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State–business relations and access to external financing*

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Abstract

Firms' contractual relations with a state may give lenders a positive signal and facilitate access to debt. This paper studies the impact of public procurement contracts on firms' access to debt using an extensive survey of Russian manufacturing firms combined with accounting and procurement data. It shows that earnings from state-to-business contracts increase the short-term debt twice as much as revenue from private contracts. Long-term debt is not affected by public contracts differently compared to private contracts. The debt sensitivity to public contracts is four times larger for politically connected firms, although it is still positive and significant for non-connected and small firms. The paper concludes that political connection does not entirely suppress the beneficial access to debt that public contracts create.

JEL Classification: G18, G32, H57

Keywords: public procurement, political connection, leverage, short-term debt, long-term debt, capital structure, Russia.

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1 Introduction

In perfect financial markets, internal and external financing are perfect substitutes for investment (Modigliani and Miller, 1958). However, under market imperfection, characterized by an asymmetry of information and agency cost, lenders are under risk. Therefore, even if the investment project may provide positive profits both to the lender and the borrower, the credit may be rationed because the lender cannot distinguish between reliable and unreliable borrowers (Stiglitz and Weiss, 1981). To reduce the information asymmetry, the borrower may signal to the lender concerning its own quality (Cho and Kreps, 1987). The value of assets as collateral is traditionally considered a signaling channel to guarantee access to debt, i.e. asset-based debt (Chaney et al., 2012). However, the recent literature has emphasized the even greater importance of earnings in determining debt access (Lian and Ma, 2021), i.e. earnings-based debt. Other signaling channels include the relationship between the borrower and state via political connection and state ownership (Khwaja and Mian, 2005; Li et al., 2009). Discovering alternative signaling channels is essential during crises, such as the COVID-19 pandemic, because crises usually shrink business-to-business activity. It is also especially relevant for small firms because the traditional channels are quite limited for them.

This paper considers contracting with the state using public procurement as another signaling channel related to earnings-based debt. There are at least two reasons to assume that public procurement contracts may create a good signal to lenders about the quality of a project undertaken by the firm. First, the risk of default of public organization is low, so the contract is likely to be paid. Second, reputational advantages in future contracts with other public organizations create incentives for the firm to execute the government contract properly. Moreover, public contracts are usually paid after the execution, so the firm may need external financing to implement them. Therefore, lenders are more inclined to give credit based on state-to-business contracts, and firms are more prone to the issue of debt compared to business-to-business contracts.[1] Thus, one can assume that debt is more sensitive to earnings from public contracts than from private ones.

The paper empirically tests this hypothesis using data from an extensive survey of manufacturing firms, namely "Russian Firms in a Global Economy". This survey was conducted in 2014 and contains information about 1,950 firms from 60 Russian regions. It includes questions about firms' activities during recent years. The survey is extended through accounting and public procurement information for these firms for the period 2011–2018. This paper

[1] Corruption in state-to-business contracts may raise a reputational concern for a honest lender, but the nonpayment risk and legal consequences are low even in this case.

uses leverage – the ratio of total annual debt to tangible fixed assets (TFA) – as a measure of debt, where normalization enables taking into account asset-based debt. The ratio of the total annual value of procurement contracts to TFA is the measure of public earnings (public contracts). This paper considers the annual revenue minus the public earnings normalized to TFA as a measure of private earnings (private contracts).

First, this paper shows that debt sensitivity to public contracts is more than twice as large as debt sensitivity to private contracts, controlling for firm and year fixed effects. Specifically, a 10% increase in the value of public contracts (private contracts) with respect to TFA is associated with a 1.8% (0.7%) increase in total debt with respect to TFA. This is in line with the hypothesis that contracting with the state gives a positive signal to lenders. Second, this paper also argues that debt sensitivity to public contracts is likely to be causal. This paper shows that neither the annual lag nor the annual lead of public contracts is associated with the leverage given firm and time fixed effects, i.e. the changes in leverage and public contracts are contemporaneous. In line with this, this paper shows that only short-term leverage is sensitive to public contracts, while long-term leverage is insensitive. These results indicate that firms winning public contracts – usually of short duration – may need more short-term debt because the contract execution requires investments, and public authorities pay later than private companies.

The literature has consistently shown that politically connected firms have easier access to debt and greater access to public procurement contracts. Accordingly, in the results above, there may be a political connection that induces the high debt sensitivity to public procurement contracts despite controlling for firm and time fixed effects. In contrast, for non-connected firms, public contracts may not give an advantage in access to debt. Therefore, this paper tests how leverage sensitivity to public contracts depends on the firms' political connections. Measuring the political connection of firms in open data is a complicated task, and such measures usually underestimate the diversity of political connections. A question from the survey helps to overcome this issue. On the one hand it covers different aspects of political connection, and, on the other, it is quite non-sensitive. The question indicates political connections via organizational (non-financial) support that firms have received from federal, regional, and local governments. This paper shows that debt sensitivity to the public contracts of politically connected firms is four times as large as that of non-politically connected firms. This means that politically connected firms issue more debt than non-connected firms for a given level of public contracts. This discrepancy is even higher if a firm receives support from the federal government compared to firms receiving support from regional or local

governments. Despite this, for non-connected firms, the debt sensitivity to public contracts is still positive and substantially higher than the debt sensitivity to private contracts.

Finally, this paper studies the heterogeneity of debt sensitivity with respect to the firm size. If the debt is substantially sensitive to public contracts for small business enterprises (SBEs), then widely used procurement preferences for SBEs are helpful not only for the support and survival of small firms, but also for developing corporate financing decisions. This paper shows that debt sensitivities both to public and private contracts for non-SBEs are twice as large as the corresponding sensitivities for SBEs. Nevertheless, even for politically non-connected SBEs, there is still a positive and significant gap between sensitivities to public and private contracts. This result shows that, despite the limited signaling channels SBEs possess, public contracts serve as a relevant channel, and procurement preferences for SBEs are policy-relevant mechanisms beyond straightforward financial support.

The paper's findings are policy-relevant, as they show that public contracts are beneficial for access to debt, and that political connection does not entirely suppress it. This result is essential for crisis periods when private demand shrinks and public demand from a state can support normal corporate financing decisions. Moreover, since many reliable signaling channels, such as certification or state subsidies, often are not available to small firms, public procurement opens access to debt via auction preferences.

Related literature and contribution

This paper is related to three strands of literature. The first strand considers the firm-specific and macroeconomic factors of capital structure. The value of assets traditionally serves as collateral for loans, so it positively affects firms' access to debt (Rajan and Zingales, 1995; Moore and Kiyotaki, 1997; Chaney et al., 2012). The recent literature has emphasized that cash-flow, measured as operating earnings, is even more important in determining debt access (Drechsel and Kim, 2021; Ivashina et al., 2021; Lian and Ma, 2021). Particularly for US non-financial firms, Lian and Ma (2021) showed that 20% of debt is based on assets, whereas 80% is based on cash-flows from firms' operations. Macroeconomic and institutional factors, such as inflation, the size of the banking sector, and the scale of corruption, are the main determinants of variation in leverage for small unlisted companies (Jõeveer, 2013). However, these factors also affect the leverage of large firms both in developed and developing countries (Demirgüç-Kunt and Maksimovic, 1998, 1999; Booth et al., 2001; Frank and Goyal, 2009; Fan et al., 2012; Fungáčová et al., 2015). This paper contributes to this strand of literature by showing that earnings received from different channels — public and private contracts — affect access to debt differently.

The second strand of literature concerns the impact of public procurement on firms' performance. The literature has shown that demand shocks, stemming from public procurement, increase firm growth measured using revenue and employment (Ferraz et al., 2015; Weichselbaumer et al., 2018; Hoekman and Sanfilippo, 2018). This effect is particularly prominent for small firms, as public procurement enables them to relax their financial constraints (Lee, 2017; Fadic, 2020). As small firms are more capacity-constrained, they are disadvantaged in competitive auctions compared to medium and large firms. Therefore, procurement regulations often prescribe giving preference to small firms or set aside part of the auctions for them (Marion, 2007; Athey et al., 2013; Nakabayashi, 2013; Shelton and Minniti, 2018). Public demand is also helpful for firms' survival, although it does not improve productivity (Bessonova, 2019; Cappelletti and Giuffrida, 2021). Hebous and Zimmermann (2021) showed that federal purchases in the US increase firms' investment. Their findings indicate that the effect of government purchases works through easing firms' access to short-term debt. These authors showed that public contracts affect short-term debt growth for financially constrained firms. My paper contributes to this literature by estimating the gap in debt sensitivity to public and private contracts.

The third strand of literature studies the role of political connections in firms' performance. This literature can be split into two streams, namely studying the effect of political connection on firms' capital structure and access to public procurement. In this literature, a firm is classified as politically connected if it is state-owned or if its CEO participates in elections or belongs to the government or a political party. The former stream of the literature, studying the relationship between firms' political connection and capital structure, shows that politically connected firms have higher access to debt. In the case of Pakistan, Khwaja and Mian (2005) showed that firms whose CEOs participate in elections borrow 45% more and have 50% higher default rates. The easier access to debt for connected firms occurs exclusively in government banks; private banks provide no preferences to politically connected firms. In the case of China, (Li et al., 2009; Song et al., 2011) showed that state-owned enterprises (SOEs) have higher access to debt, particularly long-term debt. Moreover, the state ownership and political background of the CEO can inter-affect the firm's efficiency. Chen et al. (2011) showed that SOEs have lower investment efficiency and, moreover, politically connected CEOs reduce this even more. Government subsidies, as an alternative channel of state–business relations, can also affect the capital structure. Meuleman and De Maeseneire (2012) showed that government subsidies to small firms create a positive signal of the quality, and result in easier access to long-term debt. However, the problem of subsidy allocation is

also closely related to political connection. The second stream of the literature, studying the relationship between political connection and public contract/subsidy allocation, shows that if a CEO becomes politically connected, the firm's operating returns are improved mostly due to increased public expenditure. This happens both in low- and high-corruption environments Cingano and Pinotti (2013); Amore and Bennedsen (2013); Szakonyi (2018). The literature also shows that, for firms with a connected CEO, the revenue from public procurement contracts and public subsidies increases (Wu et al., 2012; Goldman et al., 2013). The standard mechanism for awarding a contract to a connected firm is a non-transparent and non-competitive procurement procedure (Palguta and Pertold, 2017; Tkachenko et al., 2017; Dávid-Barrett and Fazekas, 2020). This paper links these two streams of literature on political connections; it shows how debt sensitivity to public procurement earnings is affected by firms' political connections, but that public contracts are beneficial for access to debt even for non-connected firms.

The most similar study to the present paper is that of (di Giovanni et al., 2022). Using Spanish firms' accounting and procurement data for 2000–2013, the authors showed that public contracts increase debt. Moreover, for young firms, the authors provided reduced-form evidence for a significant and positive gap in debt sensitivity to public and private contracts. My findings are in line with both these results. However, the present paper differs from that of (di Giovanni et al., 2022) as it emphasizes the role of political connections in debt sensitivity to public contracts. Moreover, the present paper also shows the direct evidence of the gap in debt sensitivity to public and private contracts for small rather than young firms.[2]

2 Data description

The paper uses three datasets linked together. The primary data are an extensive survey of Russian manufacturing firms – "Russian Firms in a Global Economy" (RuFIGE). The survey was conducted by the HSE University in 2014 and contains information about 1,950 firms from 60 Russian regions.[3] The same survey was used by (Levina et al., 2016) to analyze

[2]Notably, (di Giovanni et al., 2022) emphasized "... *we have seen that smaller firms, typically the most constrained, do not participate in procurement.*", which is probably due to the limitation that Spanish public authorities must publish information only about relatively large procurement contracts. Therefore, the authors had to use counterfactual simulations to provide evidence of debt sensitivity to public contracts for small firms. The present paper does not have this limitation, so it can provide direct reduced-form evidence.

[3]The survey is designed to be representative of firms' industries. Given the importance of large firms and their relatively low number in the population, they were intentionally oversampled compared to their population proportion. The survey provides sampling weights. The present paper uses these weights in the regression analysis to obtain unbiased results for the population. More information about the survey is provided on the website of the Institute for Industrial and Market Studies, Higher School of Economics: https://iims.hse.ru/en/rfge/.

firms' decentralization decisions. The respondents are high-level firm representatives (CEO, vice-CEO, Managing Director, CFO, and Commercial Director). The survey contains a large range of questions about firms' activity during 2011–2013. Some questions reveal information not available in open accounting reports. In particular, the survey includes two questions about firms' financial and non-financial relations with different levels of government. Question No. 104 of the questionnaire reads:

*"Did your firm receive any **financial** support from federal, regional, and municipal government in 2012–2013? (Give one answer in each row)".*

To answer this question, the respondents filled in the form shown in Table 1. Therefore, the survey provides information about financial support from each level of government separately. Further, question No. 105 reads:

*"Did your firm receive any **organizational** support from federal, regional, and municipal government in 2012–2013? Organizational support is any non-financial support, for example: help in contacts with Russian and foreign partners, and with other public authorities; attraction of investors; etc. (Give one answer in each row)".*

Table 1 shows the form the respondents filled to answer this question.

Table 1: Form for the questions about financial and organizational support.

		Yes	No	Hard to answer	No answer
1	From federal government				
2	From regional government				
3	From local government				

This paper uses the second question about organizational support to construct an indicator for the political connections of firms. Namely, this paper defines a firm as having received government *Support* if the respondent answered "Yes" at any government level for the second question. The firm is considered to have received *Federal support* if "Yes" was chosen in the first row of Table 1 for the second question. The *Regional support* and *Local support* indicators are created in a similar way. These variables are indicators of political connection with different levels of government; they are used as the main indicators of political connection. There are 17% of firms receiving any government organizational support, with 5.5% of firms receiving federal support, 10% receiving regional support, and 11.7% receiving local support. An alternative definition of political connection, using both questions about financial and organizational support, is presented as a robustness check.[4] Other variables from the survey

[4]If one considers both organizational and financial support, then there are 23% of firms receiving any government support, with 8.5% of firms receiving federal support, 14.5% receiving regional support, and 14% receiving local support.

data are the establishment date, firm size, two-digit industry code, an indicator of being part of a holding, an indicator of being in a business association, the presence of some state-/foreign ownership, and the location where the firm is registered. The descriptive statistics for the variables are shown in Table A1 of the Appendix. There are 3.4% of firms with state ownership, which is used as another alternative measure of political connection.

The secondary data are the accounting balance sheets of firms from the survey. The survey data were linked with the firms' official accounting information for 2011–2018[5], so the analyzed data has a panel structure. The balance sheets, among other aspects, include annual information on revenue, tangible fixed assets, and long-/short-term debt. To measure the amount of debt at the firm-year level, this paper uses *Leverage* – a ratio of total annual debt (sum of long-term and short-term debt) to tangible fixed assets (TFA). Such normalization enables taking into account asset-based debt flexibly, as tangible fixed assets are traditionally considered a collateral, determining firms' access to debt (Rajan and Zingales, 1995; Frank and Goyal, 2009; Chaney et al., 2012). The recent literature has emphasized the substantial importance of earnings in determining the access to debt (Drechsel and Kim, 2021; Ivashina et al., 2021; Lian and Ma, 2021), so this paper constructs *Revenue-TFA* equal to the ratio of annual revenue to TFA.

Finally, the information about public procurement contracts was collected from the official website of Public Procurement in Russia. The website contains all the contracts above 100 K RUB ($\sim$ 1.5 K USD). Each contract, among other aspects, includes the fiscal code of the supplier, signing date, and contract value. This paper aggregated all contracts to obtain the total value of contracts at a firm-year level and linked this to the accounting data. Exploiting this data, this paper constructs *Contracts-TFA* equal to the ratio of the total annual value of public procurement contracts to TFA. This paper winsorizes 1% of the largest positive values of *Leverage*, *Revenue-TFA*, and *Contracts-TFA* to avoid inaccuracies in the accounting information. Next, this paper calculates the normalized revenue from private contracts (*Priv.Revenue-TFA*) as the difference between *Revenue-TFA* and *Contracts-TFA*. The descriptive statistics for *Leverage*, *Priv.Revenue-TFA*, and *Contracts-TFA* are shown in Table 2. The table also shows the tangibility of assets and return on assets, because I will control for these variables in a robustness check.

[5]Collected from ruslana.bvdep.com

Table 2: Descriptive statistics for *Leverage*, *Priv.Revenue-TFA*, and *Contracts-TFA*

Variable	Obs	Mean	Std. Dev.	Median	Min	Max
Leverage	10,719	7.96	13.99	2.94	0	99.03
Priv.Revenue-TFA	10,719	23.62	70.35	6.34	0	1144.06
Contracts-TFA	10,719	0.86	6.2	0	0	150.79
Tangibility	10,717	0.28	0.22	0.23	0.00047	1
ROA	10,718	8.19	22.22	6.01	-210.13	132.95

3 Empirical methodology

This section presents the empirical approach to estimating the association between the value of public contracts and debt. *Leverage* is a dependent variable and the primary explanatory variable is *Contracts-TFA*. The main focus of the analysis is to differentiate the debt sensitivity to public and private contracts. The econometric specification has the following form:

$$Leverage_{it} = \alpha C_{it} + \gamma R_{it} + \lambda_t + \delta X_i + \epsilon_{it} \tag{1}$$

where t stands for the sequential year and i is the firm index. Variable C_{it} is the *Contracts-TFA*, and R_{it} is the *Priv.Revenue-TFA*. Variable λ_t denotes year fixed effect. The vector variable X_i is either the set of time-invariant firm's attributes presented in Table A1 of the Appendix or the firm's fixed effect.[6] The specification with firm fixed effects is more flexible as it allows to control for unobserved time-invariant characteristics. Therefore, this paper interprets specifications with firm fixed effects whenever possible. *Leverage* sensitivity to *Contracts-TFA* is α and to *Priv.Revenue-TFA* is γ. The interpretation is as follows: a 1% increase of the value of public contracts (private contracts) is associated with a α % (γ %) increase in the value of debt with respect to TFA. Following the hypothesis that state-to-business contracts create an additional positive signal to lenders compared to business-to-business contracts, this paper presents the result of the statistical test $H_0 : \alpha = \gamma, \quad H_1 : \alpha > \gamma$. In some specifications, this paper also considers short-term leverage and long-term leverage instead of the total leverage, but the right-hand side is preserved. When this paper estimates the *Leverage* sensitivity to *Contracts-TFA* separately for firms with and without political connection, it considers the following extension of the specification (1):

$$Leverage_{it} = \alpha C_{it} + \beta C_{it} * S_i + \gamma R_{it} + \lambda_t + \delta X_i + \epsilon_{it} \tag{2}$$

where $S_i = 1$ if firm i is politically connected, i.e. it received organizational support from

[6] The intercept is always included in all the models.

the government. In specification (2), α is the *Leverage* sensitivity to *Contracts-TFA* for non-connected firms and $\alpha + \beta$ is the sensitivity for politically connected firms. If β is positive and significant, then debt sensitivity to public contracts is significantly larger for politically connected firms.

This paper estimates models (1) and (2) by the weighted least squared method with weights inversely proportional to the probability of inclusion in the sample by firm size.[7] Errors ϵ_{it} are clustered at the firm level, correcting for a correlation between error terms over time within a firm.

4 Results

Table 3 shows the estimation results of model (1). Column 1 shows that variation in *Contracts-TFA* is significant in explaining the variation in *Leverage*. The magnitude of the effect holds with controls for firms' attributes (column 2). However, it substantially reduces after controlling for *Priv.Revenue-TFA* (columns 3 and 4). This paper interprets the coefficients of column 4, as it is the most flexible specification containing firm fixed effects. Specifically, the interpretation for α (γ) means that a 1% increase in public (private) contracts is associated with a 0.18% (0.07%) increase in total debt with respect to TFA. The gap in debt sensitivity between public and private contracts is statistically significant (the p-value of the test is 0.003). This result implies that public contracts increase debt twice as much as private contracts. The economic significance of the difference is substantial: if annual public procurement contracts are equal to TFA[8], then public contracts allow the issue of 11% (of TFA) more debt than private contracts. This is in line with the explanation that contracting with the state gives a positive signal, so a lender is more prone to lend on the state-to-business earning base than on the business-to-business earning base.

Notably, estimates of α and γ cannot be interpreted causally without additional evidence as participation in public procurement auctions is a strategic firm decision, [9] and firm fixed effects only partially mitigate this issue. Nevertheless, Table A2 of the Appendix shows that an increase in *Contracts-TFA* is contemporaneously associated with an increase in *Leverage*, i.e. neither the yearly lead nor the lag of *Contracts-TFA* are associated with *Leverage*. Therefore, it is likely that the increase in *Leverage* is caused by the increase in *Contracts-TFA*, or at

[7] For example, a weight of 100 in the survey means that the probability of this observation being included in the sample under simple random sampling from the population is 1/100. This is a standard approach to analyze surveys (Cameron and Trivedi, 2009)

[8] This is close to the mean value for *Contract-TFA* (see Table 2)

[9] Table 2 shows that at least 50% of firms years have zero procurement contracts, i.e. many firms do not participate in public procurement.

Table 3: *Leverage* sensitivities to *Contracts-TFA* and *Priv.Revenue-TFA*

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Leverage					
VARIABLES	Total	Total	Total	Total	Short-term	Long-term
Contracts-TFA (α)	0.31***	0.30***	0.21***	0.18***	0.17***	0.011
	(0.055)	(0.053)	(0.042)	(0.042)	(0.040)	(0.0095)
Priv.Revenue-TFA (γ)			0.071***	0.069***	0.067***	0.0027**
			(0.0073)	(0.0079)	(0.0075)	(0.0010)
Observations	10,719	10,654	10,654	10,719	10,719	10,719
Number of firms	1,646	1,636	1,636	1,646	1,646	1,646
Firm attributes	N	Y	Y	N	N	N
Firm FE	N	N	N	Y	Y	Y
Year FE	N	Y	Y	Y	Y	Y
P-value: $\alpha = \gamma$			.001	.003	.004	.201

Notes: Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The table shows the estimates of specification (1) by the weighted least squared method with weights inversely proportional to the probability of inclusion in the sample by firm size. The dependent variable of columns 1–4 is *Leverage* – the ratio of total debt to tangible fixed assets (TFA). The dependent variable of column 5 is the short-term leverage (short-term debt over TFA), and of column 6 is the long-term leverage (long-term debt over TFA). The main control variables are *Contract-TFA* (the ratio of annual public procurement contracts to TFA) and *Priv.Revenue-TFA* (the ratio of private revenue to TFA). Columns 2 and 3 include time-invariant firm attributes presented in Table A1 of the Appendix. Standard errors are clustered at the firm level, correcting for a correlation between error terms within firms. The p-value shows the result of the test $H_0 : \alpha = \gamma, \quad H_1 : \alpha > \gamma$.

least the factors that may impact both *Leverage* and *Contracts-TFA* have the same short-term dynamics.

In order to further argue that the effect mentioned above is not spurious and to deeper understand the mechanism of the impact of public contracts on debt, this paper studies how different types of debt – short-term and long-term – are related to procurement contracts. Notably, the procurement contracts are usually of short duration – below one year – as public buyers need to exhaust their annual budget by the end of a calendar year (Liebman and Mahoney, 2017).[10] Therefore, one can expect to have a positive gap in short-term debt sensitivity between public and private contracts ($\alpha > \gamma$), but not in long-term debt.[11] Columns 5 and 6 of Table 3 show the results of model (1), where the dependent variables are short-term leverage and long-term leverage, respectively. In line with expectations, column 5 shows that public contracts induce higher short-term debt than private contracts: the p-value of the test for $\alpha = \gamma$ is 0.004. For long-term leverage, the coefficient α is insignificant and γ

[10] Contracts for construction can be of long duration (above one year), but for the sample of manufacturing firms these contracts are rare.

[11] In accounting, short-term debt is issued for at most one year, and long-term debt is longer than one year.

is significant, but the test fails to reject that $\alpha = \gamma$ (p-value is 0.2). This result indicates the following mechanism: upon receiving a public contract, the firm increases the short-term debt to execute the contract, and lenders are willing to provide the debt. It also explains why we observe the contemporaneous effect of public contracts on debt and substantiates the argument of the non-spurious association between debt and public contracts.

As the next step, this paper estimates specification (2) to study the diversity of *Leverage* sensitivity to *Contracts-TFA* for firms with and without political connections. Table 4 presents the results.

Table 4: *Leverage* sensitivities to *Contracts-TFA* by government support

	(1)	(2)	(3)	(4)
VARIABLES	Dependent variable: Leverage			
Contracts-TFA (α)	0.15***	0.17***	0.16***	0.15***
	(0.036)	(0.039)	(0.038)	(0.036)
Contracts-TFA *	0.43**			
Org. gov. support (β)	(0.17)			
Contracts-TFA *		1.43***		
Org. federal support (β)		(0.17)		
Contracts-TFA *			0.47**	
Org. regional support (β)			(0.24)	
Contracts-TFA *				0.44**
Org. local support (β)				(0.17)
Priv.Revenue-TFA (γ)	0.069***	0.069***	0.069***	0.069***
	(0.0079)	(0.0079)	(0.0079)	(0.0079)
Observations	10,719	10,719	10,719	10,719
R-squared	0.210	0.212	0.209	0.210
Number of firms	1,646	1,646	1,646	1,646
Firm FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
P-value: $\alpha = \gamma$	.012	.005	.008	.012

Notes: Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The table shows the estimates of specification (2) by the weighted least squared method. The dependent variable is *Leverage*. The main control variables are *Contract-TFA*, its interaction with different levels of government organizational support, and *Priv.Revenue-TFA*. All models include firm fixed effects. Standard errors are clustered at the firm level. The p-value shows the result of testing $H_0 : \alpha = \gamma, \quad H_1 : \alpha > \gamma$.

Column 1 shows that *Leverage* sensitivity to *Contracts-TFA* for firms with political connections ($\alpha + \beta = 0.58$) is four times as large as that of firms without connections ($\alpha = 0.15$). The coefficient β in column 1 can be interpreted as follows: if the annual value of public procurement contracts equals TFA, then a politically connected firm can attract 43% more debt than non-politically connected firms. The divergence is even bigger for firms receiving support

from the federal government. Given the same level of public contracts, a firm connected with the federal government can attract 143% (of TFA) more debt than a non-politically connected firm (column 2 of Table 4). Firms receiving support from the regional or local government attract 44%–47% more debt than non-connected firms for the same value of public contracts (columns 3 and 4 of Table 4). These findings are in line with the literature showing that political rents increase with the strength of political connections (Khwaja and Mian, 2005). Notably, the coefficient α for *Contracts-TFA* is still positive and significant in all the models, and it is still significantly larger than γ for *Priv.Revenue-TFA* (see p-value for columns 1–4, Table 4). This finding shows that political connections do not entirely suppress the beneficial access to debt that public contracts create.

Finally, this paper examines the gap in debt sensitivity by firm size in Table 5.

Table 5: *Leverage* sensitivities to *Contracts-TFA* by firm size

	(1)	(2)	(3)	(4)
VARIABLES	Dependent variable: Leverage			
Contracts-TFA (α)	0.16***	0.13***	0.33***	0.27***
	(0.044)	(0.038)	(0.068)	(0.058)
Contracts-TFA *		0.53*		0.21***
Org. gov. support (β)		(0.29)		(0.080)
Priv.Revenue-TFA (γ)	0.066***	0.066***	0.11***	0.11***
	(0.0080)	(0.0081)	(0.016)	(0.016)
Observations	4,858	4,858	5,861	5,861
R-squared	0.202	0.206	0.272	0.275
Number of firms	835	835	811	811
Firm FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
P-value: $\alpha = \gamma$	.018	.04	.001	.006
Firm size	Small	Small	Med.&Large	Med.&Large

Notes: Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The table shows the estimates of specifications (1) (columns 1 and 3) and (2) (columns 2 and 4) by the weighted least squared method. Columns 1 and 2 include only small firms; columns 3 and 4 include medium and large firms. The dependent variable is *Leverage*. The main control variables are *Contract-TFA*, its interaction with government organizational support, and *Priv.Revenue-TFA*. All models include firm fixed effects. Standard errors are clustered at the firm level. The p-value shows the result of testing $H_0 : \alpha = \gamma, \quad H_1 : \alpha > \gamma$.

For small firms, column 1 shows that debt sensitivity to public contracts is twice as large as debt sensitivity to private contracts, and this gap is statistically significant. Column 2 shows that the result holds even if one takes into account the contribution of political connections. For medium and large firms, the debt sensitivities both to public and private contracts are twice as large as the corresponding sensitivities for small firms (compare columns 1 and 3),

but the contribution of political connections is less important (column 4). These results show that, even for politically non-connected small firms, there is still a positive and significant gap between sensitivities to public and private contracts.

5 Robustness check

This section provides robustness checks for the main results, implementing five variations of the main results presented in the previous section: (i) redefining the political connection by extending the government support both to organizational and financial support, as well as considering state ownership as an alternative measure of political connection; (ii) using the Heckman selection model to take into account missing values in the financial information; (iii) incorporating within-industry dynamics; (iv) proposing identification via instrumental variables; and (v) proposing additional controls for tangibility of assets and return on assets.

The first variation deals with the alternative definition of political connections. Recall that, according to the basic definition, a firm is called politically connected if it receives organizational support. This robustness check redefines that a firm is politically connected if it has state ownership (Table 6 columns 1–3) or if it receives organizational or financial support (Table 6 columns 4–6). Table 6 shows that the results are very close to those presented in Tables 4 and 5 – coefficients of interactions with political connection have the same magnitude and sign, although the coefficients of interaction for non-small firms are insignificant (columns 3 and 6). Nevertheless, Table 6 supports the main finding that public contracts are beneficial to debt access even for non-connected and small firms, and political connection is the essential factor, which determines leverage sensitivity to public contracts.

The second step of the robustness check deals with the sample selection issue. There are around 5,000 firm-year missing observations as accounting data are absent, so the panel is not balanced. This step checks how this selection of observations affects the main results. Missing values of *Priv.Revenue-TFA* are imputed to be equal to the average *Priv.Revenue-TFA* of other non-missing observations within the group defined as Industry-Region-Year-Firm size.[12] This procedure enables restoring 3,808 missing *Priv.Revenue-TFA* values. Instead of imputing *Leverage*, this paper uses the Heckman selection model to correct the estimates for missing values in the dependent variable (Heckman, 1979). There is no official Stata package working with fixed effects in the Heckman framework, so this paper uses the firm-level random-effect model with a set of firms' attributes as control variables.[13] Table 7 presents the results.

[12] Accounting information is mostly missing for small firms, so the group Industry-Region-Year-Firm size usually has several observations.

[13] Table 3 shows that the coefficients for *Contract-TFA* and *Priv.Revenue-TFA* are close in the random-effect

Table 6: *Leverage* sensitivities to *Contracts-TFA*: alternative definition of political connection

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Dependent variable: Leverage					
Contracts-TFA (α)	0.18***	0.16***	0.32***	0.14***	0.12***	0.29***
	(0.042)	(0.044)	(0.069)	(0.035)	(0.037)	(0.060)
Contracts-TFA *	0.32**	0.31**	0.24			
State ownership (β)	(0.13)	(0.12)	(0.17)			
Contracts-TFA *				0.42***	0.53***	0.15
Any gov. support (β)				(0.13)	(0.19)	(0.12)
Priv.Revenue-TFA (γ)	0.069***	0.066***	0.11***	0.069***	0.066***	0.11***
	(0.0079)	(0.0080)	(0.016)	(0.0079)	(0.0080)	(0.016)
Observations	10,719	4,858	5,861	10,719	4,858	5,861
R-squared	0.205	0.202	0.272	0.211	0.209	0.273
Number of firms	1,646	835	811	1,646	835	811
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
P-value: $\alpha = \gamma$	.004	.019	.002	.024	.081	.004
Firm size	All	Small	Med.&Large	All	Small	Med.&Large

Notes: Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The table shows the estimates of specifications (2) by the weighted least squared method. The dependent variable is *Leverage*. The variable *Any government support* is equal to 1 if a firm receives organizational or financial support. The main control variables are *Contract-TFA*, its interaction with state-ownership (columns 1–3), any government support (columns 4–6), and *Priv.Revenue-TFA*. Columns 1 and 4 include all firms. Columns 2 and 5 include small firms. Columns 3 and 6 include medium and large firms. All models include firm and year fixed effects. Standard errors are clustered at the firm level. The p-value shows the result of testing $H_0 : \alpha = \gamma, \quad H_1 : \alpha > \gamma$.

The coefficient of the interaction of *Contracts-TFA* with organizational government support is smaller compared to the main results (Tables 4 and 5), but it is positive for all models and significant for small firms. Overall, the results are similar to the main ones, emphasizing the significant gap in debt sensitivity to public and private contracts.

To consider the heterogeneity in industry dynamics, the third step of the robustness check introduces year-industry fixed effects instead of year fixed effects.[14] Table 8 shows the results, which are close to those in Tables 4 and 5. We observe a positive gap in *Leverage* sensitivity to public and private contracts even when we control for within industry dynamics.

The fourth robustness check confirms that the main results can have a causal interpretation by switching from two-way fixed effect identification to identification via instrumental variables. I use lags both of public and private contracts as instruments for their values in the current time. The identification makes two assumptions: (i) lags of public and private contracts correlate with the current value (relevance of instruments); and (ii) lags of public

model (column 3) and fixed-effect model (column 4).

[14]There are nine industries and eight years, so overall, 72 year-industry fixed effects instead of eight year fixed effects (Table A1 of the Appendix).

Table 7: *Leverage* sensitivities to *Contracts-TFA*: Heckman selection model

	(1)	(2)	(3)	(4)
VARIABLES	Dependent variable: Leverage			
Contracts-TFA (α)	0.26***	0.24***	0.21***	0.39***
	(0.019)	(0.020)	(0.028)	(0.038)
Contracts-TFA *		0.12**	0.13*	0.11
Org. gov. support (β)		(0.051)	(0.073)	(0.074)
Priv.Revenue-TFA (γ)	0.11***	0.11***	0.097***	0.14***
	(0.0025)	(0.0025)	(0.0073)	(0.0038)
Observations	14,517	14,517	7,977	6,540
Firm attributes	Y	Y	Y	Y
Firm FE	N	N	N	N
Year FE	Y	Y	Y	Y
Firm size	All	All	Small	Med.&Large

Notes: Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The table shows the estimates of specifications (1) (column 1) and (2) (columns 2–4) using the Heckman selection model with firm-level random effects. The dependent variable is *Leverage*. The main control variables are *Contract-TFA*, its interaction with organizational government support, and *Priv.Revenue-TFA*. All models include year fixed effects and firm attributes. Columns 1 and 2 include all firms, column 3 includes small firms, and column 4 includes medium and large firms.

and private contracts do not impact the current leverage given the current level of public and private contracts (exclusion restriction). While the first assumption can be tested via the first-stage F-test, the second cannot be tested. Nevertheless, Table A2 suggests that the second assumption holds because we observe only a contemporaneous correlation between public contracts and leverage given the firm fixed effects. Panels A and B of Table 9 show that the instruments are relevant, because the F-statistics are above 10. According to the Staiger–Stock rule of thumb (Cameron and Trivedi, 2005)[15], the only concern is the first stage for *Contracts-TFA* for medium and large firms. Panel C demonstrates the positive and significant gap in debt sensitivity to public and private contracts.

The final robustness check introduces additional financial variables as controls. To reduce the endogeneity issue, the main approach does not control for financial variables other than *Contracts-TFA* and *Priv.Revenue-TFA*. Nevertheless, the literature shows that return on assets and tangibility of assets usually correlate with leverage. Table 10 shows that the main results are robust to the inclusion of these variables – there is a positive gap in *Leverage* sensitivity to public and private contracts even when we control for ROA and Tangibility.

[15]The Stock–Yogo weak ID test critical value for two endogenous variables with relative bias of at most 10% is 7.03

Table 8: *Leverage* sensitivities to *Contracts-TFA*: within-industry dynamics

	(1)	(2)	(3)	(4)
VARIABLES	Dependent variable: Leverage			
Contracts-TFA (α)	0.18***	0.15***	0.12***	0.27***
	(0.041)	(0.034)	(0.036)	(0.058)
Contracts-TFA *		0.43***	0.56**	0.21***
Org. gov. support (β)		(0.16)	(0.27)	(0.080)
Priv.Revenue-TFA (γ)	0.069***	0.069***	0.065***	0.11***
	(0.0077)	(0.0077)	(0.0078)	(0.016)
Observations	10,719	10,719	4,858	5,861
R-squared	0.219	0.223	0.226	0.283
Number of firms	1,646	1,646	835	811
Firm FE	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y
P-value: $\alpha = \gamma$	.003	.013	.051	.008
Firm size	All	All	Small	Med&Large

Notes: Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The table shows the estimates of specifications (1) (column 1) and (2) (columns 2–4) by the weighted least squared method. The dependent variable is *Leverage*. Government support is constructed using the question about organizational support. The main control variables are *Contract-TFA*, its interaction with government support, and *Priv.Revenue-TFA*. Columns 1 and 2 include all firms, column 3 includes small firms, and column 4 includes medium and large firms. All models include firm and industry-year fixed effects. Standard errors are clustered at the firm-level. The p-value shows the result of testing $H_0 : \alpha = \gamma, \quad H_1 : \alpha > \gamma$.

6 Conclusion

The paper presents evidence regarding the extent to which public procurement contracts can open access to debt and how this access depends on political connections. It shows that earnings-based debt based on public contracts is significantly higher than that based on private contracts. This finding suggests that state-to-business contracts can serve as a signaling channel for lenders about the borrowers' quality. The paper also explains the mechanism: to execute a public contract, the borrower issues short-term debt, and there is no long-term effect of public contracts on the debt. This paper also shows that the debt sensitivity to public contracts is four times larger for politically connected firms, although it is still positive and significant for non-connected and small firms. Therefore, this paper concludes that public contracts are beneficial for access to debt even for small firms, and that political connection does not entirely suppress this benefit. The paper's findings are policy-relevant and essential for crisis periods, such as the COVID-19 pandemic, when private demand shrinks and public demand from a state can support normal corporate financing decisions. Moreover, since many

reliable signaling channels, such as certification or state subsidies, are often not available to small firms, public procurement opens access to debt via auction preferences.

Table 9: *Leverage* sensitivities to *Contracts-TFA*: 2SLS approach

VARIABLES	(1)	(2)	(3)
	Panel A: Contracts-TFA (first stage)		
Lag of Contracts-TFA	0.28***	0.28***	0.16*
	(0.057)	(0.063)	(0.087)
Lag of Priv.Revenue-TFA	0.0066**	0.0078***	0.0014
	(0.0026)	(0.0030)	(0.0031)
F stat.	15.7	14.1	2.6
	Panel B: Priv.Revenue-TFA (first stage)		
Lag of Contracts-TFA	0.24	0.28	-0.24
	(0.20)	(0.21)	(0.49)
Lag of Priv.Revenue-TFA	0.54***	0.56***	0.45***
	(0.069)	(0.079)	(0.081)
F stat.	35	28.6	15.6
	Panel C: Leverage (2SLS)		
Contracts-TFA(α)	0.23**	0.22**	0.90**
	(0.095)	(0.090)	(0.45)
Priv.Revenue-TFA(γ)	0.095***	0.087***	0.15***
	(0.0081)	(0.0083)	(0.017)
Observations	8,990	3,982	5,008
R-squared	0.266	0.270	0.290
Firm attributes	Y	Y	Y
Firm FE	N	N	N
Year FE	Y	Y	Y
P-value: $\alpha = \gamma$	.079	.082	.053
Cragg-Donald Wald F	1385	646.2	172.2
Firm size	All	Small	Med.&Large

Notes: Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The table shows the estimates of specifications (1) by the weighted least squared method. Panel A shows the first stage for *Contracts-TFA*, and Panel B for *Priv.Revenue-TFA*. The dependent variable of Panel C is *Leverage*. The main control variables are *Contract-TFA* and *Priv.Revenue-TFA*. Columns 1 includes all firms, and columns 2 and 3 include small and medium-large firms, respectively. All models include firm characteristics from Table A1 and year fixed effects. Robust standard errors are in parentheses. The p-value shows the result of testing $H_0 : \alpha = \gamma, \quad H_1 : \alpha > \gamma$.

Table 10: *Leverage* sensitivities to *Contracts-TFA*: additional controls for ROA and tangibility of assets

	(1)	(2)	(3)	(4)
VARIABLES	Dependent variable: Leverage			
Contracts-TFA	0.16***	0.13***	0.11***	0.25***
	(0.041)	(0.036)	(0.038)	(0.058)
Contracts-TFA *		0.43***	0.52*	0.22***
Org. gov. support (β)		(0.16)	(0.27)	(0.078)
Priv.Revenue-TFA (γ)	0.064***	0.064***	0.061***	0.11***
	(0.0077)	(0.0077)	(0.0079)	(0.016)
Tangibility	-16.1***	-16.1***	-15.8***	-18.4***
	(1.50)	(1.50)	(1.71)	(1.65)
ROA	-0.039***	-0.038***	-0.033***	-0.082***
	(0.0097)	(0.0097)	(0.010)	(0.014)
Observations	10,717	10,717	4,858	5,859
R-squared	0.246	0.250	0.245	0.333
Number of of firms	1,646	1,646	835	811
Firm FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
P-value: $\alpha = \gamma$	.009	.035	.095	.012
Firm size	All	All	Small	Med.&Large

Notes: Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The table shows the estimates of specifications (1) (column 1) and (2) (columns 2–4) by the weighted least squared method. The dependent variable is *Leverage*. Government support is constructed using the question about organizational support. The main control variables are *Contract-TFA*, its interaction with government support, *Priv.Revenue-TFA*, Return on assets (*ROA*), and Tangibility of assets (*Tangibility*). Columns 1 and 2 include all firms, column 3 includes small firms, and column 4 includes medium and large firms. All models include firm and year fixed effects. Standard errors are clustered at the firm-level. The p-value shows the result of testing $H_0 : \alpha = \gamma, \quad H_1 : \alpha > \gamma$.

References

Amore, M. D. and Bennedsen, M. (2013). The value of local political connections in a low-corruption environment. *Journal of Financial Economics*, 110(2):387–402.

Athey, S., Coey, D., and Levin, J. (2013). Set-asides and subsidies in auctions. *American Economic Journal: Microeconomics*, 5(1):1–27.

Bessonova, E. (2019). Firms' efficiency, exits and government procurement contracts. Technical report, Bank of Russia.

Booth, L., Aivazian, V., Demirguc-Kunt, A., and Maksimovic, V. (2001). Capital structures in developing countries. *The journal of finance*, 56(1):87–130.

Cameron, A. and Trivedi, P. (2009). Microeconometrics using stata stata press. *College Station, Texas*.

Cameron, A. C. and Trivedi, P. K. (2005). *Microeconometrics: methods and applications*. Cambridge university press.

Cappelletti, M. and Giuffrida, L. M. (2021). Procuring survival. *ZEW-Centre for European Economic Research Discussion Paper*, (21-093).

Chaney, T., Sraer, D., and Thesmar, D. (2012). The collateral channel: How real estate shocks affect corporate investment. *American Economic Review*, 102(6):2381–2409.

Chen, S., Sun, Z., Tang, S., and Wu, D. (2011). Government intervention and investment efficiency: Evidence from china. *Journal of Corporate Finance*, 17(2):259–271.

Cho, I.-K. and Kreps, D. M. (1987). Signaling games and stable equilibria. *The Quarterly Journal of Economics*, 102(2):179–221.

Cingano, F. and Pinotti, P. (2013). Politicians at work: The private returns and social costs of political connections. *Journal of the European Economic Association*, 11(2):433–465.

Dávid-Barrett, E. and Fazekas, M. (2020). Anti-corruption in aid-funded procurement: Is corruption reduced or merely displaced? *World development*, 132:105000.

Demirgüç-Kunt, A. and Maksimovic, V. (1998). Law, finance, and firm growth. *The journal of finance*, 53(6):2107–2137.

Demirgüç-Kunt, A. and Maksimovic, V. (1999). Institutions, financial markets, and firm debt maturity. *Journal of financial economics*, 54(3):295–336.

di Giovanni, J., García-Santana, M., Jeenas, P., Moral-Benito, E., and Pijoan-Mas, J. (2022). Government procurement and access to credit: firm dynamics and aggregate implications.

Drechsel, T. and Kim, S. (2021). Earnings-based borrowing constraints and pecuniary externalities.

Fadic, M. (2020). Letting luck decide: Government procurement and the growth of small firms. *The Journal of Development Studies*, 56(7):1263–1276.

Fan, J. P., Titman, S., and Twite, G. (2012). An international comparison of capital structure and debt maturity choices. *Journal of Financial and quantitative Analysis*, 47(1):23–56.

Ferraz, C., Finan, F., and Szerman, D. (2015). Procuring firm growth: the effects of government purchases on firm dynamics. Technical report, National Bureau of Economic Research.

Frank, M. Z. and Goyal, V. K. (2009). Capital structure decisions: which factors are reliably important? *Financial management*, 38(1):1–37.

Fungáčová, Z., Kochanova, A., and Weill, L. (2015). Does money buy credit? firm-level evidence on bribery and bank debt. *World development*, 68:308–322.

Goldman, E., Rocholl, J., and So, J. (2013). Politically connected boards of directors and the allocation of procurement contracts. *Review of Finance*, 17(5):1617–1648.

Hebous, S. and Zimmermann, T. (2021). Can government demand stimulate private investment? evidence from us federal procurement. *Journal of Monetary Economics*, 118:178–194.

Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica: Journal of the econometric society*, pages 153–161.

Hoekman, B. and Sanfilippo, M. (2018). Firm performance and participation in public procurement: Evidence from sub-saharan africa.

Ivashina, V., Laeven, L., and Moral-Benito, E. (2021). Loan types and the bank lending channel. *Journal of Monetary Economics*.

Jõeveer, K. (2013). Firm, country and macroeconomic determinants of capital structure: Evidence from transition economies. *Journal of Comparative Economics*, 41(1):294–308.

Khwaja, A. I. and Mian, A. (2005). Do lenders favor politically connected firms? rent provision in an emerging financial market. *The Quarterly Journal of Economics*, 120(4):1371–1411.

Lee, M. (2017). Government purchases, firm growth and industry dynamics. *University of San Diego (mimeo)*.

Levina, I., Kisunko, G., Marques, I., and Yakovlev, A. A. (2016). Uncertainty as a factor in investment decisions: the case of the russian federation's regions. *World Bank Policy Research Working Paper*, (7806).

Li, K., Yue, H., and Zhao, L. (2009). Ownership, institutions, and capital structure: Evidence from china. *Journal of comparative economics*, 37(3):471–490.

Lian, C. and Ma, Y. (2021). Anatomy of corporate borrowing constraints. *The Quarterly Journal of Economics*, 136(1):229–291.

Liebman, J. B. and Mahoney, N. (2017). Do expiring budgets lead to wasteful year-end spending? evidence from federal procurement. *American Economic Review*, 107(11):3510–49.

Marion, J. (2007). Are bid preferences benign? the effect of small business subsidies in highway procurement auctions. *Journal of Public Economics*, 91(7-8):1591–1624.

Meuleman, M. and De Maeseneire, W. (2012). Do r&d subsidies affect smes' access to external financing? *Research Policy*, 41(3):580–591.

Modigliani, F. and Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American economic review*, 48(3):261–297.

Moore, J. and Kiyotaki, N. (1997). Credit cycles. *Journal of Political Economy*, 105(2).

Nakabayashi, J. (2013). Small business set-asides in procurement auctions: An empirical analysis. *Journal of Public Economics*, 100:28–44.

Palguta, J. and Pertold, F. (2017). Manipulation of procurement contracts: Evidence from the introduction of discretionary thresholds. *American Economic Journal: Economic Policy*, 9(2):293–315.

Rajan, R. G. and Zingales, L. (1995). What do we know about capital structure? some evidence from international data. *The journal of Finance*, 50(5):1421–1460.

Shelton, L. M. and Minniti, M. (2018). Enhancing product market access: Minority entrepreneurship, status leveraging, and preferential procurement programs. *Small Business Economics*, 50(3):481–498.

Song, Z., Storesletten, K., and Zilibotti, F. (2011). Growing like china. *American economic review*, 101(1):196–233.

Stiglitz, J. E. and Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American economic review*, 71(3):393–410.

Szakonyi, D. (2018). Businesspeople in elected office: Identifying private benefits from firm-level returns. *American Political Science Review*, 112(2):322–338.

Tkachenko, A., Yakovlev, A., and Kuznetsova, A. (2017). "sweet deals": State-owned enterprises, corruption and repeated contracts in public procurement. *Economic Systems*, 41(1):52–67.

Weichselbaumer, M., Gugler, K. P., and Zulehner, C. (2018). Effects of government spending on employment: Evidence from winners and runners-up in procurement auctions.

Wu, W., Wu, C., and Rui, O. M. (2012). Ownership and the value of political connections: Evidence from china. *European Financial Management*, 18(4):695–729.

Appendix

Table A1. Descriptive statistics of firm characteristics from the survey

Variable name	Variable values	Firms Obs.	Firms %
Industry	Food	441	22.62
	Textile	173	8.87
	Wood	216	11.08
	Chemical	200	10.26
	Nonmetal	172	8.82
	Metal	242	12.41
	Machines	266	13.64
	Electronic	132	6.77
	Vechiles	108	5.54
	Total	1950	100
State ownership	No	1884	96.62
	Yes	66	3.38
	Total	1950	100
Foreign ownership	No	1864	95.59
	Yes	86	4.41
	Total	1950	100
Establish date	<1992	543	27.98
	1992-1999	411	21.17
	>2000	987	50.85
	Total	1941	100
Firm size	Small	1071	54.92
	Medium	315	16.15
	Large	564	28.92
	Total	1950	100
In business association	No	1629	83.54
	Yes	321	16.46
	Total	1950	100
Part of holding	No	1621	83.13
	Yes	329	16.87
	Total	1950	100
Government support	No	1620	83.08
	Yes	330	16.92
	Total	1950	100
Federal support	No	1843	94.51
	Yes	107	5.49
	Total	1950	100
Regional support	No	1755	90.00
	Yes	195	10.00
	Total	1950	100
Local support	No	1722	88.31
	Yes	228	11.69
	Total	1950	100
Locality	Moscow	116	5.95
	Reg. Center	803	41.18
	Other city	880	45.13
	Town\Village	151	7.74
	Total	1950	100

Note. The table shows firms' attributes collected from the survey answers and their distribution. Overall, there are 1950 firms participating in the survey.

Table A2: Contemporaneous effect of Contracts-TFA on Leverage

	(1)	(2)	(3)	(4)
VARIABLES	Dependent variable: Leverage			
Contracts-TFA				0.17***
				(0.043)
Lag of Contracts-TFA	0.022		0.011	-0.012
	(0.048)		(0.027)	(0.030)
Lead of Contracts-TFA		0.012	0.022	0.012
		(0.018)	(0.018)	(0.013)
Priv.Revenue-TFA	0.068***	0.069***	0.066***	0.066***
	(0.0074)	(0.0083)	(0.0082)	(0.0081)
Observations	9,443	9,471	8,202	8,202
R-squared	0.189	0.193	0.191	0.201
Number of firms	1,631	1,636	1,620	1,620
Firm FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y

Note. Significance levels: '***' 0.01 '**' 0.05 '*' 0.1. The table shows the estimates of specification (1), where Contracts-TFA is introduced with either lag (Column 1) or lead (Column 2) or with both (Column 3) and together with the contemporaneous effect of Contracts-TFA (Column 4). The dependent variable is Leverage. Leads and lags of Contract-TFA are yearly. Standard errors are clustered at the firm level, correcting for a correlation between error terms within a firm. The model is estimated by the weighted least squared method with weights to be inversely proportional to the probability of inclusion in the sample by firm size. All models include firm- and year- fixed effects.

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