Does Community Monitoring Increase the Effectiveness of Public Procurement

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December 22, 2018

Outline

Motivation

- Public procurement of good and services is one of the largest government spending activities in any country
  - 13% of GDP in OECD countries
- Recent decades has been marked by emerging use of community-based monitoring as a tool to improve public service provision
- Community members has incentives to exercise their monitoring power over providers and demand better service (Stiglitz 2002)
- Empirical evidence is limited to intervention funded by IGOs and NGOs
  - World Bank has invested USD 85 bln over the last decade

- This project
  - **uses natural policy experiment to study how community-based monitoring can impact public procurement**

Background: Procurement in Russia

- 25% of total GDP ($530 bln)
- Jan 1, 2013 - Dec 31, 2014
  - 100,000 of public sector organizations (schools and hospitals, ministries, different levels municipalities, state-owned enterprises)
  - over 2 million of procurement orders
  - at least 500,000 contacts
  - 300,000 of registered firms

Background: Institutional Framework

- Centralized E-procurement system created in 2011
- New Federal Law has been passed in 2014
- **Government Mandate effective on Jan 1, 2014**
  - **all procurement orders over RUB 1 billion RUB (USD 1.5 million) are subject to obligatory public discussion**

- Obligatory public discussion is 2-stage community monitoring intervention:
  1. comment in the specialized section of the Centralized Procurement website
  2. participate in an open public hearing
- all the citizens and organizations are welcomed to participate in the discussion
- as a result the procurement procedure may be amended or canceled

Data Sources

- Administrative data on the universe of procurement orders across 2013-2014 publicly available at the Centralized Procurement website
  - procurer and procurement officer details, object description, maximum initial price and deposits
- Administrative data from procurement placement protocols (only 2014)
  - award results and price, failure reasons

Descriptive Statistics: Order

	Jan 1, 2014 - Dec 31, 2014		Jan 1, 2013 - Dec 31, 2013	
Category	*N*	%	*N*	%
Procurement procedure:				
Sole Source	400,696	19.47	N/A	N/A
Electronic Auction	1,254,830	60.97	1,331,127	54.18
Open Tender	42,999	2.09	41,187	1.68
Request for quotations	340,615	16.55	1,084,456	44.14
Request for proposals	18,962	0.92	N/A	N/A
Size:				
<RUB1 bln	2,057,688	99.98	2,456,288	99.98
>= RUB 1 bln	414	0.02	482	0.02
Total volume (RUB bln)	129740.9		6708.35	
Observations	2,058,102		2,456,770	
Procurement Object:				
Goods	809,337	42.74	1,467,237	59.72
Services	987,959	52.18	579,111	23.57
Utility Works (energy, water, sewage)	39,761	2.1	2,808	0.11
Construction works	56,451	2.98	407,614	16.59
Observations	1,893,508		2,456,770	

Descriptive Statistics: Placement Results

Table 1: Awarded Contracts Descriptive Statistics

	Mean	SD	5th %-tile	95th %-tile
Initial Price	2,962,546	76,400,000	21,441.6	5,094,624
Award price (RUB)	2,887,586	81,000,000	15,455	4,173,518
Savings (%)	17.18468	477.362	0.353	60.712
Observations	410,585			

Table 2: Distribution of Placement Results

	N	%
Awarded	537,051	72.36
Single application	66,398	25.97
Failure Reason:		
All rejected	4,532	1.77
One application	131,514	51.43
No application	52,825	20.66

Empirical Strategy: Sharp RDD

$$Y_i = \beta_0 + \beta_1 Z_i + g(C_i - C_d) + \varepsilon_i$$

where Y_i is the outcome of interest: savings, probability of failure due to low participation, probability that a contract is awarded to a single applicant;

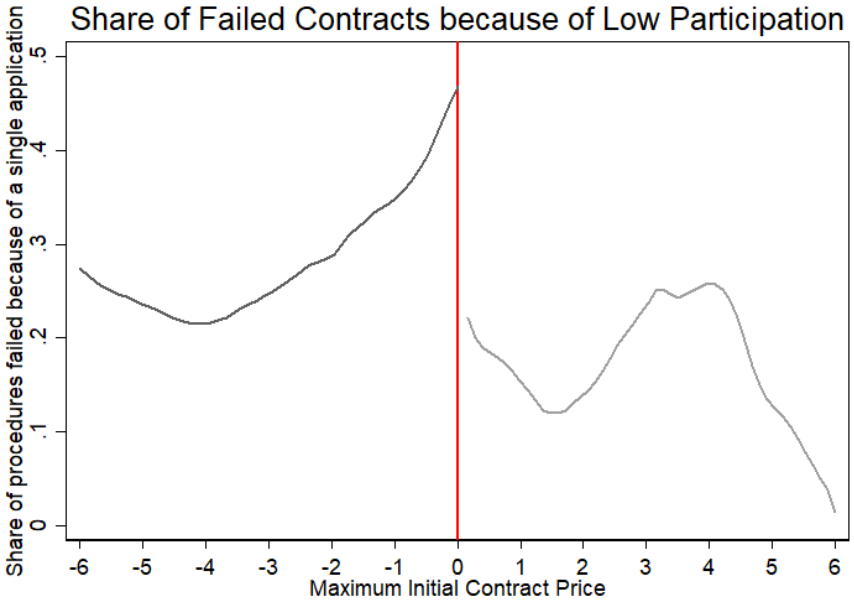
Z_i is an indicator equal to one if an order maximum price is above RUB 1 bln;

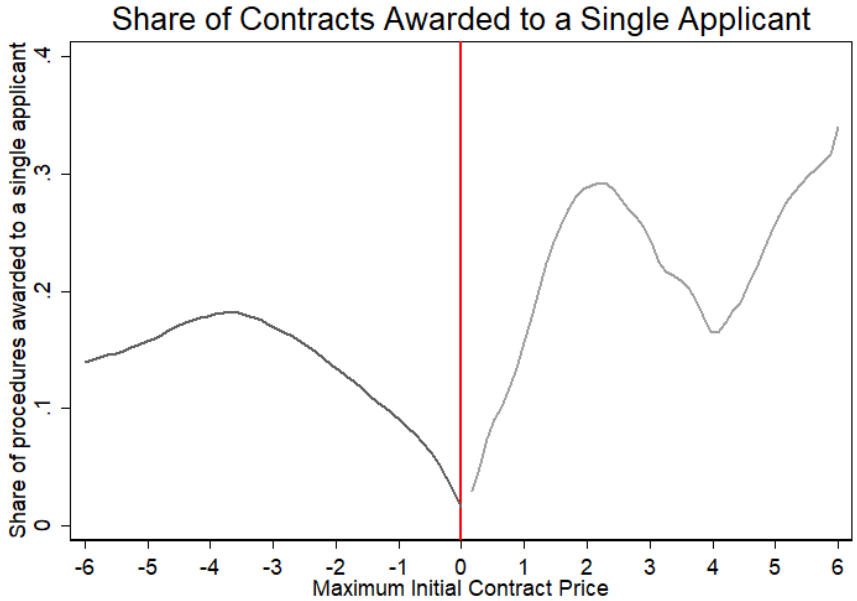
C_i is the initial price;

C_d i a RUB 1 bln threshold;

$g(\cdot)$ polynomial approximation function

RDD Results


Share of Failed Contracts because of Low Participation
Share of procedures failed because of a single application
0
.1
.2
.3
.4
.5
-6
-5
-4
-3
-2
-1
0
1
2
3
4
5
6
Maximum Initial Contract Price


Share of Contracts Awarded to a Single Applicant
Share of procedures awarded to a single applicant
0
.1
.2
.3
.4
-6
-5
-4
-3
-2
-1
0
1
2
3
4
5
6
Maximum Initial Contract Price

RDD Results

	Share failed	Share single
β_1	-0.267*	0.042
	(0.167)	(0.091)
Observations	2812	

Table 3: RDD parametric estimates

Note. - Standard errors in parenthesis. *, **, *** indicate significance at 10, 5 and 1-percent level correspondingly. The order of polynomial is set to 1. IK optimal bandwidth is used.

What went wrong?

- Lack of statistical power: pool observations across several years to increase the sample size
  - 60 observations to the right of the threshold
- Assignment is not exogenous: the initial contract price is potentially predetermined variable
  - **procurement officers has an opportunity to manipulate the maximum contract price**

Empirical Strategy: Bunching (Chetty et al. 2011)

$$Y_i = \sum_{j=0}^{q} \beta_j (C_i)^j + \sum_{j=-R}^{0} \gamma_j \mathbf{1}[C_i = j] + \varepsilon_i$$

where Y_i is the number of orders in histogram bin i;

C_i is the initial price of contracts grouped in histogram bin i;

q is the order of polynomial;

R is the number of bins excluded below the threshold RUB 1 bln;

Empirical Strategy: Bunching

The contractual density is estimated from omitting the dummy variable below the threshold

$$\hat{Y}_i = \sum_{j=0}^{q} \hat{\beta}_j (C_i)^j$$

The identifying assumption is that the counterfactual density is smooth

The excess number of orders below the threshold:

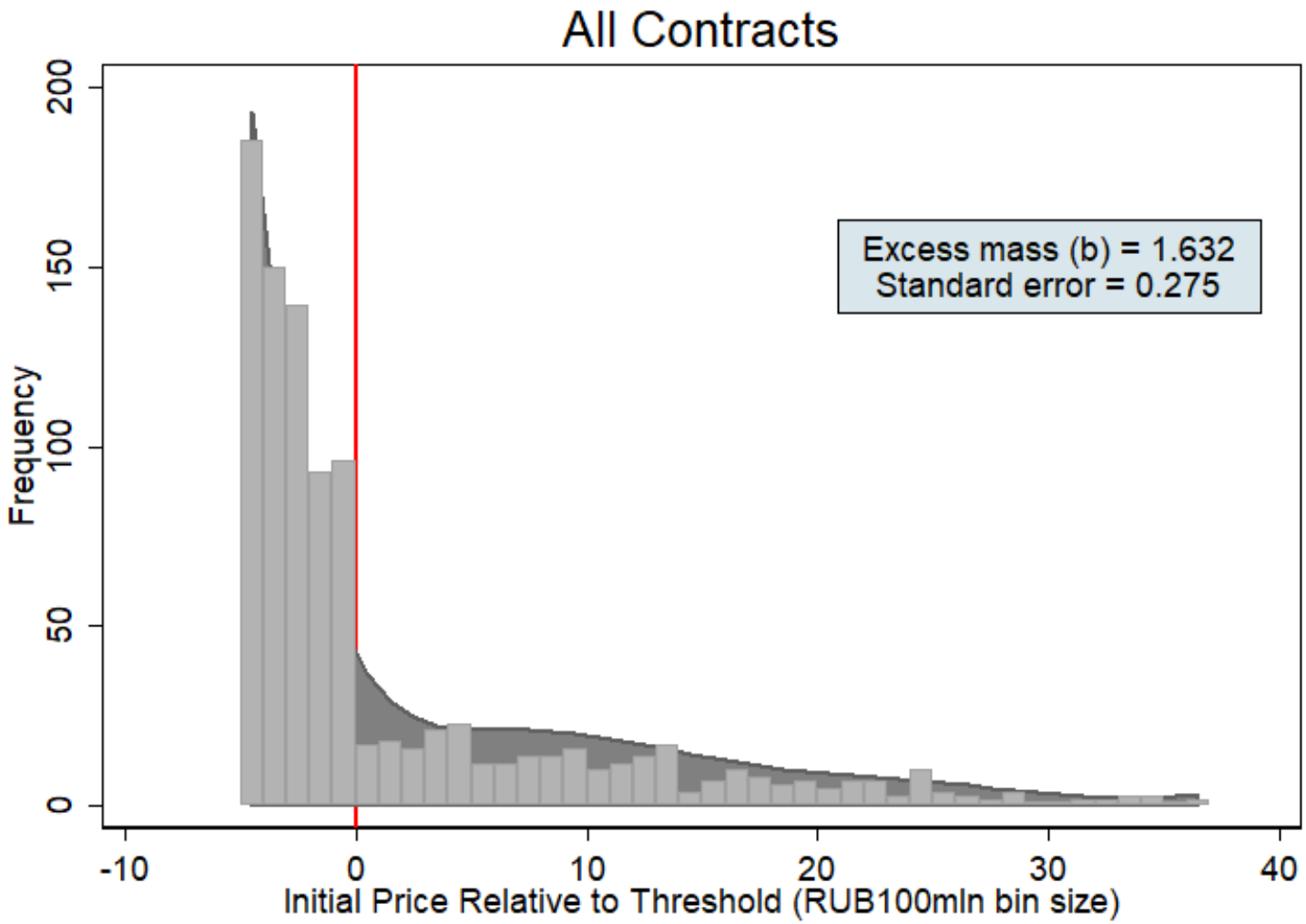
$$\hat{\beta}_N = \sum_{j=-R}^{0} Y_i - \hat{Y}_i = \sum_{j=-R}^{0} \hat{\gamma}_j$$

Empirical Strategy: Bunching

Th empirical estimate of the excess mass below the threshold relative to the average counterfatual density:

$$\hat{b} = \frac{\hat{\beta}_N}{\sum_{i=-R}^{0} \hat{Y}_i / R}$$

Bunching Estimates



Bunching Estimates

Table 4: Polynomial Regression Estimates of Excess Mass below the Threshold

	Order of polynomial		
	$q = 7$	$q = 2$	$q = 5$
$\hat{b}$	1.632	1.19	0.9874
	(0.2754)	(0.3651)	(0.1838)
$\hat{\beta}_N$	116	93	81
Observations	982		

Note. - Standard error are in parenthesis.

The manipulation affects 26% of orders with an initial price above RUB 1 bln

Conclusions and Future Work

- We detect and quantify the manipulation of procurement orders using the example of Russian public procurement system
- The incentives were created by the introduction of community monitoring of contracts above RUB 1 bln

- To further investigate the extent of manipulation and its effect on the procurement outcomes
  - use time variation: DID approach
  - use public discussion results: text processing