workers across firm size categories over time. The coefficient for the year variable ( $\text{Year} = 0.50$ ,  $p = 0.001$ ) is positive and statistically significant, suggesting a steady annual increase in the share of workers in this reference group, highlighting the growing relevance of individually operated firms in the formal labor market.

The interaction terms between the year and the firm size categories reveal a consistent deceleration in worker share growth among all firm sizes with employees. Specifically, the share of workers in micro-firms (1-9 employees) declines by 0.54 percentage points annually ( $p = 0.01$ ), while small (10–99 employees) and large firms (100+ employees) experience

<sup>32</sup>Depending on their legal status, firms are required to submit a “negative RAIS” declaration indicating they have no employees

Table 8: Regression Results: Worker Distribution by Firm Size

Variable	Estimate	Std. Error	t value	Pr(>  t )	Signif.
(Intercept)	20.744	0.590	35.167	0.000	***
Year	0.500	0.124	4.035	0.000	***
Size 1-9	-9.860	0.834	-11.819	0.000	***
Size 10-99	2.718	0.834	3.258	0.003	**
Size 100+	31.722	0.834	38.026	0.000	***
Year x Size 1-9	-0.543	0.175	-3.101	0.004	**
Year x Size 10-99	-0.577	0.175	-3.291	0.003	**
Year x Size 100+	-0.425	0.175	-2.425	0.022	*

*Notes:* The dependent variable is the percentage of workers (including both firm owners and employees) in each firm size category by year. The model follows the specification in Equation 3, estimating a linear time trend for the reference group using a continuous year variable from 2016 to 2023, with 2015 as the baseline. Firm size is defined by the number of employees (1–9, 10–99, 100+), with firms without employees (size 0) as the omitted category.

Significance levels: \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ .

yearly decreases of 0.58 and 0.43 percentage points, respectively. These results indicate a structural transformation in the formal sector, with employment growth increasingly concentrated in non-employing firms.

Complementing this analysis, as presented in Table 9, the regression results for the firm distribution also indicate significant and systematic differences in the temporal dynamics of the firm size distribution in Brazil’s formal sector.

Table 9: Regression Results: Share of Firms by Size Over Time

Variable	Estimate	Std. Error	t value	Pr(>  t )	Signif.
(Intercept)	83.220	0.393	211.658	0.000	***
Year	0.245	0.083	2.967	0.006	**
Size 1-9	-70.520	0.556	-126.825	0.000	***
Size 10-99	-79.476	0.556	-142.931	0.000	***
Size 100+	-82.864	0.556	-149.026	0.000	***
Year x Size1-9	-0.428	0.117	-3.667	0.001	**
Year x Size10-99	-0.303	0.117	-2.597	0.015	*
Year x Size100+	-0.253	0.117	-2.169	0.039	*

*Notes:* The dependent variable is the percentage of firms in each size category by year. The model follows the specification in Equation 3, with a linear time trend applied to the reference group using a continuous year variable from 2016 to 2023, and 2015 as the baseline. Firm size is defined by the number of employees (1–9, 10–99, 100+), with firms without employees (size 0) serving as the omitted category. Significance levels: \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ .

The positive and statistically significant coefficient for the year variable (0.245,  $p < 0.01$ ) suggests a gradual increase in the share of firms without employees (the reference category) over time. In contrast, all other firm size categories (1-9, 10-9, and 100+

employees) show significantly lower baseline shares, with negative and highly significant coefficients. In addition, the interaction terms between year and firm size are also negative and statistically significant, indicating that while the proportion of firms without employees increases over time, the relative shares of micro, small and large firms have grown at a slower pace, by approximately 0.25 to 0.43 percentage points less per year.

We also estimated a model treating the year as a categorical variable to allow for nonparametric year-to-year variation, but the fixed effects approach did not yield statistically significant coefficients for individual years, suggesting that deviations from the base year were not systematically different. Moreover, the linear model outperformed the fixed effects model based on AIC and BIC, indicating a better fit to the model. These findings suggest that, while individual year effects may appear modest, the lack of significance in the categorical model does not rule out a gradual and cumulative trend in the share of non-employing firms and corresponding declines across other firm size categories, precisely what the linear model captures more effectively.

In summary, the data underscore a dual structure within the formal labor market: on the one hand, a large number of firms without employees; on the other hand, a small group of large firms responsible for the majority of formal employment. The coexistence of highly concentrated employment in large firms along with a growing mass of small-scale and solo formal businesses may be associated with barriers to firm growth, regulatory rigidities, and strategic segmentation of the labor market. In addition, the continued expansion of individually operated firms may reflect both economic necessity and institutional incentives for self-employment, with important implications for labor market dynamics, employment stability, and worker access to social security benefits.

These findings align with [Peters and Zilibotti \(2021\)](#), who argue that in developing countries, mid-sized firms are more restricted in their growth than small informal firms. As a result, their limited capacity to expand and create quality jobs restricts the economic alternatives available to marginal entrepreneurs, ultimately reducing the likelihood of exit from low-productivity small firms. In a similar vein, [WorldBank \(2018\)](#) question the cost-effectiveness of some SME-targeted programs, noting that larger firms typically account for the most stable job creation and, within this context, reducing barriers to firm growth and promoting competitive markets may prove more effective than easing firm entry. Reinforcing this view, [Vandenbussche et al. \(2006\)](#) emphasize that in the absence of transformative firms and capital investment, the demand for skilled labor remains constrained, thus limiting the potential of education and training to enhance labor income and foster economic development.

## 8. Conclusion

The analysis showed that while individual business establishment had been growing before legislative changes, the 2017 outsourcing law played a key role in accelerating this

trend. By facilitating the transition from traditional employment to individual contracting, the law has allowed businesses to increase flexibility in labor relations and minimize costs related to social security, benefits, and other labor protections.

Applying the regression model to different occupation categories of employees, we observe that the overall trend of increased individual firm creation is consistent across all industries, with the magnitude nearly doubling from 2017 onward. Sellers and beauty services groups show pronounced growth in firm creation after dismissals, likely driven by the rise of independent, commission-based opportunities and the expansion of digital commerce. In contrast, the food services and construction sectors show significant increases in firm creation primarily after 2017, suggesting that labor regulatory changes, particularly the liberalization of outsourcing practices, played a pivotal role in driving firm creation in these industries. While outsourcing likely influenced these trends, the broader formalization process appears to have contributed to the increase in firm creation, especially in the Food Services sector. These findings underscore the importance of considering industry-specific factors when analyzing firm creation dynamics, highlighting that uniform policies often yield varied results across sectors. While outsourcing is a dominant trend across sectors, its expansion can be strongly influenced by specific legal frameworks and their enforcement.

Regional differences are also notable in this context. Although all regions experienced growth in individual firm creation, the Southeast and South saw the most substantial increases after 2017. In contrast, the North, Northeast and Central-West exhibited slower growth, although significant gains in 2017. Since regulatory changes were enacted at the federal level, this regional heterogeneity underscores the influence of local economic and institutional factors in shaping the impact of these reforms.

Although the results indicate that a notable shift occurred through the formalization of self-employment, particularly among former wage workers through the creation of individual firms, and despite expectations that the expansion of outsourcing following institutional reforms would lead to greater labor precarization and a decline in formal employment, the data on RAIS composition trends indicate that formal employment levels remained stable, the use of intermittent and part-time contracts remained marginal, and the average firm size and wages showed little variation. One possible explanation is that outsourcing did not replace formal jobs with informal ones, but rather transformed the way workers are incorporated into the labor market. Rather than signaling a return to informality or a rise in precarious work, this trend may reflect growing worker preferences or firm-level incentives for greater flexibility in labor relations.

Finally, this study also highlights an important trend in Brazil's formal business landscape, marked by the rapid expansion of individually operated companies and the consolidation of a dual labor market structure characterized by a small group of large companies concentrating the majority of formal employment and a growing number of firms operating

without employees.

Investigating this dynamic is essential for assessing the impact of outsourcing legislation on labor market inequality and workers' well-being. Further research is needed to determine whether these new forms of work offer adequate social protection and economic security. In addition, understanding to what extent labor flexibilization has redistributed risks from firms to workers is crucial to evaluating the equity and long-term sustainability of these reforms. Such an analysis is also key to inform policies that ensure both flexibility and fairness in the labor market.

### **Declaration of Competing Interest**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### **Disclaimer: The views expressed by the authors in this paper**

The views expressed in this paper are those of the authors and do not necessarily reflect those of the Banco Central do Brasil.



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## Appendix A. Economic Activity Code

The description of economic activities by the CNAE code is presented in Table A.10.

Table A.10: Classification of Economic Activities (Portuguese and English)

<b>Código</b>	<b>Atividade (Português)</b>	<b>Activity (English)</b>
4781400	Comércio de Vestuário e Acessórios	Clothing and Accessories Retail
9602501	Cabeleireiro, Manicure e Pedicure	Hairdressing, Manicure, and Pedicure
4399103	Obras de Alvenaria	Masonry Work
7319002	Promoção de Vendas	Sales Promotion
5620104	Fornecimento de Alimentos - Domicílio	Food Provision - Home Service
5611203	Fornecimento de Alimentos - Lanchonete	Food Provision - Snack Bar
8219999	Serviços Especializados de Apoio Administrativo	Specialized Administrative Support Services
4712100	Minimercados, Mercarias e Armazéns	Mini-markets, Groceries, and Warehouses
4930201	Transporte Rodoviário de Carga - Municipal	Road Freight Transport - Municipal
9602502	Atividades de Estética e Beleza	Aesthetic and Beauty Activities
5611201	Fornecimento de Alimentos - Restaurante	Food Provision - Restaurant
4723700	Comércio Varejista de Bebidas	Retail Beverage Sales
4321500	Instalação e Manutenção Elétrica	Electrical Installation and Maintenance
9700500	Empregado Doméstico	Domestic Employee
8599699	Atividades de Ensino	Educational Activities
5612100	Fornecimento de Alimentos - Ambulante	Food Provision - Street Vendor
5320202	Entrega Rápida	Express Delivery
5229099	Motoristas Autônomos, entre outros	Independent Drivers, among others
5772500	Comércio de Cosméticos e Higiene Pessoal	Cosmetics and Personal Hygiene Retail
4330404	Pintura de Edifícios	Building Painting

Source: Author's elaboration with IBGE information available at [cnae.ibge.gov.br](http://cnae.ibge.gov.br).

## Appendix B. Regression Results

The regression results for the openings for sole entrepreneurs are presented in Table B.11.

Table B.11: Regression Results

	<i>Dependent variable:</i>		
	MEI:1yr	MEI:2yrs	PJ:2yrs
YEAR2014	0.001 (0.001)	0.001 (0.001)	0.002*** (0.001)
YEAR2015	0.002*** (0.001)	0.004*** (0.001)	0.006*** (0.001)
YEAR2016	0.012*** (0.001)	0.020*** (0.001)	0.021*** (0.001)
YEAR2017	0.023*** (0.002)	0.051*** (0.002)	0.052*** (0.003)
YEAR2018	0.038*** (0.0003)	0.060*** (0.0004)	0.061*** (0.0005)
YEAR2019	0.038*** (0.001)	0.080*** (0.001)	0.082*** (0.001)
Constant	0.005*** (0.0003)	0.007*** (0.0004)	0.009*** (0.0004)
Number of Observations	9,134,205	9,134,205	9,134,205

Note: Results for the OLS estimates from Equation 1, where  $\beta_{2013}$  serves as the reference category. The dependent variable is a binary indicator equal to 1 if the worker registers a firm under one of the following scenarios: (i) as an individual entrepreneur within one year of separation (MEI:1yr); (ii) as an individual entrepreneur within two years (MEI:2yrs); or (iii) any type of firm within two years of separation (PJ:2yrs).  
 $*p < 0.1$ ;  $**p < 0.05$ ;  $***p < 0.01$

## Appendix C. Regression Results: iterative regression models

The regression results for occupational groups relative to the reference categories: year = 2013 and occupation group = "Other" as a proxy for the general labor market according to Equation 2 are presented in Table C.12.

Table C.12: Regression Results with Sector Interactions

<i>Dependent variable: Formalization within 2 Years</i>		
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>
Year 2014	0.001	(0.001)
Year 2015	0.004***	(0.001)
Year 2016	0.020***	(0.002)
Year 2017	0.052***	(0.004)
Year 2018	0.056***	(0.001)
Year 2019	0.078***	(0.001)
Beauty Service	-0.008***	(0.001)
Clerk	0.003**	(0.002)
Construction	-0.003*	(0.002)
Food Service	-0.003	(0.002)
Sales Promotion	0.001	(0.002)
Transport	0.004	(0.003)
2014 x Beauty	0.082*	(0.046)
2015 x Beauty	0.139*	(0.076)
2016 x Beauty	0.147*	(0.076)
2017 x Beauty	0.510***	(0.124)
2018 x Beauty	0.264***	(0.004)
2019 x Beauty	0.207***	(0.029)
2014 x Clerk	0.006**	(0.003)
2015 x Clerk	0.010***	(0.003)
2016 x Clerk	0.021***	(0.006)
2017 x Clerk	0.026**	(0.011)
2018 x Clerk	0.016***	(0.002)
2019 x Clerk	0.032***	(0.003)
2014 x Construction	-0.0003	(0.002)
2015 x Construction	-0.002	(0.002)
2016 x Construction	-0.011***	(0.003)
2017 x Construction	-0.018**	(0.008)
2018 x Construction	-0.005***	(0.002)
2019 x Construction	-0.013***	(0.003)
2014 x Food	-0.002	(0.003)
2015 x Food	0.004	(0.004)
2016 x Food	-0.011**	(0.005)
2017 x Food	-0.005	(0.009)
2018 x Food	-0.005**	(0.002)
2019 x Food	-0.009**	(0.003)
2014 x Sales	0.003	(0.003)
2015 x Sales	0.010***	(0.004)
2016 x Sales	0.018***	(0.006)
2017 x Sales	0.010	(0.009)
2018 x Sales	0.018***	(0.002)
2019 x Sales	0.014***	(0.003)
2014 x Transport	-0.002	(0.004)
2015 x Transport	-0.001	(0.004)
2016 x Transport	0.003	(0.006)
2017 x Transport	-0.019**	(0.008)
2018 x Transport	0.006**	(0.003)
2019 x Transport	0.003	(0.005)
Constant	0.008***	(0.001)
Number of Observations	9134205	
Log Likelihood	-457,615.600	
Akaike Inf. Crit.	915,329.200	

Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01



The regression results for the regions relative to the reference categories: year = 2013 and North region, according to Equation 2 are presented in Table C.13.

Table C.13: Regression Results with Sector Interactions

<i>Dependent variable: Formalization within 2 Years</i>		
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>
Year 2014	0.009***	(0.003)
Year 2015	0.010***	(0.004)
Year 2016	0.020***	(0.005)
Year 2017	0.029***	(0.007)
Year 2018	0.044***	(0.002)
Year 2019	0.059***	(0.003)
NE	0.002	(0.002)
SE	0.001	(0.002)
S	-0.0001	(0.002)
MW	0.006**	(0.003)
Year 2014 x NE	-0.006*	(0.003)
Year 2015 x NE	-0.003	(0.004)
Year 2016 x NE	0.003	(0.006)
Year 2017 x NE	0.023**	(0.009)
Year 2018 x NE	0.001	(0.002)
Year 2019 x NE	0.003	(0.004)
Year 2014 x SE	-0.007**	(0.003)
Year 2015 x SE	-0.006*	(0.004)
Year 2016 x SE	-0.003	(0.006)
Year 2017 x SE	0.028***	(0.008)
Year 2018 x SE	0.022***	(0.002)
Year 2019 x SE	0.025***	(0.004)
Year 2014 x S	-0.008**	(0.003)
Year 2015 x S	-0.002	(0.004)
Year 2016 x S	0.007	(0.006)
Year 2017 x S	0.021**	(0.010)
Year 2018 x S	0.026***	(0.002)
Year 2019 x S	0.036***	(0.004)
Year 2014 x CW	-0.010**	(0.005)
Year 2015 x CW	-0.003	(0.006)
Year 2016 x CW	0.006	(0.008)
Year 2017 x CW	0.016	(0.011)
Year 2018 x CW	0.009***	(0.003)
Year 2019 x CW	0.017***	(0.005)
Constant	0.008***	(0.002)
Observations	9,133,664	
Log Likelihood	-464,955.600	
Akaike Inf. Crit.	929,981.100	

Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

## Appendix D. Regression Results with Controls

The sole entrepreneur opening regression with controls results is presented in Figure D.14.

Table D.14: Regression Results

	<i>Dependent variable:</i>		
	MEI:1yr	MEI:2yrs	PJ:2yrs
2014	0.002*** (0.001)	0.003*** (0.001)	0.005*** (0.001)
2015	0.005*** (0.001)	0.009*** (0.001)	0.010*** (0.001)
2016	0.016*** (0.001)	0.026*** (0.001)	0.027*** (0.001)
2017	0.027*** (0.002)	0.056*** (0.002)	0.057*** (0.003)
2018	0.039*** (0.0004)	0.061*** (0.0004)	0.063*** (0.0005)
2019	0.036*** (0.001)	0.077*** (0.001)	0.079*** (0.001)
Education	-0.006*** (0.0002)	-0.005*** (0.0002)	-0.007*** (0.0002)
Squared Education	0.001*** (0.00002)	0.001*** (0.00002)	0.002*** (0.00002)
Age	0.003*** (0.00003)	0.004*** (0.00004)	0.004*** (0.00004)
Squared age	-0.00004*** (0.00000)	-0.0001*** (0.00000)	-0.0001*** (0.00000)
Black	-0.007*** (0.0001)	-0.010*** (0.0002)	-0.011*** (0.0002)
Northeast	0.002*** (0.0003)	0.003*** (0.0004)	0.003*** (0.0004)
Southeast	0.013*** (0.0003)	0.020*** (0.0004)	0.019*** (0.0004)
South	0.015*** (0.0003)	0.022*** (0.0004)	0.022*** (0.0004)
Midwest	0.009*** (0.0003)	0.013*** (0.0004)	0.014*** (0.0004)
Constant	-0.063*** (0.001)	-0.086*** (0.001)	-0.090*** (0.001)
Number of Observations	9,130,615	9,130,615	9,130,615

*Note:* \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

## Appendix E. Economic Activity and Occupation Code Correspondence

The correspondence of the occupation code (CBO) and the firm economic activity code (CNAE) is presented in Table E.15 and Table E.16.

Table E.15: Industry/Occupation Group Correspondence

Activity Group	CNAE	Industry Description	CBO	Occupation Description
<b>Sales Promotion</b>	4781400	Comércio de Vestuário e Acessórios	5241	Vendedores em domicílio
	5772500	Comércio de Cosméticos e Higiene Pessoal	5242	Vendedores em bancas, quiosques e barracas
	7319002	Promoção de Vendas	5243	Vendedores ambulantes
			5201	Supervisores de vendas
			5211	Operadores de comércio em lojas e mercados
			4223	Operadores de telemarketing
			3541	Técnicos de vendas especializadas
			2532	Comercialização serviços bancários
			1423	Gerentes de comercialização, marketing e comunicação
<b>Construction</b>	4399103	Obras de alvenaria	7152	Trabalhadores de estruturas de alvenaria
	4321500	Instalações elétricas	7156	Trabalhadores de instalações elétricas
	4330404	Serviços de pintura de edifícios em geral	7166	Pintores de obras e revestidores de interiores
			1413	Gerente de obras em empresas de construção
<b>Food Service</b>	5620104	Fornecimento de Alimentos - Domicílio	5132	Cozinheiros
	5611203	Fornecimento de Alimentos - Lanchonete	5134	Garçons, barmen, copeiros e sommeliers
	5611201	Fornecimento de Alimentos - Restaurante	5135	Trabalhadores auxiliares nos serviços de alimentação
	5612100	Fornecimento de Alimentos - Ambulante	5136	Churrasqueiros, pizzaiolos e sushimen
			2711	Chefes de cozinha e afins
			1415	Gerentes de operações em turismo, alojamento, alimentação

Source: Author's elaboration with IBGE and Ministry of Labor information.

Table E.16: Industry/Occupation Group Correspondence

Activity Group	CNAE	Industry Description	CBO	Occupation Description
<b>Beauty Service</b>	9602501	Cabeleireiro, Manicure e Pedicure	5161	Trabalhadores nos serviços de embelezamento e higiene
	9602502	Atividades de Estética e Beleza	3221	Técnicos em terapia complementar e estética
<b>Minimarkets</b>	4712100	Minimercados, Mercearias e Armazéns	-	-
	4723700	Comércio Varejista de Bebidas	-	-
<b>Clerk</b>	8219998	Serviços Especializados de Apoio Admin.	4110	Agentes, assistentes e auxiliares administrativos
			4151	Auxiliares de serviços de docum., inform., e pesquisa
			1421	Gerentes adminstrativos, financeiros, de risco e afins
			1422	Gerentes de recursos humanos e relações do trabalho
			1424	Gerentes de suprimentos e afins
			1425	Gerentes de tecnologia da informação
			1427	Gerentes de manutenção
			2410	Advogados
			2521	Administradores
			2522	Contadores e afins
			2524	Profissionais recursos humanos
			2525	Profissionais adm. economico financeira
			3171	Técnicos de informática
			3542	Compradores
			4101	Supervisores administrativos
			4102	Supervisores financeiros e controle
<b>Transport</b>	4930201	Transporte Rodoviário de Carga: Municipal	7825	Motoristas de veículos de cargas em geral
	5320202	Entrega Rápida	5191	Motociclistas e ciclistas de entregas rápidas
	5229099	Motoristas Autônomos, entre outros	7823	Motoristas de veículos de pequeno e médio porte
			7824	Motorista de ônibus urbanos, metropolitanos e rodoviários
			1416	Gerentes de operações de transporte, comun. e logística

Source: Author's elaboration with IBGE and Ministry of Labor information.