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► Supporting micro and small enterprises through public policies

Impact assessment of Brazil's preferential public procurement policy



► **Supporting micro and small enterprises through public policies**

Impact assessment of Brazil's preferential public procurement policy

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► Foreword

Micro, small, and medium enterprises (MSMEs) are the backbone of economies worldwide, especially in developing countries. They contribute 70 per cent of global employment and 50 per cent of GDP while playing a key role in generating new jobs. MSMEs therefore not only drive economic development but also create opportunities for inclusive growth. Despite their significant role, MSMEs face persistent structural challenges including limited access to markets and formal finance, low productivity, and weak managerial capacities. Public policies are crucial in supporting MSMEs in overcoming those barriers and opening new opportunities. Beyond providing direct support, governments can shape an enabling environment supportive for MSME growth and, as explored in this report, leverage public procurement to expand MSMEs' access to markets and help upgrade their capabilities.

Effective policy frameworks aimed at MSME development align closely with the ILO's sustainable enterprise agenda endorsed by the International Labour Conference 2007. Among various policy initiatives, public procurement stands out as a powerful tool to achieve a number of objectives towards MSME growth and competitiveness, including offering them larger-scale market opportunities, encouraging them to meet higher standards, diversifying their client base while strengthening their resilience to meet changing demands, and enabling them to compete progressively on a more level playing field with larger firms and ultimately to participate more fully in formal markets. Indeed, public procurement has also been used as an incentive for firms to formalize.

Brazil has distinguished itself through a long-standing policy commitment to micro and small enterprises (MSE) development. By opening doors to government contracts, the Brazilian government has over the past decades used its purchasing power to open a path for MSEs to recover from crises and to step into wider market opportunities and to formalize.

Against this backdrop, this technical report assesses the effectiveness of Brazil's public procurement policies designed to support MSEs. Specifically, it provides an in-depth evaluation of three specific measures and their impact on MSE inclusion (these are the SIMPLES national, set-aside policy and extension of deadline for tax and labour compliance) and the impact of winning contracts on firm survival. The findings underscore the strategic importance of selecting effective measures to increase MSE participation in government procurement. The paper also highlights Brazil's experience as a valuable case study in designing and evaluating MSE support mechanisms, offering lessons for other countries seeking to strengthen the role of MSEs in economic development through policymaking.

The paper is the result of a collaboration between the MSME Branch of the ILO's Enterprises Department and the Institute of Applied Economic Research (IPEA) — a leading research institution in Brazil advising the federal government on public policies and contributing to informed public debate on national development issues. The partnership draws on IPEA's extensive expertise in public policy evaluation across economic and social sectors and the ILO's commitment to promoting sustainable enterprise and decent work, especially through effective evidence-based public policies.

This technical paper compiles data and synthesizes conclusions of four empirical evaluation studies conducted by IPEA in 2023 and 2024, in collaboration with ILO Enterprises Department. It is authored by a team of IPEA senior researchers: Eduardo Pedral Sampaio Fiuza, Carlos Henrique Leite Corseuil, Mauro Oddo Nogueira, Matheus Stivali, with the support of Athos Vinicius Cavalcante Carvalho, Leandro Pereira da Rocha, and Jonathan Alves Sousa de Oliveira. The four papers were consolidated and finalized by Huong Thu Ngo, under the technical guidance and overall management of Sandra Yu, with valuable support from Eleonore D'Achon from the Enabling Environment for Sustainable Enterprises team within the MSME Branch, ILO Enterprises Department. Additional thanks to Geoffrey Ducanes for his preliminary summary and to Johanna Son for copy editing.

This publication highlights Brazil's experience as an exemplary effort in enabling MSMEs through dedicated policies. *Supporting MSEs through public policies: Impact assessment of Brazil's preferential public procurement policy* is intended to serve as a resource for policymakers, practitioners, and researchers. It offers insights on the role of public policy for MSME development. The publication also exemplifies how effective policy evaluation supports evidence-based policymaking, thus fostering resilient businesses and equitable economic growth. We hope the case of Brazil proves useful in advancing the development of MSMEs through public policies.



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► Introduction

Micro and small enterprises (MSEs) play a crucial role in job creation and in creating an environment for innovation and entrepreneurship, particularly in small cities and less developed regions. In Brazil, MSEs¹ account for approximately 62 per cent of employment and 50 per cent of national value added (OECD 2020). Despite their contributions, MSEs face structural disadvantages such as lower capital intensity, smaller operational scales and limited financial and managerial capacity — when compared to larger firms. Recognizing their significant contribution to employment and GDP as well as to the achievement of various economic and social objectives, the Brazilian government thus implements supportive policies that address the disadvantages that MSEs face and create more favourable conditions for them. Brazil has provided longstanding policy support for MSEs across different levels of government. Since the 1990s, Brazilian legislation has aimed to reduce statutory burdens on MSEs, particularly in taxation, social security and labour obligations, focusing on revenue levels and compliance costs.

Among the government's various public policies, the awarding of public contracts to MSEs is viewed as playing a crucial role in fostering innovation, entrepreneurship, job creation and regional development. This approach aligns with the ILO's longstanding recognition of the importance of MSMEs in promoting decent work, as emphasized in Recommendation No. 189 (1998) and further underlined in Recommendation No. 204 (2015), which encourages member states to promote MSMEs' access to public procurement as a means to support their formalization and growth. Additionally, the ILO Guide to Recommendation No. 189 (2022) emphasizes the needs to address barriers such as difficulties in accessing public procurement for MSMEs. The ILO committee of experts (2023) in its report of the on the application of international labour standards also recognized that public procurement contracts could generate significant economic benefits for MSMEs. By enhancing MSEs' entry into public procurement, governments provide them with better market access opportunities that support their survival and growth and strengthen their capacities. Complex procedures, administrative burdens and complicated technical and financial requirements, however, often limit the participation of MSEs in public procurement. Promoting their involvement in this sector has thus become a key goal of economic policy. Specific characteristics of public procurement can also pose additional challenges for MSEs, thus requiring targeted policy interventions to ensure their fair and effective participation in it.

In 2023, the ILO Enterprises Department partnered with the Institute of Applied Economic Research (IPEA), a government-led organisation in Brazil dedicated to advising the state in public policymaking and evaluation, to assess the effectiveness of public procurement measures on MSEs (Annex D). Under this collaboration with the ILO, the IPEA evaluated a horizontal policy, specifically the SIMPLER regime (a unified tax benefit for small firms in specific activities) as well as vertical policies aimed at fostering MSE participation and contract award in public procurement opportunities. It studied two specific measures, namely, the value-based set-aside policy for MSEs and the extra time given to winning MSE bidders for tax and labour compliance. In principle, this time extension mechanism gives more time for preparation and, combined with the incentive of obtaining a public contract, encourages full compliance and formalization. Additionally, it collected insights about the right to undercut the lowest bidder and assessed how winning of public procurement contracts impacted firms' survival. This consolidated paper brings together the findings of the four studies, presented as follows: an overview of MSEs in Brazil (section 1), a review of public policies supporting MSEs, including innovation, credit access and procurement participation (section 2); the impact of various preferential programmes for MSE participation in public procurement (section 3); and conclusions (final section).

¹ According to the official definition used by the government since 2014 (Supplementary Law 147/ 2014), MSEs are enterprises with annual gross revenues not exceeding BRL4.8 million, and micro enterprises have annual gross revenues less than BRL360,000.

► Key findings

The main findings of the of the ILO-IPEA collaboration assessing the effectiveness of Brazil's public procurement policies for MSEs are as follows:

1. Despite their vital role, MSEs face challenges such as low labour productivity, wide productivity gaps compared to large firms and high levels of informality, which restrict access to credit and government support. Their participation in public procurement remains limited.
2. The classification of small businesses in Brazil is controversial due to the different criteria used by public and private entities. These may be based on the number of employees, gross revenue or a combination of both. The current regulatory framework for official purposes in Brazil classifies MSEs according to revenue level only.
3. Recognizing the importance of MSEs, the 1988 Federal Constitution mandates that government at all levels provide MSEs with preferential treatment in taxation, regulations, labour law and other policy areas. Key legislation applicable to MSEs includes the so-called SIMPLES Law (Law 9317/1996), replaced and enlarged by the MSE General Law (Supplementary Law 123/2006), and their subsequent amendments. Supplementary Law 123/2006 (MSE General Law) unified tax regulations across all government levels (federal, state and municipal) and introduced a special tax regime called *Simples Nacional*, a simplified collection system that unified all taxes into a single payment and reduced rates of various taxes. Beyond providing tax benefits, the General Law also simplified business registration and the regimes for exports and labour obligations, credit access, innovation support, public procurement and administrative procedures.
4. In Brazil, Federal Law provides many potential targeted benefits to MSEs relating to labour and social security contributions, special lines of credit, financial support for innovation, access to technological services, training, support for exports, credit guarantee programmes, tax incentives, and special and simplified procedures in public procurement.
5. The key policy measures adopted in Brazil to enhance MSEs' access to public procurement include e-procurement, the division of contracts into lots and the adoption of a set-aside policy for MSEs. There are also other measures to enhance MSEs' award probability and participation including the provision of a time extension for submitting proof of legal compliance, thereby incentivizing formalization, and offering preferential treatment such as the MSEs' right to undercut the lowest bidders.
6. In Brazil's public procurement, the Federal Government offers more contract opportunities for MSEs than state governments. But the average federal payments to MSEs are lower than those from state contracts.
7. The set-aside policy in Brazil helped MSEs gain access to government contracts, as evidenced by increased participation and a higher contract award rate, particularly among newer MSEs. However, there is a downside to this policy. It appears to have reduced competition, as reflected in the decrease in the total number of bidders. Additionally, government costs rose as contracts under the set-aside policy reported incurring significant price increases and getting lower discounts off the reserve price (that is, the maximum price set by the public buyer). Moreover, signs of collusive behaviour, such as cover bidding (fake competition) and missing bids, were more prominent.

8. In assessing the effectiveness of the Brazilian government's policies that promote MSEs' participation in public procurement, Supplementary Law 123/2006 and its amendment, Supplementary Law 147/2014, provided SMEs with more lenient treatment by granting them a grace period to submit qualification documents (proof of tax, labour and social security compliance). The time extension policy is examined alongside the SIMPLES status for qualifying MSEs, which lowers administrative burdens but does not directly affect bid preference. MSEs also get special treatment in public auctions through a mechanism called *empate ficto* (fictitious tie), a right to undercut the lowest bidder, hereafter referred to as the fictitious tie. This helps them win bids in cases where there is a narrow margin with the front-runner. While Supplementary Law 123/2006 introduced this benefit, it Decree 8538 (enacted in 2015) provided detailed regulations. However, during the study period, there was no major event that could enable this experiment to assess the impact of this particular benefit. In addition, bidders adjust their strategies in response to the fictitious tie mechanism, especially since they lack information about the MSE status of their competitors. As a results, it is not possible to isolate and evaluate the impact of this mechanism without constructing a fully structural counterfactual model. However, some descriptive statistics showing the distribution of the award rates among bidders and among MSEs in particular are provided.
9. The study assesses Brazilian policies favouring MSEs' participation in public procurement — Supplementary Law 123/2006 and its amendment, Supplementary Law 147/2014, which provides MSEs with a grace period for legal compliance and, for a fair share of them, the SIMPLES regime, which aimed to reduce tax and administrative burdens for MSEs. Overall, the policy of giving extra time for compliance helps MSEs win more contracts in public tenders.
10. In evaluating how winning government contracts affects firms' survival with a focus on variations between periods of economic crisis and expansion, results show that, overall, winning a public contract increased a firm's probability of survival. Winning federal contracts has a larger positive impact than winning state contracts on firms' survival. Those that win both types of contracts have an even higher probability of survival. The effect of winning a public contract depended on the phase of the business cycle. Firms that started operations during economic crises experienced less immediate benefits from public contracts in their first year, as they were more vulnerable to adverse shocks.

Overall, the impact assessment studies demonstrate the usefulness of public policies that favour MSEs in public procurement, as illustrated by the case of Brazil. The country is an excellent case study for analysing the impact of supportive policies toward MSEs, given their large contribution to Brazil's total employment and value added, the longstanding support for them across different levels of government, and the availability of rich databases on their characteristics.



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► 1. Micro and small enterprises in Brazil

Characteristics of MSEs

Small businesses account for large shares of total employment (70 per cent) and value added (55 per cent) in member countries of the Organisation of Economic Co-operation and Development (OECD 2018a). In Brazil, micro, small and medium enterprises (MSMEs) play a huge economic role, especially in the services and industry sectors. MSMEs are estimated to account for 62 per cent of the country's total employment and close to 50 per cent of its national value added, making them important engines for economic growth and social inclusion (OECD 2020). MSMEs are especially important in providing employment in small cities and in the less developed regions of the country.

Among MSMEs, special attention is paid to the subset comprising MSEs, which are given preferential treatment in taxation, regulations, labour law and other policy areas under the 1988 Federal Constitution (OECD 2020).² Formal MSEs are estimated to account for 48 per cent of total employment and 25 per cent of national value added in Brazil.

Low labour productivity in MSEs

Labour productivity levels and growth in Brazil are low, particularly for MSEs. Productivity gaps between MSEs and large firms are wider in Brazil than in the OECD countries, and more significantly so in industry. Average labour productivity in industrial large companies (123,600 Brazilian real) is more than twice that in the micro and small-sized firms (BRL46,500 and BRL42,700). Labour productivity levels between Brazil and the OECD have diverged in the last 15 years. Between 2001 and 2016, growth in labour productivity (measured as GDP per person employed) averaged 0.7 per cent in Brazil, compared with 0.9 per cent in the OECD. This divergence is mostly found in industry and commerce, while the gap is narrower in construction and services (OECD 2020).

Prevalence of informal business

As in many other middle-income countries, business informality is widespread in Brazil, particularly in MSEs. The size of the Brazilian shadow or informal economy has been estimated at 32.2 per cent in 2022 by World Economics; 17.8 per cent in 2022 by the Underground Economy Index conducted by the Brazilian Institute of Competition Ethics (ETCO) and the Brazilian Institute of Economics (IBRE-FGV); and 33.4 per cent in 2018 by the World Bank. While labour informality refers to workers employed without proper registration and social protection, business informality involves enterprises that operate outside legal and regulatory frameworks. This limits their access to credit, government support and market opportunities.

In 2003, the Brazilian Institute of Geography and Statistics (IBGE) estimated that there are 10.33 million informal enterprises in Brazil, accounting for 98 per cent of businesses with one to five employees, mostly in urban areas. Many of these businesses function without proper registration: 56 per cent lacked legal registration and 34 per cent were classified as irregular (IBGE 2005). Only 12 per cent had formal legal status, and a small number registered as micro enterprises or joined the SIMPLES taxation system, which simplifies compliance for small businesses. Credit access was limited for informal businesses, with only 1.74 per cent starting with bank loans and 53.5 per cent relying on personal resources to

² According to the official definition used by the Brazilian government since 2014 (Supplementary Law 147 enacted in 2014), MSEs are enterprises whose annual gross revenues do not exceed BRL4.8 million. Micro enterprises have annual gross revenues less than BRL360,000.

fund their ventures. Informality hinders MSEs' access to credit and government support, limiting their growth potential.

Low participation in public procurement

Public procurement accounted for 12 per cent of GDP worldwide in 2018 (Bosio, et al. 2022), compared to more than 15 per cent of GDP in low-income countries (Djankov, Asif Islam and Saliola 2016). However, SMEs are under-represented in public procurement. In Brazil, MSEs' share in public procurement payments is also low at 9.55 per cent.

Regulatory framework for defining MSEs

Classification of MSEs

The classification of small businesses in Brazil is controversial due to the different criteria used by public and private entities, such as the number of employees, gross revenue or a combination of both. The first criterion is based on the number of people employed, one that varies depending on the economic sector — for example, manufacturing and construction have higher limits for the maximum number of employees than services and commerce. This approach originates from the economic surveys of the Brazilian Institute of Geography and Statistics (IBGE). Although the institute does not officially recognize these criteria as a size classification system, they are used publicly given the fact that these surveys are among the few firm-level data sources available for quantitative studies in Brazil. However, this stratified sampling method based on the number of employees fails to account for substantial within-industry heterogeneities because companies with vastly different activities, such as software development and hairdressing, may be classified in the same category, as seen in Table 1.

► **Table 1. Size classification of enterprises according to number of employees**

Size of enterprise	Sector	
	Commerce/services	Industry/building industry
Micro	Below 10	Below 20
Small	From 10 to 49	From 20 to 99
Medium	From 50 to 99	From 100 to 499
Large	Above 99	Above 499

Source: SEBRAE - Serviço Brasileiro de Apoio às Micro e Pequenas Empresas (2012).

Another criterion for classifying companies in Brazil is their gross revenue, using reference values set by the General Law of MSEs — Supplementary Law (SL) 123/2006 (amended by SL 128/2008 and SL 155/2016)³, which also established a differentiated tax and accounting regime called the *Simples Nacional*⁴. This classification criterion lays the foundation for the tax benefit policies for small businesses, which is the main instrument for promoting MSEs development in the country. This criterion is also widely adopted by public agencies at all government levels (federal, state, and municipal), as well as

³ The General Law of MSEs classifies businesses based on annual gross revenue and defines Individual Micro-entrepreneurs (MEI) as those earning up to BRL81,000 and at most one employee; "micro-enterprises" are those with up to BRL360,000, and "small enterprises" are those with up to BRL4.8 million.

⁴ While the General Law (Supplementary Law 123/2006) uses revenue as the sole criterion for MSE eligibility, the *Simples Nacional* and MEI tax regimes also consider other parameters such as economic activity and export values, with a state version called *Simples Estadual* that introduced a separate state value added tax ceiling of BRL3.6 million since 2018 due to inflation.

private agents that support and offer special services for this segment. It applies only to MSEs, and not to medium-sized companies. Unfortunately, it lacks a consistent rule for adjusting tax brackets and revenue thresholds for inflation. This creates uncertainty for companies about the sustainability of their tax status.

► **Table 2. Yearly turnover ceilings for eligibility to *Simples Nacional* (in thousand BRL)**

Period	MEI	Micro	Small	Law
2007 to 2011	36*	240	2 400	SL 123/2006
2012 to 2016	36	360	3 600	SL 139/2011
2017 to 2023	81	360	4 800	SL 155/2016

*The MEI was only implemented in 2009, by LC 128/2008.

Sources: Brasil (2008, 2010, 2011, 2006), compiled by the authors.

The turnover criterion for the tax regimes, with its single instead of stepwise threshold, might discourage company growth due to its imposition of disproportionate compliance costs against marginal increments in revenues across the threshold for companies (CMAP 2020). This, in turn, can lead to “semi-formality” as termed by Nogueira and Zucoloto (2019), as well as distortions in official statistics and public policy. Financial institutions also use revenue classification criteria but with different revenue ranges, because they adjust the limits each year to account for inflation.

There is a mixed criterion — a combination of the number of employees with export values — used by the Foreign Trade Secretariat (SECEX) of the Ministry of Development, Industry, Commerce and Services (MDIC). Mercosur⁵ has also used this criterion to implement regional policies that support MSEs, as shown in Table 3.

► **Table 3. Size classification according to the Foreign Trade Secretariat (SECEX)**

Enterprise size	Industry		Commerce and services	
	Number of employees	Value of exports	Number of employees	Value of exports
Micro	Up to 10	Up to US\$400,000	Up to 5	Up to US\$200,000
Small	From 11 to 40	Up to US\$3.5 million	From 6 to 30	Up to US\$1.5 million
Medium	From 41 to 200	Up to US\$20 million	From 31 to 80	Up to US\$7 million
Large	Above 200	Above US\$20 million	Above 80	Above US\$7 million

Source: Compilation based on data of Ministério do Desenvolvimento, Indústria e Comércio Exterior (2015).

The diversity of classification criteria in Brazil leads to problems such as inconsistency, lack of coordination (the biggest problem of Brazilian public policies, according to Nogueira and Zucoloto (2019)), and failure to capture the regional, within-and cross-industry differences among small businesses. These lead to a weakening of public policies.

⁵ The Southern Common Market is a trade bloc consisting of Brazil, Argentina, Paraguay and Uruguay.

Overview of legislation applicable to MSEs

Key legislation applicable to MSEs in Brazil is summarized below and illustrated in Figure 1, using data compiled from Sebrae (2022) and Nogueira et al. (2023).

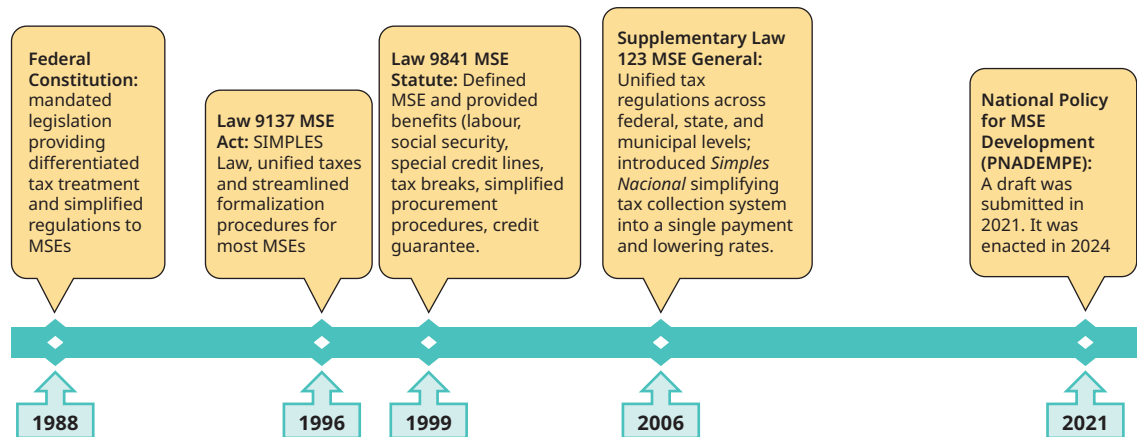
- The Federal Constitution of 1988 mandates that governments at all levels provide MSEs with differentiated and favoured tax treatment and simplified regulations.
- Law 9 317/1996, known as the Micro and Small Enterprise Act, instituted the Integrated System for Payment of Taxes and Contributions of Micro and Small Enterprise (SIMPLES Law). SIMPLES unified taxes and streamlined formalization procedures for most MSEs, excluding only those under certain economic activities.
- In 1999, Law 9 841, known as the MSE Statute, introduced the definition of MSEs and benefits related to labour and social security contributions, special lines of credit, tax breaks, financial support for innovation, simplified procedures in public procurement and credit guarantee systems. Its effectiveness was limited due to the lack of detailed implementation guidelines and the federal government's limited power over state and municipal governments.
- In 2003, lobbying efforts led to a constitutional amendment that paved the way for the Supplementary Law 123/2006, called MSE General Law. This unified tax regulations across all government levels (federal, state, and municipal) and introduced a special tax regime called *Simples Nacional*, a simplified collection system unifying all taxes into a single payment and reducing rates on various taxes. Beyond tax benefits, the General Law also simplified business registration, simplified regimes for exports and labour obligations, credit access, innovation support, preferred treatment in public procurement, and administrative procedures.
- As the MSE General Law was continuously improved, a major update in 2008 introduced the Individual Microentrepreneur (MEI) category, which provides even more simplified tax and registration requirements.
- The MSE General Law provides the basis for the National Policy for MSE Development (PNADEMPE). A draft was submitted in 2021, but it was only enacted in 2024 by the Decree 11993. This delay has contributed to uncoordinated implementation of public policies across government levels.

A new Ministry for Entrepreneurship and MSEs was created in 2023, primarily to accommodate new allies in the government. Prior to that, from 2019 to 2022, the Ministry of Economy combined the main offices in charge of policies for MSEs, including the Special Secretariat for Productivity, Employment and Competitiveness⁶ (responsible for many programmes targeted at MSEs) and the Special Secretariat for Federal Revenues⁷ (responsible for the two preferential tax regimes, *Simples Nacional* and MEI (OECD 2020)).

⁶ Formerly the Secretariat for MSEs within the Cabinet of the Presidency of the Republic, which held ministerial status from 2013 to 2015 and was in charge of MSE policymaking from 2013 to 2018.

⁷ It has been part of the Ministry of Finance for most of Brazil's history, and was reinstated in 2023.

► Figure 1. Timeline



Data sources for studying MSEs

The main official data sources available for analyzing MSEs in Brazil are summarized as below (not exhaustive):

Federal procurement data

- Since the 2000s, the Federal Government has consolidated Siasg, a comprehensive procurement data repository covering various stages of the procurement cycle, including procuring and purchasing units, registered suppliers and bidders, auctions, contracts, inspections and payments.
- The Comprasnet database focuses on hybrid auctions (electronic and face-to-face), tracking bid protests, timestamps and bidder self-declarations as MSEs. It is important to note that MSE eligibility may change before the year end if turnover exceeds legal thresholds. Therefore, it is the most reliable source of identification of bidder's a priori eligibility to the statutory benefits provided to MSEs.
- Most non-confidential datasets are accessible via APIs on Comprasnet, but poor documentation requires researchers to verify variable definitions manually.

Payments to private enterprises from all government levels

In 2004, the Federal Office of the Comptroller-General launched the Federal Transparency Web Portal⁸ to compile payments from federal agencies to private entities, with full company identification and partial individual disclosure. In 2009, Supplementary Law 131 mandated similar transparency across all government levels, though some states omit contract details.

Pharmaceutical procurement data across government levels

Besides the purchases of pharmaceuticals and medical devices included in DW Siasg, the Health Price Database (BPS) compiles purchases undertaken by state and municipal governments, and by non-profit organisations with a standardized classification in harmony with the Federal catalogue. This database also provides information on brands, package sizes and marketing authorization IDs. Information about purchases is self-declared by the procuring entities, although the requirement to report this in the database only became mandatory in 2017.

⁸ <https://portaldatransparencia.gov.br/>

Labour data

The Annual Social Information Report (RAIS) is a mandatory form that formal employers in Brazil submit annually to the Ministry of Labour. Failure to comply results in a uniform penalty, which represent a relatively high cost for MSEs. Thus, underreporting is expected to be much lower for MSEs. This form provides the most detailed payroll census available. At the company level, it is possible to geolocate plants, branches and even construction sites, calculate the size of firms' total labour force and collect their attributes relating to tax regime, legal status and structure, main economic activity and others. At year end, the business declares whether it falls under the Simples Nacional tax regime, and whether it is classified as a micro or small enterprise. At the employee level, it provides data on tenure (monthly), schooling, age, gender and race, and tracks employees across companies through their unique identification numbers.

Corporate data

The National Business Registry (Cadastro Nacional de Empresas – CNE) is managed by the Ministry of Development, Industry, Commerce and Services (MDIC) and is updated by the Commercial Registry of each Brazilian state. It stores companies' historical data, such as equity value, boards of directors, major shareholders with their respective shares, legal structures and addresses. A possible replacement for CNE is the Companies' Open Data web application, available from the Brazilian Federal Revenue Service. However, it lacks shareholder identities and their equity shares.

► 2. Government policies supporting MSEs in Brazil

2.1 Overview of public programmes that support MSEs

MSEs contribute to innovation and entrepreneurship, job creation and economic growth, as well as to local and regional development. But unlike larger enterprises, they usually have lower capital intensity, smaller scales of operation, and lower financial and managerial capacities. MSEs are more likely to be disadvantaged by what is termed imperfect information in economics. Imperfect information is considered a form of market failure or a distortion in the market that prevents its efficient functioning and could justify government intervention. Preferential treatment for MSEs by a government, therefore, aims to provide MSEs more favourable conditions that address the disadvantages they face.

In Brazil, federal law provides many potential targeted benefits to MSEs relating to labour and social security contributions, special lines of credit, financial support for innovation, access to technological services, training, support for exports, credit guarantee programmes, tax incentives and special and simplified procedures in public procurement⁹. These programmes are summarized in Table 4 below.

► Table 4. Main public programmes providing favourable conditions for MSEs in Brazil

Instrument	Year of implementation	Coverage (number of companies)	Agency	Targets	Scope
BNDES Card	2003	624 000	BNDES	MSMEs	Credit
Microcredit	2005	899 481	BNDES	Micro-enterprises	Credit
Finame	2006	121 395	BNDES	General companies	Credit
BNDES Automático	2008	3 358	BNDES	MSMEs	Credit
Simples Nacional	2006	5 000 000	–	MSEs	Management
Peac Maquininhas	2020	112 161	BNDES	MSEs	Credit
Pronampe	2021	–	–	MSMEs	Credit
Fampe	1995	290 000	Caixa and Sebrae	MSEs	Credit
MEI	2008	7 823 040	–	–	Management
Incubators	1984	369	BNDES	MSMEs	Innovation
Proger Urbano	1995	386 000	Ministry of Labour and Social Security	MSMEs	Credit
Crediamigo	1998	2 000 000	Banco do Nordeste	Micro enterprises	Credit
Inovar	2001	100	FINEP ¹⁰	MSEs	Innovation
Credit Guarantee Cos.	2005	6 312	–	MSEs	Credit

⁹ In particular, Law 9841/1999 – the former Micro and Small Enterprises Statute.

¹⁰ Financiadora de Estudos e Projetos (Funding Authority for Studies and Projects) is a public company under the Ministry of Science, Technology and Innovation that funds scientific and technological research.

► **Table 4. Main public programmes providing favourable conditions for MSEs in Brazil (Cont.)**

Instrument	Year of implementation	Coverage (number of companies)	Agency	Targets	Scope
Economic subvention to Innovation	2006	450	FINEP	General companies	Innovation
Criatec	2007	36	BNDES	Innovative MSEs, in which BNDESPAR is the main investor	Credit
Operations Guarantee Fund	2009	417 800	–	MSMEs	Credit
Proimpe	2009	1 091	Sebrae	MSEs	Innovation
Crescer Caixa	2011	600 000	Caixa	Microenterprises	Credit
MPME Inovadora	2014	137	BNDES	Innovative MSMEs	Innovation
Brasil Mais	2020	90 000	Brazilian Agency of Industrial Development (ABDI) ¹¹ , SEBRAE and National Industrial Learning Service (SENAI) ¹²	MSEs	Management
AntecipaGov	2021	–	–	Suppliers of any size to Federal Government	Credit
Productive Chains Credit	2022	–	BNDES	MSEs	Credit
Joint Ordinance No.76 – tax exemption related to foreign trade	2022	–	Secretariat for Foreign Trade and International Affairs (SECINT) and Federal Revenue Service (RFB)	MSEs that opted for Simples Nacional	Tax

Source: Compilation by authors based on data of BNDES (2021), SEBRAE (2022), FINEP, Nogueira and Zucoloto (2019).

2.2 Innovation programmes for MSEs

Innovation programmes for MSEs are crucial for economic and technological growth in Brazil. These address financial and knowledge barriers through five major initiatives that were launched between 2005 and 2015 to support research, development and modernization. The five programmes listed below have served around 100,000 Brazilian MSEs.

- Economic Subsidy Programme for Innovation (2006) aimed to stimulate innovation in companies with annual revenues lower than or equal to BRL90 million. The programme offered financial support for companies developing innovative projects in partnership with research institutions.

¹¹ A federal executive agency.

¹² A vocational education system maintained by the Industrial Federations with mandatory contributions paid by the employees of manufacturing firms.

- Criatec (2007) invested in innovative technology-based startups with revenues up to BRL16 million, offering financial resources and mentorship to these companies.
- MSE Competitiveness Supporting Programme (Proimpe) (2007) enhanced MSE competitiveness by offering financial resources for the acquisition of machinery and equipment, as well as technical training for entrepreneurs.
- BNDES Innovating MSME Programme (Inovadora) (2010) aimed to stimulate the creation of innovative products and services in the market by providing credit for MSME innovation projects, with a focus on firms with revenues up to BRL90 million.
- Brazil Plus (Brasil Mais) (2013) aimed to improve MSME productivity through consultancy, training and process optimization.

2.3 Credit support programmes for MSEs

Credit programmes for MSEs in Brazil have mostly relied on loan subsidies from the government, either directly (such as the reduction of interest rates) or through a guarantee fund to cover loan non-payment. The share of loans to MSEs out of total loans given by BNDES, Brazil's largest public development bank, increased from 30.6 per cent in 2016 to 46.8 per cent in 2018 (OECD 2020). Loan guarantees are much less common. Notable credit support schemes are:

- Guarantee Fund for Micro and Small Enterprises (FAMPE) — Established in 1995 as a joint initiative of Caixa Econômica Federal and Sebrae, with an exclusive focus on credit for MSEs. FAMPE provides complementary financial guarantees to MSEs in various sectors (manufacturing, agriculture, trade, services, among others), improving their access to credit. It has a track record of serving more than 300,000 companies and covers around 50,000 firms.
- Operations Guarantee Fund (FGO) — Launched in 2009 and managed by Banco do Brasil, FGO supports MSEs and individual microentrepreneurs (MEIs) by complementing credit guarantees, helping businesses that lack sufficient collateral.
- Guarantee Fund for Investment (FGI). Nascimento (2022) examined the role of the FGI in fostering financial inclusion for 36,717 MSEs between 2009 and 2020. The complex processes involved in formalizing credit operations, along with the lack of solid guarantees, make it difficult for MSEs to access loans since they do not have the same financial stability that larger companies have. As a result, MSEs face financial exclusion or higher costs that undermine their competitiveness. In fact, 36 per cent of MSEs cite the lack of guarantees as a major barrier to accessing credit which raises their financial costs and limits their ability to grow (Pombo-González, P., Molina-Sánchez, H. D. and Ramírez-Sobrinho, J. N. 2015).

An impact assessment conducted by the Federal Court of Accounts (TCU¹³) found that credit programmes targeting small businesses and three other emergency credit programmes (two of them also targeted toward MSEs) successfully increased employment levels and the firms' access to credit as a whole, and recommended that public funds be coupled with private funds. The assessed programmes provided guarantees of up to 80 to 100 per cent of the loaned amounts.

¹³ See Brasil (2021a) and (2021b)

2.4 Preferential programmes for MSEs in public procurement

Public procurement plays a critical role in supporting the survival and growth of MSEs by providing them market access and strengthening their capabilities. However, the complexity of procedures, administrative burdens and technical and financial requirements often hinder these enterprises' participation in this sector.¹⁴ The fact that MSEs do not enjoy "equal measure in business-to-government transactions" (EBRD 2017) limits their growth prospects and ability to diversify their customer base. Given their significant contribution to employment and GDP, this might result in reducing competition in supply markets. As a result, fostering MSE participation in public procurement has become a customary economic policy goal. Since the 1990s, Brazilian legislation has aimed to reduce the statutory burden on MSEs, particularly in terms of tax, social security and labour obligations, focusing on both their revenues and the cost of compliance.

OECD countries have implemented various reforms to make it easier for small and medium businesses to access public procurement opportunities. such as (in order of importance): encouraging the use of e-procurement; encouraging the division of contracts into lots; encouraging joint bidding/consortia rules so as not to discourage MSE participation; simplifying processes and documentation requirements for MSEs; encouraging prime contractors to subcontract with MSEs and/or make subcontracting arrangements to facilitate/encourage MSE participation; arranging timely and efficient payment terms for MSEs (or for lower-value contracts); giving preferential financial treatment for MSEs, such as fee waivers. (OECD 2018b)

In Brazil, most of the abovementioned measures have been adopted in one way or another, as described below. However, none were proposed with declared measurable goals or sets of goals. This means that the assessments of their success have thus far been undertaken in a scattered, non-systematic and occasional manner as Nicholas and Fruhmman (2014) have remarked in the case of other countries.

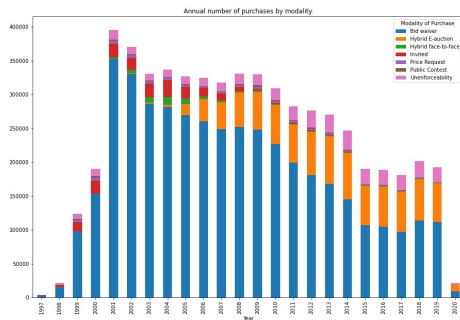
2.4.1 E-procurement

E-procurement in Brazil began in 2000 with the creation of the E-Procurement Exchange (BEC) by the State of São Paulo, which first implemented a system of electronic bid waivers, followed by electronic invited bidding, in 2001. Both instruments comply with the General Procurement Law enacted by the National Congress, which the Brazilian Constitution has empowered to legislate on public procurement in all levels of government (national, state or municipal). In 2000, the Federal Government enacted Provisional Law 2026/2000 (converted by the Congress into permanent Law 10520 in 2002) that provided for an electronic version of the hybrid auction named *pregão* (an auction made up of a sealed bid stage followed by an open bid session). It also published Decree 3697/2000, which was replaced by Decree 5450 in 2005, to regulate two versions of hybrid auctions: face-to-face (*pregão presencial*) and e-auction (*pregão eletrônico*). These face-to-face and e-auctions have become the dominant procurement modality in terms of number of tenders and lots, although not in value (as shown in Figure 2 and Figure 3). As far as federal procurement procedures are concerned, registered suppliers' identities are archived in the centralized digital logbook system of Brazil's Data Warehouse Siasg. This makes it possible to analyse whether more MSEs have been awarded contracts. However, only the *pregões* keep records of all bids and bidders' identities — making it difficult to analyse how and how many MSEs have competed for lots in other procedures. Moreover, as mentioned, the statutory basis for running *pregões* came up in 2005, just one year before the MSE General Law was enacted. This complicates an assessment of the impact that e-auctions have on MSEs' participation in public procurement and winning contracts. While it is unclear if the adoption of e-procurement has led to increases in the participation and contract awarding

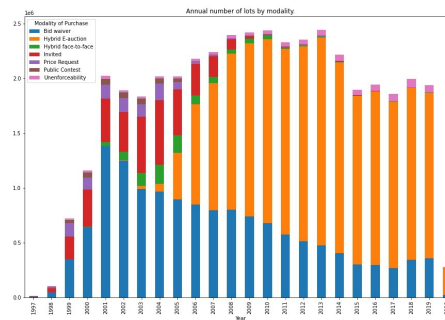
¹⁴ Among the very relevant constraints on small and medium businesses' access to public contracts in OECD countries, as shown in responses to a survey among 26 OECD countries, are: difficulties relating to the size of contracts, too high administrative burdens, access to relevant information, late payments or lengthy terms of payment and quality and understanding of provided information (OECD 2018b).

rates of small businesses, it has become the prevalent modality of procurement in number of tenders and number of lots. Therefore, e-auction data are likely to be representative in assessing their impact on the total public procurement turnover.

► Figure 2. Number of purchases/batches by modality



► Figure 3. Number of lots by modality



2.4.2 Division of contracts into lots and the set-asides programme

Brazilian legislation fostering MSEs allows for two strategies of exclusive small lot bidding. Specifically, article 48 of the Supplementary Law 123 outlined two situations for the division of contracts into smaller lots:

- Item I (contract threshold) allows set-aside lots for MSEs for purchases below BRL80,000.
- Item II (set-aside quota) allows set-aside lots for MSEs in 25 per cent of the yearly total value of divisible goods and services procured.

In 2014, Supplementary Law 147 amended Supplementary Law 123 to mandate the setting up of set-asides for MSEs, with exceptions for cases involving fewer than three eligible MSE competitors or when the treatment would not be advantageous to the public administration. It also specifies that small-value purchases through a bid waiver procedure also be made from MSEs as long as the price aligns with market or prior government purchase prices. In other words, prior to the 2014 amendment of SL123, set-asides were voluntary, so that procuring entities were not required to label all applicable lots as set-asides. But after 2014, this labelling became mandatory under specific conditions. Since 2014, it has also been mandated that direct purchases of small value are made from MSEs if the price is compatible with market rates or previous government purchases. This marked a change from the 2006 policy, which gave procuring entities greater discretion in labelling small lots for free access from bidders of any size. Moreover, some ambiguities in the wording of this article existed regarding whether the threshold applies to individual lot prices or total batch prices. While the wording became clearer in the amendment regarding the applicable threshold (batch value versus lot value), it remains unclear whether the controversy has completely disappeared.

It is worth noting that two exceptions (opt-outs) have never been removed from the law. First, procurement officers may claim that a set-aside treatment is not advantageous for the public administration or represents damage to the aggregate to be contracted. Second, they may demonstrate that there are not at least three competitive MSEs based locally or regionally and capable of meeting the requirements established in the bidding notice.

Subcontracting

Supplementary Law 123/ 2006 (article 48) also allows MSE subcontracting (limited to a maximum 30 per cent of the contract's value). The amendment to Supplementary Law 147/2014 removes the 30 per cent ceiling, but limits subcontracting to construction and services. However, subcontracting data (lots labelled as mandatory for subcontracting to MSEs) in Federal records (DW Siasg) is almost non-existent — suggesting that such information is rarely recorded, or recorded in non-machine-readable files, or that the subcontracting is used infrequently.

2.4.3 Simplifying qualification requirements

In Brazil, the administrative burden for enterprises is especially high. MSEs, in particular, face the most significant challenges due to the record number of hours spent on tax preparation in the country. Brazil topped the list of countries sorted by the average number of hours spent to prepare and pay taxes in a year (1,501 hours against an average of 226 hours, and median of 192 hours across a sample of 190 countries surveyed by the World Bank¹⁵. One partial¹⁶ solution to this was done by unifying taxes and labour payments into a single contribution through the *Simples Nacional* tax regime and individual microentrepreneurs (MEI) regimes (as described in Box 1). Its implementation also reduced the number of certificates that firms need to submit (although they are not actually waived from their financial obligations) and gave MSEs extra time to hand in the required documentation to the procuring entity after they win a bidding lot (two extra working days in SL123/2006, and five working days in SL147/2014)¹⁷. Evaluating the impact of providing time extension for documentation requires formal analysis, as there is no direct account of its usage. The impact of *Simples Nacional* can be approximated by comparing the shares in awarded value and number of lots of undertakings enrolled in the programme each year vis-à-vis other MSEs.

► Box 1. *Simples Nacional* and Micro Empreendedor Individual (individual microentrepreneurs – MEI)

Simples Nacional and MEI are two important preferential tax and regulatory regimes for MSEs. The *Simples Nacional* is a tax regime for small firms (MSEs and individual microentrepreneurs – MEI), created under the Brazil's MSEs General Law (SL 123/2006). The regime aims to ease the fiscal and administrative tax burdens for small firms through the unification of eight taxes and mandatory contributions (six of them federal, one state and one municipal) into a single payment. *Simples Nacional* and MEI significantly simplify the process of fulfilling tax obligations, thus providing eligible suppliers greater competitiveness in public procurement. Firms opting into this tax regime pay lower and progressive tax rates based solely on their revenue, and have a much simpler tax compliance process. These firms have simplified tax returns that reduce their bookkeeping requirements (Matsumoto 2021). *Simples Nacional* is the main federal policy for MSEs, with 65 per cent of Brazilian companies operating under this regime. Such companies account for one quarter of federal tax exemptions.

MEI, a policy introduced in 2009, is much smaller than *Simples Nacional* (and may be understood as its sub-regime). It is mostly aimed at self-employed workers and with annual gross revenues below BRL81,000, in order to support their formalization. Under this regime, the microentrepreneur pays a single monthly amount that covers pension contributions and tax duties. MEI is the main business formalization policy of the federal government. In sum, both policies have encouraged the formalization and survival of MSEs. (OECD 2020)

¹⁵ Source: [Explanations for Revisions to Historical Data During the Doing Business Data Cycle April 2021](#).

¹⁶ "Partial" because not all MSEs are eligible to join the *Simples Nacional* regime.

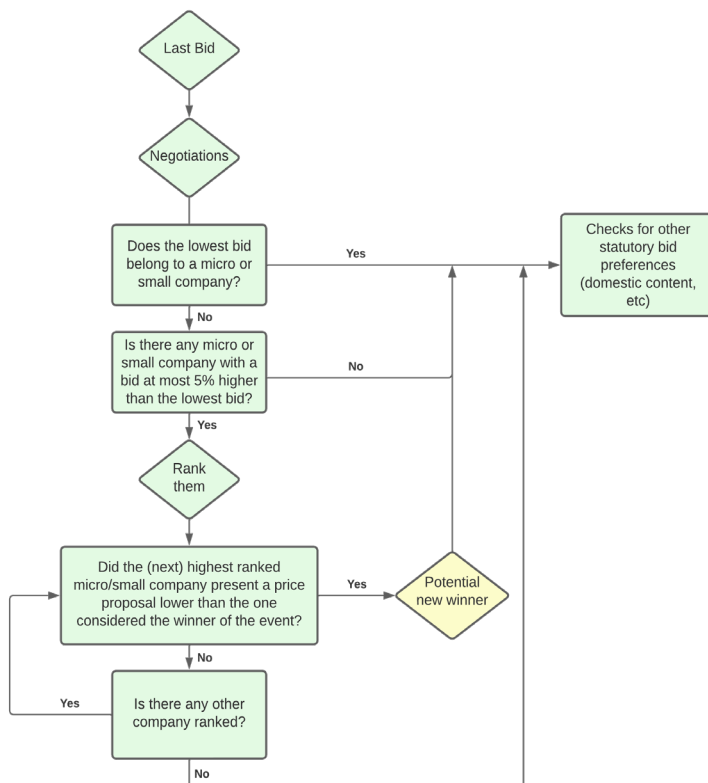
¹⁷ MSEs may apply for two additional extensions, but are subject to penalties if they fail to produce the required documentation within the provided total time frame.

2.4.4 Preferential financial treatment of the fictitious tie

In Brazil, MSEs are not exempted from financial obligations when they participate in procurement auctions, and no bid subsidies are provided for them. However, MSEs benefit from a unique mechanism called fictitious tie, the right to undercut the lowest bidder. In hybrid auction (*pregão* — Law 10,520/2005), which consists of two stages — the sealed-bid stage followed by the open bidding stage — this mechanism allows MSEs the right to undercut a non-MSE front-runner within 5 per cent of the lowest bid at the end of the auction, after the closure of the open bidding stage). In pure sealed bid auctions, they can undercut within a 10 per cent range.

Initially, MSEs submit bids and, if eligible, may lower their bid until the session closes. Afterward, if the lowest bid is from a non-MSE, the auctioneer checks if any MSE has a bid that falls within 5 per cent of the lowest bid and invites them to undercut the front-runner as mandated in the MSE General Law (Supplementary Law 123/2006). If no MSE fits this range, the auctioneer searches for MSEs among the three lowest bids above the front-runner's own bid. In case of undercut, the new winning MSE must provide compliance documentation before the award is finalized. If the first invited MSE fails, the process continues with other MSEs within the eligible range. If no MSEs succeed in both undercutting and qualifying, the auctioneer calls the original non-MSE front-runner, which should then also comply with the documentation requirements. Otherwise, the next bidder in rank becomes the front-runner, and the range of MSEs eligible for undercutting is redefined — which in turn implies that the MSEs now have a conveniently higher price to undercut. The sequence of open bidding in hybrid auction and the right to undercut is depicted in Figure 4.

► **Figure 4. Sequence in the open bidding stage of hybrid auction (*pregão*) for awarding public contracts**

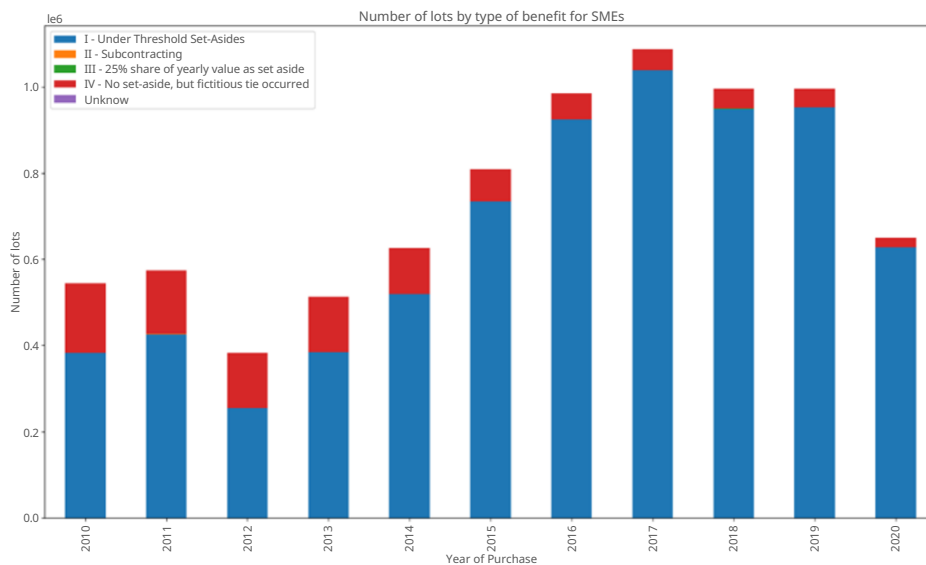


Source: Authors' illustration based on Law 10520/2005 and Supplementary Law 123/2006, including later amendments.

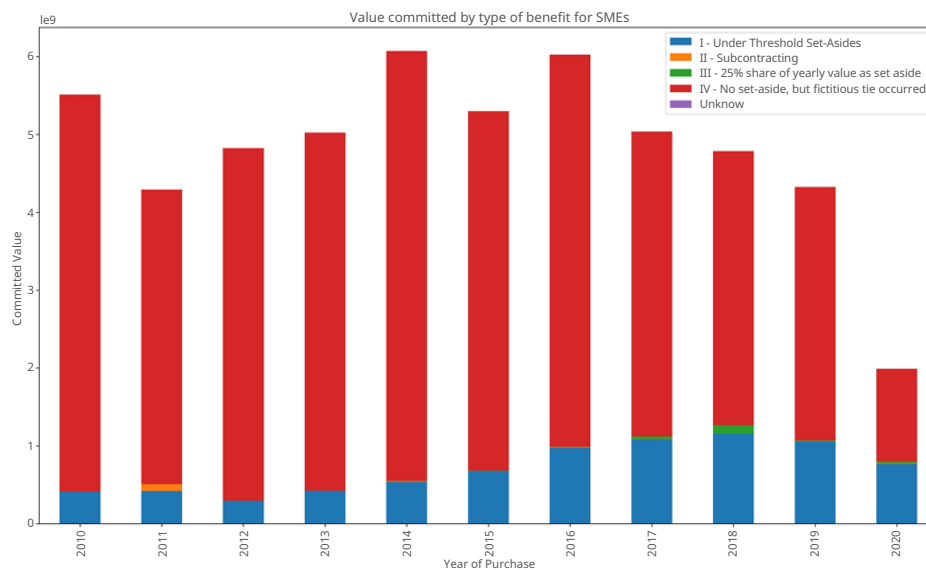
2.4.5 Statistics related to preferential programmes in public procurement

Set-aside lots valued below BRL80,000 have become the primary way to benefit MSEs, whose share of total lots have increased from 10 per cent to 40 per cent (Figure 5). However, in terms of payment value, the majority of the funds awarded to MSEs are linked to fictitious tie (10 per cent of value), compared to just 2 per cent for set-asides. This contrast is due to the lower value of most set-aside lots, while fictitious tie occurs in higher-value auctions (Figure 6).

► **Figure 5. Number of lots within preferential programmes by type**

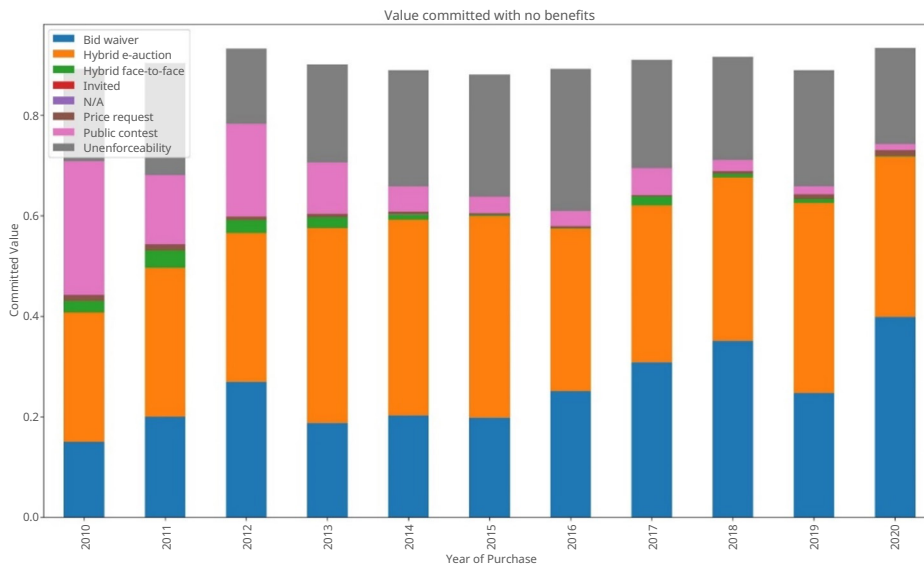


► **Figure 6. Awarded value of lots within preferential programmes by type of benefit**



Although the number of lots benefiting MSEs increased due to set-aside programme, the share of awarded value with preferences barely increased, as the value share of contracts without preferences did not decline significantly (see Figure 7).

► Figure 7. Awarded value with no preference (share in total)



The impact assessment of these preferential programmes is introduced in the following section. The outcomes that are discussed are related to the impact of (1) set-asides for MSEs; (2) SIMPLES regime; (3) extra time for compliance for MSEs; (4) winning public procurement on firms' survival.

► **3. Impact assessment of preferential programmes for MSEs in public procurement**

Regulations favouring SMEs in public procurement have been in place for nearly two decades in Brazil, and its public procurement expenditures relative to GDP aligns with the OECD average. Although Brazil is a developing country, public procurement expenditures represented 12.5 per cent of its GNP from 2006 to 2016, close to the OECD countries' average (OECD 2020). In 2023, the ILO Enterprise Department collaborated with the Institute of Applied Economic Research (IPEA) to conduct a series of studies assessing the effectiveness of Brazil's public procurement measures for SMEs. This section presents the findings of these studies, which looked into policies such as set-asides and the time extension for MSE submissions in tandem with SIMPLES. An assessment of the overall impact that winning public procurement has on firms' survival will also be introduced.

3.1 Role of federal and state levels in public procurement

An analysis of the share of MSEs in public procurement payments at the levels of the federal and state governments was conducted by merging databases RAIS and the federal and states' transparency portals, which have data on payments by the public sector to private companies. Data at the state level are organized for the period between 2010 and 2019, covering 14 states¹⁸. At the federal level, data are available from 2014 onwards.

In terms of number of firms, the Federal government provides more public procurement opportunities for MSEs than state governments. On average, 244,546 enterprises (83.65 per cent of the total) received payments from public contracts annually (Table 5). Federal government payments dominate, accounting for such payments to 202,141 enterprises compared to 69,172 at the state level (Table 6). A total of 28,312 firms received payments from both Federal and state governments. MSEs have accounted for 44.2 per cent of the subset of the firms classified by size that have been awarded contracts and been paid for them (Table 5). MSE participation is higher at the state level (53.8 per cent) than at the Federal level (37.9 per cent). (Table 6). Micro enterprises that have income from Federal contracts were on average 2.25 times as many as those earning from state contracts.

¹⁸ States with available information are: Alagoas, Amazonas, Amapá, Distrito Federal, Mato Grosso, Pará, Paraíba, Pernambuco, Paraná, São Paulo, Rio de Janeiro, Santa Catarina, Mato Grosso do Sul and Rio Grande do Sul, with the last four being included as of 2012. These states account for 75% of the national Gross Domestic Product.

► **Table 5. Total number of enterprises receiving federal or state payments or both, per year, by size range**

Year	Size of enterprise			Total
	Micro	Small	Other	
2014	87 509	32 141	144 387	264 037
2015	81 676	29 776	136 062	247 514
2016	78 531	29 157	132 220	239 908
2017	76 545	28 138	135 890	240 573
2018	73 210	27 830	139 338	240 378
2019	72 703	31 853	130 312	234 868
Average	78 362	29 816	136 368	244 546

Source: Compilation by authors based on data of RAIS and transparency portals.

► **Table 6. Number of enterprises receiving federal or state payments per year, by size**

Year	Micro		Small		Other		Total	
	State level	Federal level	State level	Federal level	State level	Federal level	State level	Federal level
2012	26 421		11 209		33 478		71 108	
2013	30 443		12 249		36 346		79 038	
2014	29 290	64 993	11 370	24 917	34 419	126 446	75 079	216 356
2015	26 763	60 659	10 447	22 916	31 108	119 270	68 318	202 845
2016	25 654	58 449	10 069	22 588	30 377	116 650	66 100	197 687
2017	24 999	56 923	9 715	21 714	29 671	120 546	64 385	199 183
2018	23 897	54 651	9 849	21 480	29 349	124 547	63 095	200 678
2019	24 342	54 004	11 451	24 382	30 459	117 712	66 252	196 098
Average	26 476	58 280	10 795	23 000	31 901	120 862	69 172	202 141

Source: Compilation by authors based on data of RAIS and transparency portals.

In terms of total contract value, MSEs accounted for 9.8 per cent of state-level payments and only 3.15 per cent of federal payments. Moreover, state payments often exceeded the turnover ceilings for MSEs, raising concerns about compliance and potential under-reporting of revenues to retain eligibility for preferential treatment. Payments to firms from both government levels constituted a significant portion of total public spending (Table 7).

► **Table 7. Total yearly amount paid by states or the Federal Government in public contracts, by size range of enterprises – million BRL at 2020 prices**

Year	Micro		Small		Other		Total	
	State level	Federal level	State level	Federal level	State level	Federal level	State level	Federal level
2014	48 329	9 777	81 095	12 197	1 089 650	606 894	1 219 074	628 869
2015	33 882	10 965	59 553	10 689	838 371	631 245	931 805	652 898
2016	30 454	8 677	41 653	9 713	738 638	544 445	810 745	562 835
2017	34 545	8 889	47 840	8 445	800 965	546 442	883 350	563 776
2018	26 673	8 117	52 962	10 326	708 414	540 336	788 050	558 778
2019	27 082	6 417	44 378	7 614	708 430	569 122	779 890	583 153
Average	33 494	8 807	54 580	9 831	814 078	573 081	902 152	591 718

Source: Compilation by authors based on data of RAIS and transparency portals.

Overall, the Federal Government, compared to the state governments, has been offering more opportunities for contracts that have been taken up by MSEs. However, average federal payments to MSEs are lower than state payments.

3.2 Impact assessment methodological techniques

The evaluation of public policies to determine their causal effects is not a straightforward exercise because of the inherent difficulty in attributing causation. Ideally, the effect of a policy on an outcome of interest for some specific population is measured as the difference between (1) the level of the outcome after the policy has been implemented, with all other factors that could affect the outcome held fixed, and (2) the level of the outcome if the policy was not implemented and all other factors that could affect the outcome were held fixed or unchanged. The latter is called the counterfactual, or what the outcome would have been if not for the policy. The problem with the counterfactual is that it is not observable in real life. Once a policy has been implemented, only the factual outcome can be observed. A rigorous assessment of the effects of policies and other interventions is typically undertaken through quantitative techniques. Quantitative techniques could be used in impact evaluations to produce a good or acceptable counterfactual. The frequently used techniques for impact assessment are briefly described in Box 2.

► **Box 2. Standard techniques for impact evaluation**

1. Randomized control trial – uses the randomization of treatment assignment (or who gets to benefit from the intervention). The counterfactual is the outcome for the control group (or those randomly assigned not to receive the intervention).
2. Instrumental variable regression – proceeds by finding a variable that is correlated with the likelihood of receiving treatment but is uncorrelated with the outcome of interest otherwise. This variable is used as an instrumental variable in a type of regression analysis (called instrumental variable regression) that attempts to tease out the effect of the treatment.
3. Difference-in-differences analysis – used when the data have a time dimension (before and after treatment) and comprise a subgroup that received a treatment and a subgroup that did not receive a treatment. The effect of the treatment is measured as the change (or difference) in outcome for the treated group minus the change in outcome for the control group. The underlying assumption is that without the intervention, the change in outcomes for both groups would be the same.
4. Regression discontinuity design – used for programmes or interventions that employ a continuous eligibility index (such as income or predicted income), with a clearly defined eligibility cut-off score to determine who gets the intervention. The control group comprises those on the side of the cut-off that is ineligible for the intervention, and the counterfactual is the outcome for this group.
5. Propensity score matching – uses statistical techniques to construct an artificial control group by matching, for every observation in the treatment group, an observation (or observations) in the control group that has the most similar characteristics possible. By necessity, matching can only be done based on observed characteristics, which is its main limitation – meaning the two groups could still differ in unobserved characteristics.

This report illustrates the use of difference-in-differences analysis (and its variant, triple differences) and regression discontinuity design.

The analysis employed a combination of data from Comprasnet, SIASG, RAIS and the transparency portals, as described in Section 1.

3.3 Assessment of the set-aside policy

Among the measures and approaches used to support MSEs in public procurement, as listed by the OECD (2018b), the second most cited by the surveyed OECD countries is the division of contracts into lots¹⁹ and set-asides²⁰. However, the impact assessment of such policies remains scarce. This is because the non-random allocation of lots as set-asides led most studies to forgo direct evaluation, requiring them to rely instead on econometric techniques that explicitly model auction participation decisions.

¹⁹ Division of contract into lots refer to the practice of splitting larger government contract into smaller portions, by value or quantity, allowing MSEs to bid on sections that match their capacity.

²⁰ Set-asides are provisions that reserve certain government contract lots exclusively for MSEs

3.3.1 Literature review on the benefits of set-asides

Among the few impact assessment studies on set-asides, findings were mixed. While set-asides may encourage SME participation, they also introduce inefficiencies and cost implications. Brannman and Froeb (2000) analyse US Forest Service timber auctions and find that eliminating the set-aside programme for small mills or loggers would increase government revenues by 15 per cent, while granting bidding preferences to small and distant bidders would raise revenue by less than 0.1 per cent. Nakabayashi (2013) shows that in Japan, in the absence of the small business preferential programme set-asides, SMEs would win 4.7 per cent less often than large firms, earn 46 per cent lower expected payoffs and experience a 36 per cent drop in participation, and that the preferential policy ends up reducing effective procurement costs by 0.22 per cent. Hoekman and Taş (2000) find that a higher score in public procurement regulation quality is associated with the higher participation rate of SMEs and the higher probability that they win in European tenders. The subdivision of contracts into lots is also associated with greater SME participation but not necessarily with increasing the probability of winning the contract, as the likelihood of win increases only when lot sizes fall below €25,000. Athey et al. (2013) find that the US set-aside programme leads to revenue losses of 5 per cent and efficiency losses of 17 per cent. But when accounting for endogenous entry of the small firms, these losses are mitigated as compared to a scenario without entry effects, where revenue and efficiency losses would be 30 per cent and 28 per cent respectively. Cappelletti and Giuffrida (2024) use machine learning and IPWRA methods to analyse US federal procurement data, finding that set-asides increase small bidder participation but also lead to higher cost overruns and delays, especially in more restrictive auctions. Shagbazian et al. (2023) study Russian set-aside auctions and find that while tenders with “small and medium reserve prices” attract more bidders and yield greater bid discounts due to lower security deposits, auctions with higher reserve prices result in higher final prices and reduced competition.

3.3.2 IPEA assessment study of the set-aside policy

In Brazil, as described in section 2.4.2, set-aside lots in public procurement are defined under the Supplementary Law 123/2006, article 48. The set-aside policy reserves certain contracts based on contract value thresholds for MSEs for purchases below BRL80,000, or in 25 per cent of the total value of divisible goods and services procured in one year. Before an amendment to the MSE General Law in 2014 through Supplementary Law 147, procuring entities were not required to label all applicable lots as set-asides. The amended Supplementary Law 147, enacted in 2014, makes set-asides mandatory, although opt-outs were still possible. There could be opt-outs (or no set-asides) if the purchasing agency determined that having set-asides would be disadvantageous to public administration or if the number of eligible MSE competitors based locally or regionally was less than three. This points to legislative loopholes. For example, a federal procurement official noticed that many small-business-only contracts (set-asides) failed due to a lack of qualified bidders or high prices. As a result, these contracts had to be reopened to all bidders, leading the agency to stop using set-asides and document their decision for audits. While greater barriers to entry in the markets for some pharmaceuticals were conjectured as a factor, data did not show a major difference in the reopening rates for them. Over time, the share of reopened contracts increased, indicating challenges in attracting small businesses despite the growing use of set-asides. (The number of reopened lots jumped from 0.57 per cent of the set-asides in 2014, before the reform, to 1.62 per cent in 2021. When calculated with respect to the total number of open-access lots, the share of reopened lots rose from 0.23 per cent to 3.93 per cent in the same period.)

IPEA's impact assessment study seeks to understand the participation and winning mechanisms for MSEs, and economic effects on auction characteristics of the set-aside policy favouring MSEs. Specifically, it analyses whether and to what extent set-aside lots for MSEs affect: (1) the number of bidders, (2) the number of participating MSEs, (3) the discount (winning price relative to reserve price), and (4) the probability of the auction going to the open bidding stage when the auction is either preferentially or exclusively aimed at MSEs.

3.3.3 Dataset

The assessment built on a combination of data from Comprasnet, SIASG, and RAIS. It focuses solely on goods, thus excluding procurement for services. Observations with missing supplier data and auctions involving international suppliers were omitted. The dataset spans 2009 to 2018 for selected goods, consisting of frequently purchased essential inputs²¹ and all pharmaceutical drugs. These products are selected for their relative homogeneity and clear descriptions, with pharmaceuticals being highly standardized, while other categories are less so, facilitating cross-auction comparisons.

The observations are grouped according to goods with the same code. However, there is a lack of standardization for ordinary merchandise, such as nails, paint, gasoline and solvents, which are sold in various pack sizes and formats. These supply units are prone to inconsistent wording, numeric variations and errors. For pharmaceuticals, in contrast, the Ministry of Health has implemented better standardization, specifying drug codes that describe active ingredients, strengths and pharmaceutical forms. However, inconsistency remains in the measuring units for liquid orals, injectables and topical drugs. The lack of standardization in raw data required additional coding efforts to create a more standardized dataset, where a “product” is defined as a combination of good and supply unit as shown in Table 8. In the study, selected product categories were standardized in combination with supply units. The dataset contains 14,399 unique products. In the final dataset, over 570,000 auctions were included.

► Table 8. Examples of products included in the sample

Goods	Unit
Acrylic paint	3.6 litre tin
Adhesive label	Unit
Construction nail	1 kilogramme
Construction wood	Square metre
Diesel	Litre
Dipyrrone	Dragee
Enamel paint	3.6 litre tin
Fluorescent lamp	Unit
Galactosamine	Flask
Gasoline	Litre
Ibuprofen	Capsule
Liquid solvent	Litre
Nicotine	Tablet
Paint	3.6 litre tin
Paint thinner	Litre
Paracetamol	Pill
Plastic bags	100 units
PVC tubes	unit
Stamp	unit
Water	500 ml bottle

²¹ Acrylic paint, adhesive label, construction nail, construction wood, diesel, enamel paint, fluorescent lamp, galactosamine, gasoline, liquid solvent, paint, paint thinner, plastic bags, PVC tubes, stamp, water.

3.3.4 Estimation methodology

Under Brazilian law, procurement lots with value below BRL80,000 were to be allocated exclusively to MSEs, although there were certain opt-outs. The law was also more ambiguously worded before 2014. Still, this means that the probability of having a set-aside lot increases substantially when comparing lots valued slightly below BRL80,000 with lots valued slightly above this threshold. The assumption is that procuring entities with lots near BRL80,000 are homogeneous in all other aspects, such as preferences for local suppliers and auction structuring. This assumption would mean that the change in the probability of having a set-aside occurs exogenously around this threshold is entirely due to the threshold — and to no other factor. This satisfies the condition for the use of regression discontinuity design (RDD). A partially fuzzy RDD estimator deals with imperfect compliance, while dismissing concerns about setting values below or above the relevant threshold. With the fuzzy RDD analysis, data are divided into two groups. The first is for 2012–2014, when the set-aside rule was more ambiguously worded, and the second for 2016–2018, when the set-aside rule was more clearly worded.^{22 23}

To validate the sample, before running the estimation, the authors tested the samples to ensure that (i) there was no bunching of lots before or after the 2014 amendment; (ii) the increase in lots under the set-aside rule just below the threshold after the 2014 reform did not cause a decrease in number of lots above the threshold. Results show that there is no strong evidence of non-random lot selection around the BRL80,000 threshold, and RDD is an appropriate technique.²⁴ Additional regression results on data subsamples also confirm no manipulation within major purchasing agency groups for both the 2012–2014 and 2016–2018 periods. (Details on this test explanation is available in Annex A1).

3.3.5 Key findings

Several variations of the fuzzy RDD estimator were employed. The results are relatively robust across different estimations with the following key findings.

The set-aside policy attracted more and newer MSEs to bid after the reform in 2014. Both the participation rate and the award success rate of MSEs were significantly boosted by the set-aside policy. To assess the effects of the set-aside policy, fuzzy RDD models were run on two subsamples to compare those lots with values just above and just below the BRL80,000 threshold. The estimation results for 2016–2018 (after the reform was implemented) show that set-aside lots attract more MSEs. In fact, the share of MSEs in bidding increased between 37.7 and 51.3 percentage points, and the share of MSEs' awarded lots increased between 54.1 and 61.3 percentage points when lots are exclusively allocated to them (Table A3 and A5 in Annex A). The impacts of the set-aside mechanism could not be confirmed before the reform (between 2012–2014).

²² The simplest identification strategy would compare set-aside lots with other lots, but this approach could lead to biased estimates due to confounding factors that influence both the allocation of exclusive lots and auction outcomes. For example, exclusive lots may be used to favour small local suppliers or used by less organized procuring entities with unclear public notices. As a result, the probability of a set-aside lot is not random across all lots.

²³ Estimation equation is as follows: $y_a = \alpha + \beta T_a + f(X_a - X_0) + \epsilon_a$ where y is the outcome variable, α indexes auctions; β is the coefficient of interest. T is the treatment (set-aside) dummy; $f(X_a - X_0)$ is a polynomial function of the re-centred reserve price of the batch ($X_0 = \text{BRL}80,000$); and ϵ_a is a mean-zero disturbance term. The probability of a set aside lot does not vary exogenously in general, which means that T_a and ϵ_a would be correlated, biasing OLS estimates of β . In order to circumvent this problem, the sample is restricted to lots whose reserve prices are close to BRL80,000 BRL and use the set-aside eligibility dummy ($Da = 1\{X_a \leq 80k\}$) as an instrumental variable to the treatment dummy. Such a strategy fits into the category of regression with fuzzy discontinuity.

²⁴ This was formally tested using a polynomial density estimation (Cattaneo, et al. 2018), which failed to reject the null hypothesis of no manipulation either in the period 2012–2014 or 2016–2018.

This increase in MSEs' participation in public procurement is mainly driven by newer firms. As a result, the average age of participating firms declined by over 4.5 years (53 months). The change in law was quite effective in attracting newer MSEs to auctions in public procurement (see Tables A3 and A5 in Annex A)²⁵. For the 2012–2014 period (before the reform), there was no significant effect on attracting newer firms (see Tables A4 and A6 in Annex A). The robustness check of the results confirms the significantly greater MSE participation ratio and MSE win ratio, as well as the significantly lower age of MSE.²⁶

A reduction in the total number of bidders came as a result of the set-aside policy regardless of the increases in participation and success of MSEs in winning bids. It decreased by approximately two bidders per lot (Table A5). Even controlling for time and product fixed effects²⁷, the increase in the number of MSEs bidding on lots below the value threshold did not fully offset the decline in participation from larger firms (Tables A5 and A6). Restricting larger firms from competing led to reduced overall competition.

Higher price and lower discount on reserve price: In terms of pricing, contracts under the set-aside policy experienced significant price increases and lower discounts off the reserve price²⁸. The average price goes up 29.2 per cent and bid discount decreased by 10 percentage points after the reform (Table A5). This suggests that set-aside policies may lead to higher procurement costs, possibly due to reduced competition. Additionally, fewer auctions reached the open cry stage²⁹, as indicated by the reduction in the open auction ratio by 8 percentage points in 2016–2018 (Tables A5 and A6), possibly because reduced competition meant less aggressive bidding.

Signs of collusion: Fewer bidders and higher prices, reinforced by the lower discount on reserve price, can indicate some level of collusion. This concern is further reinforced by an increase in single-bid lots by 10 percentage points (Table A7)³⁰, suggesting a rise in collusive missing-bid strategies among bidders operating below the threshold. Additionally, there is indirect evidence of cover bidding strategies, based on the patterns of downward trend of two collusive price markers: the coefficient of variation and skewness (Table A8), both indicating greater collusion risk.

In conclusion, this impact assessment study reveals that the set-aside policy helped MSEs gain access to government contracts, as evidenced by increased participation and a higher contract award rate, particularly among newer MSEs. However, the policy also has downsides. It appears to have reduced competition, as reflected in the decrease in the total number of bidders. Additionally, government costs rose, with contracts under the set-aside policy experiencing significant price increases and lower discounts off the reserve price. Moreover, signs of collusive behaviour, such as cover bidding (fake competition) and missing bids, were more prominent.

²⁵ Another - less benign - interpretation is that new MSEs were created just to participate in procurement auctions. Investigating whether they have shareholders in common with greater companies could reveal a pattern of gaming the rules.

²⁶ The estimation results are found to be robust when the models were run using an asymmetrical bandwidth and Epanechnikov Kernel with Optimal Bandwidth.

²⁷ A more detailed classification of products was created taking into account how they are supplied. Using these new categories, individual fixed effect dummies, along with quarter-year time dummies, were added following Fazio (2022) and regression discontinuity design (RDD) was repeated for each outcome. First, the authors calculated the optimal bandwidths, then ran the IV-HDFE (High Dimensional Fixed Effects with Instrumental Variables) model, using threshold dummies as instruments and product plus quarter-year dummies as fixed effects.

²⁸ The discount variable measures how much lower bids are compared to the reserve price. A lower discount signifies that firms bid closer to the reserve price.

²⁹ A hybrid auction consists of a first stage (sealed bid) where bidders submit initial bids privately, and a second one (open bid stage) where bidders can adjust their offers in real time. Open auction ratio refers to the rate of auctions that proceed to the open cry stage.

³⁰ Two other important collusive markers, i.e. the coefficient of variation of bids and the skewness of the bid distribution were significantly affected.

3.4 Impact of the extra time for compliance policy, SIMPLES tax regime and the right of MSEs to undercut the lowest bidder

3.4.1 Policies under review

The IPEA study examines the impact of two Brazilian government policies that favour MSEs in public procurement. The first is Supplementary Law 123/2006, along with its amendment, Supplementary Law 147/2014. These laws provide more lenient treatment for MSEs by granting them additional time to submit qualification documents, such as proof of compliance with tax, labour and social security obligations, and good standing with regard to the judicial system. The time extension policy is analysed in conjunction with SIMPLES status for qualifying MSEs. SIMPLES regime reduces the tax compliance burden for eligible MSEs, thus potentially increasing their ability to secure contract awards.

Under the first set of policies studied, MSEs are allowed to settle pending issues (including the payment, even if in instalments, of tax or labour debts) within an extra time period (two days in SL 124/2006, increased to five days in SL 147/2014) that can be extended by another period of the same length. This extension is provided for all MSEs — regardless of whether they are eligible for SIMPLES — to settle pending debts and other issues and thus be able to issue new (and regular) certificates in case they win a public contract.

The SIMPLES tax regime is available for MSEs in a limited number of activities.³¹ SIMPLES excludes MSEs that are in economic activities marked by labour intensiveness, or are related to finance, real estate, and professional services. Its purpose is threefold: (i) to avoid excessive tax breaks that can generate imbalances in the social security system; (ii) to make sure that industries requiring detailed scrutiny continue to submit detailed tax records to authorities; and (iii) to avoid giving unfair tax advantages to industries dominated by small firms and where the owners are well-off (Viol and Rodrigues 2000). The lack of perfect correspondence between MSE status and SIMPLES eligibility helps isolate the effect of policy on extra time for compliance for MSEs.

It is important to note that this assessment is conditional on the bidder having placed the lowest bid, regardless of the timing of bid submission. This distinction is emphasized because Brazil employs another mechanism that benefits MSEs, fictitious tie, which grants MSEs the right to undercut the lowest bidder. This mechanism allows them to surpass the front-runner even when their bid is higher, up to 5 per cent, than the leading bid by the end of the open bid stage. However, the IPEA study does not distinguish whether the undercut occurred before the end of the open bid stage (a typical win) or after its closure (such as by utilizing the tie-breaking privilege under the fictitious tie status). Additionally, the analysis does not differentiate whether the tie-breaking mechanism favoured the runner-up or a bidder ranked lower (such as second or third in rank).

The following section presents the literature review on the benefits of SIMPLES tax regime. It is followed by a discussion of the findings of IPEA's assessment of the impact of time extension for compliance for MSEs, along with the benefits that MSEs get from the right to undercut the lowest bidders.

3.4.2 Literature review on the benefits of the SIMPLES tax regime

In Brazil, the first legislation that brought favourable conditions to MSEs at the national level was the Law 9317/1996, known as "Micro and Small Enterprise Act". This law created a simplified system for MSEs to pay taxes and contributions, known as SIMPLES. This approach was strengthened by Supplementary Law 123/2006 (MSE General Law), which unified tax regulations across all government levels (federal, state, and municipal) and introduced the special tax regime called *Simple Nacional*, a simplified collection

³¹ In fact, not all MSEs are eligible for SIMPLES. This is not only because of their registered activities, but also for other reasons, such as having other enterprises as shareholders, having common owners, shareholders or administrators.

system unifying all taxes into a single payment and reduced rates on various taxes. MSEs qualifying for this regime therefore have *SIMPLES* status, a term used in this report.

The *Simples Nacional* tax regime replaced six federal taxes that range from 0.65 per cent to 50 per cent, and local taxes that range from 2 per cent to 28 per cent (levied on different tax bases: profits, gross revenue, payroll, value added) with a much lower single tax levied on gross revenue. This ranges from 3–12.6 per cent of gross revenue in the baseline schedule, with an added 0.5 percentage point in all brackets for manufacturing firms and a 50 per cent increase in rates for some industries in the services sector (Matsumoto 2021). Moreover, it reduced the administrative burden for firms with *SIMPLES* status. Matsumoto (2021) found that firms “that switch tax regime (out from *SIMPLES*), operating with revenues at the eligibility threshold, can expect a five percentage-point increase in the average tax rate, and at least a one percentage point increase in tax compliance costs, as a fraction of revenue”.³²

Another study on 11 Latin American countries by Levy-Carciente (2022) highlighted the significant benefits of *Simples Nacional* for Brazilian MSEs through their findings that Brazilian MSEs incur the (by far) smallest administrative burden for legal obligations and payments (including tax, labour, and regulatory compliance): only 180 hours per year, against a median 477, a mean 548 and a maximum 1,062.

Monteiro and Assunção (2012) analysed the impact of the *Simples Nacional* programme on the formalization of small companies in Brazil and investment. Results show a 13 per cent increase in formal permits for retail companies after the programme's implementation compared to companies in non-eligible sectors, while the other eligible sectors (construction, manufacturing, transport and services) were not affected by the new legislation. The programme has a more notable effect on retail companies that sell to individual customers, but has little effect on businesses that serve other companies or the government, which already require official invoices. Piza (2018), with an alternative approach correcting the measurement errors and sector-specific seasonal shocks in the study of Monteiro and Assunção (2012), argued that *Simples Nacional* did not impact formalization rates.

Corseuil and Moura (2016) studied the impact of the earlier *Simples Federal* (which unified Federal taxes and contributions only) on total employment, formal employment, admissions, dismissals, average salary, and a proxy of economic profit in the manufacturing sector using IBGE's industrial survey data. They found that the programme, when implemented in 1997, increased number of jobs in industrial firms, besides helping to prevent closures of smaller firms. But between 1999 and 2006, when changes were made to the eligibility criteria for the programme (which raised the revenue ceiling for eligibility in 1999), the programme had no significant effect on employment levels.

The World Bank (2017) reviewed *SIMPLES* as expensive and potentially distortionary. According to their evaluation, “the programme also appears to be inefficient, since it has the unintended productivity consequence of keeping firms small. Another concern is that preferential treatment of small businesses in combination with low effective tax rates for large businesses may result in an inverted U-shaped pattern of the tax burden, potentially placing medium-sized businesses at a competitive disadvantage”. The programme also introduced distortions in the choice of intermediary inputs, which result in productivity losses (Caprettini and Ciccone 2015)³³.

³² This estimate was computed by proxying the administrative costs of paying taxes with third-party payments for legal and accounting services reported in microdata of the manufacturing industry annual survey run by IBGE (Pesquisa Industrial Anual - PIA).

³³ This is because a tax on turnover, such as *SIMPLES*, distorts production decisions every time inputs are exchanged along the production chain, because inputs can always be substituted with labour. Thus, the aggregate deadweight loss created by the tax grows with the number of times the sectors exchange inputs — the number of stages of production. More interestingly, a tax on turnover also affects prices, because it increases the cost of one of the inputs of production (Caprettini and Ciccone 2015).

The Council for Monitoring and Evaluation of Public Policies (CMAP) undertook the only official assessment of SIMPLES available. It found that SIMPLES increased business entry by 1.8 per cent and reduced exit by 0.3 per cent, while formal employment growth is estimated to be boosted by around 3 per cent (CMAP 2020). Regarding the impact on tax revenue, the report calculated the elasticity of revenue with respect to the tax rate and concluded that the tax waiver is 13 per cent less than the regular estimate reported annually by the Treasury, due to the effects on firm set-up and survival and on employment³⁴. The report confirmed that *Simples Nacional* successfully ensures a simplified and efficient operational framework, providing favoured treatment for MSEs. The review above shows mixed findings on the benefits of SIMPLES status in empirical studies.

3.4.3 Impact of the extra time for compliance policy

The study conducted by IPEA examines whether the extra time for compliance policy given to MSEs affects the rate of acceptance of an MSE in a public bid, which is defined as the percentage of lots in which the company with the lowest bid is awarded the contract. The particular outcome of interest is the likelihood of MSEs being awarded a bid after submitting the lowest bid.

There are two challenges encountered in designing an estimation strategy. First, the change in legislation in 2015 occurred at the time of a major economic recession in Brazil, which affected small businesses more severely than larger firms. Because of the recession, it is likely that the outcomes for the small firms would have been different from the big firms anyway, even without the change in the time extension policy.³⁵ However, small and micro enterprises can reasonably be expected to be affected by the recession in the same way. Second, small businesses face heterogeneous red-tape burdens depending on their different tax regimes — in particular whether they operate under SIMPLES or non-SIMPLES tax regime, as discussed above.

3.4.4 Estimation methodology

A simple comparison of the bid performance of MSEs with non-MSEs is not applicable, as MSEs and non-MSEs likely differ in other ways that could affect their success rates. The same issue is encountered when simply comparing outcomes for SIMPLES-eligible enterprises versus non-SIMPLES (that is, SIMPLES-ineligible) enterprises. Further complicating this is the fact that most MSEs are also SIMPLES eligible, making it difficult to isolate the causal effects of MSE status and SIMPLES status. Due to these complexities, the standard difference-in-differences methodology approach is not applicable, as an ordinary difference-in-differences estimator would not be able to unravel the effect of the time extension policy from the effect of the recession. A way to deal with this problem is to add another layer of comparison that identifies two groups that can be expected to be affected the same way by the recession, but which can be separated very clearly and could potentially be affected by the treatment differently. This additional layer was the SIMPLES status. The lack of perfect correspondence between MSE status and SIMPLES eligibility helps isolate the effect of the policy on extra time for compliance for MSEs. The triple differences model estimate, a variant of difference-in-differences,³⁶ is then applicable in this case. Following this strategy, estimation is limited to the effect of time extension on the award probability of firms in industries non-eligible to SIMPLES tax regime, relative to those in industries eligible for SIMPLES tax regime. An important assumption for this estimation strategy is that in the absence of the extension policy, the difference in the probability of being awarded a contract between

³⁴ Based on Treasury reports (Brasil, 2011–2020), the tax waiver would raise the average tax burden from 6.75% to 11.34% (by 4.59 percentage points), while CMAP's estimate shows the rise would be only to 10.74% (by 3.99 percentage points).

³⁵ For example, small firms are probably more likely to be unable to pay tax obligations during a recession. This thus reduces their ability to win a public tender, regardless of any time extension.

³⁶ The triple differences method simply builds on the difference-in-differences method by adding an extra level of comparison so as to further limit potential biases. Interaction terms were included in the estimation equation.

small and big firms would have remained constant over time, regardless of whether their industry qualifies for the SIMPLES tax regime. The model specification is detailed in Annex B.³⁷

3.4.5 Data

Data on government procurement are from the Comprasnet and DW Siasg databases, providing information on bidders, auctions and auction lots. Data on the status of MSEs, such as data over time that distinguishes between MSEs and non-MSEs from Comprasnet and between SIMPLES-eligible and SIMPLES-ineligible enterprises from RAIS, is utilized. To be more precise, distinctions between SIMPLES and MSE status in Brazil are as follows:

1. A company with annual revenue under BRL4.8 million in the preceding year has qualified for the SIMPLES status since 2017, which is indicated in RAIS report. SIMPLES status does not affect any type of bid preference throughout the auction. It only lowers the cost of compliance for a bidder's qualification and its awarding of a contract.
2. On the contrary, MSE status affects a firm's eligibility to receive bid preferences (in set-asides, fictitious tie and time extension). MSE status is self-reported every time a bidder registers for bidding. It can therefore change within a fiscal year if its revenues for the given year have already exceeded BRL4.8 million. Because SIMPLES and MSE status follow different rules, a company might still be marked as an MSE when bidding, according to the Comprasnet, but no longer qualify as one when submitting the RAIS report to the labour ministry at the end of the fiscal year.³⁸

As explained above, SIMPLES status is only available for determined activities, which leads to the situation shown in Table 9, where many MSEs do not participate in the programme, and therefore appear as non-SIMPLES.

► Table 9. MSE status declared at auction versus SIMPLES status

	Number of enterprises		Share (percentage)	
	MSE	Non-MSE	MSE	Non-MSE
All bidders				
SIMPLES	1 651 835	19 411	48	1
Non-SIMPLES	760 478	1 007 642	22	29
Winning bidders only				
SIMPLES	237 475	2 566	41	0
Non-SIMPLES	110 031	226 700	19	39

³⁷ Estimation equation: $low_win_{it} = \alpha + \delta_k + \beta_1 low_mse_{it} + \beta_2 non_simples_k + \beta_3 non_simples_k \times low_mse_{it} + \beta_4 post_{it} + \beta_5 low_mse_{it} \times post_{it} + \beta_6 non_simples_k \times post_{it} + \beta_7 non_simples_k \times post_{it} \times low_mse_{it} + \epsilon_{it}$
where low_win_{it} is a dummy that indicates if firm i , which was the lowest bidder for a tender lot occurred at time t , was awarded the public bid; δ_k represents fixed effect for industry k ; $non_simples_k$ is a dummy to indicate if firm i industry classification k was non-eligible for SIMPLES until 2017; low_mse_{it} is a dummy to indicate if the lowest bidder (firm i) declared MSE status at time t ; $post_{it}$ is a dummy for the period after the enactment of Supplementary Law 147/2014. Other variables are the interactions between these explanatory variables.

³⁸ This happens when the company loses its MSE status but still remains in the SIMPLES programme.

Table 9 breaks down the different combinations of SIMPLES and self-declared MSE status, first among all the bidders, and then among the winning bidders. The figures indicate that 48 per cent of bidders were self-declared MSEs and were at the same time SIMPLES-eligible, 29 per cent were self-declared non-MSEs and SIMPLES-ineligible, 22 per cent were self-declared MSEs while SIMPLES-ineligible, and only a residual 1 per cent were self-declared non-MSEs while SIMPLES-eligible. The latter would be those who exceeded the revenue threshold for MSEs for the year at the time of the auction (but not in the previous year). Among the winning bidders, 41 per cent were self-declared MSEs that were SIMPLES-eligible, 39 per cent were self-declared non-MSEs and at the same time SIMPLES-ineligible, and 19 per cent were MSEs while SIMPLES-ineligible. Among winning bidders, virtually no self-declared non-MSE was SIMPLES-eligible.

3.4.6 Key findings

The impact evaluation finds that extra time for compliance policy helps MSEs win more contracts in public tenders. This effect was stronger for MSEs in industries that do not qualify for the special SIMPLES tax regime. Specifically, MSEs in industries ineligible for the SIMPLES tax regime experience a larger increase in their chances of being awarded contracts, as compared to MSEs industries eligible for the SIMPLES tax regime. The differential effect (the difference in impact between the two groups) ranges from 8 to 11 percentage points. Non-SIMPLES MSEs see their award probability increase by 8 to 11 percentage points more than SIMPLES-eligible MSEs. MSEs are disadvantaged over non-MSEs. MSEs with the lowest bid have lower probability than non-MSEs of eventually being awarded the tender by 7 to 8 percentage points. However, the policy change introduced in 2014 by Supplementary Law 147 increased the probability of being awarded a tender for the lowest bidder by 2 percentage points. This is particularly beneficial for MSEs, whose probability of being awarded a tender for the lowest bidder post-policy change was higher by 2 to 3 percentage points.

The results are fairly robust. Details are presented in Table B1 of Annex B. The estimated effect is presented as a range, although a narrow one, because different specifications of the triple differences model yield slightly different estimates of the impact of the time extension policy, depending on additional fixed effects for product type, state and time (year of auction) added.

3.4.7 Benefits of the right to undercut lowest bidders for MSEs

As earlier explained, MSEs get special treatment in public auctions through a process called fictitious tie, which helps them undercut the lowest bidder (see section 2.4.4 above). While the study did not aim to assess the impact of the fictitious tie mechanism, given its relevance into the analysis, the descriptive statistics related to its incidence in bidder awards are presented.

Descriptive statistics

Before and after the Decree 8538 was enacted in 2015, non-SIMPLES companies still had a higher chance of winning than SIMPLES ones. This occurred even though the acceptance rate for the lowest bidder improved only slightly after the decree enacted in 2015 (See Table B2 in Annex B). When fictitious tie occurs, multiple companies are ranked in a tie-breaker. Most of the time, the top-ranked company wins. Data shows that the first ranked company in auction with fictitious tie had a 39.5 per cent chance of winning before the Decree 8538 and 38.6 per cent after its enactment. However, many companies in fictitious tie might choose not to bid in the tie-breaker (companies do not have to bid if they are called), which partly explains why some MSEs do not win. When accounting only for companies that did bid in the tie-breakers, the success rate of the first-ranked companies increases — they had a 74.1 per cent and 77.9 per cent chance of winning before and after Decree 8538 was enacted. This indicates that the grace period granted to them for legal compliance increased their award chances once they decide to undercut (it is worth noting that the fictitious tie has existed since 2006).

How fictitious tie affects bidding strategies

It is evident that fictitious tie provides MSEs an easier environment to win a lot. This, however, is merely statistical and does not demonstrate the impact of fictitious tie on awards, as there is no control for confounding factors or endogeneity. The whole strategy of bidders is affected by this “last minute opportunity to overturn the result”. An MSE may refrain from undercutting during the open bid stage because it expects that the front-runner is not eligible for the fictitious tie mechanism. Anticipating the undercut could prompt a fiercer reaction from the front-runner and end up in a lower final price. Since the identities of the bidders are not known before the end of the open bid stage, this strategy bears some risk of miscalculation. It is uncertain whether the MSE has less chance of survival if it engages in fiercer competition instead of waiting for the chance to overturn. In Table B2 (Annex B), both SIMPLES and non-SIMPLES bidders have lower award rates when they are declared winners after a fictitious tie. As expected, the award rates increased for both SIMPLES and non-SIMPLES — both with and without fictitious tie after Decree 8538.

Limitations of fictitious tie

When an MSE was the lowest bidder, the probability for a non-MSE being awarded was only 3.7 per cent (before Decree 8538). However, this dropped to 1.9 per cent after Decree 8538 was enacted, making it even rarer for non-MSEs to win. But many non-MSEs still win contracts in auctions with fictitious tie, especially when there is only one bidder in the tie-breaker (Table B3 in Annex B). When there was only one company in the tie-breaker, the likelihood of auction being awarded to a non-MSE was 42 per cent, before and after the reform in 2015. This means that even when a fictitious tie is supposed to favour MSEs, a large percentage of auctions still go to non-MSEs. In other words, while fictitious tie helps MSEs, they do not guarantee them the contract, especially if few companies participate in the tie-breaker. The effectiveness of fictitious tie mechanism is limited by low participation in the tie-breaker, which can allow non-MSEs to win, even when the fictitious tie is intended to favour MSEs.

In conclusion, the policy intervention of Supplementary Law 147/2014, which gives extra time to MSEs, helps increase their chances of winning, particularly for those outside the SIMPLES tax regime. A future study is suggested to assess whether fictitious tie preferential treatment does improve the award rate of MSEs.

3.5 Impact of winning public procurement contracts on firms' survival

IPEA also conducted an evaluation of how winning government contract affects firms' survival, with a focus on variations between periods of economic crisis and expansion. Its study takes into account the different phases of the economic cycle, such as contraction and expansion phases. Brazilian firms operating from 2012 to 2019 were studied. While this period does not consider the impacts of the COVID-19 pandemic, it covers the market business cycle phases in Brazil, encompassing two expansions and one contraction. Even though all firms can bid in the public procurement process, MSEs have special treatment in order to drive part of public sector demand to these firms. While prior studies in Brazil have examined factors influencing firm survival, none have explored the effects of public procurement or considered variations across the business cycle.

3.5.1 Data

Data from the federal Transparency Portal established by the CGU in 2004 are combined with the RAIS administrative data for the analysis. Using federal Transparency Portal data, it is possible to identify all the enterprises that have received federal payments since 2004. Additionally, *Lei Complementar* (Supplementary Law) 131 in 2009 also established the mandatory disclosure of similar data by all levels of government including states and municipalities. Data were collected from all state and federal transparency portals and aggregated at the enterprise level.

The states differed in the amount of information collected and in the years for which the information is available. The final panel dataset includes 14 states between 2012 and 2019. After cleaning the data to keep only information on verified enterprises, 714,064 enterprises were identified to have received state payments between 2012 to 2019, and 1,492,852 enterprises have received federal payments. There were 171,967 enterprises that received both state and federal payments. In total, there were 2,034,949 enterprises that received state or federal payments, and 82.7 per cent of these were matched to RAIS data,

► **Table 10. Firms receiving federal and state payments**

Federal payments	State payments		Total
	No	Yes	
No	0	542 097	677 945
Yes	1 320 885	171 967	1 492 852
Total	1 320 885	714 064	2 034 949

Source: Compilation by authors based on data of transparency portals.

After excluding firms that are inactive and public companies, the final sample comprises a little more than 6 million enterprises (Table 11).

► **Table 11. Total number of enterprises and those that received state or federal payments (in thousands)**

Year	Number of enterprises in RAIS	Total number of enterprises in RAIS and transparency portals (received state or federal payments)	Percentage that received state or federal payments
2012	6 334	69	1.1
2013	6 592	76	1.1
2014	6 350	230	3.5
2015	6 397	217	3.3
2016	6 334	211	3.2
2017	6 347	209	3.2
2018	6 351	208	3.2
2019	5 809	197	3.3

Note: *For 2012 and 2013, the firms in the transparency portals only refer to those that received state — and not federal — payments.

Source: Compilation by authors based on data of RAIS and transparency portals.

3.5.2 Estimation strategy

The impact cannot be measured by a simple comparison of the survival rates of firms that won a government contract and those that have not won a government contract, as these two types of firms can differ in important ways. For example, firms that engage in public procurement are likely more technically savvy, bigger and better resourced than firms that do not engage in public procurement, as these attributes contribute to participation and success in public procurement. Because these attributes also contribute to firm survival outside of their effect on the likelihood of winning a public procurement contract, any such comparison would lead to biased estimates of the effect of winning a government contract.

A firm survival outcome variable is defined as surviving up to at least a third year of operation. Difference-in-differences estimator was used to estimate the impact of winning a government contract in any of the first two years on the probability of survival of firms. The model considers the exogenous variables in a linear and simple way, and is estimated for different periods between 2014 and 2017, corresponding to the years in which the firms completed their third year of existence. The model compares the changes in survival between the firms that have a contract with the government (treatment group) and those that do not have (control group), taking into account the effects of the economic cycle. It has to be noted that the period covered by the study includes two recessions and one expansion. Therefore, an assumption is made that the effect of obtaining a public contract on the survival of firms may differ during a recession and an expansion period, and this is taken account in the model specifications for estimation, detailed in Annex C.³⁹ A Kaplan-Meier estimator was then used to validate the results.

3.5.3 Descriptive statistics

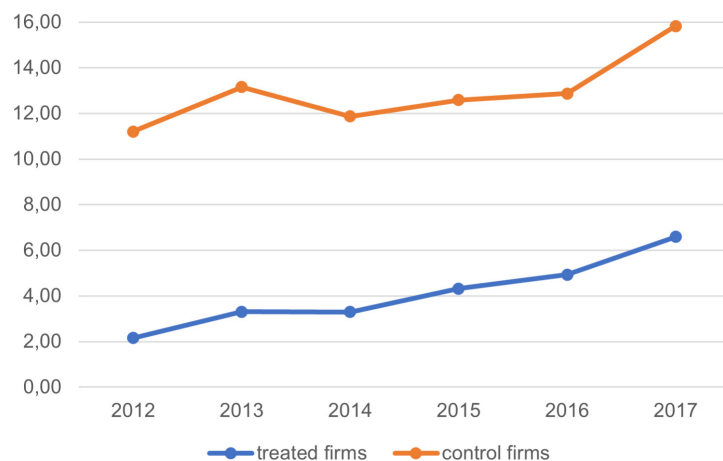
Figure 8 displays descriptive insights into how the probability of firms exiting the market varies between those that secured a public contract and those that did not. Firm's exit rates conditioned on other firms' characteristics of age and size groups are also illustrated. The first group of firms is referred to as treated firms (or treatment group) and the second group, as control firms (or control group).

³⁹ The estimation equation takes the following form:

$$y_{it} = \beta_1(G_{it} \times P_t) + \beta_2 G_{it} + \varnothing_{st} + \rho_{rt} + \delta_t + \varepsilon_{ikt}$$

where i indexes the firm, t indexes year, s indexes the (3-digits) industry, and r denotes regions of the country. G is a dummy variable that indicates whether the firm won a public contract in its first two years of life, and P indicates whether the year was a recession year. $\varnothing_{st}$ represents sector and year fixed-effects, and ρ_{rt} represents geographical region (of the enterprise) and year fixed-effects, δ_t represents year fixed-effects. β_1 and β_2 report the effect of obtaining a public contract on survival and the relative effect of obtaining a public contract in time of crises versus expansion. β_2 is the main difference-in-differences estimate. A more detailed explanation is found in Annex C.

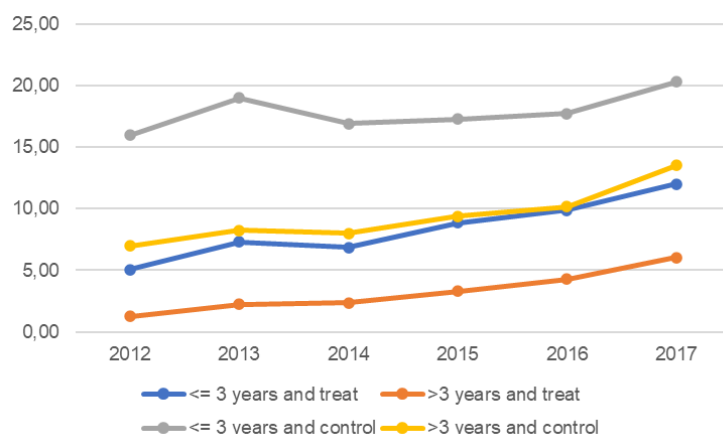
► **Figure 8. Exit rate by treatment status**



Source: Authors' illustration based on data of RAIS and transparency portals.

Differences in exit rates between firms with (treated) and without (control) a public contract are much bigger than differences within groups across phases of the business cycle. According to Figure 8, the difference in exit rates between treated and control firms amounts to roughly 10 percentage points. Within both groups, the exit rate does not vary more than 5 percentage points between the expansionary and recession periods. Such huge differences across the two groups of firms may reflect differences in groups composition relative to other determinants of the exit probability. Hence, Figure 9 illustrates the evolution of exit rates for the two groups of firms grouped by age categories. Public purchase contracts seem to affect a firm's probability of exit heterogeneously according to its position in its life cycle. Compared to older firms, newer enterprises (established within the past 3 years) seem to get much more benefit from selling to government. In sum, firms that win public purchase contracts — especially newer ones — face much lower risk of exit.

► **Figure 9. Exit rate by treatment status and age category**



Source: Authors' illustration based on data of RAIS and transparency portals.

3.5.4 Key findings

The analysis does not distinguish between MSEs and non-MSEs, and so the conclusion applies to both. On average, firms that won a public procurement contract with the government in its first two years of operation have a greater probability of surviving until the third year than those that have not. However, this effect is attenuated in periods of economic crisis (as shown by the negative and significant coefficient of the interaction between public procurement and periods of crisis).

A public procurement contract was estimated to have increased a firm's probability of survival by about 28 to 34 percentage points, depending on the type of public contract (from which level of government that grants them). Federal contracts have a greater effect than state contracts, significantly increasing the probability of survival of the firms that win them. Firms that receive both contracts have an even higher probability of surviving. The estimation results are presented in Annex C, Table C1.

While winning a public contract increased a firm's probability of survival, by how much was contingent on the phase of the business cycle. Firms that started during economic crises experienced weaker immediate benefits from public contracts in their first year, as they were more vulnerable to adverse shocks. Even the potential positive effects of government procurement were insufficient to shield them from the threats posed by economic crises. During times of recession, effects are slightly more muted, increasing the probability of survival by 27 to 33 percentage points instead of 28 to 34 percentage points—a decline of about one to two percentage points. The finding was robust under different specifications.

► Conclusions

Regulations favouring MSEs in public procurement have been in place for nearly two decades in Brazil, and its public procurement expenditure relative to GDP aligns with OECD average. Drawing on literature and impact assessments conducted by Brazil's IPEA, this study highlights key findings on the effectiveness of preferential programmes for MSEs, offering valuable insights into policymaking for MSMEs.

In term of methodological techniques, the assessments employed highly technical but widely accepted impact evaluation techniques and used large firm-level panel data that is unique to Brazil. Specifically, regression discontinuity design, difference-in-differences methodology and its variant — triple differences — were applied using data from Comprasnet, SIASG, RAIS and the Transparency Portals including a federal and 14 states.

The main findings of the impact assessment are highlighted as follows.

1. In Brazil's public procurement, the federal government offers more contract opportunities for MSEs than state governments, but the average federal payments to MSEs are lower compared to those from state contracts. The paper's analysis shows that the policies supporting MSE participation in public procurement have been effective.
2. The set-aside programme has increased the number and share of MSEs participating in public procurement, as well as the share of MSEs that are awarded public contracts. The set-aside policy was also effective in encouraging younger firms to participate in public bids. However, the policy also has downsides. The rise in the number of MSEs apparently came at the expense of a net reduction in the total number of bidders, or reduced competition. In terms of pricing, contracts under the set-aside policy experienced significant price increases and lower discounts on the reserve price. Fewer bidders and higher prices, reinforced by the lower discount on reserve price, can indicate some signs of collusive behaviour, such as cover bidding (fake competition) and missing bids.
3. The extra time for compliance policy mandated in Supplementary Law 147/2014 significantly increased the probability that a lowest bidder classified as MSE secures a public contract award, particularly for MSEs outside the SIMPLES tax regime. This study is limited to descriptive statistics on the benefits of fictitious tie status. Future research is recommended to separately assess whether preferential treatment through fictitious tie effectively increases the award rate for MSEs, either by using more robust structural modelling approach or by identifying some novel natural experiment that may provide a valid control group.
4. Overall, Brazilian procurement policy intervention favouring MSEs has been demonstrated to be effective in benefiting MSEs that participate in public tenders by boosting their contract awarded rate. Their winning of public procurement contracts then positively impacts their survival rate. Securing a public contract enhances a firm's survival probability in both expansionary and crisis periods, even though the positive impact is tempered during economic downturns. The impact of public procurement contracts on firm survival was contingent on the level of government awarding them. Federal contracts exert a more pronounced effect than state contracts, significantly increasing the probability of survival for recipient firms. Firms that receive both contracts have an even higher probability of survival.

This paper's findings show the effectiveness of public policy favouring MSEs in public procurement in Brazil. It stands out as an exemplary case study for MSE support, given that MSEs contribute significantly to the country's employment and value added, have extensive support at various government levels. Moreover, this paper illustrates the use of empirical study techniques in impact assessment and leveraging rich firm-level data as evidence base to inform policy revision.

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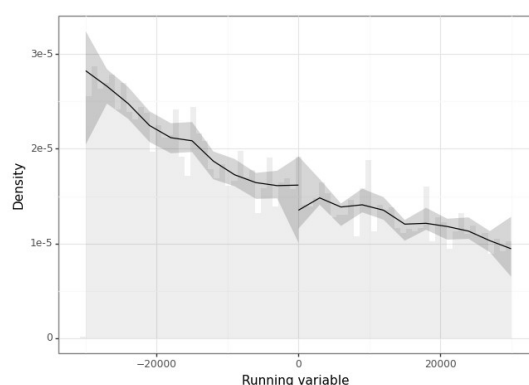


► **Annex A:** **Impact assessment of the set-aside policy**

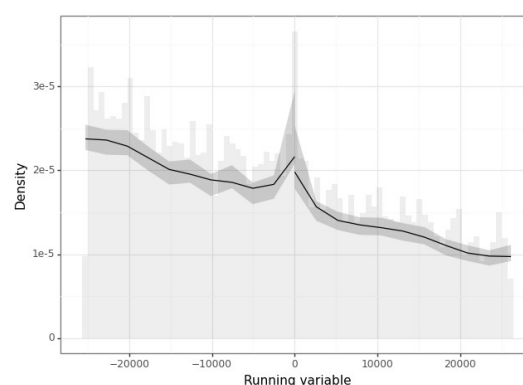
A1. Test of manipulation for running variables: Preliminary (lack of) evidence on non-random selection

Figures A1 and A2 present the results graphically, while Table A1 shows the used specification and values. The test failed to reject the null hypothesis of no manipulation into treatment for both analysed periods.

► **Figure A1. Manipulation test - 2012–2014.**



► **Figure A2. Manipulation test - 2016–2018.**



For additional evidence of balanced samples on either side of the threshold, the authors ran a regression with four different subsamples, comprising the distribution of procuring entities by four major government activities; namely education, health, public administration, and army with the following model:

$$y_i = \beta_1 runvar_i + \beta_2 less80k_i + \mu_p + \lambda_t + \epsilon_i, \quad (1)$$

Where y is a procuring entity sectoral dummy; $runvar$ is the distance to the threshold; $less80k$ is a dummy equal to 1 for reference values under 80k and 0 otherwise; μ are product fixed effects; λ are trimester fixed effects; and ϵ is the error term. Tables A1 and A2 show the results. Again, no evidence of manipulation is found, as shown by the lack of significance in the $less80k$ dummy.

► **Table A1. Manipulation in subsamples (2012–2014)**

VARIABLES	(1) Education	(2) Health	(3) Army	(4) Public administration
runvar	-3.14e-07 (7.54e-07)	1.16e-06** (4.98e-07)	-5.23e-07 (7.41e-07)	2.26e-07 (8.00e-07)
less_80k	0.00621 (0.0214)	0.0188 (0.0142)	-0.00775 (0.0211)	-0.0119 (0.0227)
Observations	6 252	6 252	6 252	6 252
R-squared	0.000	0.001	0.000	0.000

Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

In sum, there is no strong evidence of lots being non-randomly selected to the left or right of the BRL80,000 threshold. Therefore, it validates the approach of assessing effects of the set-aside regime by comparing those lots with values just above and just below the BRL80,000 threshold, as done in the sharp RDD strategy.

► Table A2. Manipulation in subsamples (2016-2018)

VARIABLES	(1) Education	(2) Health	(3) Army	(4) Public administration
runvar	3.65e-07 (6.62e-07)	6.75e-07* (4.04e-07)	-1.99e-06*** (6.39e-07)	-4.95e-07 (6.79e-07)
less_80k	0.0102 (0.0183)	0.0181 (0.0111)	-0.0326* (0.0176)	-0.0134 (0.0187)
Observations	8 491	8 491	8 491	8 491
R-squared	0.000	0.000	0.002	0.000

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

A2. Estimation results on participation and composition of the bidders

In assessing the participation and composition of the bidders, dependent variables include: (1) total number of bidders in the lot, regardless of size; (2) number of MSEs bidding in the lot; (3) ratio of MSEs bidding in the lot; (4) ratio of MSEs awarded contracts; (5) the average age of all bidders in the lot; (6) Open auction ratio — a dummy indicating whether the bidders lower their bids when the open bid stage is opened (they may refrain from proceeding and in case the front-runner's bid is compatible with the reserve price, the auctioneer may close the auction and call the front-runner to produce its documentation); (7) the level of the discount obtained off the reserve price; (8) distance of the awarded supplier to the farthest purchasing agency (as the dataset includes frame contract awards). In assessing the effects of the set-asides on prices in other dimensions: (9) the price in natural logarithm; (10) the ratio between price and the reserve price in natural logarithm. A few collusive markers include (11) coefficient of variation of bids⁴⁰; (12) skewness of the bid distribution⁴¹; and (13) Kurtosis⁴² of the bid distribution.

⁴⁰ $CV_t = \frac{S_{b_t}}{b_t}$; where b_t is the average of all bids, and s_{b_t} is their standard deviation. Normalization by the mean renders this statistic invariant to scale and therefore amenable to comparisons across lots of different product categories.

⁴¹ $Sk_t = \frac{n_t}{(n_t-1)(n_t-2)} \sum_{i=1}^{n_t} \frac{(b_{it}-b_t)^3}{(S_{b_t})^3}$ where n_t denotes the number of bidders in tender t . If the differences in the covering bids are small and if the differences in the first and second lowest bids are significant, the asymmetry will be more evident. Therefore, a greater negative asymmetry is expected to be found for the (biased) distribution of bids within the collusive tenders.

⁴² $Kurt_t = \frac{n_t(n_t+1)}{(n_t-1)(n_t-2)(n_t-3)} \sum_{i=1}^{n_t} \frac{(b_{it}-b_t)^4}{(S_{b_t})^4} - \frac{3(n_t+1)^2}{(n_t-2)(n_t-3)}$ where n_t denotes the number of bidders in tender t . Thus, if there is a transformation in the distribution of bids, and the kurtosis statistic reaches higher values, evidence of bid convergence is inferred, probably arising from communication among the bidding ring members.

► **Table A3. 2016–2018**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Number of bidders	Number of MSEs	MSE ratio	Ratio of MSEs awarded	Mean company age	Open auction ratio	Discount	Distance to Supplier	ln(price)	ln(ratio)
RD_estimate	–0.119	3.025***	0.513***	0.613***	–53.968***	0.001	–0.007	–65.202	0.958***	0.015*
Observations	[5 769; 3 721]	[4 809; 3 347]	[4 975; 3 408]	[7 179; 4 315]	[6 516; 4 044]	[8 262; 4 694]	[5 885; 3 765]	[5 784; 3 721]	[6 403; 4 001]	[4 804; 3 346]
Robust 95% CI	[–1.486; 1.392]	[1.679; 4.361]	[0.442; 0.602]	[0.497; 0.699]	[–74.066; –33.732]	[–0.098; 0.079]	[–0.094; 0.066]	[–304.403; 146.886]	[0.414; 1.560]	[–0.131; 0.165]
Kernel type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular
Conventional std. error	0.628	0.587	0.035	0.043	8.728	0.038	0.033	98.275	0.246	0.065
Conventional p-value	0.850	0.000	0.000	0.000	0.000	0.978	0.837	0.507	0.000	0.823
Robust p-value	0.949	0.000	0.000	0.000	0.000	0.838	0.726	0.494	0.001	0.823
Order loc. poly (p)	1	1	1	1	1	1	1	1	1	1
Order bias (q)	2	2	2	2	2	2	2	2	2	2

Optimal bandwidth. Estimates based on local regressions implemented with rdrobust package. Optimal bandwidth obtained following Calonico et al. (2020) We use a triangular kernel with a linear local polynomial and quadratic bias. *** p < 0.01, ** p < 0.05, * p < 0.1

► Table A4. 2012–2014

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Number of bidders	Number of MSEs	MSE ratio	Ratio of MSEs awarded	Mean company age	Open auction ratio	Discount	Distance to supplier	ln(price)	ln(ratio)
RD_estimate	0.472	1.767	0.265	0.040	–103.645	0.095	0.011	–307.909	0.718	–0.049
Observations	[5 223; 3 376]	[5 977; 3 644]	[6 209; 3 720]	[6 004; 3 651]	[4 648; 3 147]	[7 218; 4 022]	[2 570; 2 043]	[6 340; 3 764]	[5 857; 3 600]	[5 576; 3 499]
Robust 95% CI	[–10.144; 6.363]	[–5.435; 8.316]	[–0.251; 0.740]	[–0.695; 0.710]	[–276.853; 1.406]	[–0.451; 0.578]	[–0.799; 0.459]	[–1383.307; 1004.367]	[–2.488; 4.350]	[–1.198; 0.924]
Kernel type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular
Conventional std. error	3.068	2.570	0.189	0.266	52.950	0.196	0.246	445.885	1.300	0.405
Conventional p-value	0.878	0.492	0.160	0.882	0.050	0.629	0.966	0.490	0.581	0.904
Robust p-value	0.653	0.681	0.334	0.982	0.052	0.808	0.596	0.756	0.594	0.800
Order loc. poly (p)	1	1	1	1	1	1	1	1	1	1
Order bias (q)	2	2	2	2	2	2	2	2	2	2

Optimal bandwidth. Estimates based on local regressions implemented with rdrobust package. Optimal bandwidth obtained following Calonico et al. (2020). We use a triangular kernel with a linear local polynomial and quadratic bias.

► Table A5. 2SLS Optimal bandwidth (2016–2018)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Number of bidders	Number of MSEs	MSE ratio	Ratio of MSEs awarded	Mean company age	Open auction ratio	Discount	Distance to supplier	ln(price)	ln(ratio)
set_aside	-1.960*** (0.484)	0.687* (0.385)	0.377*** (0.0263)	0.541*** (0.0386)	-53.24*** (8.588)	-0.0814** (0.0378)	-0.107* (0.0599)	29.67 (97.07)	0.292*** (0.0753)	0.0834 (0.0665)
runvar	1.94e-05*** (6.42e-06)	1.19e-05** (4.86e-06)	-3.71e-07 (3.10e-07)	-4.19e-07 (3.78e-07)	1.65e-05 (0.000108)	-1.53e-08 (5.53e-07)	-1.80e-06 (3.00e-06)	7.84e-05 (0.000971)	-2.17e-07 (9.82e-07)	-2.16e-06** (9.29e-07)
runvar2	-2.10e-10 (3.12e-10)	1.01e-10 (2.22e-10)	0** (0)	-0 (0)	-8.46e-10 (4.96e-09)	-5.15e-11* (0)	7.47e-10 (6.12e-10)	-2.67e-08 (3.31e-08)	0 (0)	0 (0)
Observations	8 411	8 887	9 621	11 777	8 886	7 573	2 074	11 473	8 585	7 933
R-squared	0.070	0.005	0.370	0.297	0.108	0.012	0.008	-0.001	0.019	0.011

Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. Estimates based on local regressions using 2SLS method implemented with the ivregdfe package, controlling for product and quarter fixed effects. Optimal bandwidths obtained following Calonico et al. (2020) as implemented in the rdrobust package, using data after demeaning product fixed effects.

► Table A6. 2SLS Optimal bandwidth (2012–2014)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Number of bidders	Number of MSEs	MSE ratio	Ratio of MSEs awarded	Mean company age	Open auction ratio	Discount	Distance to supplier	ln(price)	ln(ratio)
set_aside	-1.404 (2.108)	0.394 (1.796)	0.140 (0.135)	0.145 (0.210)	-22.31 (34.31)	0.109 (0.174)	0.107 (0.194)	-354.4 (449.9)	-0.591 (0.471)	-0.00887 (0.378)
runvar	7.85e-06 (7.30e-06)	5.19e-06 (6.71e-06)	-1.03e-07 (4.31e-07)	-6.48e-07 (6.42e-07)	2.46e-05 (7.66e-05)	8.24e-07 (5.19e-07)	1.38e-06 (8.75e-07)	-0.000457 (0.00142)	-7.18e-07 (1.66e-06)	-2.12e-06* (1.22e-06)
runvar2	-6.55e-10* (3.43e-10)	-3.30e-10 (3.34e-10)	0* (0)	-0 (0)	3.10e-09 (2.49e-09)	-0 (0)	-0 (5.22e-11)	-3.19e-08 (5.11e-08)	-0 (8.10e-11)	0 (0)
Observations	5 868	5 460	6 587	7 110	9 743	7 352	4 451	6 829	5 718	6 543
R-squared	0.007	0.004	0.069	0.036	0.010	-0.007	-0.003	-0.007	-0.051	0.003

Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. Estimates based on local regressions using 2SLS method implemented with the ivregdfe package, controlling for product and quarter fixed effects. Optimal bandwidths obtained following Calonico et al. (2020) as implemented in the rdrobust package, using data after demeaning product fixed effects.

► Table A7. Collusive price markers (Estimation result for 2016–2018)

Variables	(1) Coefficient of variation	(2) Skewness	(3) Kurtosis	(4) Single bid
set_aside	-0.613*** (0.0570)	-0.350*** (0.146)	0.387 (0.469)	0.108*** (0.0325)
runvar	6.97e-07 (6.69e-07)	-9.63e-07 (2.21e-06)	4.55e-06 (5.59e-06)	3.28e-07 (3.92e-07)
runvar2	1.48e-11 (2.70e-11)	-9.69e-11 (1.23e-10)	8.67e-11 (2.38e-10)	2.68e-11 (1.70e-11)
Observations	9 670	7 268	9 420	9 308
R-squared	0.024	0.010	0.006	0.017

Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. Notes: estimates of a two stage least squares approach (using the ivreghdfe package and controlling for product and quarter fixed effects) with the optimal bandwidth given by the rdrobust package after controlling for quarter and product fixed effects (2016–2018).

► Table A8. Collusive price markers (Estimation result for 2012–2014)

Variables	(1) Coefficient of variation	(2) Skewness	(3) Kurtosis	(4) Single bid
set_aside	0.0903 (0.210)	0.0877 (0.523)	0.639 (1.902)	-0.191 (0.119)
runvar	3.40e-07 (5.08e-07)	-4.69e-07 (1.28e-06)	-2.69e-08 (4.91e-06)	-3.61e-07* (2.05e-07)
runvar2	1.24e-11 (1.68e-11)	-2.90e-11 (4.19e-11)	-1.36e-10 (1.65e-10)	4.96e-12 (5.07e-12)
Observations	9 030	8 942	8 409	13 593
R-squared	-0.004	-0.002	-0.005	-0.031

Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. Notes: Estimate of a two stage least squares approach (using the ivreghdfe package and controlling for product and quarter fixed effects) with the optimal bandwidth given by the rdrobust package after controlling for quarter and product fixed effects (2012–2014).

► Annex B: Extra time for compliance, SIMPLES regime and fictitious tie mechanism for MSEs

B1. Model specifications

The equation adopted for the triple differences estimation is the following:

$$\begin{aligned} low_win_{i,t} = & \alpha + \delta_k + \beta_1 low_mse_{i,t} + \beta_2 non_simples_k + \beta_3 non_simples_k \times low_mse_{i,t} + \beta_4 post_{i,t} \\ & + \beta_5 low_mse_{i,t} \times post_{i,t} + \beta_6 non_simples_k \times post_{i,t} + \beta_7 non_simples_k \times post_{i,t} \times low_mse_{i,t} \\ & + \varepsilon_{i,t} \end{aligned}$$

where $low_win_{i,t}$ is a dummy that indicates if firm i , which was the lowest bidder for a tender lot occurred at time t , was awarded the public bid; δ_k represents fixed effect for industry k ; $non_simples_k$ is a dummy to indicate if firm i industry classification k was non-eligible for *SIMPLES* until 2017; $low_mse_{i,t}$ is a dummy to indicate if the lowest bidder (firm i) declared MSE status at time t ; $post_{i,t}$ is a dummy for the period after the enactment of Supplementary Law 147/2014. Other variables are the interactions between these explanatory variables.

B2. Regression results

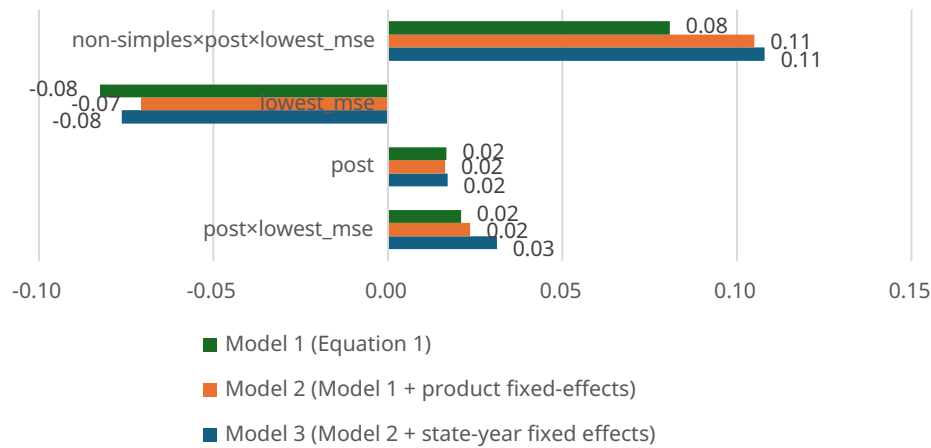
► Table B1. Regression results

Variables	(1) FE - Industry	(2) FE - Prod/Industry	(3) FE - Prod/Ind/State-Yr
non_simples_post_low_mse	0.0808*** (0.0217)	0.105*** (0.0219)	0.108*** (0.0218)
low_mse	-0.0825*** (0.00160)	-0.0708*** (0.00168)	-0.0762*** (0.00169)
post	0.0168*** (0.00182)	0.0164*** (0.00185)	0.0171*** (0.00348)
low_mse_post	0.0209*** (0.00229)	0.0236*** (0.00233)	0.0312*** (0.00236)
non_simples	-0.163*** (0.0144)	-0.237*** (0.0160)	-0.237*** (0.0159)
non_simples_low_mse	0.226*** (0.0142)	0.275*** (0.0151)	0.263*** (0.0150)
non_simples_post	-0.119*** (0.0200)	-0.149*** (0.0202)	-0.149*** (0.0201)
Constant	0.847*** (0.00118)	0.840*** (0.00121)	0.841*** (0.00171)
Observations	538 217	531 274	531 274
R-squared	0.037	0.096	0.116

Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

In the first column we report estimates for the coefficients and the respective standard errors (in parenthesis) relative to a regression model corresponding to the one in equation 2. In the next two columns, we report analogous results obtained from regression models which sequentially incorporates product type fixed effects, and state $\times$ year fixed effects.

► Figure B1. Effect on probability of being awarded tender lot



Notes: All coefficients are significant at the 1% level. See Fiuza et al. (2024) for the full regression results.

Figure B1 depicts in graphical form the main results of the statistical analysis. For MSEs not under *SIMPLES*, the effect of the time extension policy was to increase the probability of a lowest bidder self-declared as MSE being awarded by 8 to 11 percentage-points (coefficient of the *non_simples x post x lowest_mse* variable). The effect is given as a range, although a fairly narrow one, because different specifications of the triple differences model yield slightly different estimates of the impact of the time extension policy. The different models correspond to different control variables added in the regression model. Model 1 corresponds to column 1 in Table B1. Model 2 corresponds to Model 1 plus additional variables that control for the type of products being auctioned. Model 3 corresponds to Model 2 plus additional variables that control for state and year of auction. The results are fairly robust.

Figure B1 also shows that in general the MSEs are disadvantaged. MSEs with the lowest bid have lower probability than non-MSEs of eventually being awarded the lot (coefficient of the *lowest_mse* variable). In general, post-policy change, the probability of being awarded a lot for the lowest bidder was higher (coefficient of *post* variable). But for MSEs in particular, the probability of being awarded a lot for the lowest bidder post-policy change was higher (coefficient of the *post x lowest_mse* variable).⁴³

⁴³ The authors note that the identification of the coefficient of the triple interaction term relies on more credible hypothesis than those needed for identification of coefficients on the other “lower order” interaction terms.

B3. Fictitious tie status

► **Table B2. Acceptance rate of the lowest bidder, before and after Decree 8538**

	Fictitious tie		No fictitious tie	
	Before Decree 8538	After Decree 8538	Before Decree 8538	After Decree 8538
SIMPLES	0.652	0.675	0.728	0.737
Non-SIMPLES	0.706	0.721	0.807	0.825

► **Table B3. Auctions with fictitious tie, by number of companies in the tiebreaker and number of non-MSEs awarded, before and after Decree 8538/2014**

Number of bidders in tie-breaker	Number of lots		Number of lots awarded to non-MSEs		Ratio	
	Before Decree 8538	After Decree 8538	Before Decree 8538	After Decree 8538	Before Decree 8538	After Decree 8538
1	21 117	7 260	10 163	3 480	0.420	0.428
2	2 527	753	745	209	0.240	0.238
3	449	104	113	23	0.198	0.184
4	91	15	18	2	0.148	0.095
5	18	2	1	0	0.032	0.000
6	7	2	2	0	0.154	0.000
7	4	2	1	0	0.167	0

► Annex C: Impact of winning public procurement on bidders' survival rate

C1. Estimation methodology

The determinants of the survival variable are modelled as follows.

$$y_{it} = \beta_1(G_{it} \times P_t) + \beta_2 G_i + \beta_3 P_t + \beta_4 R_t + \beta_5 Y_t + \beta_6 \varepsilon_{ikt}$$

where i indexes the firm, t indexes year, s indexes the (3-digits) industry, and r denotes regions of the country (micro regions). β_1 , our main coefficient of interest, reports the relative effect of obtaining a public contract in time of crises vs expansion.

The study employs a difference-in-differences strategy, using a binary variable that indicates whether the firm won a public contract in one of its first two years of life ($G_i = 1$), a binary variable that indicates whether the year was of crisis ($P_t = 1$) or of non-crisis ($P_t = 0$), and the interaction between them. In addition, we include fixed effects of year, region $\times$ year, and sector of activity $\times$ year.

The coefficient of the interaction is the differential effect that we seek to estimate. As a dependent variable, we use the probability of a firm " i " reaching the third year of life in RAIS in the year " t " ($y_{it} = 1$). We consider as treated the firms that had a public contract in the first or second year of life. If the firm ceased operations in the second year, we use the information from the first year to define the variable G_i . We estimate the model in a linear manner, given the convenience of interpreting the interaction terms.

The sample consists of all firms that appeared at least once in RAIS between 2014 and 2017. These firms may have "born" in 2012, if they had three years in 2014, or 2013, if they had three years in 2015.

In a second step, we restrict the sample to firms that were in sectors (three digits) and in microregions where there was at least one firm contemplated with public procurement in their first two years of life. This restriction aims to ensure a common support criterion between the contemplated and non-contemplated firms.

Finally, the model specification above allows for heterogeneity of effects of the crisis (or any macroeconomic shock) on the regions and sectors; by including dummy variables of interaction between aggregate sector (two digits) and year, and between macro-region and year.

This strategy allows us to estimate consistently the effect of public procurement on the survival of newly born firms. The public procurement variable works as a treatment that affects the probability of the firms staying in the market after three years. By comparing the firms that received the treatment with those that did not, controlling for other relevant variables, we can identify the causal impact of public procurement on the survival of the firms.

Robustness check by Kaplan-Meier estimator: The Kaplan-Meier model enabled us to estimate the probability of a company surviving at each point in time, considering right censoring (for example, that are still in operation after the third year). This allowed us to compare survival between companies that received benefits and those that did not, providing valuable insights into the impact of these benefits on company survival.

The results in tables C1 to C3 confirm that public contracts tend to increase the chances of survival (see positive coefficients reported in the first line of the three tables) but this effect is reduced during recessionary periods (see negative coefficients reported for the interaction term).

C2. Estimation results

► **Table C1. Effect of public procurement and economic cycle on firm survival: evidence from the difference-in-differences model**

Variables	(1)	(2)	(3)	(4)
Public contract	0.302*** (0.002) [0.000]	0.270*** (0.002) [0.000]	0.290*** (0.001) [0.000]	0.316*** (0.002) [0.000]
Public contract * crisis	-0.013*** (0.002) [0.000]	-0.006 (0.003) [0.106]	-0.009*** (0.002) [0.000]	-0.017*** (0.004) [0.000]
Type of contract	Federal	State	Federal or State	Federal and State
Observations	2 836 721	2 836 721	2 836 721	2 836 721
R-squared	0.048	0.044	0.049	0.043

Note: Cells present regression coefficients with clustering standard errors at the firm level in parentheses and p-value in brackets *** p<0.01, ** p<0.05, * p<0.1). The dependent variable in the regression is firm survival.

► **Table C2. Effect of public procurement and economic cycle on firm survival: evidence from the difference-in-differences model**

Variables	(1)	(2)	(3)	(4)
Public contract	0.302*** (0.002) [0.000]	0.269*** (0.002) [0.000]	0.290*** (0.001) [0.000]	0.315*** (0.002) [0.000]
Public contract * crisis	-0.013*** (0.002) [0.000]	-0.004 (0.003) [0.304]	-0.009*** (0.002) [0.000]	-0.014*** (0.004) [0.000]
Type of contract	Federal	State	Federal or State	Federal and State
Observations	2 835 235	2 581 800	2 835 514	2 465 155
R-squared	0.048	0.043	0.049	0.041

Note: Cells present regression coefficients with clustering standard errors at the firm level in parentheses and p-value in brackets *** p<0.01, ** p<0.05, * p<0.1). The dependent variable in the regression is firm survival. The sample of firms that had public procurement peers in their sector and region.

► **Table C3. Effect of public procurement and economic cycle on firm survival: evidence from the difference-in-differences model**

Variables	(1)	(2)	(3)	(4)
Public contract	0.335*** (0.001) [0.000]	0.281*** (0.002) [0.000]	0.316*** (0.001) [0.000]	0.343*** (0.002) [0.000]
Public contract * crisis	-0.016*** (0.002) [0.000]	0.007** (0.003) [0.047]	-0.008*** (0.002) [0.000]	-0.008** (0.004) [0.035]
Type of contract	Federal	State	Federal or State	Federal and State
Observations	3 125 427	3 849 997	3 125 712	2 739 607
R-squared	0.043	0.037	0.045	0.035

Note: Cells present regression coefficients with clustering standard errors at the firm level in parentheses and p-value in brackets *** p<0.01, ** p<0.05, * p<0.1). The dependent variable in the regression is firm survival. The sample of firms that had public procurement peers in their sector and region.

(1) **Model 1:** Federal contract

(2) **Model 2:** State contract

(3) **Model 3:** Federal or state contract

(4) **Model 4:** Federal and state contract

► **Annex D:** **IPEA institutional directory**

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