Corruption in Procurement
and
Shadow Campaign Financing:
Evidence from Russia

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Motivation

- Corruption is known to be a widespread phenomenon in transition and developing world
- Yet, most of the systematic evidence on corruption comes from surveys, where firm managers or citizens assess overall corruption levels
    - Bribes are unobservable
    - Survey questions on incidence of paying or receiving bribes are sensitive and respondents refuse to answer them
- Recently, the literature turned to evaluating corruption using policy experiments (e.g., Reinikka & Svensson 2004) and field experiments (e.g., Olken 2007)
    - Experiments allowing evaluation of the scale of corruption are rare and often cover a very specific area of corrupt economic activities
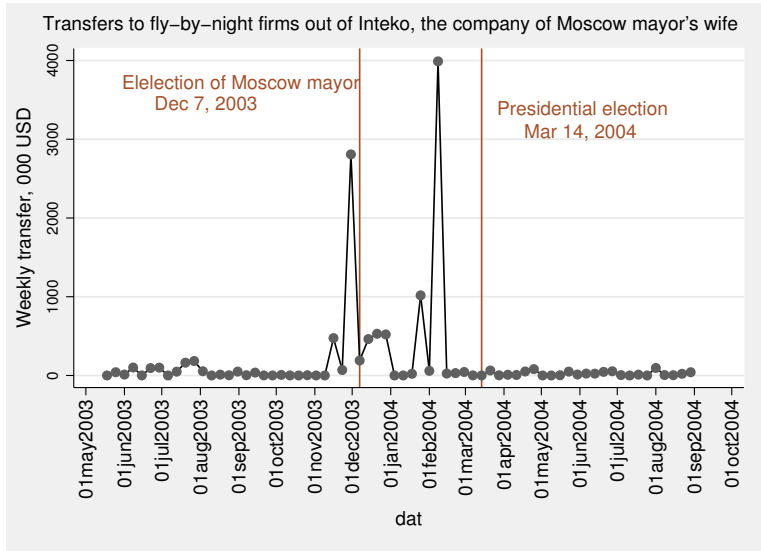
The goal of this paper

- To provide a reliable measure of corruption in public procurement and assess its welfare implication
    - using objective data
    - without narrowing down the scope:
        - for all procurement contracts
        - for the near-population of large firms in Russia
- We measure the amount of cash tunneled (Johnson et al. 2001) illegally out of firms around the time of regional elections
    - and relate it to the probability that the firms obtained procurement contracts from the government

Main findings

1. Tunneling activity exhibits a strong political cycle for firms that get public procurement contracts
   - There is no political cycle in tunneling for firms without procurement revenue
   - Abnormal tunneling levels around elections indicate that cash is channeled to politicians as they need cash the most during election campaigns
2. Using the strength of relationship between allocation of procurement contracts to specific firms and tunneling around regional elections as a measure of local corruption, we show that corruption leads to less efficient allocation of public procurement
   - Thus, we reject the "efficient greasing" hypothesis and conclude that corruption has negative welfare implications

Elena Baturina made her multi-billion fortune from procurement contracts with Moscow government

Transfers to fly−by−night firms out of Inteko, the company of Moscow mayor's wife

Elelection of Moscow mayor
Dec 7, 2003

Presidential election
Mar 14, 2004

Weekly transfer, 000 USD

dat

Related literature

1. Literature on corruption and its implications for welfare (e.g., Shleifer & Vishny 1993,1994)
   - In particular, literature on objective rather than perception-based measures (surveyed in Svensson 2005)
     - E.g., Reinikka & Svensson 2004; Bertrand et al. 2007; Olken 2007; Ferraz & Finan 2011
2. Political connections
   - E.g., Fisman 2001; Johnson & Mitton 2003; Bertrand et al. 2007; Khwaja & Mian 2005; Faccio 2006
3. Political business cycles (surveyed in Drazen 2001)
   - Most of this literature focuses on benefits directed to voters
     - Bertrand et al. 2007: the costs to firms of political connections (i.e., excess employment) follow political cycle
     - Burgess et al. 2011 show a political cycle in illegal activity that brings cash to incumbents, namely, deforestation

Motivation
○○○○

Literature
○

Data
●○○○○○

PBC in tunnelling
○○○○○○○○

Causality
○○○○○

Greasing
○○

Conclusions
○

Roadmap

1. Discuss data and measures of tunneling
2. Estimate political business cycle in tunneling for firms with and without public procurement revenue
3. Find exogenous source of variation in tunneling and show that the relationship is causal
4. Test whether corruption is an efficiency-enhancing greasing and show that it has real efficiency costs

Main dataset

- A list of banking transactions of legal entities in Russia leaked from Central Bank of Russia and available for free on the internet

- For 1999-2004, information on the date, sender, recipient, amount and self-stated purpose

- 513,169,660 transactions for 1,721,914 government and business entities and individual entrepreneurs

- We eliminate government entities, firms with 100% state ownership, financial institutions, foreign firms and self-employed entrepreneurs without legal enterprise status (85% of all entities)

- Left with a near-population of domestic, non-financial, non-government business legal entities

Fly-by-night firms (Mironov 2011)

- First, we identify "legitimate" and "fly-by-night" firms
- Intuitive criterion: fly-by-night firms are those that do not pay taxes, but should be doing so according to Russian law
    - Taxes are easily observable as they show up among a firm's banking transactions as transfers to the Treasury
    - In Russia taxes can only be paid by means of banking transfer (no other means of payment allowed)
    - Fly-by-nights are usually created to get cash out of the companies illegally for various purposes
        - tax evasion, expropriation of minority by majority shareholders and of shareholders by managers
        - registered on stolen passports, do not provide real goods or services, usually "consulting"

Legitimate firms (Mironov 2011)

- Legitimate firms are those that pay taxes
  - Focus on large legitimate firms (above 1M in annual revenue) as small firms are both unlikely to get procurement contracts and to finance elections
  - Resulting list covers 78.4% of Russian economy (close to population of large firms)
  - The list practically coincides with the list of Russian large firms from the registry of firms, collected by the Russia's statistical office

Definition of tunneling, public procurement, and additional data

- Define tunneling at each point in time for each legitimate firm as transfers from legitimate firms to fly-by-night firms
    - We aggregate the data to weekly frequency to have data set of manageable size
    - 52,073 legitimate firms, out of which 32,735 made at least one transfer to fly-by-night firms +/- one year from regional elections
- Take all regional governor elections b/w 1999 and 2004: 87 regions, 129 elections, 48 different points in time
- Identify firms with public procurement contracts as those (legitimate) firms that get payments for goods and services from government entities (in the transactions dataset)
- Add basic firm characteristics from registry for 2003

Hypothesis 1

- Tunneling activity of firms with public procurement contracts is more affected by proximity to regional elections than of firms without public procurement revenue
  - Estimate political cycles in tunneling for the two groups of firms

Specifications: diff-in-diff

- Control for the full set of week and firm dummies
- Estimate above-average tunneling activity each week $+/-$ 20 weeks away from election differentially for firms with and without procurement revenue
  - Also estimate relationship b/w size of tunneling during elections and procurement revenue
  - **X**: As larger firms have higher capacity to finance elections, we allow PBC to vary with firm revenue; we also control for the inflow of revenue
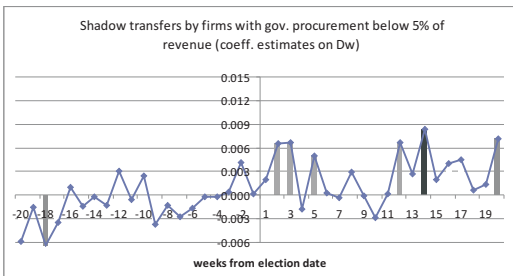
The distribution of shadow transfers over time:

$$\frac{ST_{ft}}{\overline{ST}_f} = \sum_{w=-20}^{20} \beta_w^1 D_w G_f + \sum_{w=-20}^{20} \beta_w^2 D_w + \mathbf{X}'_{ft}\beta_w^3 + \tau_t + \phi_f + \varepsilon_{ft}$$

Shadow transfers as a share of revenue:

$$\frac{ST_{ft}}{R_f} = \sum_{w=-20}^{20} \gamma_w^1 D_w \frac{PR_f}{R_f} + \sum_{w=-20}^{20} \gamma_w^2 D_w + \mathbf{X}'_{ft}\beta_w^3 + \tau_t + \phi_f + \varepsilon_{ft}$$

Political Business Cycle in tunneling

The difference in shadow transfers by firms with gov. procurement above and below 5% (coeff. estimates on Gov05*Dw)

Shadow transfers by firms with gov. procurement below 5% of revenue (coeff. estimates on Dw)
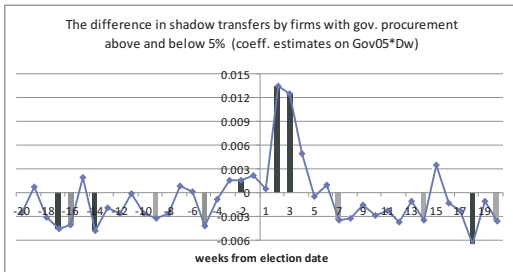
■ -significant at 1% level
■ -significant at 5% level

Size of tunneling per procurement revenue

Shadow transfers / revenue per additional 1 percentage point of gov. procurement in revenue

weeks from election date

Shadow transfers/Revenue for firms with gov. procurement = 0

weeks from election date
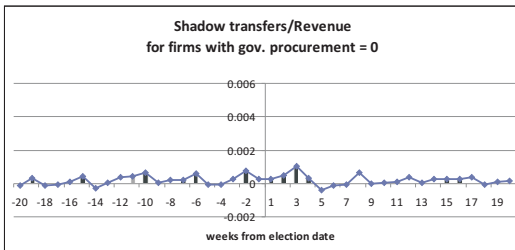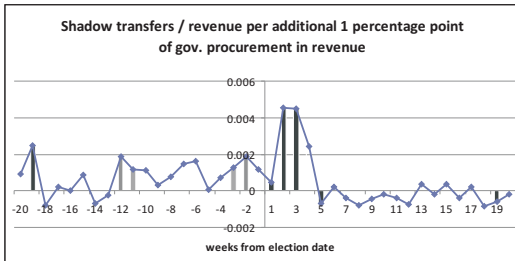
-significant at 1% level
-significant at 5% level
-significant at 10% level

Discussion

- F-stats for joint significance of coefficients inside election window [-4; +4] and for equality of coefficients inside vs. outside election window are above 25
- Abnormal tunneling starts 3-12 weeks before election, but vast majority of it occurs right after election
  - Firms wait for electoral uncertainly to be resolved and campaigns are financed by incumbents themselves (Inteko example)

Could the results be driven by differential trends?
Placebo, dates

Placebo results, equation 1

Value of F in the real data

Density

F−statistic: (inside elections) = (ouside elections)

250 iterations
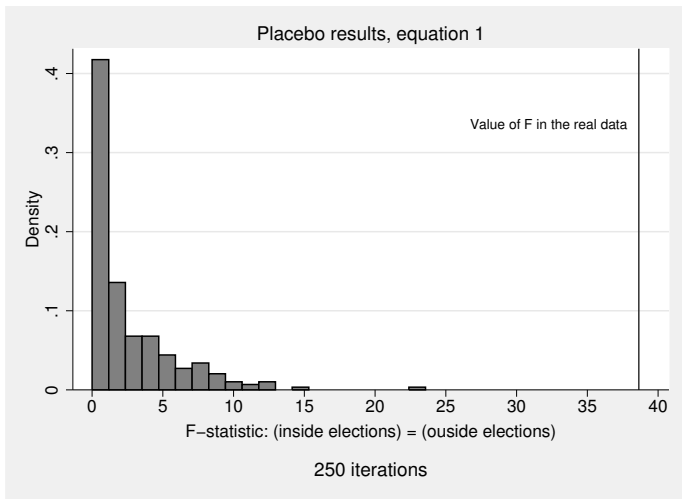
The picture is the same for placebo in equation 2

Could the results be driven by increase in legitimate economic activity around elections? Placebo, white vs. shadow transfers (tunneling)
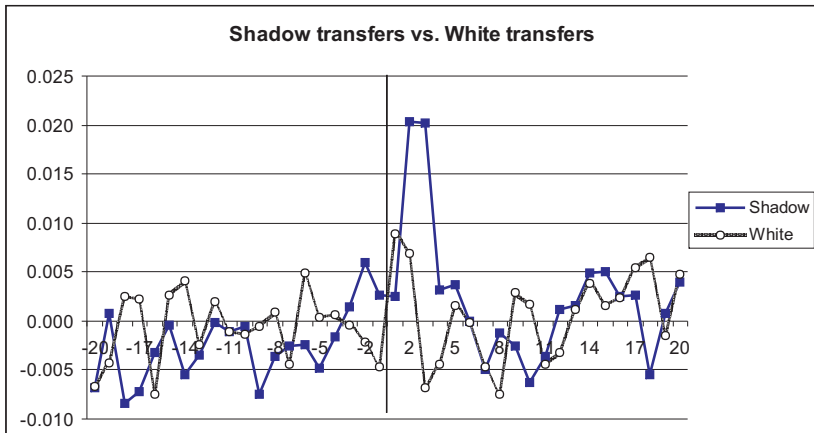
Magnitude

Difference-in-differences estimate of the size of shadow election financing per firm with non-zero public procurement revenue			
		Window:	
	+/−4 weeks	average 8 weeks	Dif:
	around election	outside election window	(inside) - (outside)
(ST per firm | Gov>0)	$ 107 760	$ 72 960	$ 34 800
(ST per firm | Gov=0)	$ 24 000	$ 20 000	$ 4 000
(ST | Gov>0)-(ST | Gov=0)	$ 83 760	$ 52 960	$ 30 800
Campaign financing per firm			$ 30 800
Av. # of firms with Gov>0 per region			81
Average size of shadow campaign financing			$ 2 488 730

- Av. firm-recipient of public procurement transfers 30, 800 USD more for an av. regional campaign and receives 100,000 USD in annual revenue from procurement contracts

- The amount of illegal campaign financing per av. campaign associated with distribution of public procurement is about 2.5 million USD

  - Average region is much poorer than Moscow

Political cycle in tunneling and closeness of elections

| | Winner: | | Incumbent: | |
	got <50%	got >50%	lost	won
Specification 1				
Gov05 x Election window	0.003	0.006	0.001	0.006
	(0.003)	(0.001)**	(0.003)	(0.001)**
Election window	-0.001	0.003	0.002	0.002
	(0.003)	(0.002)*	(0.004)	(0.001)
Number of obs	450375	1294117	191951	1384562
Number of firms	10561	25042	4719	27805
Specification 2				
Proc rev. share x Election	0.0002	0.0016	0.0003	0.0016
	(0.0001)**	(0.0004)**	(0.0001)**	(0.0004)**
Election window	0.0001	0.0004	0.0001	0.0003
	(0.0001)	(0.0001)**	(0.0001)	(0.0001)**
Number of obs	450375	1294117	191951	1384562
Number of firms	10561	25042	4719	27805

- PBC increases with the margin of victory
- Closer elections may be an indicator of better democratic institutions and, therefore, lower corruption

Does it pay to finance elections?

- As Ms. Baturina case demonstrates, one of the mechanisms behind the cycle in shadow campaign financing is political connections
  - Politically connected firms may both support politicians during election campaigns and get procurement contracts
  - As this is corruption, we primarily are interested in OLS
- Is this the only mechanism? One needs to find a source of variation in tunneling unrelated to firms political connections
- Tax agencies vary in the strength of tax enforcement
  - Dummies for tax agencies – weak instruments
  - LIML and Conditional Likelihood Ratio confidence intervals for weak instruments
- Firms assigned to tax agencies on the basis of legal address
  - Take only firms for which actual and legal addresses coincide (about 1/2 of all firms)

Cross-sectional specifications

$$Prob[ProcR_{fe} > 0] = \alpha_1 \log(1 + ST_{fe}^{window}) + \mathbf{X}'_{ft}\alpha_2 + \tau_e + \varepsilon_{fe}$$

$$\log(1 + ProcR_{fe}) = \alpha_1 \log(1 + ST_{fe}^{window}) + \mathbf{X}'_{ft}\alpha_2 + \tau_e + \varepsilon_{fe}$$

- *window*:
  1. Election: [-4; +4] weeks from election
  2. Outside Election: before -4 week from election
- Take procurement revenue received during the year after the elections
- **X**: size, profitability, leverage, sector, region

Probability of procurement contracts and tunneling

Linear Probability Model

	Dummy: revenue from procurement contracts > 0				
	IV LIML	IV LIML	OLS	OLS	OLS
Log(ST/week), election	0.802		0.062		0.039
	(0.121)***		(0.002)***		(0.003)***
	[0.593; 1.188]				
Log(ST/week), outside el.		0.355		0.067	0.038
		(0.045)***		(0.003)***	(0.003)***
		[0.266; 0.47]			
Log(Revenue)	-0.170	-0.059	0.021	0.019	0.016
	(0.031)***	(0.012)***	(0.002)***	(0.002)***	(0.002)***
Net Income/Revenue	-0.262	-0.052	0.020	0.026	0.019
	(0.058)***	(0.023)**	(0.017)	(0.017)	(0.017)
Debt/Assets	-0.179	-0.107	-0.026	-0.031	-0.031
	(0.035)***	(0.018)***	(0.011)**	(0.011)***	(0.011)***
Ind., reg., el. FE	Y	Y	Y	Y	Y
R-sq			0.191	0.190	0.196
Number of obs	41983	41983	41983	41983	41983
Number of firms	25108	25108	25108	25108	25108
F-stat, excl. instr.	3.63	4.90			

Volume of procurement contracts and tunneling

	Log (1+Procurement revenue)				
	IV LIML	IV LIML	OLS	OLS	OLS
Log(ST/week), election	0.386		0.244		0.171
	(0.104)***		(0.011)***		(0.014)***
	[0.146; 0.636]				
Log(ST/week), out. el.		0.216		0.248	0.124
		(0.079)***		(0.012)***	(0.014)***
		[0.04; 0.392]			
Log(Revenue)	0.090	0.132	0.127	0.123	0.112
	(0.027)***	(0.022)***	(0.008)***	(0.008)***	(0.008)***
Net Income/Revenue	-0.092	-0.003	-0.038	-0.012	-0.043
	(0.071)	(0.063)	(0.068)	(0.068)	(0.068)
Debt/Assets	-0.179	-0.157	-0.150	-0.165	-0.168
	(0.046)***	(0.046)***	(0.045)***	(0.045)***	(0.045)***
Ind, Reg, El. FE	Y	Y	Y	Y	Y
R-sq			0.164	0.160	0.167
Number of obs	41983	41983	41983	41983	41983
Number of firms	25108	25108	25108	25108	25108
F-stat, excl. instr.	3.63	4.90			

Reality check: Perceived corruption and our analysis

Take perception-based TI index of corruption available at the regional level for 40 regions; check if allocation of procurement contracts is more corrupt in these regions (a reality check)

| | Dummy: proc. revenue >0 | | | |
	IV	OLS	IV	OLS
Log(ST/week), elect	0.105	0.055		
	(0.021)***	(0.002)***		
Perceived corr x Log(ST/week), elect	0.013	0.023		
	(0.006)**	(0.002)***		
Log(ST/week), out elect			0.098	0.060
			(0.019)***	(0.003)***
Perceived Corr x Log(ST/week), out elect			0.009	0.021
			(0.005)*	(0.003)***
Log(Revenue)	0.009	0.021	0.010	0.019
	(0.006)	(0.002)***	(0.006)*	(0.002)***
Net Income/Revenue	0.006	0.023	0.020	0.031
	(0.023)	(0.02)	(0.022)	(0.02)
Debt/Assets	-0.037	-0.025	-0.040	-0.029
	(0.014)***	(0.013)**	(0.014)***	(0.012)**
Ind, Reg, El. FE	Y	Y	Y	Y
R-sq				0.06526365
Number of obs	35614	35614	35614	35614
Number of firms	20342	20342	20342	20342

Hypothesis 2

- Does corruption grease the wheel? Does it allow more efficient firms to get procurement contracts?
  - Take coefficient on ST in regression for GovProc as a measure of corruption

Test of "efficient greasing" hypothesis

Tax-agency-level corruption - measured at the level of tax agencies as α_1 in

$$Prob[Gov_{fe} > 0] = \alpha_1 \log(1 + ST_{fe}^{elec}) + \alpha_2' X_f + \alpha_3 S_f + \tau_e + \varepsilon_{fe} \text{ ——}$$

Estimate which firms get procurement contracts:

	dummy: government procurement >1 % of revenue			
	(1)	(2)	(3)	(4)
sample:	all firms	all firms	same address	same address
Log labor productivity	-0.012	-0.007	-0.009	-0.005
	(0.002)***	(0.002)***	(0.003)***	(0.003)*
Tax-agency-level corruption	0.225	0.529	0.281	0.532
	(0.038)***	(0.089)***	(0.062)***	(0.131)***
[Log labor productivity x		-0.104		-0.087
Tax-agency-level corruption]		(0.026)***		(0.038)**
Log(Revenue)	0.008	0.008	0.008	0.008
	(0.002)***	(0.002)***	(0.002)***	(0.002)***
Net Income/Revenue	-0.039	-0.039	-0.030	-0.030
	(0.015)***	(0.015)***	(0.021)	(0.021)
Debt/Assets	-0.029	-0.030	-0.030	-0.030
	(0.007)***	(0.007)***	(0.012)**	(0.012)**
Ind, Reg, El. FE	Y	Y	Y	Y
R-sq	0.06	0.06	0.07	0.07
Number of obs	36 801	36 801	17 153	17 153
Number of firms	20 792	20 792	9 732	9 732

- Robust to including locality fixed effects, using dummy for significant coefficient as a measure of corruption, using another cut off for procurement revenue

Conclusions

- Corruption in Russia is pervasive
- As a rule, the allocation of public procurement contracts depends on bribes payed by firms to politicians
- Bribes follow a political cycle
- Weaker tax enforcement leads to more cash being tunneled to politicians and higher government procurement contracts
- Shadow election financing in exchange for public procurement contracts is not just a pure transfer; it has negative implications for efficiency of public procurement
- Less productive firms win public procurement contracts with corruption