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Insper Working Paper

WPE: 368/2016

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This version: July, 2016

Working paper: please do not circulate without consent of the author

Acknowledgements: I thank the financial support of the Brazilian Council of Scientific Research (CNPq), the Graduate Program in Management of the Federal University of Bahia (NPGA-UFBA), and Insper. I thank the invaluable research assistance provided by Paulo Reis and the support of Antonio Nascimento, Danilo Sobral, and Thomaz Teodorovicz. I also benefitted from the comments by Paulo Arvate, Paulo F. Azevedo, Klenio Barbosa, João Manoel Pinho de Melo, Naercio Menezes, and Rajeev Sawant as well as seminar participants at FGV-SP, Insper, JMS Special Workshop, Imperial College Business School, and RWIO São Paulo. An earlier version of this paper received the Charles E. Levine Best Conference Paper Award, Public and Nonprofit Division, Academy of Management, 2016 (Anaheim -CA), and the Carolyn Dexter Nomination, Public and Nonprofit Division, Academy of Management, 2016 (Anaheim-CA). Usual caveats apply.

The role of capabilities in policy interventions to favor small firms in public contracting

ABSTRACT

This paper analyzes how capabilities can attenuate the pervasive effects of policy interventions to favor small firms (SMEs) in public contracting. Results obtained from a quasi-experiment in Brazil comprising 1472 service contracts show that public officer's contract-management capabilities can moderate the effects of policy interventions and promote cost savings, increased responsiveness (government-level outcomes), and enhanced buyer-supplier coordination when favored firms are successful in public contracting. Execution capabilities of private suppliers can also attenuate the undesired side-effects of policy interventions on firm level outcomes, by moderating the severity of sanctions due to deficient provision. The paper highlights the mechanisms for leveraging performance in public-private interactions. By focusing on the interactions between public and private actors in public contracting, the study adds to the current knowledge of strategic management in the context of public organizations by demonstrating how capabilities can reconcile conflicting goals despite inherent contract incompleteness and bureaucratic rigidity.

Keywords: capabilities, government outcomes, firm outcomes, public contracting, policy intervention

INTRODUCTION

In an attempt to address ongoing calls to connect strategic management research and broader societal goals, there is increasing interest in studying the role of governments as strategic actors who shape business opportunities, enable value creation, and influence firm-level outcomes (Barney, 2005; Kivleniece & Quelin, 2012; Mahoney, McGahan, & Pitelis, 2009; Rangan, Samii, & Van Wassenhove, 2006). Some strategy scholars are also examining new forms of interaction across public-private boundaries (Cabral, Lazzarini, & Azevedo, 2013; Klein, Mahoney, McGahan, & Pitelis, 2013; Rufin & Rivera-Santos, 2012) while others are trying to understand the relationships between government interventions and performance (Inoue, Lazzarini, & Musacchio, 2013; Lazzarini, 2015). In this vein, government intervention in public contracting (i.e. when a public entity is the buyer) is a promising area that can benefit from theoretical insights and policy recommendations emerging from strategic

management scholars (McGahan, 2007; McGahan, Zelner, & Barney, 2013).

Accounting for almost one-third of government expenditures in developed countries, public contracting is often subject to government intervention to promote economic growth, stimulate the development of certain industries, and to activate regional production chains by favoring local and small firms in government acquisitions (Brown, Potoski, & Van Slyke, 2010; De Mariz, Abeillé, & Menard, 2014).

Despite criticisms that excessive government activism in contracting may generate malignant effects (Marion, 2007, 2009), little is known about the mechanisms that can reconcile conflicting goals: address government objectives and promote positive impacts on public and private outcomes. The concept of capabilities can be particularly useful to highlight some underexplored areas in management scholarship, such as the performance implications of policies in the pursuit of the public interest (McGahan, et al., 2013), the consequences of public-private interactions in public contracting (Kivleniece & Quelin, 2012), and how buyers and suppliers can reduce their exposure to contractual hazards in public contracting and leverage the benefits of outsourcing (Fabrizio, 2012)

With government actions to favor small businesses as a context, this paper addresses the voids listed above by examining how accumulated resources and capabilities of public and private actors can attenuate adverse aspects of policy interventions on government-level and firm-level outcomes. I develop four hypotheses exploring how the individual capabilities of public managers (contract-management capabilities) and the organizational capabilities of private firms (execution capabilities) influence cost savings and responsiveness during the contracting process (government-level) and ex-post performance (firm-level). I test these hypotheses by using a unique dataset of 1472 service contracts in Brazilian public universities from 2003 to 2012.

Brazil implemented new legislation favoring small and medium enterprises (SMEs) in public contracting at federal level in 2007. This removed several bureaucratic restrictions so as to reduce entry costs for entrants and allowed purchasing units to allocate bids to SMEs. This meant that I could use observations from auctions before and after the new legislation to identify the impact of the exogenous intervention and the moderating role of capabilities on government and company outcomes.

Results show that the policy intervention to favor small firms did not promote improved government and firm-level outcomes. However, contract-management capabilities on the public side at the individual level can enable superior outcomes and alleviate the negative effects of preferential treatment in public contracting. This is probably because more capable managers can promote more competitive auctions, stimulate more aggressive bids from suppliers and increase savings in auctions won by favored firms. They seem to have in-depth knowledge of how government works, which can be helpful to overcome the bureaucratic hurdles prevalent in government bureaucracies, thus decreasing the duration of the contracting lead-times and increasing responsiveness in public contracting. Execution capabilities on the entrepreneur side can also attenuate the problems associated to government interventions in public contracting but only on firm-level outcomes. As small firms accumulate more contracts with the same government purchasing unit, they are able to improve service quality and to reduce the severity of sanctions applied in case of deficient provision. This indicates that execution capabilities seem to be relevant especially when favored firms have effective control of the necessary resources to accomplish the expected objectives.

The paper sheds light on the role of capabilities in the context of public organizations, by demonstrating how capabilities can reconcile conflicting goals in the pursuit of the public interest: foster SMEs participation in public contracting and

obtaining positive outcomes on both government-level and firm-level despite the presence of contract incompleteness and bureaucratic rigidity which characterizes public contracting. Unpacking capabilities in distinct dimensions allowed to observe how the individual abilities of public managers and the accumulated learning of companies can attenuate some of the undesired side-effects of policy interventions on observed performance. Capabilities seem to increase the efficiency of outsourcing contracts during the contracting process and limit the hazards of opportunism during the contract execution in contexts characterized by multiple goals and a more complicated set of relationships among several stakeholders with competing interests. In other words, individual and organizational capabilities can be important aspects to deal with the increased complexity generated by policy interventions with potential contradictory goals. All these findings contribute to the nascent debate on the mechanisms for leveraging value creation and performance expectations in public-private relationships. Finally, this study informs public and private managers about the conditions in which preference programs in public contracting might work.

CONTEXT: POLICY INTERVENTIONS TO FAVOR SMALL FIRMS IN PUBLIC CONTRACTING

Public contracting occurs when public authorities are buyers in market-type relationships to acquire goods and services and address citizens' needs (Blöndal, 2005). Public contracting is affected by contract incompleteness. In this setting, parties cannot verify the several states of nature and the anticipation of possible contingencies is costly, thus leading parties to draw up contracts that will be subject to ex-post renegotiation and transaction costs (Hart & Moore, 1999; Williamson, 1996). Contractual safeguards have limited power in assuring smooth buyer-supplier relationships in public contracting if performance is hard to measure (Poppo & Zenger,

2002) and these situations are even more problematic when it is prohibitively costly for governments to internalize certain activities (Argyres & Liebeskind, 1999).

Despite these peculiarities, national, regional, and local governments throughout the world often use public contracting to favor targeted groups, such as selected industries in industrial policies (Lazzarini, 2015), race and gender minorities (Marion, 2009), and small businesses (Denes, 1997; Marion, 2007), the focus of this paper. Considering that small firms are recognized as a source of job creation, innovation increased competition, collusion prevention, and economic growth (Nooteboom, 1994), many governments introduce policies to support small locally-owned businesses and entrepreneurship (George, McGahan, & Prabhu, 2012).

In general, preference programs are designed to reduce entry barriers for SMEs and nascent firms in public contracting. Normally, these initiatives assign exclusive bids or a percentage of the eligible lots to SMEs, and make the awarding of government contracts possible to favored bidders if their price is not more than a given percentage above the lowest bid from non-favored bidders in reverse auctions or sealed bid tendering (Dimitri, Piga, & Spagnolo, 2006; Marion, 2007; Reis & Cabral, 2015). Programs such as the U.S. Small Business Act and the U.S. Buy-American Act, which favor small domestic firms in public contracting, can be found in several developed and developing countries despite international treaties against protectionism (McAfee & McMillan, 1989). These practices have direct implications in both government-level and firm-level outcomes.

Effects of policy interventions to favor SMEs on government-level outcomes

Besides fostering the entry of SMEs, policy interventions in public contracting may influence the contracting process and consequently some government outcomes such as contracting costs and responsiveness in public contracting.

On the one hand, some argue that the increased number of bidders encouraged by preference programs to favor SMEs can stimulate competition, enable cost savings (McAfee & McMillan, 1989; Nakabayashi, 2013) and avoid differences between restricted bids and unrestricted solicitations in public contracting (Denes, 1997). Favored companies may also offer cheaper goods and services when they are able to address specific customer needs not covered by non-favored rivals (Flambard & Perrigne, 2006; Nootboom, 1994). Policy interventions may also affect a critical dimension in public contracting: responsiveness. Delays due to operational problems during the contracting phase (*ex-ante*) can hamper the accomplishment of public goals, and in this sense some governments design policies to reduce the existing burden of regulations and procedures (Bozeman, 2000).

However, some argue that giving preferential treatment to specific groups in public contracting signals precaution because favoritism to preferred groups might jeopardize government outcomes. When analyzing the effects of preference programs to favor small firms in the Californian Highway procurement auctions, Marion (2007) argues that procurement costs may escalate because preferences might encourage favored companies to increase their bids and consequently some contracts are likely be transferred from low cost to high cost companies, the participation of more efficient firms will be discouraged, and, consequently, higher costs participants prevail. Similarly, Athey, Coey and Levin (Athey, Coey, & Levin, 2013) argue that preferences for SMEs in the market of natural resources in the U.S. increased government costs because the program made it impossible for more efficient firms to enter and compete with higher costs firms. Less efficient firms can also frustrate policymaker's intended increased responsiveness by not responding to government needs in a timely and accurate fashion. Indeed, overcoming the bureaucratic barriers to settle the contracts and

to increase the speed of the contracting process requires some knowledge about how public bureaucracies work.

Consequently, the positive impacts of policy interventions to favor nascent and inexperienced firms on ex-ante government outcomes (cost and responsiveness) must be seen in perspective.

Effects of policy interventions to favor SME's on firm-level outcomes

Public contracting is normally subject to strict accountability rules that postulate the use of competitive tendering instead of negotiations with selected suppliers and in general involves arms-length relationships with non-contractible quality and few possibilities to provide incentives to suppliers (Bajari, McMillan, & Tadelis, 2009). Consequently, problems related to agent opportunism are likely to engender maladaptation and poor performance in these buyer-supplier relationships (Eisenhardt, 1989; Mahoney, 2005).

Incentive problems may beset preference programs to favor SMEs in public contracting. In fact, low-powered incentives offered to favored firms may induce the adoption of less effective technologies and jeopardize quality standards (Branco, 2002). Incentives can lead to quality shading in the presence of fixed-price contracts with favored companies in public contracting especially when an excessive pursuit for cost reductions is prevailing (Loader, 2007). Furthermore, inherent characteristics of small firms may lead to deficient provision and increase the odds of contractual sanctions against favored firms in public contracting (Reis & Cabral, 2015). Indeed, small firms are more susceptible to market risks (Hoffmann & Schlosser, 2001) and normally face greater financial constraints that can hamper their development and their ability to deliver goods and services to acceptable standards (Beck & Demirguc-Kunt, 2006). Financial burden may also make it difficult for SMEs to accomplish contractual

standards (Smith, Hobbs, & Britain, 2002). All these aspects can be associated to increased risks of contractual termination in public contracting and exacerbate the problems of policy interventions to favor specific groups, such as SMEs.

Overall, it seems likely that policy interventions to favor small firms in an incomplete contract setting will not improve contracting process efficiency (costs and responsiveness) and ex-post performance at the firm level (i.e. sanctions applied for poor performance). In the next section, I discuss how capabilities can mitigate these potential negative effects.

CAPABILITIES AND POLICY INTERVENTIONS IN PUBLIC CONTRACTING: RECONCILING CONFLICTING GOALS

The intention to leverage entrepreneurship by favoring SMEs in public contracting increases imposes the need to reconcile potentially conflicting goals: fostering SMEs participation in public contracting and obtaining positive outcomes. In this section I argue that specific capabilities possessed by public managers and present in favored firms can help attenuate the adverse effects of preferential treatment to small firms on government level and firm level outcomes, thus helping to overcome less effective public contract design.

Resource-based and capabilities theories have been widely used to explore the dynamics of interorganizational relationships. Capabilities—the organizational practices and routines that allow an organization to coordinate their activities and exploit their resources (Winter, 2003)—are key aspects that enable organizations to obtain positive results according to their competitive environment and may include abilities to implement buyer-supplier strategies (Parmigiani & Holloway, 2011), to manage alliances (Arino & Reuer, 2004), to develop relational ties with suppliers, and to design contracts (Argyres & Mayer, 2007).

Although capabilities are not indicative of outstanding ability but the potential for adequate performance (Helfat et al., 2007), the notion of capabilities has been used to understand performance implications in the context of public organizations (Andrews, Beynon, & McDermott, 2015; Klein, et al., 2013). There is increasing convergence between public administration and strategic management literatures about the suitability of the capabilities approach in public bureaucracies and in organizations subject to public-private interactions (Klein, et al., 2013; Piening, 2013). Yet the existing heterogeneity of resources among public and private organizations involved in public contracting helps to explain why resources and capabilities are transformed into unique sources of value creation and why such combinations can alleviate contracting problems in public-private interactions (Cabral, et al., 2013).

However, the use of the capabilities approach in the public contracting domain requires further refinement. One aspect to be taken into account is the functional area where capabilities evolve (Helfat, et al., 2007). In fact, the appropriation of the benefits associated with public contracting by both government and private suppliers rely strongly on the abilities of the public managers involved in the negotiation and monitoring phases as well as on the inherent technical abilities of the private entrepreneurs. It is crucial to operationalize the capabilities construct in a more streamlined fashion by taking into account the differences between buyers and suppliers in public contracting.

In this sense, I unpack the capabilities construct and I identify two sets of capabilities that may affect performance in public contracting in the presence of policy interventions to favor SMEs: *contract-management capabilities* on the public side and the *execution capabilities* of private entrepreneurs on the other.

Contract-management capabilities and performance: The public manager's side

Public bodies can draw on public managers capabilities to ensure that the public interest will be pursued and that the innate side effects of public policies will be offset (Moore, 1995). As I have demonstrated before, policy interventions in public contracting can spur small firm participation at the expense of higher costs and quality deterioration; however, I argue that in the context of public contracting, superior contract-management capabilities can attenuate the malignant consequences of overprotection of inefficient firms.

Inspired by Argyres and Mayer (2007), Brown and Potoski (2003), and Fabrizio (2012), I define *contract-management capabilities* as the abilities to procure goods efficiently in the market in terms of setting up a bid, selecting appropriate suppliers, and negotiating a contract. During the contract execution phase, contract-management capabilities refer to the ability to manage relationships with other suppliers and evaluate contractor behavior in pursuit of the public interest.

Public organizations have some constraints that can hamper flexibility and hinder their contract-management capabilities, such as budget limitations, difficulties hiring capable employees and firing inefficient ones, rigid bureaucratic rules, among others that restrain their room for maneuver. On the other hand, the rigidity of public organizations enhances job stability for civil servants and boosts the accumulation of knowledge on contracting matters. Indeed, learning by doing is one of the main ways of generating and accumulating capabilities as it enables the modification of organizational routines and the reconfiguration of the resources' base towards more effective scenarios (Zollo & Winter, 2002).

Evidence from public service organizations shows that learning through experimentation is the main mechanism through which these organizations build relevant capabilities (Pablo, Reay, Dewald, & Casebeer, 2007; Piening, 2013) and it is

an important factor for superior performance in the public contracting environment. These accumulated capabilities in public managers are crucial to enabling increased partnering between parties, to preventing unilateral bargaining, and to stimulating sustainable relationships (Domberger, Farago, & Fernandez, 1997) , thus helping shape improved buyer-supplier relationships (Eisenhardt, 1989).

Although bounded when compared to private counterparts, public organizations can use contract-management capabilities to prevent the collateral effects of policy interventions in public procurement. Experienced managers are more likely to manage relationships and search for skillful suppliers, to devise proper price standards, and to negotiate supply conditions (prices, payment terms and delivery dates) and to align expectations of both parties based on the contracting strategies (Argyres & Mayer, 2007). Accumulated knowledge on the public managers' side can facilitate the organization of competitive auctions, stimulate aggressive bids from suppliers, and encourage the exploitation of management systems in the contracting function (Brown & Potoski, 2003).

The contracting cycle does not end when a purchase order is placed; it goes until final delivery and involves monitoring to assure that the contractual terms have been met. In the context of public contracting, increased ability to gather information, verify supplier behavior, implement mechanisms of rewards (if applicable) and sanctions all ensure contractual performance meets desired standards. Monitoring capacity may induce agents to behave in the interests of the principal (Brown, et al., 2010; Van Slyke, 2007). Besides limiting the hazards of agent's opportunism and reducing some of the pervasive effects of public-private relationships, contract-management capabilities in their monitoring facet can increase stakeholder awareness about contractual outcomes. In addition, superior monitoring capabilities can also enhance interorganizational

coordination between buyers and suppliers (Kim & Mahoney, 2006) and address accountability standards especially if the contracted service involves rectitude and probity concerns (Cabral, et al., 2013).

Overall, contracting-management capabilities on the public managers' side can be extremely useful in the context of services procured through discriminatory programs favoring small and nascent firms. Improved capabilities from experienced and technically capable officers are likely to attenuate the problems generated by less efficient suppliers in policy interventions to favor SMEs. Furthermore, although bureaucratic rules may discourage the development of relational governance in buyer-supplier relationships, increased contract-management capabilities can encourage tighter coordination and additional opportunities for interaction between monitors and monitorees, thus attenuating potential problems associated to favoritism and selection of weak bidders of policy interventions in public contracting. Hence:

H1: The higher the level of public managers' contract-management capabilities, the lower the negative effects of policy interventions to favor SMEs on government-level outcomes (cost and responsiveness)

H2: The higher the level of public managers' contract-management capabilities, the lower the negative effects of policy interventions to favor SMEs on firm-level outcomes (ex-post performance)

Execution capabilities in public contracting: The supplier side

Received theories in management recognize that accumulated knowledge and experience for entrepreneurs are important sources of competitive advantage (Teece, Pisano, & Shuen, 1997; Winter, 2003). Equally important are *execution capabilities*, i.e. the abilities to perform the tasks and activities that allow a company to deliver goods and services. Like operational capabilities, execution capabilities enable firms to earn a

living (Winter, 2003) and must conciliate customer and company requirements in order to provide some degree of differentiation and competitive advantage (Helfat, et al., 2007). As well as this, deliberate learning by doing is a key aspect in the accumulation and further deployment of execution capabilities (Zollo & Winter, 2002). Superior execution capabilities can be a result of the combination of prior experience in performing related activities and knowledge of management practices to retain and exploit organizational resources in an effective fashion (Cepeda & Vera, 2007; Zollo & Winter, 2002).

Execution capabilities also play a leading role in activities involving SMEs as services provided by them can be of inferior quality because they may not have the managerial expertise, experience curve, and effects of scale economies (Ebben & Johnson, 2005). Considering the inherent problems of SMEs in terms of access to financial and human resources, superior capabilities on the entrepreneur side can circumvent liabilities of smallness and newness (Lee, Kelley, Lee, & Lee, 2012) in SMEs engaged in government relationships, including in the presence of favored companies supplying goods and services to public authorities.

In fact, in the context of public contracting, suppliers can develop increased abilities over time resulting from accumulated experience, which yield superior execution capabilities that are able to enhance both company value-capture and value-creation potential (Kivleniece & Quelin, 2012). More specifically, supplier capabilities can alleviate problems related to contract design, contractual disputes and conflict resolution through repeated buyer-supplier relationships (Arino & Reuer, 2004). These capabilities can complement the prevailing control-oriented behavior of public bureaucracies and lead to evolved and better crafted relationships in public contracting (Van Slyke, 2007). The accumulated experience of private firms engaged in public-

private interactions is also likely to enable the creation of absorptive capacities (Cohen & Levinthal, 1990) that make these suppliers more able to understand the idiosyncratic requirements and constraints of public authorities, thus allowing these firms to improve the levels of value creation and their own performance (Cabral, et al., 2013).

In other words, more capable firms will be more likely to understand buyer demands and peculiarities of public bureaucracies, to deliver more-adjusted proposals, more aggressive bids, and present increased competitive advantage (Karjalainen & Kempainen, 2008; Reijonen, Tammi, & Saastamoinen, 2014; Silva, 2005). Superior execution capabilities can enhance the alignment of incentives from public authorities and suppliers, mitigate conflicts between contracting parties and preserve public interest despite poorly designed and incomplete contracts. Such execution capabilities can act as additional sources of value creation and can attenuate the potential negative effects of policy interventions to favor SMEs in public contracting. Therefore:

H3: The higher the level of a firm's execution capabilities, the lower the negative effects of policy interventions to favor SMEs on government-level outcomes (cost and responsiveness)

H4: The higher the level of a firm's execution capabilities, the lower the negative effects of policy interventions to favor SMEs on firm-level outcomes (ex-post performance).

METHODOLOGY

Data

In order to assess how accumulated resources and accumulated capabilities are able to attenuate the side-effects of preferential treatment to small firms in public contracting, I have built a unique dataset of on-line reverse auctions for contract services managed by the Brazilian federal government. In 2007 Brazil introduced new

legislation favoring small and medium enterprises (SMEs) in public procurement at the federal level. Considering that Brazilian legislation follows the examples of other similar programs in terms of content and orientation, such as the U.S. Small Business Act, and that the Brazilian government uses online bidding platforms analogous to those of other governments throughout the world, the Brazilian example can be considered a valid laboratory for the assessment of the relationship between policy interventions in public contracting, accumulated capabilities in public and private entities, and the underlying implications on government-level and firm-level outcomes ¹.

More precisely, Brazilian legal innovation has promoted changes that have a) lowered the entry costs for favored firms by removing some bureaucratic barriers b) allowed purchasing units to allocate bids below the reservation price of US\$ 25,000 (R\$ 80,000) exclusively to SMEs c) permitted government purchasing units to prefer SMEs even if their bids are not the lowest, up to a limit of 5% of bids of non-SMEs. These changes are used here as a quasi-experiment to observe behaviors in auctions before and after the new legislation. Such an exogenous shock allowed me to assess the effects of the governmental action on government outcomes (costs and responsiveness) and on firm outcomes (severity of sanctions against firms due to contractual noncompliance).

I used the following data collection strategy to ensure the comparability of my observations. I analyzed contracts from similar organizations: public universities run by the Brazilian federal government. Public universities are interesting given the existing heterogeneity of contracted services such as security and cleaning maintenance, and transportation services. As of 2015, there were 64 public universities run by the

¹ Brazilian reverse auction procedures follow international standards in procurement. Companies interested in supplying goods and services to the government must be qualified to participate in the auctions. On the publicly announced date, the auctioneer starts the auction. The low bid is communicated to the auction participants and bidders compete to present the lowest bids. Bidders are not informed about who or how many competitors there are, thus preventing collusion or strategic bids. In the end, the company which offers the lowest bid is declared the winner.

Brazilian government at federal level. To capture the existing diversity, I analyzed data from the two most important universities in each geographical region in Brazil (Central-West, North, Northeast, South, and Southeast), totaling 10 federal universities. Table 1 provides greater detail on these organizations and on some of the type of services in the sample². I have listed all the auctioned service contracts of these 10 universities between 2003 and 2012 made available in the online bidding platform of the Brazilian Federal Government (*ComprasNet*).

Insert Table 1 about here

My dataset comprises 1472 observations. My unit of analysis is the auctioned service contract and I observe detailed information about the negotiation (*ex-ante*) and contract execution (*ex-post*) phases. The construction of this unique dataset required considerable effort. Information was gathered and crossed from six different sources. Data collection involved the author and three other research assistants, and as automated data retrieval from robots was not technically possible in this case, the data collection was performed manually. First, we assessed the information from all the auctions performed by the chosen organizations on the *ComprasNet* system. From this online dataset, we collected information about the auction process (i.e. number of bidders, price details, application of the special treatment for SMEs, among others). Second, we checked the website of the Brazilian Federal Revenue Agency (*RF*). We collected detailed fiscal information about the auction winner and we double checked if the winning company could be deemed a SME. Third, we checked the Brazilian Transparency Portal (*PT* - a federal online platform containing information about how

² I have considered 16 different types of services in my analysis. Due to space limits I only show the most relevant ones in Table 1.

public resources are spent) in order to gather information about the contract execution details and data about the civil servants involved in both the auction and contract execution phases. Fourth, we assessed the Federal Official Gazette of Brazil (*DOU*- a daily publication that registers the official acts of the federal government) to identify if there was any record of contract termination. Fifth, we consulted the Brazilian Federal Government Supplier Registration System (*SICAF*) to identify the exact types of sanctions against the supplier in the observed contract service (financial penalty, contract termination, suspension from government contracting). Sixth, we also performed a document analysis of the Personnel Bulletins of each university so as to obtain information about the assigned contract monitors, when available. Once the name of the contract supervisor was found, we checked her/his personal information in the Brazilian Transparency Portal. Unfortunately, information about the contract supervisor was found for only three universities (UFBA, UPFE, and UFRJ) and did not cover all the service contracts for the organizations in this study. As a result, for the variables related to contract monitors, we only obtained detailed information for 148 contracts.

Dependent Variables

To exploit how exogenous changes in the legislation have influenced public contracting dynamics and how capabilities moderate the effects of policy interventions to favor small firms, two sets of dependent variables were used.

In order to estimate the government-level outcomes (costs and responsiveness), the following proxies are used: *price savings* and *auction length*. The first variable captures the savings obtained in a given auction and this is calculated using the following formula: $Price\ savings = ((Reservation\ price - Winning\ bid) / Reservation\ price)$, where *RESprice* is the reservation price defined by the government purchase unit through extensive market research, and *FINALbid* is the last bid made by the winning

firm during the reverse auction³. The second variable uses the duration of the auction process (*length_auct*) to proxy for responsiveness, as the longer the time the auction process takes to complete, the longer the time that the final users have to wait to benefit from the purchased good or service, the higher the process inefficiency, and the lower the responsiveness of public authorities in public contracting.

The heterogeneity found in the 16 different types of contracts I examined in this study made it difficult to find observable performance indicators related to firm outcomes (i.e. a cleaning services contract is evaluated differently from a contract involving maintenance services for elevators or personal computers). To circumvent this problem, I use the dependent variable *sanction_types* as a proxy for firm outcomes in contracts that had already been executed. I built this variable in an ordinal basis from to the lowest to the highest degree of punishment severity (no sanction, fine, contract termination, suspension of future public contracting auctions).

Table 2 presents the variables used in this study and how they were measured, and the summary statistics. Descriptive statistics are split into two groups: before and after the changes in legislation favoring SMEs. Correlation analysis found that there were no severe multi-collinearity problems among the variables (Table 3).

Insert Table 2 about here

Insert Table 3 about here

³ One may argue that our “Price savings” variable is inappropriate because governments might over or underestimate these prices either to favor or hinder SMEs in public contracting. However, these assumptions do not hold in the context I analyze in this paper. In fact, for several services, such as cleaning and security, the Brazilian Federal Government provides upper and lower price limits according to the geographic region. For more specific services, public managers must have at least three different formal proposals from different suppliers in order to set the reservation prices. Given that public managers do not receive any rewards based on savings but are severely accountable to procedural misbehavior and collusion with suppliers, these measures can decrease the odds of biased estimates.

Independent Variables

The first set of independent variables relates to the policy intervention under scrutiny. The variable *winner_SME* informs if an auction has been won by a favored company. *Change in law* refers to when the auction was performed, assuming 1 if the auction was after the implementation of the law (September 2007), and 0 otherwise. The coefficient of the interaction between *Change in law* and *winner_SME* enables us to assess the effect of SMEs (after the new law) on government-level and on firm outcomes.

The impact of public capabilities was also tested. The characteristics of public managers are used to estimate the influence of contract-management capabilities on public value and on company outcomes when small firms win public contracts. Considering the homogenous nature of a public organization in terms of rules and procedures, individual capabilities present in public managers are important sources of heterogeneity and play a leading role in the attainment of the public interest (Moore, 1995) and this is why I focus on contract-management capabilities at the individual level. In this vein, the variable *Pub_mgr_background* tells us if the public manager responsible for the auction process has a degree in management, economics or accounting. Such degree courses provide a deep knowledge of the aspects of contracting out compared to non-business related courses. Consistent with the received literature that considers accumulated experience as a proxy for capabilities (Cepeda & Vera, 2007; Fabrizio, 2012; Zollo & Winter, 2002), the variable *Pub_mgr_experience* captures how experienced the public officer is by measuring her/his time in the civil service. The variable *Pub_mgr_wage* represents the monthly salary of the public manager responsible for the observed auction. It is implicitly assumed that the higher the salary, the higher the accumulated contract-management capabilities on the public

side. The variable *Pub_mgr_comm* represents whether the public manager responsible for running the auction process occupies a leading position in the organizational hierarchy. In order to estimate the effects of ex-post *contract-management capabilities* on company outcomes, I observe the characteristics of the public officers assigned to monitor the auctioned service. Using the same reasoning above, the variables *monitor_background*, *monitor_experience*, *monitor_wage*, and *monitor_comm* are used to proxy for contract-management capabilities for monitoring. To test H1 and H2, all these variables are interacted with the variable *winner_SME* and it is expected that the resulting coefficients of these interactions are *non-negative* for price savings and *negative* for *length_auct* and *sanction_types* variables.

To assess the impact of the capabilities present on the entrepreneur side (*execution capabilities*) on public value creation and on firm outcomes, two distinct measures are used. The variables *age_winner_firm* and *experience_winner_firm* address how long the winning firm has been operating and the number of previous contracts signed with public institutions, respectively. These variables can reflect the accumulated capabilities over time and influence the company behavior *ex-ante* and *ex-post*, therefore affecting performance. In the same vein, to test H3 and H4, both variables are interacted with the variable *winner_SME* and it is expected that the resulting coefficients of these interactions on *sanction_types* are negative.

Control Variables

The dataset includes several controls that can influence the dependent variables and the residual effects of the relevant independent variables. In this vein, several characteristics of the auction and the service execution process can be captured. For example, the variable *Num_bidders* captures the number of bidders participating in the auction and informs the intensity of competition in a given auctioned service: the higher

the number of participants, the higher the price savings⁴. I also control for the *reservation price* of the procured service. The distribution of the reservation prices over the size of the contracts (not demonstrated here but available upon request) shows that 42% of the auctioned contracts are below the threshold for SME preference (R\$ 80,000). One may expect that the higher the reservation price is, the higher the potential for savings, however, it can be expected that responsiveness tends to be lower because contract managers on the public side will be more alert and increase scrutiny on bigger contracts. In addition, I control for the duration of the service contract (*Contract_length*) and I expect the same effects mentioned above. According to new legislation, public officers can assign bids below the aforementioned threshold (variable *Preference_threshold*) exclusively to SMEs (variable *Bid_exclusive SME*), and also force a tie-breaking bid (variable *tie_breaking*) in order to make it possible for a favored firm to challenge the lowest offer of a non-SME. These aspects might explain why a favored firm wins a contract and it is important to control for these. Finally, given the existing diversity in the public contracting setting under analysis, the characteristics of the observed organizations were controlled for (university fixed effects), for 16 different types of services procured (type of service fixed effects) and for temporal changes in the performance indicators (year dummy fixed effects). When possible, I include interactions between fixed effects (university and year dummies). This procedure improved the control for the correlation between covariates present in the model and omitted variables in the error term (Bettis, Gambardella, Helfat, & Mitchell, 2014).

Estimation Methods

My dataset consists of cross-sectional data of auctions performed between 2003 and 2012, before and after exogenous strategic actions from the government to foster

⁴ Concerning the number of bidders variable, when *Num_bidders* is used as a dependent variable we have seen that the policy intervention does not predict the number of bidders. This is not reported here due to space limits.

entrepreneurship through increased participation of SMEs in public contracting. Both the effects of the exogenous change and the influence of capabilities on public contracting by using two different econometric models are estimated (Ordinary Least Squares,(OLS), and Ordered Probit).

An issue that might affect the validity of these results is the presence of bias in the estimates. Some may argue that observations from auctions won by favored companies differ from observations from non-SMEs, thus nullifying any results obtained from the methods mentioned above. In order to avoid this serious problem and to ensure the robustness of the obtained findings, the Propensity Score Matching (PSM) procedure was used (Rosenbaum & Rubin, 1983). PSM techniques deal with selection bias issues (Heckman, Ichimura, & Todd, 1998) and have been recently adopted by management and public administration and strategic management scholars to reproduce the conditions of quasi experiments by assuring the comparability of the observations and by allowing causality analysis (Bifulco, 2012; Chang, Chung, & Moon, 2013; Kapoor & Lee, 2013; Reis & Cabral, 2015). To operationalize PSM in the present study, I consider favored SMEs as the treatment group and non-favored companies as the control group. Using Stata 12 software, auctions won by favored and non-favored groups were matched to make comparable observations. This procedure generates weights that are subsequently used in the regressions related to cost and quality performance indicators. Observations that did not have a region of common support were discarded. On the one hand, this decreased the number of observations in the performed regressions. For example, in the cost savings regressions the number of observations was reduced to 1142 observed contracts. On the other, this procedure has several benefits. It endorses the comparison between treatment and treated groups in a similar range of propensity scores, it improves the quality of matches, and it enables

increased reliability of results (Becker & Ichino, 2002). In this paper, PSM weights are used with robust standard errors in all the regressions run.

RESULTS AND DISCUSSION

Effects on Government- level Outcomes

Table 4 exhibits the results of regressions for government-level outcomes (cost savings and responsiveness). Models 1 and 2 examine the impacts of covariates on price savings, while Models 3 and 4 analyze the effects on the time between the start of the auction process and the initial date of contract execution. As previously expected, the interacted variable *Winner_SME * Change in law* does not demonstrate any positive influence on contracting costs nor on responsiveness as a result of the change in policy.

Nevertheless, regressions with PSM estimators suggest that the presence of individual contract-management capabilities can decrease government costs when small firms win public contracts (*Pub_mgr_backg * winner_SME*, $p < 0.05$ in Models 1 and 2) and increase responsiveness (*Pub_mgr_backg * winner_SME*, $p < 0.01$ and *Pub_mgr_exp * winner_SME*, $p < 0.05$ in Models 3 and 4). Public managers responsible for managing public auctions who come from business related careers (accounting, economics, and management) seem to have superior knowledge of contracting processes compared to public managers who studied non-business related courses. Consequently, these managers can craft more competitive auctions, encourage more aggressive bids from favored and non-favored suppliers, thus increasing savings in auctions won by small firms. More capable and more experienced managers can also circumvent bureaucratic restrictions in public contracting and reduce contracting lead-times. Hence, contract-management capabilities on the government side can increase the efficiency of the contracting process (lower costs and superior responsiveness) when small firms are successful in public contracting, and make policy interventions to favor

SMEs generate positive effects aligned with the public interest, thus supporting Hypothesis 1.

On the other hand, results show that execution capabilities are not able to contribute to improved government outcomes in terms of decreased costs and superior responsiveness when small firms are successful (*age_winner * winner_SME* and *ex_contrac * winner_SME*, N.S.), thus not supporting Hypothesis 3. Small firm capabilities are not enough to promote cost reductions or increase the contracting responsiveness probably because private firms have limited ability to overcome the bureaucratic rigidity inherent to the public contracting process.

Insert Table 4 about here

Effects on Firm-level Outcomes

Table 5 shows the regression results for the aspects related to firm outcomes, which are measured by contractual sanctions against winning firms. As mentioned before, information for contract-management capabilities (monitoring) was found only for 148 contracts. The PSM techniques used in this paper restrained estimates to 123 observations in the region of common support, which hampered the inclusion of fixed-effects interactions in the firm-level estimates. However, despite this reduction, the obtained results are robust. In line with our expectations, the coefficient of the variable *Winner_SME * Change in law* is positive and highly significant ($p < 0.01$) across all specifications (Models 5, 6, and 7). This indicates that favored companies are more likely to present insufficient performance standards. Small firms seem to present innate fragilities prompting poor service delivery and increased sanctions. An alternative explanation is that these results are not necessarily related to deficient provision by

SMEs. It might be easier to punish small forms as they are more vulnerable and they cannot afford to appeal to decisions against them in courts.

In line with Hypothesis 2, contract-management capabilities (monitoring) in the public side negatively affects the chances of more severe contractual sanctions against service providers. Contract monitors occupying a leading position in the organizational hierarchy and more experienced monitors are less likely to implement sanctions against small firms. These results remain steady across all specifications (*monitor_comm* * *winner_SME*, $p < 0.01$, and *monitor_exp* * *winner_SME*, $p < 0.01$, Models 5, 6, and 7). One may argue that these managers could collude with private entrepreneurs and restrain from imposing penalties on small firms. However, by observing the isolated coefficients of *monitor_comm* and *monitor_exp*, one can see that the presence of these capabilities increases the overall level of sanctions against the entire set of firms ($p < 0.01$) and it seems implausible that contract monitors with these characteristics only collude with small firms. It seems more likely to be due to the fact that the presence of capabilities on the public side can stimulate favored suppliers to behave in the interests of the client, thus contributing to both generate positive results and improve the overall perception of deficient provision associated to firms with preferential treatment in public contracting.

Insert Table 5 about here

Similarly, the effects of execution capabilities on company outcomes are generally aligned with the theoretical statements in Hypothesis 4: the presence of firm execution capabilities can attenuate the negative impacts on ex-post quality of policy interventions to favor small firms in public contracting. Model 7 exhibits a curvilinear

effect and demonstrates the following: the more small firms win public bids and accumulate contracts with the same government purchasing unit over time, the less the winning firm will be sanctioned severely (*ex_contrac_sq * winner_SME*, $p < 0.01$, Model 7). This result can be interpreted in at least two possible ways. First, the accumulated execution capabilities over time allows winning firms to better carry out their activities and adapt their service delivery characteristics according to customer needs. Second, recurrent buyer-supplier interactions may strengthen ties between the private company and contract monitors and such increased proximity may create collaborative problem-solving practices that can avoid contractual friction and sanction severance.

On the other hand, although marginally significant, the coefficient of the variable capturing how long the winning firm has been operating apparently suggests that older small firms do not present the same behavior as small firms engaged in repeated interactions with the same government purchasing unit (*age_winner_sq * winner_SME*, $p < 0.1$, Model 7). If this is true, such a capability measure is not able to attenuate the sanctions due to insufficient provision. However, interpreting interactions between variables in nonlinear models is complicated, and in such cases graphing the marginal effects may offer a more nuanced view of some facts not obvious when analyzing the isolated coefficients (Hoetker, 2007). I computed the marginal effects of the interactions above and I focused on the predicted likelihood of being sanctioned due to unsatisfactory provision (types 1, 2, and 3). Figure 1 shows that small firms have a decreased probability of being sanctioned compared to non-protected firms at least those with up to 30 years of operation. Considering that in the present sample the average age of the small firms are 10 years (s.d. = 8 years), the propensity of harsher punishment seems to hold only for a very small portion of favored firms. These older SMEs probably have an increased propensity to be sanctioned because they have

outside options and/or fewer incentives to improve service quality for a particular customer.

Overall, empirical results generally support Hypothesis 4. Although execution capabilities in private firms are not able to either reduce contracting costs or increase responsiveness, the number of completed contracts with the same client can avoid the negative impacts on company outcomes from policy interventions to favor SMEs in public contracting.

Insert Figure 1 about here

The number of bidders’ problem: Robustness Check

This paper uses some strategies to address potential endogeneity problems, such as a quasi-experimental approach modeled through propensity score matching techniques, checks to verify reverse causality, the inclusion of fixed effects related to year, organization, and type of contracted service, and interactions between fixed effects.

Despite these procedures, the issue of the number of bidders involved in a particular auction needs to be addressed. On the one hand, the number of bidders can affect the final price of an auctioned good or service which makes the inclusion of this variable plausible in regression models on procurement prices. On the other hand, entry decisions can be endogenously determined as increased participation in auctions can be contingent to the supplier’s expectations regarding their future profits (Bajari & Hortacsu, 2003). If this is true, estimators can be biased and regression results must be seen in perspective.

To circumvent these problems and to assess the consistency and the reliability of the obtained results, following Angrist and Pischke (2009), I run the *ex-ante* regressions which are possibly affected by entry decisions excluding the number of bidders. I also perform regressions interacting the number of bidders with the treatment variable (*winner_SME * change in law*). If the treatment coefficient remains unchanged and the coefficients of the capabilities determinants are not altered, criticism about possible bias caused by the number of bidders participating in the observed auctions can be restricted.

Table 6 exhibits the results of the robustness regressions. Models 8, 9, 10, and 11 demonstrate that compared to the results reported in Table 4, the magnitude and the significance of the coefficients of the main variable of interest remain unchanged, thus assuring the reliability of the obtained results.

Insert Table 6 about here

Table 7 summarizes the main results obtained and some possible explanations.

Insert Table 7 about here

DISCUSSION

This paper reveals some regular patterns in the relationship between policy choices to foster increased participation of small firms in public contracting, government outcomes and firm outcomes. In this matter, I have observed that the presence of discriminatory actions does not lead to cost savings and increased responsiveness during the bidding phase. In addition, favored firms through preference

programs are more likely to undergo contractual sanctions, which can be an indicator of deficient quality in service delivery. However, the contract-management capabilities of public authorities and the execution capabilities of private firms play important roles in both ex-ante and ex-post contracting phases and have important repercussions on government and firm outcomes. These findings have implications for theory and practice.

Implications for Managerial Literature

Received wisdom on strategic management asserts that public entrepreneurship can engender perverse outcomes even without explicit regulatory capture by private interests (Klein, et al., 2013). Nevertheless, my findings support the idea that the existence of capabilities in the public and private spheres can work in the public interest, by enabling cost savings, increasing responsiveness, and encouraging improved service execution. These results offer a nuanced portrait of the possibilities and contingencies of more complex government actions involving potential contradictory goals and may inform the extant debates between managerial research and policymaking.

A second contribution to the literature resides in the efforts to unpack the capabilities dimensions and to examine the potential effects of each dimension on performance. Strategic management scholars recognize that capabilities must be tailored to the settings in which they operate and ought to consider the specific functional domains where the collection of resources and assets evolve (Helfat, et al., 2007). Recognition of the underlying differences and of the different types of capabilities is crucial to devising contractual provisions that leverage capabilities as sources of competitive advantage (Argyres & Mayer, 2007). The different roles played by each type of capability on public contracting outcomes reveals that unpacking the capabilities

construct is vital to verifying how abilities can influence results from buyer-supplier interactions in public contracting and how the accumulated knowledge and experience of public and private actors can shape policy making to spur value creation and appropriation. In this realm, these results suggest that public manager capabilities are crucial for improved efficiency of the contracting process and can alter the prevailing pattern of coercive and compliance-based monitoring in favor of relationships based on trust and goal-alignment (Van Slyke, 2007). Capabilities present on the private side can also attenuate the pervasive impacts of policy intervention to favor SMEs and shape evolved buyer-supplier relationships which can positively influence firm outcomes, thus moderating the extant effects of misalignment between buyers and suppliers in public contracting.

This paper also adds to the current knowledge of strategic management in the context of public organizations, a point made by scholars on both sides of the fence (Brown, et al., 2010; Mahoney, et al., 2009). Given the existing environment in which many organizational arrangements involving public and private agents interact in collaborative and often in adversarial fashion, it is crucial to diagnose relevant points of convergence between these two streams and integrate the pertinent features to understand what really facilitates superior government results and positive firm outcomes. This paper highlights the importance of cross fertilization between strategic and public management approaches by acknowledging the role of accumulated knowledge and the experience of public and private actors on policy outcomes in settings characterized by multiple goals and by several stakeholders with competing goals. The obtained results can also help to illuminate the existing tradeoffs between efficiency at the micro level and broader societal goals and, more importantly, they are a genuine effort to make strategic management theories broadly recognized and

disseminated (Barney, 2005), thus helping to guide further research on public-private collaboration in a cross disciplinary way.

Implications for Practitioners and Policymakers

The results of this paper demonstrate to policymakers that by reducing entry barriers and by providing some advantages to SMEs, contracting cost reductions and increased responsiveness only occurs if certain contract-management capabilities on the public side are present. Government purchasing units should avoid allocating managers with inadequate training to run the contracting process. Based on the influence of capabilities on performance, politicians and policymakers should consider leveraging the existing level of contract-management capabilities of public officers involved in public-private interactions either through focused recruitment or continuous training. Experienced and well-formed bureaucrats can definitely increase the efficacy of governmental programs by stimulating more efficient contracting processes, crafting better contracts and by taking buyer-supplier relationships in public contracting towards a more problem-solving and collaborative approach.

Private entrepreneurs may also benefit from the results of the present research. Small firms interested in government contracts must be aware of the higher probability that their contracts will be sanctioned. Besides improving the level of their services, favored firms can make an effort to accumulate more contracts with governments and build knowledge on the peculiarities of this particular customer. This will help to anticipate adaptation problems and avoid contractual sanctions. Government programs can be devised to support SMEs leveraging their accumulated knowledge on legal and contractual matters. These initiatives can be particularly relevant for firms overcoming the liability of smallness and increase their odds of survival.

CONCLUSION

By assessing a rich and unusual data set of government contracts with private entrepreneurs before and after policy intervention to favor small companies in public contracting, this study shows the consequences of government strategizing behavior on government and on firm outcomes. It demonstrates how the capabilities possessed by firms and public managers involved with contracting activities attenuate the negative effects of government intervention on public-private relationships despite existing contract incompleteness and bureaucratic rigidity. The results help to illuminate the challenges of value creation in the context of public contracting and to improve existing knowledge of strategic management in public organizations.

On the one hand, the obtained results highlight the importance of management scholarship in policymaking. On the other, management theories benefit from the different challenges imposed by public organizations characterized by multiple goals and a more complicated set of relationships among the several stakeholders. The present study shows that unpacking capabilities in distinct dimensions helped to identify the mechanisms through which abilities present in public and private domains can influence contracting performance and moderate the hazards of outsourcing contracts in a public-private setting.

Further studies can continue to cement bridges between strategic management and policy issues by exploring for instance how the micro-foundations of capabilities can conciliate societal goals and firm performance in other policy interventions. These could include areas such as affirmative action in education and industrial policies to stimulate specific industries, how capabilities determinants and institutional aspects affect scope decisions and organizational performance of public-private partnerships, and how capabilities present in public and private domains co-evolve and change.

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Table 1 – Summary of the Observed Organizations (Selected Public Universities in Brazil) and Type of Service Contracts

Geographic Region	University	Number of Students (Undergrad. and Graduate)*	Number of service contracts by each university (2003-2012)**	Type of service	Number of contracts per type of service (%)
Central-West	Federal University of Goiás (UFG)	26,299	115 (7.81%)	Security	204 (13.9%)
Central-West	University of Brasília (UnB)	34,874	155 (10.53%)	Cleaning	113 (7.7%)
North	Federal University of Amazonas (UFAM)	26,038	39 (2.65%)	ICT + Telecom	122 (8.8%)
North	Federal University of Pará (UFPA)	45,880	82 (5.57%)	Engineering + Construction	129 (8.7%)
Northeast	Federal University of Bahia (UFBA)	37,175	173 (11.75%)	Maintenance	340 (23.1%)
Northeast	Federal University of Pernambuco (UFPE)	39,521	91 (6.18%)	Lab Services	67 (4.5%)
South	Federal University of Rio Grande do Sul (UFRGS)	42,112	163 (11.07%)	Transport and Travel Services	93 (6.3%)
South	Federal University of Paraná (UFPR)	22,866	242 (16.44%)	Printing Services	115 (7.8%)
Southeast	Federal University of Rio de Janeiro (UFRJ)	56,499	93 (6.32%)	Rental + Insurance	120 (8.1%)
Southeast	Federal University of Minas Gerais (UFMG)	39,378	319 (21.67%)	Others	169 (11.1%)
			1472 (100%)		1472 (100%)

Source: Information available from the respective websites

* Do not include certification and extension programs

** Contracts available in the ComprasNet Platform. Comprasnet has been used since 2001 in Brazil, however, some universities did not use the platform all this time. The number of auctioned contracts also varies according to the auction strategy used by each university. Some universities may have decided to bundle the lots in batches, thus decreasing the number of service contracts.

Table 2 – Description of Variables and Summary Statistics

Type of variable	Variables	Source	Description	Change in law (Policy Intervention)								
				All contracts (2003 to 2013)			Ex ante (2003 - Sep 2007)			Ex post (after Sep 2007)		
				Cases	Mean	(SD)	Cases	Mean	(SD)	Cases	Mean	(SD)
Dependent Variables (Govt. Outcomes)	price savings (cost)	Comprasnet	Obtained savings in the auction - ((Reservation price - Winning bid) / Reservation price)	1438	0.20	(0.25)	283	0.18	(0.27)	1155	0.20	(0.24)
	length_of auction (responsiveness)	Comprasnet and PT	Total time (days) between the start of the auction process and the initial date of contract execution	1472	53.47	(55.18)	295	41.27	(33.43)	1177	56.53	(59.02)
Dependent Variable (Firm outcomes)	sanction_types	DOU and SICAF	Ordinal variable coded 0 if the firm had no sanction in the observed contract; 1 if financial penalty is imposed to supplier; 2 if the firm had its contracted terminated; and 3 if the firm was suspended from supplying services to the government	1472	0.13	(0.51)	295	0.07	(0.39)	1177	0.14	(0.54)
Independent Variables (policy intervention in public contracting)	Change in law	Comprasnet	Dummy coded 1 if the auction was performed after Sept 2007 (policy intervention)	1472	0.80	(0.40)	295	0.00	(0.00)	1177	1.00	(0.00)
	winner_SME	Comprasnet and RF	Dummy coded 1 if a SME won the bid; 0 otherwise	1472	0.51	(0.50)	295	0.37	(0.48)	1177	0.54	(0.50)
	winner_SME * Change in law	Comprasnet and RF	Dummy coded 1 if a SME has won an auction after the new legislation	1472	0.43	(0.50)	295	0.00	(0.00)	1177	0.54	(0.50)
Independent Variables (Contract-management capabilities - Public side)	<i>Pub_mgr_background</i>	Comprasnet and PT	Dummy coded 1 if the public manager responsible for the auction has a degree in management, economics, or accounting.	1232	0.16	(0.36)	267	0.19	(0.39)	965	0.15	(0.35)
	<i>Pub_mgr_experience</i>	Comprasnet and PT	Time (years) of the public manager responsible for the auction in the civil service	1232	19.27	(10.32)	267	19.78	(7.71)	965	19.13	(10.93)
	<i>Pub_mgr_comm</i>	Comprasnet and PT	Dummy coded 1 if the public manager responsible for the auction has a commissioned job (superior position in the internal organizational hierarchy)	1233	0.646	(0.478)	267	0.596	(0.492)	966	0.66	(0.4738)
	<i>Pub_mgr_wage</i>	Comprasnet and PT	Monthly salary of the public manager responsible for the auction (R\$)	1232	6,231.70	(2,315.08)	267	6,994.74	(2,725.79)	965	6,020.58	(2,141.97)
	monitor_backg	Comprasnet and PT	Dummy coded 1 if the contract supervisor has a degree in management, economics, or accounting.	148	0.03	(0.18)	21	0.05	(0.22)	127	0.03	(0.18)
	monitor_exp	Comprasnet and PT	Time (years) of the contract supervisor in the civil service	148	20.54	(9.20)	21	20.57	(5.55)	127	20.54	(9.68)

	monitor_wage	Comprasnet and PT	Monthly salary of the contract supervisor (R\$)	148	8,671.68	(4,453.74)	21	8,251.24	(5,304.40)	127	8,741.20	(4,317.56)
	monitor_comm	Comprasnet and PT	Dummy coded 1 if the contract supervisor has a commissioned job (superior position in the internal organizational hierarchy)	148	0.284	(0.452)	21	0.286	(0.462)	127	0.283	(0.453)
Ind.Variables Execution Capabilities (Private side)	age_winner firm	Comprasnet and RF	Age of the winning firm (years) at start of bidding	1472	13.90	(11.03)	295	14.03	(10.45)	1177	13.87	(11.17)
	exp_winner firm	Comprasnet and RF	Number of past contracts executed by the winning firm with the same government purchasing unit	1472	0.74	(1.47)	295	0.40	(0.77)	1177	0.83	(1.59)
	Num_bidders	Comprasnet	Number of firms participating in the auction	1472	8.30	(9.69)	295	7.40	(8.40)	1177	8.53	(9.97)
	Reservation_price	Comprasnet	Reservation price estimated by the government purchasing unit (KR\$)	1472	860.93	(2,310.95)	0.30	471.55	(1,119.69)	1.18	958.52	(2,513.79)
Auction Characteristics	Contract_length	PT	Contract Duration (days)	1469	818	(593.00)	295	947.97	(670.19)	1174	785.52	(567.56)
	Bid_exclusive SME	Comprasnet	Dummy coded 1 if bidding was assigned exclusively to SME	1472	0.07	(0.26)	295	0.00	(0.00)	1177	0.09	(0.29)
	Preference_threshold	Comprasnet	Dummy coded 1 if the reservation price is below R\$ 80,000 (threshold of preference program for SME)	1472	0.42	(0.49)	295	0.56	(0.50)	1177	0.39	(0.49)
	tie_breaking	Comprasnet	Dummy coded 1 if the auctioneer forced a tie-breaking bid	1472	0.15	(0.36)	295	0.00	(0.00)	1177	0.19	(0.39)

Table 3 – Correlation Analysis

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1 winner_SME	1																					
2 price savings	-0.14	1																				
3 length_auct	-0.08	-0.16	1																			
4 sanction_types	-0.10	-0.03	0.24	1																		
5 change in law	0.11	0.02	0.13	0.02	1																	
6 Pub_mgr_backg	-0.15	0.06	0.22	0.21	0.07	1																
7 Pub_mgr_comm	-0.01	-0.01	0.12	0.10	0.19	-0.13	1															
8 Pub_mgr_exp	0.11	-0.33	0.17	-0.06	-0.16	0.04	-0.22	1														
9 Pub_mgr_wage	-0.05	-0.04	0.29	0.20	0.06	0.69	0.03	0.40	1													
10 age_winner	-0.31	0.25	-0.08	-0.23	0.17	-0.03	0.07	-0.18	-0.12	1												
11 exp_winner firm	-0.22	0.04	0.01	-0.11	0.16	0.00	0.03	-0.11	-0.12	0.28	1											
12 monitor_exp	-0.04	-0.05	0.04	0.03	-0.02	0.14	0.05	0.09	0.01	-0.01	0.00	1										
13 monitor_wage	-0.02	-0.05	0.07	0.05	0.02	0.05	-0.13	0.07	0.03	-0.06	0.14	0.20	1									
14 monitor_backg	0.07	0.01	-0.01	0.05	-0.02	-0.09	0.09	-0.15	-0.07	-0.05	0.13	-0.22	0.10	1								
15 monitor_comm	-0.04	0.02	0.20	0.28	0.00	0.29	-0.14	0.01	0.30	-0.16	0.05	0.07	0.14	0.22	1							
16 Num_bidders	0.03	0.14	0.04	0.36	0.15	-0.06	0.06	-0.28	-0.06	-0.22	-0.05	-0.10	0.09	0.25	0.17	1						
17 Inreservation_price	-0.28	0.09	0.24	0.31	0.30	0.09	0.07	-0.10	-0.02	0.10	0.36	-0.04	0.14	-0.01	0.06	0.26	1					
18 lnContract_length	-0.26	0.20	0.03	0.21	0.08	0.07	0.00	-0.05	-0.03	0.08	0.19	-0.10	-0.09	-0.06	0.14	0.12	0.37	1				
19 Bid_exclusive SME	0.30	-0.15	-0.11	-0.12	0.11	0.07	0.12	-0.17	0.10	-0.05	-0.14	0.03	-0.06	-0.05	-0.03	-0.15	-0.35	-0.28	1			
20 Preference_threshold	0.18	-0.11	-0.21	-0.22	-0.30	-0.09	-0.10	-0.04	-0.01	-0.07	-0.21	-0.02	-0.13	0.01	-0.08	-0.25	-0.71	-0.36	0.55	1		
21 tie_breaking	-0.08	0.01	-0.01	0.14	0.26	-0.06	-0.13	-0.10	-0.06	-0.15	0.02	-0.21	0.20	0.15	0.15	0.48	0.33	0.24	-0.16	-0.28	1	

Table 4 – Policy Intervention to favor SMEs and Capabilities: Effects on Government- level Outcomes
(Contracting Cost and Responsiveness) - OLS Regressions

Variables		Model 1 (cost) price savings	Model 2 (cost) price savings	Model 3 (responsiv.) length	Model 4 (responsiv.) length
Policy intervention in public contracting	winner_SME	0.090 [0.064]	0.113* [0.068]	21.056** [10.478]	21.133* [12.263]
	change in law	0.004 [0.048]	0.005 [0.048]	12.333 [8.544]	13.480 [8.698]
	winner_SME * change in law	0.006 [0.041]	0.006 [0.042]	-9.266 [7.300]	-11.089 [7.646]
Contract- management capabilities (Public side - Ex- ante)	Pub_mgr_backg	-0.053 [0.052]	-0.055 [0.053]	38.292*** [14.092]	38.177*** [14.010]
	Pub_mgr_comm	-0.037 [0.028]	-0.039 [0.028]	5.061 [5.082]	5.458 [5.141]
	Pub_mgr_exp	-0.001 [0.001]	-0.001 [0.001]	0.991** [0.397]	1.020*** [0.393]
	Pub_mgr_wage	0.000 [0.000]	0.000 [0.000]	-0.002 [0.002]	-0.003 [0.002]
	Pub_mgr_backg * winner_SME	0.139** [0.065]	0.138** [0.065]	-32.140*** [12.255]	-30.028** [12.699]
	Pub_mgr_comm * winner_SME	0.026 [0.033]	0.027 [0.033]	-5.606 [7.014]	-4.955 [7.371]
	Pub_mgr_exp * winner_SME	0.002 [0.001]	0.002 [0.001]	-0.833** [0.404]	-0.881** [0.392]
	Pub_mgr_wage * winner_SME	-0.000* [0.000]	-0.000* [0.000]	0.002 [0.002]	0.002 [0.002]
Execution Capabilities (Private side)	age_winner		0.001 [0.001]		-0.047 [0.237]
	ex_contrac		-0.003 [0.006]		0.011 [1.635]
	age_winner * winner_SME		-0.002 [0.002]		-0.149 [0.372]
	ex_contrac * winner_SME		-0.001 [0.016]		9.017 [9.089]
Auction Charac.	Num_bidders	0.005*** [0.001]	0.005*** [0.001]	0.814*** [0.226]	0.828*** [0.238]
	Inreservation_price	0.013* [0.007]	0.013* [0.007]	4.168*** [1.498]	4.195*** [1.481]
	lnContract_length	-0.002 [0.017]	-0.002 [0.017]	8.029*** [2.592]	8.309*** [2.695]
	Bid_exclusive SME	-0.043 [0.039]	-0.043 [0.039]	-13.505** [6.678]	-12.648* [6.711]
	Preference_threshold	0.013 [0.027]	0.014 [0.027]	9.558* [5.755]	9.990* [5.674]
	tie_breaking	-0.027 [0.025]	-0.026 [0.025]	-14.050** [6.618]	-14.322** [6.647]
	Bid_exclusive SME * tie_breaking	0.004 [0.046]	-0.001 [0.046]	-4.158 [8.659]	-3.125 [8.861]
Fixed-Effects (FE)	Year, Purchasing unit, Type of service, and FE interactions	Yes	Yes	Yes	Yes
	Observations	1,142	1,142	1,166	1,166
	F-test	***	***	***	***
	R-squared	0.202	0.203	0.242	0.249

*** p<0.01, ** p<0.05, *p<0.10 – Robust Standard errors in brackets. All regressions consider weights based on a propensity score matching (PSM) using kernel matching in the region of common support. Constant results are not shown due to space limits

Table 5 – Policy Intervention to favor SMEs and Capabilities: Effects on Firm-level Outcomes (Severity of Sanctions) - Ordered Probit Regressions

		Model 5	Model 6	Model 7
	Variables	Sanction Types	Sanction Types	Sanction Types
Policy intervention in public contracting	winner_SME	3.897* [2.013]	1.907 [1.818]	5.535* [2.883]
	change in law	0.976 [0.948]	0.896 [1.009]	1.882 [1.401]
	winner_SME * change in law	4.353*** [0.790]	4.764*** [0.785]	4.976*** [0.907]
Contract- management capabilities (Public side Ex-post)	monitor_backg	-0.486 [0.742]	-1.010 [0.762]	0.148 [0.905]
	monitor_comm	2.409*** [0.570]	2.226*** [0.564]	2.329*** [0.620]
	monitor_exp	0.212*** [0.068]	0.188*** [0.057]	0.189*** [0.061]
	monitor_wage	0.000 [0.000]	0.000 [0.000]	0.000** [0.000]
	monitor_backg * winner_SME	0.508 [1.033]	1.289 [1.092]	1.121 [1.449]
	monitor_comm * winner_SME	-2.663*** [0.800]	-2.582*** [0.811]	-3.534*** [0.966]
	monitor_exp * winner_SME	-0.256*** [0.070]	-0.240*** [0.063]	-0.207*** [0.068]
monitor_wage * winner_SME	-0.000 [0.000]	-0.000 [0.000]	-0.000*** [0.000]	
Execution Capabilities (Private side)	age_winner		-0.092** [0.039]	0.085 [0.111]
	age_winner_sq			-0.005* [0.003]
	ex_contrac		0.025 [0.322]	1.757* [1.014]
	ex_contrac_sq			-0.803* [0.424]
	age_winner * winner_SME		0.128*** [0.045]	-0.114 [0.159]
	age_winner_sq * winner_SME			0.007* [0.004]
	ex_contrac * winner_SME		-0.685 [0.745]	4.414* [2.267]
	ex_contrac_sq * winner_SME			-4.537*** [1.233]
Controls	Auction Characteristics	Y	Y	Y
Fixed Effects	Year	Y	Y	Y
	Purchasing unit	Y	Y	Y
	Type of Service	N	N	N
	Wald chi-square	***	***	***
	Observations	123	123	123

*** p<0.01, ** p<0.05, *p<0.10 - Robust Standard errors in brackets. All regressions consider weights based on a propensity score matching (PSM) using kernel matching in the region of common support.

Table 6 – Robustness Checks

	Variables	Model 8 (cost) price savings	Model 9 (cost) price savings	Model 10 (responsiv) length_auct	Model 11 (responsiv) length_auct
Policy intervention in public contracting	winner_SME	0.104 [0.069]	0.113* [0.068]	19.790 [12.279]	21.074* [12.245]
	change in law	-0.003 [0.048]	0.005 [0.048]	11.804 [8.424]	13.491 [8.708]
	winner_SME * change in law	0.029 [0.042]	0.007 [0.043]	-7.025 [7.441]	-11.774 [7.951]
Contract-management capabilities (Public side - Ex-ante)	Pub_mgr_backg	-0.052 [0.053]	-0.055 [0.053]	38.370*** [14.005]	38.160*** [14.014]
	Pub_mgr_comm	-0.026 [0.029]	-0.039 [0.028]	7.730 [5.039]	5.604 [5.152]
	Pub_mgr_exp	-0.001 [0.001]	-0.001 [0.001]	1.047*** [0.396]	1.020*** [0.393]
	Pub_mgr_wage	-0.000 [0.000]	0.000 [0.000]	-0.003 [0.002]	-0.003 [0.002]
	Pub_mgr_backg * winner_SME	0.140** [0.066]	0.138** [0.065]	-29.423** [12.667]	-29.980** [12.722]
	Pub_mgr_comm * winner_SME	0.016 [0.033]	0.027 [0.033]	-6.845 [7.174]	-5.039 [7.371]
	Pub_mgr_exp * winner_SME	0.001 [0.001]	0.002 [0.001]	-0.932** [0.392]	-0.879** [0.393]
	Pub_mgr_wage * winner_SME	-0.000* [0.000]	-0.000* [0.000]	0.002 [0.002]	0.002 [0.002]
Execution Capabilities (Private side)	age_winner	0.000 [0.001]	0.001 [0.001]	-0.141 [0.233]	-0.052 [0.239]
	ex_contrac	-0.002 [0.006]	-0.003 [0.006]	0.107 [1.634]	0.020 [1.636]
	age_winner * winner_SME	-0.001 [0.002]	-0.002 [0.002]	-0.078 [0.370]	-0.141 [0.371]
	ex_contrac * winner_SME	-0.006 [0.016]	-0.002 [0.016]	8.595 [9.271]	9.055 [9.124]
Auction Charac.	Num_bidders		0.005*** [0.001]		0.785*** [0.271]
	Num_bidders * winner_SME *change in law		-0.000 [0.002]		0.097 [0.379]
Controls	Other Auction Characteristics	Y	Y	Y	Y
FE	Year	Y	Y	Y	Y
	Purchasing unit	Y	Y	Y	Y
	Type of Service	Y	Y	Y	Y
	FE interactions	Y	Y	Y	Y
	Observations	1,142	1,142	1,166	1,166
	F-test	***	***	***	***
	R-squared	0.185	0.203	0.240	0.249

*** p<0.01, ** p<0.05, *p<0.10 - Robust Standard errors in brackets. All regressions consider weights based on a propensity score matching (PSM) using kernel matching in the region of common support.

TABLE 7 - Summary of Results

Hypothesis	Result	Possible Explanations
H1: The higher the level of public managers' contract management capabilities, the lower the negative effects of policy interventions to favor SMEs on government-level outcomes (cost and responsiveness)	Supported. Contract management capabilities on the government side can increase the efficiency of the contracting process (lower costs and increased responsiveness) when small firms are successful in public contracting, which may attenuate the effects of policy interventions to favor SMEs.	Public managers with superior negotiation skills can encourage more competitive auctions, stimulate more aggressive bids from suppliers and increase savings in auctions won by small firms. More capable managers can also circumvent bureaucratic restrictions in public contracting and decrease the contracting lead-times. Capabilities present in public managers are able to conciliate government goals (foster small firms' participation) and process efficiency in public contracting.
H2: The higher the level of public managers' contract management capabilities, the lower the negative effects of policy interventions to favor SMEs on firm-level outcomes (ex-post performance)	Supported. Contract management capabilities can improve outcomes for small firms (reduced level of sanctions) and attenuate firm-level problems associated to policy intervention to favor SMEs in public contracting.	Increased contract –management capabilities can decrease the severity of sanctions applied against small firms. Experienced and more capable public managers can induce favored firms to behave in the interests of the principal. Capabilities on the public side contribute to improve the overall perception of deficient provision associated to small firms favored by affirmative actions in public contracting.
H3: The higher the level of firm's execution capabilities, the lower the negative effects of policy interventions to favor SMEs on government-level outcomes (cost and responsiveness)	Not supported. Execution capabilities from private firms are not able to improve government-level outcomes in auctions won by SMEs.	Small firms' capabilities are not able to promote cost reductions or increase the contracting responsiveness probably because they have limited discretion to overcome the bureaucratic rigidity inherent to the public contracting process.
H4: The higher the level of firm's execution capabilities, the lower the negative effects of policy interventions to favor SMEs on firm-level outcomes (ex-post performance).	Generally Supported. Execution capabilities can attenuate some problems associated to policy interventions to favor SMEs in public contracting.	As small firms accumulate more contracts with the same government purchasing unit, they are able to improve service quality and to reduce the severity of sanctions applied in the case of deficient provision. This indicates that execution capabilities seem to be relevant when firms have effective control of the resources necessary to meet desired goals.

Figure 1- Marginal effects of age (years) of the winning firm on the probability of being sanctioned due to deficient provision (dashed lines indicate 95% confidence intervals)

