SMEs and Public Procurement: the Costs of Restricting Tenders

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Abstract

While there are numerous examples of policies that benefit small and medium-sized enterprises (SMEs) worldwide, research offers little direct evidence on the benefits of such policies for the economy. Additionally, assessments of the costs of implementing such policies are practically ignored in the literature. This paper exploits a quasi-experimental variation from a program incentivizing the restriction of public tenders to SMEs in Sao Paulo, Brazil, to estimate this policy's costs. The way that this institutional change occurred allows me to assess those costs only indirectly. Using detailed data on public procurement and a variation of the standard DiD method (difference-in-differences in reverse), I estimate the pre-intervention effects of the policy shift. I find that before the policy shift, for group 65 (the 'switched' group) in comparison with other groups (the 'always treated' group): (i) the negotiated prices were lower (between 4.58% and 8.08%); (ii) the number of participants was approximately 22% higher; and (iii) the number of valid bids was approximately 25% higher. These results suggest that the policy of incentivizing the restriction of public tenders to SMEs may severely undermine the quality and efficiency of the public procurement process. Finally, before the policy change, sellers who won tenders for group 65 were more distant from the public buyer units (approximately 4 km). This result may indicate that the policy change has successfully induced more local suppliers to win more bids for this group of items.

Keywords: public procurement, small and medium-sized enterprises, policy costs, restricted public tenders, difference-in-differences in reverse.

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1 Introduction

Small and medium-sized enterprises are economically important in countries worldwide. In Europe, for instance, SMEs represent nearly 99.8% of all registered companies, accounting for more than half of the European GDP and two-thirds of all jobs in the private sector (PwC 2014). Similar figures can be observed in Brazil, where approximately 97% of all firms are SMEs[2], representing approximately 50% of Brazil's formal jobs (Bastos et al. 2018).

In recent years, governments worldwide have implemented public policies that favor SMEs based on the potential or actual benefits that these policies can bring to the economy.

The literature widely acknowledges that SMEs have massive potential for job creation, local development, and innovation (SIGMA 2016). However, there is limited evidence on the social costs of such policies, since most research and case studies do not address this point. This paper exploits a quasi-experimental variation from a public SME-related program to estimate the costs of incentivizing restricted public tenders to SMEs in Sao Paulo, Brazil.

The use of public procurement as a policy tool has been a major trend worldwide (Thai 2017). Policies that favor sustainable or '*green'* procurement[3] or utilize

[2] This terminology varies slightly from country to country. In Brazil, the term most widely used to refer to these companies is 'small and micro enterprises', which is equivalent to the term SMEs in the international literature.
[3] Public tenders with environmentally oriented procurement goals. See also (Lundberg and Marklund 2018).

social criteria to restrict bids to a target group of sellers[4] are prime examples of public procurement policy that aims to achieve social and economic outcomes.

One of the most widespread practices to promote local development through public procurement is the restriction of public tenders to SMEs. The significant presence of SMEs in the economy suggests that these companies are an essential channel through which to infuse economic development (de Mel, McKenzie, and Woodruff 2008; Freedman 2013), although there is evidence that the effectiveness of this mechanism depends on the quality of management practices (McKenzie and Woodruff 2015) or how capital is provided through investment in SMEs (Fafchamps et al. 2014).

The primary justifications for implementing policies that favor SMEs in public procurement are related to the various entry barriers to public tender that SMEs face (OECD 2018; Loader 2015; Hoekman and Tas 2020). Better access to the public procurement market might catalyze SMEs' productive potential, especially in contexts with demand constraints (Cardoza et al. 2016; Ferraz, Finan, and Szerman 2016). It may expand government networks of goods and services providers, thus enhancing the competition among firms and enabling public acquisitions at more competitive prices (Loader 2013).

Despite the potential positive effects generated by favoring SMEs in public tenders, such a policy may undermine the quality and efficiency of the public

[4] 'Social' public procurement refers to policies that favor specific social groups in public tenders, such as woman-owned companies or companies with minimum labor standards. See also (McCrudden 2007).

procurement process (Nakabayashi 2013). First, it may lead to smaller-scale purchases per bid because SMEs generally cannot handle large orders.

Second, restricting public bid participation may harm firms' screening process and increase the likelihood of selecting fewer, less efficient firms or no firms at all (Nakabayashi 2013; Loader 2013). Thus, either negotiated prices may be higher than usual or there may be a waste of public resources since planning and executing a bid is costly. However, there is evidence that the costs of negotiating and executing public contracts may be mitigated by public managers' contract management capabilities and private sellers' contract execution capabilities (Cabral 2017).

Additionally, depending on the characteristics of their sector, SMEs may not reach competitive price-cost levels when providing a good or service to the government (Nakabayashi 2013). Thus, organizing an unsuccessful tender means wasting resources; the government may incur severe costs with few results for SMEs or the local economy.

While there are numerous examples worldwide of policies favoring SMEs in public tenders, there is little direct evidence of the impacts of such policies on firms performance. Additionally, the costs of implementing such a policy are practically ignored in the literature.

Estimating the public costs of favoring SMEs in public procurement is a complicated issue to assess empirically because doing so requires establishing an

appropriate counterfactual (Hoekman and Tas 2020). I utilize a policy experiment in the state of Sao Paulo, Brazil, to estimate the costs of favoring SMEs in public procurement. I exploit the timing of a change in a policy of restricted SME tenders (March 2018) that affect only a specific group of items (group 65). The identification strategy simultaneously uses time and cross-sectional variations to estimate the effects of this policy shift.

However, in this paper, examining how institutional change occurred allows the costs of the SME policy to be assessed only indirectly. Instead of using a standard difference-in-differences (DiD) method, I use a variation of this method known as difference-in-differences in reverse (DiDiR), or 'time-reversed DiD' (Kim and Lee 2019). In the DiD method, there is a control group that is never treated and a treatment group that is treated at some point in time. In the DiDiR method I employ, the control group is always treated (instead of always untreated), and the other group is the 'switched group,' subject to the change in policy.

In Sao Paulo, the government can execute public tenders for SMEs only. Between August 2014 and February 2018, the government's *default choice* consisted of executing SME-only tenders for all items with a value less than or equal to R$80,000, except for a group of items identified as code 65, which was only allowed to execute open tenders in this period.

The government can avoid restricted tenders for SMEs if it considers that any

item in a bidding process falls within the exceptions provided for by law through a costly process of justification to its watchdogs. In case of any irregularity or failure to comply strictly with the law, public officers can be punished. From March 2018 on, after a change in the law's interpretation, group 65 became subject to the general rule just as any other group of purchased items. Thus, the 'always treated' group here consists of all groups of items but group 65, comprising the switched group.

Notably, DiDiR identifies pre-switch-period effects; i.e., it estimates effects for the past (Kim and Lee 2019), assessing the costs of the policy switch indirectly. I estimate this pre-switch-period effect on the switched group, comparing the observed outcomes for group 65 before the shift in policy and the outcomes that would have occurred for this group if there had been opt-out costs before March 2018.

Thus, the DiDiR method reveals that the negotiated prices are, on average, between 4.58% and 8.08% lower for group 65 than other groups before March 2008. Moreover, in the *pre*-period, the number of participants in group 65 is approximately 22% higher than that in other groups of items.

The number of valid bids follows the same pattern as the number of participant firms: there are approximately 25% more valid bids in group 65 than in the other groups of items. Finally, before the policy change, sellers that won tenders for items in group 65 were approximately 4 km further away from public buyer units

(PBUs) than in open tenders.

This paper has five sections, including this introduction. Section 2 provides a brief overview of the institutional background related to SME law and public procurement in Sao Paulo, Brazil, which is relevant to the empirical section. Section 3 describes the datasets and sample definitions. Section 4 presents the empirical analysis. Section 5 concludes the paper.

2 Institutional Background

This section provides a brief institutional background on SMEs' participation in the context of public tenders in Sao Paulo, Brazil. I focus on the details of that are most pertinent for the empirical analysis.

First, I briefly discuss general aspects of public procurement and the legislation on micro and small businesses in Brazil, highlighting the established criteria for the occurrence of SME-only public tender. Finally, I describe how the state of Sao Paulo applied this law in accordance with its own understanding of exclusive tenders for health-items.

2.1 Public Procurement and SME law in Brazil

Public procurement constitutes a relevant part of economies worldwide. In 2016, OECD countries spent an average of approximately 12% of GDP on public

procurement, while in Brazil, this proportion was approximately 10% in the same year.

As in many other countries, Brazilian law establishes as a general rule that all purchases, services, and works hired by the public administration should be subject to a public tender. Federal Law 8,666/1993 institutes a general framework applicable to all public bids in the country, and all three government branches must adhere to this framework.

Entities directly or indirectly controlled by the federal, state, or municipal governments must comply with the government procurement rules. Federal, state and municipal governments, autonomous government entities, public foundations, regulatory agencies, state-owned companies, and mixed capital companies controlled by the government are subject to these rules. These entities are known as public buyer units (PBUs).

Although the public administration may decide to make purchases centrally, in Brazil, almost all acquisitions are decentralized and made by PBUs. A ministry or bureau may consist of many PBUs that have budgetary autonomy and make purchases from private companies. PBUs may contract a wide variety of products and services from private companies, including engineering and infrastructure work. However, this paper focuses on analyzing the acquisition of common and standardized goods.

The primary purpose of a bidding process conducted by a PBU is to seek the

best contract possible for the government. The Brazilian public procurement law provides guidelines on how the procurement process should be organized and executed. In some cases, public tenders for SMEs are subject to different treatment.

The Brazilian federal SME law was created in 2006[5] to regulate favored, simplified and differentiated treatment for this sector, as provided for in the Federal Constitution[6]. This law's explicit goal was to promote SMEs' economic and social development and competitiveness as a strategy for job creation, income distribution, social inclusion, reduced informality, and a strengthened economy.

The Brazilian SME law adopts the following classification for companies, according to their annual gross revenue: (i) microbusiness: annual gross revenue of R$360,000 or less (roughly US$72,000); and (ii) small business: annual gross revenue greater than R$360,000.00 and less than or equal to R$4,800,000 (between US$72,000 and US$960,000). In this paper, these companies are referred to as SMEs.

SMEs enjoy many benefits provided by law, including tax benefits and fewer bureaucratic requirements to adhere to. In addition, public tenders held at the federal, state, and municipal levels can grant differentiated and privileged treatment to SMEs to promote economic and social development, increase

[5] Federal Law n. 123/2006.
[6] Constitution of the Federative Republic of Brazil in http://english.tse.jus.br/arquivos/federal-constitution.

public policies' efficiency, and stimulate technological innovation[7].

The content of the SME law, in its 2006 version, indicated that the public administration *could* create tenders exclusively for the participation of SMEs in purchases in which the item value was up to R$80,000 (approximately US$16,000.00). Thus, choosing tenders for SMEs only was optional for PBUs.

However, the federal SME law underwent a significant change from SMEs' exclusivity in tenders in 2014[8]. The term '*could'* has been replaced with *'must,'* making it mandatory to execute exclusive public tenders for SMEs up to a value per item of R$80,000.

The law changed PBUs' default choice if the item value fell below the threshold of eighty thousand reais: previously, the default choice was open bids. As of 2014, the standard option for PBUs is to execute public tenders for SMEs only, unless the bid's conditions fall within the exceptions provided for in the updated legislation.

PBUs can avoid restricted bids if at least one of the following conditions is met: (i) there are two or fewer potential competing SME suppliers that are locally or regionally based and able to comply with the notice requirements, and (ii) PBUs consider that the differentiated and simplified treatment for SMEs might not be advantageous for the public administration[9]. Thus, PBUs choose whether the

[7] Federal Law n. 123/2006.
[8] Federal Law n. 147/2014.
[9] Idem.

public tender is restricted, but they must justify their choices to their watchdogs, such as audit courts or the judiciary.

On the one hand, this discretion provided for by law can be beneficial since PBUs can more efficiently choose the bidding type to be carried out. However, there are costs involved in the process of avoiding bids restricted to SMEs. For each bidding procedure, PBUs must create an extensive report listing in detail the reasons that justify the use of an open bidding process to the detriment of a bidding process restricted to SMEs.

Additionally, these PBU justifications are subject to scrutiny by both the audit courts and the judiciary. If these bodies consider the arguments unfounded or insufficient, administrative proceedings and punishments may be brought against the public agents responsible for planning and executing the bid in question. Thus, this discretion brings costs to PBUs. I call these costs associated with avoiding SME-only tenders *opt-out costs*.

2.2 SME-only Public Tenders: Group 65 As an Exception

Sao Paulo is the wealthiest and most populous state in Brazil. This state accounts for approximately 23% of the total population and nearly one-third of Brazil's GDP (nearly US$500 billion in 2018). This amount is equivalent to the GDP of countries such as Sweden, Poland, and Belgium and more than twice

the GDP of Portugal, Greece, and Finland[10]. The state of Sao Paulo has a diversified economy driven by the automobile, textile, chemical, aeronautical, and computer industries, in addition to services such as finance and agriculture.

Since 2005, all PBUs in the state of Sao Paulo have been required to purchase common goods and services through Bolsa Eletronica de Compras (BEC), an electronic purchasing platform. The BEC figures are revealing: in 2019, approximately R$13 billion (about US$3 billion) in trade was conducted on this e-platform. Since its implementation in 2005, BEC has moved more than R$105 billion (about US$20 billion) in negotiations; 860,000 purchase offers have been made, and approximately 4.8 million items have been sold.

Despite being subject to federal laws, Brazilian states have the prerogative to regulate or interpret these laws' specific elements. The state of Sao Paulo, for example, has a specific interpretation of how to apply SME law in public procurement.

Since BEC's implementation, the Sao Paulo state government has considered the group of items consisting of health-related products, including medication and hospital supplies (code 65), as a strategic set of items in the public procurement process. For example, bidding procedures related to medication can be carried out only with dynamic reverse auctions (*pregao*) or sealed bidding (*convite*). Direct negotiation (*dispensa de licitacao*), which is very common in

[10] Source: Brazilian Institute of Geography and Statistics (IBGE). See also https://www.ibge.gov.br/cidades-e-estados/sp.html.

the purchase of other types of common goods, has always been prohibited for group 65 in Sao Paulo.

Between 2006 and 2014, when the first version of the SME law was enforced, PBUs located in the state of Sao Paulo had the *default choice* to hold open tenders; it was optional to set procedures restricted to SMEs. During this period, in accordance with this legal arrangement, there was low adherence to restricted bids; items in these bids accounted for 6 to 13% of the total number of items bid for in the state of Sao Paulo. However, for group 65, there were no bids exclusively for SMEs in this same period. The government had an internal orientation to hold open tenders for group 65, with the explicit agreement of the audit court of the state of Sao Paulo (TCE-SP).

After 2014, with the update of the federal law on SMEs, the *default choice* was to execute SME-only tenders if the item value was less than or equal to R$80,000. In the state of Sao Paulo, if PBUs consider that any item in a bidding process falls within the exceptions provided for by law, they must justify in detail the reasons for the non-execution of an exclusive bid for SMEs through a report sent to TCE-SP.

This justification offered by PBUs to avoid restricted tenders not only requires excessive work effort for PBUs but also is subject to the scrutiny of the TCE-SP and the judiciary. Public officers can face punishment if there are irregularities or failure to comply strictly with the law.

With the introduction of considerable opt-out costs for PBUs, this incentive scheme appears to be effective in encouraging the choice of offering exclusive bids to SMEs: adherence to this procedure has increased from approximately 13% to almost 70%, on average, in subsequent periods.

However, between August 2014 and February 2018, bids related to group 65 did not change. The Sao Paulo state government and TCE-SP, in a joint agreement, used a specific interpretation of the new version of the federal SME law to leave group 65 as an exception. The federal law provides that the requirement of restricted bids to SMEs does not apply when "it is not advantageous to the public administration or represents a loss to public resources." Thus, using this guideline, which allows for a high degree of discretion, the state of Sao Paulo and TCE-SP operated on the interpretation that because group 65 constitutes a set of strategic items to meet such an essential public policy, it should always be subject to open bids. Thus, in this period, there was no bidding restricted to SMEs involving group 65.

However, in November 2017, a different control agency in the state of Sao Paulo, PGE-SP[11], issued a document containing a legal opinion[12] that changed this interpretation. This document reinforces that the principle of isonomy in law enforcement should prevail in public procurement. Then, items in group 65 should be considered for public procurement purposes in the same way as other

[11] Attorney General of the State of São Paulo (PGE-SP).
[12] PGE-SP's Referential Opinion n. 13/2019.

groups.

Hence, as of March 2018, the opt-out costs also apply to group 65. Between March 2018 and December 2019, adherence to exclusive bids for SMEs for this group was, on average, 43%. This lower proportion of restricted bids for SMEs for group 65 compared with other groups may be due to the existence of more oligopolies in this group of items, which include, for example, medication. Thus, in many cases, it is not possible to find at least three potential suppliers that are SMEs.

3 Data

This section describes the data source and details the sample characteristics used in the empirical section.

I use administrative data on bidding-level public procurement tenders of common goods and services in the state of Sao Paulo, Brazil, from January 2016 to December 2019. All transactions took place on the electronic procurement platform called BEC, available for all PBUs across the state. The SEFAZ/SP is responsible for the operational management and centralization of BEC's bidding data.

On BEC, 1,344 PBUs regularly make purchases. These entities include state-level bureaus from the executive, legislative, and judiciary branches in the state of Sao Paulo as well as other affiliated entities, such as municipalities located

in the state of Sao Paulo and private organizations. PBUs purchased 82,569 different items (goods) totaling 832,984 successful transactions from 2016 to 2019.

Table 1. Descriptive Statistics: Public Tenders

BEC has a very detailed catalog of standardized goods and services organized in three levels of detail: group, class, and item. For instance, health items are classified as group 65 (medical, dental, and hospital equipment and supplies). The item coded as 110639 refers to the drug 'Furosemide 40 milligrams, coated tablets, units', belonging to class 6531 (Medicines prescribed with or without ANVISA notification/registration) and group 65[13].

Data are organized by purchase offer (*PO*), the electronic document issued by the PBU that identifies and quantifies the goods and services that will be purchased. A *PO* is defined by a 22-character code and may contain one or more items listed, but each item has its own purchase process. Thus, the purchase of an item is uniquely identified by the combination of the *PO* and the purchased item codes (*POI*).

[13] Another example is group 89 (Foodstuff). Item 257419 refers to 'Special coffee; gourmet; roasted in uniform grains; consisting of 100% Arabic grains; free of strange taste; free of fermented black, green, burnt, black-green grains, soft drink or better; striking flavor, medium and clear roasting, chocolate notes, marked sweetness, low bitterness; minimum superior global quality of 7.30 points on the sensory scale; vacuum packaging; with minimum validity on the delivery date of 10 months, with date of manufacture and expiry printed on the packaging', which belongs to class 8965 (Coffees, Teas, Chocolate and Other Soluble Drinks).

There is a crucial variable for the empirical section, defined from the item group codes. It is a binary variable that assumes the value of 1 if the item belongs to group 65[14] and 0 otherwise. The items in group 65 constitute the 'switched group', i.e., the set of items affected by the purchasing policy change. Group 65 accounted for almost 27% of all purchases from 2016 to 2019. All other groups of items comprise the 'control group.'

There are 75 groups of items, excluding group 65. Between 2016 and 2019, the most significant groups were groups 89 (food products), 75 (office supplies), 86 (computer products), and 79 (cleaning materials), representing 37.5% of the total purchases in this period.

For each *POI*, there is information about item quantities, bid prices (winners and losers), the number of participant firms, the number of bids, whether the public tender was successful or not, the identification of the PBU, and firms' and PBUs' location, among other variables.

4 Empirical Strategy and Results

This section is organized into two parts. First, I describe the method I use to estimate the impacts of the SME public procurement policy shift on the selected

[14] Items related to medical, dental, and hospital equipment and supplies.

outcomes. I perform a DiD analysis, but unlike a standard DiD, the control group is always treated instead of always untreated (Kim and Lee 2019). Then, I discuss the identifying assumptions in the context of the DiDiR I employ. In the second part, I discuss the main results.

4.1 Main Specification and Identification Strategy

The identification strategy exploits the timing of a change in the policy of restricted SME tenders (March 2018) that affect only a specific group of items (group 65). Thus, it is possible to simultaneously use time and cross-sectional variations to estimate the potential effects of this policy shift.

In a standard DiD with treatment d and outcome y, there exists a group of units ($q = 1$) with its treatment changing from $d = 0$ to $d = 1$ at some date, and there exists another group ($q = 0$) in which $d = 0$ always. In this paper, however, the framework is slightly different: the group 'q = 0' always has $d = 1$ instead of $d = 0$, and the group 'q = 1', as in DiD, undergoes a switch in the treatment.

This variation of a standard DiD is known as difference-in-differences in reverse (DiDiR), or 'time-reversed DiD' (Kim and Lee 2019). This same framework can be found in (Kotchen and Grant 2011), (Chemin and Wasmer 2009), (Autor, Donohue III, and Schwab 2006), (Shapiro and Gentzkow 2008), and (Monstad, Propper, and Salvanes 2008).

As described in section 3, from August 2015 to February 2018, PBUs faced opt-

out costs to avoid tendering for SMEs only, with the exception of group 65 (with mandatory open tenders). From March 2018 to December 2019, PBUs were subject to opt-out costs for all groups of items purchased. Thus, the always treated group here consists of all groups of items but group 65, which comprises the switched group. Table 2 summarizes the above description.

Table 2. Description of groups in DiDiR

Groups	t=1 (before March 2018)	t=2 (after March 2018)
Group 65 (switched group)	Opt-out costs = 0	Opt-out costs > 0
Others (always treated group)	Opt-out costs > 0	Opt-out costs > 0

DiDiR identifies pre-switch-period effects; i.e., it estimates effects for the past (Kim and Lee 2019). I estimate this pre-switch-period effect on the switched group, comparing the observed outcomes for group 65 before the policy shift and the outcomes that would have occurred for this group if there had been opt-out costs before March 2018 (t=1).

Using subindex p to denote purchase offer, i to denote items, t to denote months, and g to denote groups of analysis, I estimate the following DiDiR model:

$$y_{pigt} = \eta_i + \gamma Pre_t + \beta g65_{pgt} * Pre_t + \mathbf{x}\boldsymbol{\delta} + \epsilon_{pigt} \quad (1)$$

where *y* is an outcome, η_i is item fixed effects, and *Pre* is a dummy variable with the value of 1 if it is a month before March 2018 and 0 otherwise. The variable *g65* is binary with a value of 1 if it belongs to group 65 and 0 otherwise. The covariates are represented by $\mathbf{x}$. The error ϵ_{itg} is clustered by item.

The coefficient of interest, β, captures the pre-switch-period effect of the shift in the SME tender policy on the outcomes for the switched group. The central identifying assumption behind the empirical model is that in the period after the shift in the tenders policy, the outcomes for group 65 and the set of all other groups of items would have followed a similar trajectory. Thus, it is necessary to check whether the outcome paths of the always treated and switched groups are parallel in the post-switch period.

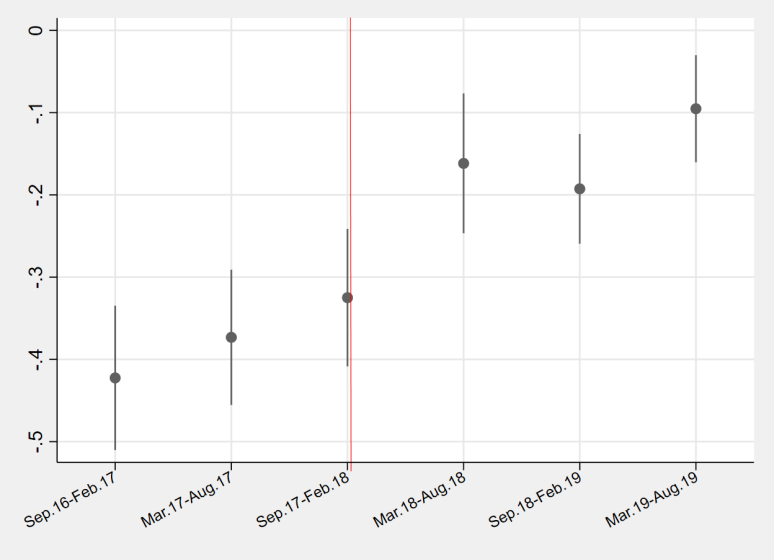
The validity of this assumption of parallel trends in the post-switch period can be partially assessed by estimating the following nonparametric regression, similar to (Naritomi 2019) and (Gallego, Prem, and Vargas 2020):

$$y_{pgt} = \eta_g + Semester_t + \sum_{k=-3}^{3} \tau^t \left(\beta g65_{pgt} * Semester_t\right) + \mu_{pgt} \quad (2)$$

where η_g is the group fixed effects, and *Semester* is a set of dummies for each

semester in this period. The error μ_{itg} is clustered by the group of items. Figure 1 plots the coefficients (without a constant) and the 95 percent confidence intervals from estimating equation (2) with log prices as the dependent variable. The graphs for the other outcomes of interest are included in the appendix.

Figure 1. Log Prices: Difference between the always treated group and the switched group



Although there are few periods observed after the change in the SME purchasing policy, it is possible to observe that the difference between the two groups is relatively constant after the policy shift. The difference between the groups narrows dramatically after the change in the purchasing policy and then

stabilizes in subsequent periods. Figures A.1, A.2, and A.3 (appendix) report equivalent results regarding the distance from PBUs to winner firms, the number of participant firms, and the number of valid bids, respectively.

In this context, the validity of the parallel trends assumption in the post-change period might be reinforced by an institutional reason. Over time, PBUs accumulate knowledge and develop expertise on how to buy items from the market. After the policy change, when new restrictions are imposed, PBUs adapt to the new conditions, and the pattern of results in tenders might change. However, in subsequent periods, it is reasonable to expect that prices and other performance indicators in tenders tend to vary little, *ceteris paribus*, given that PBUs have already adapted to the new situation.

4.2 Results

I perform item-level regressions in a two-period DiDiR for which t is collapsed by *pre* and *post* periods. The estimations refer to the pre-switch-period effect for four distinct outcomes: negotiated prices, the number of participant firms, the number of valid bids, and the distance from PBUs to winner firms.

For each outcome, I run regressions for three different time windows considering different *pre-* and *post-change periods*: (i) a 6-month window where the *pre-change* period is from September 2017 to February 2018 and the *post-change* period is from March 2018 to August 2018; (ii) a 12-month window where the

pre-change period is from March 2017 to February 2018 and the *post-change* period is from March 2018 to February 2019; and (iii) an 18-month window where the *pre-change* period is from September 2016 to February 2018 and the *post-change* period from March 2018 to August 2019. The results for log prices are presented in Table 3.

Table 3. Prices (log): Pre-switch-period effect on group 65

	(1) 6-month window	(2) 6-month window	(3) 12-month window	(4) 12-month window	(5) 18-month window	(6) 18-month window
g65xPre	-.0719***	-.0843***	-.0469***	-.0527***	-.0484***	-.0602***
	(.0121)	(.0112)	(.0097)	(.0086)	(.0092)	(.0084)
Sealed bids	-.4407***	-.609***	-.4373***	-.5911***	-.426***	-.5739***
	(.0179)	(.0212)	(.0156)	(.019)	(.0136)	(.0178)
lquantity	-.3191***	-.3716***	-.313***	-.3665***	-.3024***	-.3557***
	(.012)	(.011)	(.0104)	(.0097)	(.009)	(.0088)
_cons	6.1259***	6.4848***	6.1238***	6.8105***	5.9612***	6.4265***
	(.1987)	(.2067)	(.1999)	(.278)	(.1821)	(.1946)
Observations	213422	213422	427544	427544	632729	632729
R-squared	.2817	.3867	.2748	.3698	.2704	.3541
Item Fixed Effects	YES	YES	YES	YES	YES	YES
Controlling for PBU	NO	YES	NO	YES	NO	YES

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1*

As observed, the negotiated prices are consistently lower in group 65 tenders that occurred before March 2018. Considering all baseline specification variations, the negotiated prices, on average, are between 4.58% and 8.08% lower for group 65 than for other groups before March 2008.

This result emerges as expected. PBUs face better trading conditions in open

tenders than in SME-restricted tenders. Accordingly, lower prices for group 65 before the shift in the SME tender policy may suggest less competition among firms. There is evidence of a decrease in competition in Table 4, which presents estimations for the difference in the number of participant firms.

Table 4. Number of Participant Firms (log): Pre-switch-period effect on group 65

	(1) 6-month window	(2) 6-month window	(3) 12-month window	(4) 12-month window	(5) 18-month window	(6) 18-month window
g65xPre	.1985***	.2081***	.1162***	.1221***	.0689***	.0763***
	(.0083)	(.0084)	(.0064)	(.0065)	(.0062)	(.0062)
sealed-bids	.0373***	.0503***	.012	.0188*	.0319***	.0461***
	(.0089)	(.0114)	(.0078)	(.0096)	(.0075)	(.0091)
lquantity	.1458***	.144***	.149***	.1467***	.1455***	.145***
	(.0022)	(.0021)	(.002)	(.0019)	(.0018)	(.0018)
_cons	1.0883***	1.3251***	1.0625***	.9251***	1.0742***	1.0783***
	(.0649)	(.2044)	(.0608)	(.1153)	(.0491)	(.0679)
Observations	260024	260024	522289	522289	769633	769633
R-squared	.1669	.2388	.1714	.2357	.1612	.2216
Item Dummies	YES	YES	YES	YES	YES	YES
PBU Dummies	NO	YES	NO	YES	NO	YES

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1*

There is a consistent increase in companies participating in group 65 bids when PBUs only used open bids. The number of participant firms was higher for group 65 than for other groups in every time window in the analysis.

These effects appear higher for the short term: comparing the six months before the policy change with the six months after this change, the number of

participants in group 65 is approximately 22% higher than that in the other groups of items in the *pre-switch* period. For instance, in the 18-month time window, this effect is lower (approximately 7%). PBUs accumulate knowledge and develop expertise on how to buy items from the market. It is possible that after facing initial difficulty in attracting companies to bid, PBUs might adapt to the new situation over time and be better able to handle exclusive bids from SMEs.

A higher number of companies does not necessarily mean more competition. Some market items consist of oligopolies with very competitive dynamics, for instance. Thus, the number of valid bids can be complementary information to the number of participant firms to assess the degree of competition in a tender. Table 5 reports the estimations for the difference in the number of valid bids between groups.

Table 5. Number of Valid Bids (log): Pre-switch-period effect on group 65

	(1) 6-month window	(2) 6-month window	(3) 12-month window	(4) 12-month window	(5) 18-month window	(6) 18-month window
g65xPre	.2219***	.2349***	.1061***	.1145***	.0562***	.0668***
	(.0118)	(.0121)	(.0094)	(.0095)	(.0094)	(.0095)
sealed-bids	-1.1372***	-1.1298***	-1.1653***	-1.1649***	-1.0871***	-1.0897***
	(.0119)	(.0159)	(.0106)	(.0138)	(.0098)	(.0127)
lquantity	.1638***	.1565***	.1647***	.1582***	.1675***	.1604***
	(.0031)	(.003)	(.0027)	(.0026)	(.0024)	(.0025)
_cons	2.2482***	3.0999***	2.2302***	1.8244***	2.1121***	2.1099***
	(.0596)	(.5513)	(.0555)	(.1679)	(.047)	(.0854)
Observations	260024	260024	522289	522289	769633	769633
R-squared	.3485	.3868	.3474	.3814	.3261	.3608
Item Dummies	YES	YES	YES	YES	YES	YES
PBU Dummies	NO	YES	NO	YES	NO	YES

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

The pattern is the same as that for the number of participant firms. In the short term, the effect is more pronounced (almost 25% greater), while in a longer window of 18 months, for example, the effect drops to approximately 6%.

In addition to a higher level of competition, a higher number of participants associated with a higher number of valid proposals may indicate that sellers' screening process is better in open tenders. Depending on the item purchased, more efficient companies with more flexible cost structures may participate in open tenders rather than exclusive tenders for SMEs. These combined factors may set up the primary mechanism that explains the lowest prices in group 65 before March 2018.

One explicit objective of the policy of restricting bids to SMEs is to encourage local and regional development. It is expected to observe purchases from local suppliers closer to the PBUs. Table 6 reports the estimations for the difference in the distance from PBUs to winner firms between groups.

Table 6. Distance from PBUs to winner firms: Pre-switch-period effect on group 65

	(1) 6-month window	(2) 6-month window	(3) 12-month window	(4) 12-month window	(5) 18-month window	(6) 18-month window
g65xPre	6.5123**	3.3937**	10.6433***	5.6029**	9.8629***	4.8085**
	(2.8813)	(1.8905)	(2.215)	(2.1899)	(2.0851)	(2.0442)
convite	-25.2587***	-12.1397***	-22.2555***	-10.2858***	-20.9674***	-7.6826***
	(2.2172)	(2.3924)	(1.9588)	(1.9587)	(1.7872)	(1.7127)
lquantidade	1.4456***	4.0076***	1.6784***	4.2032***	1.3763***	4.3312***
	(.5426)	(.5036)	(.4589)	(.3983)	(.4274)	(.3428)
_cons	156.8374***	134.1891***	162.7939***	126.0552***	157.0111***	110.9477***
	(6.8616)	(7.044)	(5.971)	(33.5564)	(5.1836)	(15.4403)
Observations	213422	213422	427544	427544	632729	632729
R-squared	.003	.147	.0024	.1321	.0021	.1258
Item Dummies	YES	YES	YES	YES	YES	YES
PBU Dummies	NO	YES	NO	YES	NO	YES

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1*

As observed, before the policy change, the companies winning tenders for items in group 65 were more distant from the PBUs. On average, when controlled by PBUs among other variables, the winning suppliers were located approximately 4 km away in open public tenders for group 65. This result may indicate that the policy change has successfully induced more local suppliers to win more bids for this group of items.

5 Conclusion

In recent years, governments worldwide have implemented public policies that favor SMEs, since such policies have massive potential for job creation, local development, and innovation. One of the most widespread practices to promote local development through public procurement is the restriction of public tenders to SMEs.

While there are numerous examples of such policies worldwide, there is little direct evidence on how favoring SMEs in public tenders benefits firms performance. Additionally, the costs of implementing such policies are practically ignored in the literature.

This paper exploits a quasi-experimental variation from a public SME-related program to estimate the costs of incentivizing the restriction of public tenders to SMEs in Sao Paulo, Brazil. I exploit the timing of a change in the policy of restricted SME tenders (March 2018) that affect only a specific group of items (group 65). The identification strategy simultaneously uses time and cross-sectional variations to estimate the effects of this policy shift.

However, the way this institutional change occurred allows only an indirect assessment of the costs the SME policy in this paper. Using a variation of the standard DiD method (DiDiR), the findings show that before the shift in policy, for group 65 in comparison with other groups: (i) the negotiated prices were

lower (between 4.58% and 8.08%); (ii) the number of participants was approximately 22% higher; and (iii) the number of valid bids was approximately 25% higher.

These results suggest that incentivizing the restriction of public tenders to SMEs may undermine the quality and efficiency of the public procurement process because this policy may harm firms' screening process and increase the likelihood of selecting fewer, inefficient firms or no firms at all. Additionally, depending on the sector characteristics, SMEs may not be able to reach competitive price-cost levels when trying to provide a good or service to the government; this could be the case for group 65.

Finally, before the shift in policy, sellers who won tenders for group 65 were more distant from the PBUs (approximately 4 km). This result may indicate that the policy change has successfully induced more local suppliers to win more bids for this group of items.

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Appendix

Figure A.1 – Distance from PBU to winner firms: Difference between the always treated group and the switched group

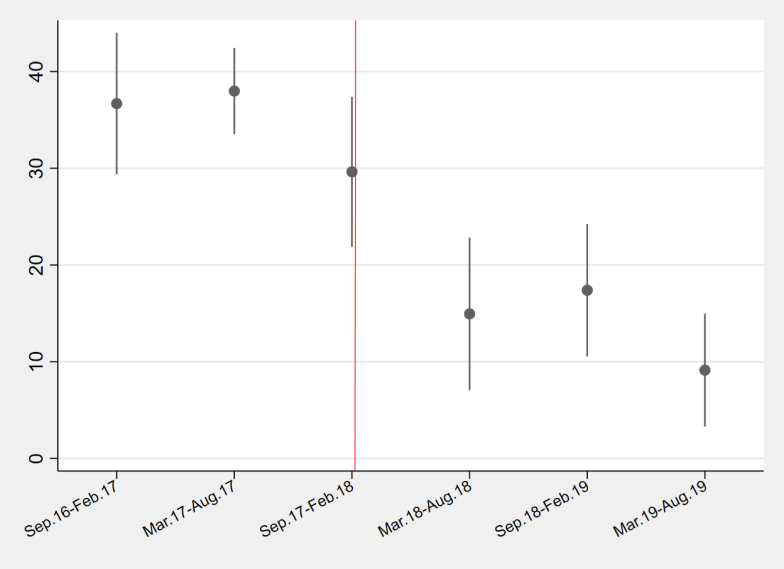

Figure A.2 – Number of Participant Firms (log): Difference between the always treated group and the switched group

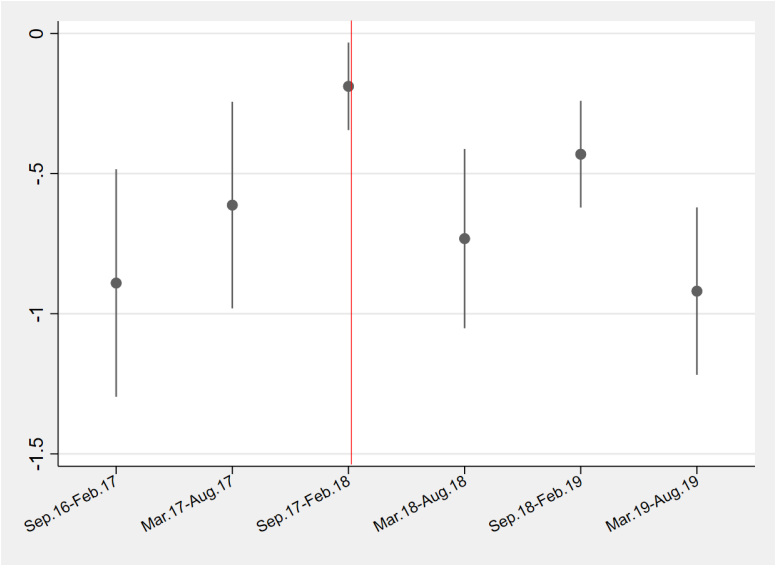

Figure A.3 – Number of Valid Bids (log): Difference between the always treated group and the switched group