EFFECT OF REGIONAL ELITE TURNOVER ON PROCUREMENT CORRUPTION IN RUSSIA

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ABSTRACT

In this paper, I research the effect of regional elite turnover on procurement corruption during 2000 – 2005 in Russia. I use *tunneling to fly-by-night firms* as a proxy of fraud and political corruption. With fixed effect design, I investigate the governor and head of police change as treatment effects on the level of *tunneling*. Firstly, I found that the governor's turn decreases the frequency and amount of tunneling near the election. Secondly, tunnelling declines regardless of the political party affiliation of a new governor. Thirdly, political competition in a region might be an instrument which helps to decrease tunneling by increasing uncertainty for the firm’s corruption behaviour.

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Dedicated to **Valentina Roy**.

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new things for a long time.

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1 INTRODUCTION

Corruption is a significant problem for developing countries (Olken & Pande, 2012). It changes the system of interaction between agents and the government, distorts market relations, and reduces the trust of citizens to institutions (Chang & Chu, 2006). Cumulatively it leads to a decrease in the efficiency and growth rate of countries' development. Some vivid examples of that process are former Soviet Union republics, which transformed into a market-based economy in the early 1990s.

The transformation from planned to the market-based economy of post-soviet states left corruption as prevalent legacy (Shelley, 2009). Long-term allocation of goods and services by central planner created rooms for the deficit. To get better products and services, agents, ready to take part in corruption. It also helped the business survive and develop firms in the new rent-seeking (Levin & Satarov, 2015) reality, where companies need to pay to get quotas or permits for international trade. That made political connections valuable asset for companies.

The market economy transition was supposed to change the behavior of agents. However, the majority of interactions with governmental agencies and companies remain highly corrupted (Stefes, 2006), especially in a system of government purchase. Among OECD countries, more than half cases of proved corruption connected with governmental purchases (OECD, 2014). For those reasons, I focus on corruption in procurement, as demanding issue that has been widely discussed in Russian media outlets and academia all the time[1].

1 See, for instance, news at Kommersant, RBC and Transparency International

Corruption in procurement usually means a violation of procurement law, kickbacks to governmental authorities through an illegal withdrawal of capital from the firm or the bribery to obtain a contract. I mainly focus on the harmful effects of corruption, despite the idea that it could be considered as an "efficient grease" (Huntington et al., 2006). Some authors proved inconsistency of that hypothesis (Mironov & Zhuravskaya, 2016), (Méon & Sekkat, 2005), (Habibov et al., 2017).

First of all, the effect of corruption extends throughout all institutions: from the regular work of the courts to equal access to legal education or health care. Secondly, corruption reduces the efficiency of resource usage. A company that has connections strives to bypass laws, to win procurement contracts, regardless of the indicators of their effectiveness (Mironov & Zhuravskaya, 2016). Thirdly, corruption is illegal enrichment, which stimulates the capital outflow from the country. All of that leads to an inefficient distribution of funds, a slowdown in foreign investments (Mauro, 1995) and economic development decrease.

Corruption is a sensitive subject (Klitgaard, 1988). As part of the shadow economy, it is challenging to study because of complex identification. The hidden nature of corruption does not allow researchers to determine the real effect on the economy. In principle, corruption can be studied through qualitative and quantitative analysis. Qualitative research is about the process of collecting surveys and the compilation data into ratings of attitudes towards corruption — for example, the Corruption Perception Index (CPI) by Transparency International. By quantitative methods can be useful in the analysis of economic crimes related to corruption, or by studying some of the proxies that can identify corruption.

In this paper, I am concentrating on the quantitative method of assessing corruption in procurement, which is quite new. To determine it, I analyze transactions from big legal firms to *fly-by-night* firms. Fly-by-night firms are determined by absence or insignificant amount of

taxes relative to company's turnover (Mironov, 2013). Russian tax system prescribes value-added fees, social security taxes and property taxes even to the firms with losses. These firms usually take part in illegal cash flow out of the significant legal firms, also known as *tunneling* (Johnson et al., 2000).

Quantitative methods of corruption assessment might help understand how exactly corruption decrease welfare. Mironov and Zhuravskaya (2016) showed that companies with procurement revenue increase the number of tunneling in the period of local elections. They found that political cycle positively effects on illegal transfers among firms with procurement revenue. In this thesis, I estimate the effect of regional governors' turnover on tunneling among firms with procurement revenue. Since the structure of the political process and government (Shleifer & Vishny, 1993) can affect corruption, a change of the governor or elite members may limit level (Ferraz et al., 2009) of transfers to fly-by-night firms. Since the political cycle has an impact on procurement corruption (Mironov & Zhuravskaya, 2016), change of the governor as an actor might affect it.

The thesis organized as follows. Section 2 covers literature about corruption and political power, and institutional details about the electoral process in that period in Russia. Section 3 includes information about data and collecting process. Empirical process is explained in Section 4. Results and alternative model are discussed in the Section 5. Section 6 presents discussion and ideas for policy recommendations.

2 BACKGROUND

In this paper, I am going to follow Transparency International definition of *corruption*, which is the abuse of power received, for a personal gain, usually involving bribery or money laundering. *Procurement corruption* is the abuse of the process of governmental spending's (OECD).

All post-communist countries are infected buy corruption to some degree. Russia, Kazakhstan, Ukraine, Azerbaijan, Kyrgyzstan and other post-soviet states are ranked more than 100th in the list of countries perceiving corruption (Transparency International, 2020). Only Baltic countries and Georgia significantly succeed in fighting with it. Reasons for that efficient structural reforms of police, institutions and full governmental refreshment (Burakova, 2014). Planned economies met some troubles changing the governmentally based structure of the economy to the free market. Naturally, countries with a high level of governmental control tend to intervene in the market, to correct market failures. That creates a spacious room for corruption (Acemoglu & Verdier, 2000). Widespread corruption decreases the efficiency of public finance, reduces taxes revenue (Hillman, 2004) and brings informal rules to formal institutions.

When corruption is deeply integrated with society, the perception of corruption might turn into a social norm (Takács et al., 2011). In that case citizen's expectations about policy implementation is negative and companies prefer to continue to pay rent for inviolability. Lack of trust in legal procedures distort policy performance (Graycar, 2015). Overall it influences society's state of mind about economic and political development, changing the functioning of inclusive institutions, which consequently interferes with long-term growth (Acemoglu et al., 2005).

Corruption is inevitably connected with political power. The intention of the firms to be closer to political decision centers is known for a long time. Sometimes the value of being closer to decision-maker has a direct impact on taxation, preferable competition decisions or other regulatory practices. A corporate political relationship is widespread in the globe, and they are more developed in less transparent countries (Faccio, 2006). The threat of replacement for elites in democratic regimes is constant and it restraints their excessive power (A. I. Heidenheimer et al., 2019), setting rules of the game secure.

The connection between large business and political power in Russia emerged after privatization started in 1992 when oligarchy received control of main energy assets. New business elite wasn't able to find the ways to legitimate asset purchase and extent of its inviolability. If political clientelism implies exchange for electoral support (Stokes, 2009), political corruption is the misuse of public power for the personal profit of politicians (A. J. Heidenheimer & Johnston, 2007). System of new crony capitalism started with Putin leadership. High integration of government in the economy was enforcing developed rent-oriented behaviour of Russian bureaucracy (Yavlinsky, 2019). Business and elite connection helped constructed current political system (Monday, 2017) reinforcing corruption. 12 percent of large Russian firms have vivid political relationships with ministers and parliament members (Faccio, 2006).

Government purchases controlled by federal law about procurement and the same system of state orders operate for all regions. Any public procurement contract must be conducted through a public auction or tender, in which firms meet the formal requirements. All information relative to the auction and bidders should be available in the media (since 2009 in the unite website). After participants consideration by authorities, they publicly announced the winner. Almost all of the procurement contracts are distributed at the local level (Mironov &

Zhuravskaya, 2016) and the tunneling near election period is increasing. However, it is not clear how the change of the elite members influences on tunneling, especially the governor or head of police.

Russian regions had direct elections from 1996 – 2004 and the federal center was not able to control all incumbents. The term limit of office for head of federal entities in Russia cannot exceed five years. The first half of the 2000s was a time of consolidation of regional authoritarian regimes. Federal power deprived legislative assembles as a real authority (Golosov, 2011) and that solves the problem of excessive independence of governors. In the 88 regional elections held in 2000 - 2004, only 51 won, even though general tendency for the governors was not to lose their office (Golosov, 2011).

After the economic crisis in 1998, some southern regions tended to support the Communist Party. That known as "red belt" (Hesli & Reisinger, 2003). However, in the other areas, there is no proof of any political party support pattern. United Russia became one political party only in 2003 merged from 3 different political parties. After 2004 till 2012 the governors in Russian regions were assigned by the president and local parliament approve the candidate. That deprived compelling local candidates and launched the phenomena of governors outsiders (Kynev, 2019). Before that, in the period 1996 – 2004, most governors come with local support, and outsiders were rare. 2000 – 2005 is quite a unique period for research because regional power in Russia had direct elections, and a major political party was not able to control all incumbents.

In this paper, I will test the hypothesis, that change of the governor in the period 2000 - 2004 has a negative impact on the procurement corruption in regions. Regional elite turnover changes the behaviour of firms, and they tunnel less for a certain time.

3 DATA

I use the available online dataset from Mironov and Zhuravskaya (2016). The units of observations are Russian firms and their weekly transactions to fly-by-night firms in rubles in the period 2000 – 2005. Dataset includes the id of the firm, amount of transaction, total and procurement revenue, and a number of week when the transaction takes place. Weeks are numbered from 0 to 320, starting from January 2000 (see details in Table 1).

TABLE 1. NUMBER OF WEEKS AND YEARS

Week number	Year
0 – 52	2000
53 – 104	2001
105 – 156	2002
157 – 209	2003
209 – 264	2004
265 – 320	2005

Originally transactions data was leaked from Moscow branch of Central Bank in 2005, and it was available for online purchase (Mironov, 2013), but currently, I can't find it either for sale or free. The government never confirmed the reliability of this data. However, the same dataset appeared in conference about Tax Evasion at the Ministry of Economy in 2006. It signals about its reliability. Mironov and Zhuravskaya fully described the clearing process of data from mistakes and doublings (Mironov & Zhuravskaya, 2016). They left firms coincided with the database of official Russian statistical agency by id, name and regional tax affiliation. The variables of main interest for the thesis are illegal transfers to fly-by-night firms, procurement revenue, election week and region code.

To analyze the political effect on regional procurement corruption, I expanded dataset with information about governors change. I collected data about 88 local elections in Russian

regions from the period 2000 – 2005. There is no unite database about regional governors, and in some cases, there is no official information about acting governor in the early 2000s. I encoded it with dummy variable gov_chng, which happened 37 times in that period (see Table 1 Appendix A). Also, I collected data about the change of regional head of police. In the regions where governor changed it happened 45 times (in some cases id didn't happen, in some cases, it happened twice or more).

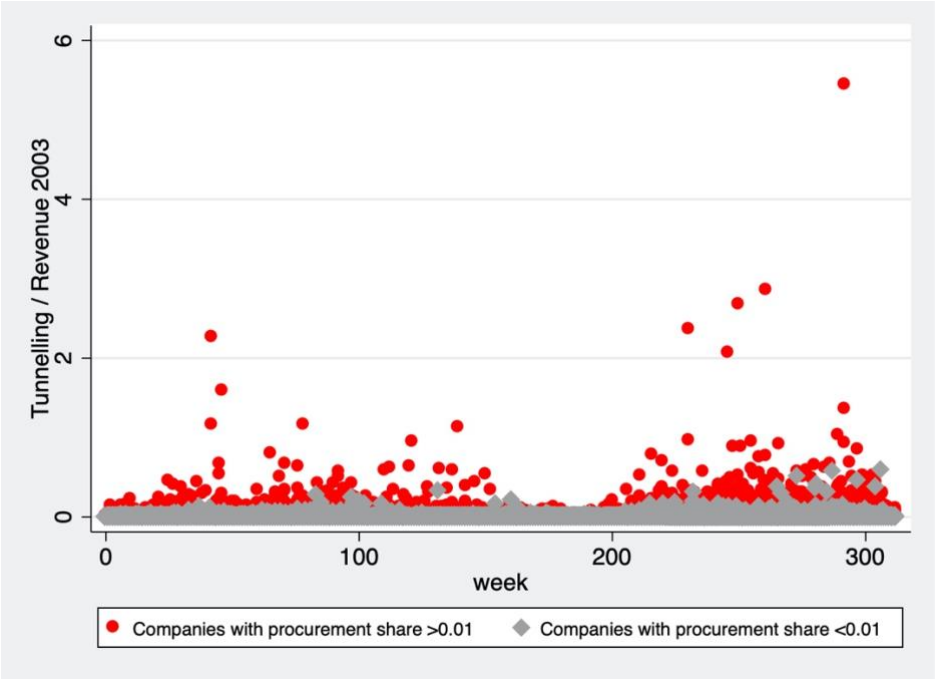
TABLE 2. SUMMARY STATISTICS

Variable	*Obs*	*Mean*	*Std. Dev.*	*Min*	*Max*
id_firm	10,405,002	5.86e+09	2.18e+09	1.01e+08	8.91e+09
week	10,405,002	150.6604	95.77632	0	312
region	10,405,002	58.41493	21.8815	1	89
transf_w	10,405,002	160085.1	5384168	0	5.41e+09
proc_w	10,405,002	899295.3	3.41e+07	0	1.86e+10
el_week	10,405,002	151.4432	92.63087	16	312
rev2003	10,405,002	3.79e+08	4.43e+09	3.00e+07	7.81e+11
year	10,405,002	2002.384	1.816728	2000	2005
proc_ratio	10,405,002	.0017138	.0729899	0	188.7617
pol_chng	10,405,002	.8298332	.3757793	0	1
gov_chng	10,405,002	.005672	.0750987	0	1

Panel has information about firm's id (tax number), region where it located, some financial data and firms' weekly transfers. Elections period is different in regions. The variable *el_week* shows the number of election week in the region. In the period 2000 – 2004 it happened in 54 different points of time. For example, the first elections week number among areas is 16 and the last number of election week is 312. *transf_w* – weekly amount transfer to fly-by-night firm and *proc_w* is a weekly amount of procurement revenue.

From the sample of all elections, I found 44 turnovers of governors. Among the regions where governor changed, I found 45 cases of change head of police position (it happened a few times in some regions). All regional head of police (министр внутренних дел) are assigned by presidential decree. All that decree is publicly available on the president website since 2002. All data about names and positions in the regional police departments before 2002 was found in the media, blogs and local newspapers.[2]

GRAPH 1. LARGE PROCUREMENT CONTRACTORS AND TUNNELING



The more procurement revenue company has, the more cash outflow it has in the research period. In the graph 1 red dots are companies with procurement share bigger than 1% threshold. I will compare the behaviour of these groups of companies in the empirical analyze.

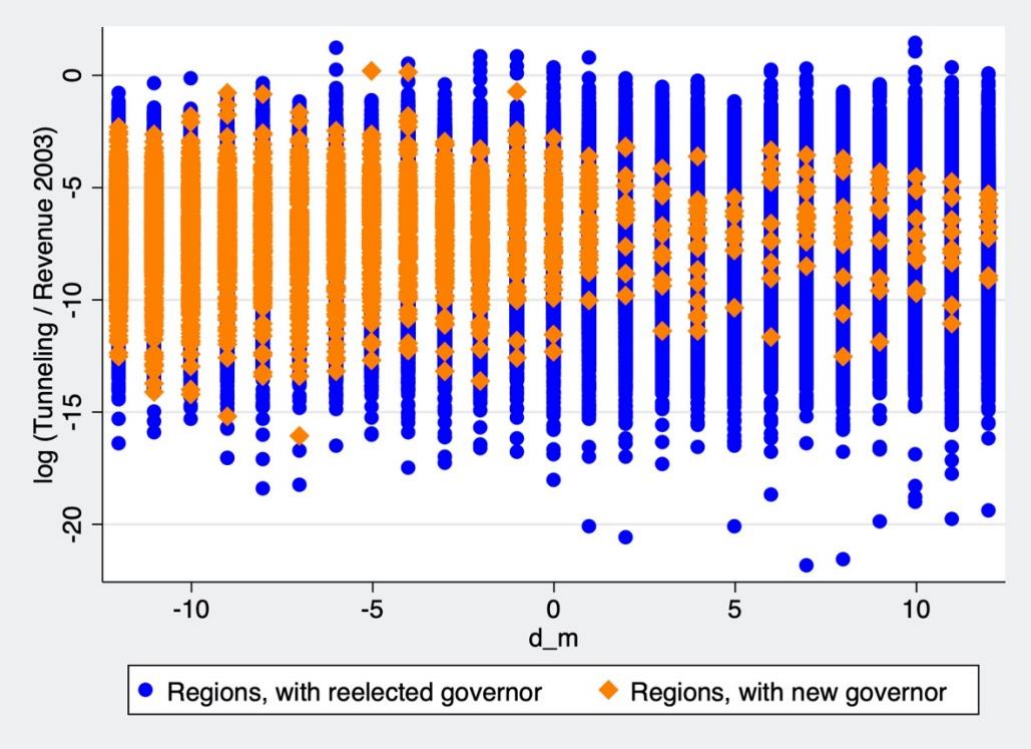
[2] Data before 2002 was collected from regional departments of internal affairs websites. Historical pages are not obligatory, and departments choose to do it or not. If data wasn't available there, I used archives of newspapers.

4 EMPIRICAL STRATEGY

4.1 VISUAL ANALYZE

Political threat of regional elite turnover force firms involved in corruptions to change their behaviour. Visually this pattern of firms' transfers to fly-by-night firms is different in the regions, where governor changed.

GRAPH 2. TUNNELING BEHAVIOR AND GOVERNOR TUNROVER



Graph 2 shows transfers to fly by night firms. Each point is a sum of removal of one company to fly-by-night firm at a specific time. X-axes shows time distance from the election in months, where 0 is the month of elections. For example, "-12" is a distance of 12 months before elections. The cycle of procurement usually less than one year, that's why 24 months is enough to see the pattern of behaviour. Y-axes shows the logarithm of tunneling normalized by revenue in 2003. I use the logarithm to scale observations.

From Graph 2, we see that firms tunnel less in areas where the governor is expecting to change (also see Appendix A Table 2). The orange area after the elections is smaller by amount and frequency. Meanwhile, in regions where governor hoping to stay in the office, tunneling remains continuously high. That graphs illustrate the hypothesis that change of the governor might have an impact on the amount and frequency of grey transfers, which can be assumed as a proxy to procurement corruption.

4.2 MODEL

In the model, I will compare firms' behaviour in regions where the governor changed with areas where the governor was reelected, using fixed-effect design. I regress tunneling of each firm from 2000 to 2004 normalized by revenue in the base year of the company on a set of dummies. The unit of observations here is a firm in a particular week. Based year for normalization is 2003.

$$\frac{Tunnel_{iw}}{rev_{2003_i}} = \beta_0 + \beta_1 * ewind_r \times bigproc + \beta_2 * ewind_r + \beta_3 * ewind_r \times govch_r + \beta_4 * pol_{change_r} + \alpha_i + u_{iw},$$

$$i \in (1; 63478), \quad w \in (0; 312)$$

where $Tunnel_{wi}$ is the amount of transfer to fly-by-night firm, rev_2003_i is revenue in 2003, which I choose as the base year. $ewind_r$ indicates election window which is [-4; +4] weeks from the elections ($\pm$1 month). $bigproc$ shows companies with procurement revenue bigger than 1%. $govch_r$ is a dummy which indicates the change of the governor in region *r* in the elections. pol_change_r is a dummy, which takes 1 if the head of police left her office the same year with the elections. If a governor and police minister changed in the same year, I would assume it as regional elite turnover.

The model explains the level of tunneling of companies with high procurement level and how companies change the tunneling behaviour in case of political turnover. In Table 3, we see the results of panel data analyze with fixed effect design. By fixed effect, I assume unobserved commonalities of firms and regions, which might affect the propensity to take part in corruption.

TABLE 3. FIXED EFFECT AND GOVERNOR CHANGE

VARIABLES	(1) tunel	(2) tunel	(3) tunel	(4) tunel
$ewind_r \times bigproc$	0.000126*** (1.98e-05)	0.000137*** (2.00e-05)	0.000161*** (1.99e-05)	0.000145*** (1.96e-05)
$ewind_r \times govch_r$		-0.000622*** (2.80e-05)	-0.000358*** (3.06e-05)	- 0.000361*** (3.07e-05)
$police\_change_r$			-0.000407*** (1.84e-05)	- 0.000407*** (1.84e-05)
$ewindow_r$				1.63e-05*** (1.08e-06)
Constant	0.000888*** (2.00e-06)	0.000888*** (1.99e-06)	0.00102*** (6.54e-06)	0.00102*** (6.54e-06)
Observations	10,405,002	10,405,002	10,405,002	10,405,002
R-squared	0.000	0.000	0.000	0.000
Number of id_firm	63,478	63,478	63,478	63,478

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

From Table 3 we see that companies with significant procurement share $ewind_r \times bigproc$ tunnels more. That means, that procurement corruption has a systemic character. Firms intensify tunneling near elections (Mironov & Zhuravskaya, 2016) which shown as $ewindow_r$, but the same time, in the second specification, we see that interaction of a governor change with election window has a significant negative effect on the amount of

tunneling. In the specification 3 we see change of police in the region, which also negatively effect on tunneling compare to regions without elite change.

The model shows the potential mechanism on how the political risk of regional elite turnover might change procurement corruption behaviour. Economic uncertainty which comes from political risk force firms to change their activities. The firms connected to the local elite, undergo the lack of information about the new elite. Until the new «rules of the game» will be established for a certain firm, they decrease tunneling.

5 INTERPRETATIONS OF FINDINGS

Table 3 shows the negative effect of governor change on normalised tunnelling. Since I ignored any political party affiliation of governor in the model, it means that even new governors from the same party in average change "rules of the game" in a procurement corruption scheme, according to tunnelling dynamics. For example, in Krasnodarskiy krai (region 11) new governor Aleksander Tkachev from communist party change Nikolai Kondratenko also from the communist party.

Head of police turn also has negative effect on transfers. Probably it can be explained that police learn new rules of the superiors and companies prefer not to risk before individual signals.

Since corruption is growing in societies, where institutions have a lack of trust, and people prefer norms to them (Getz & Volkema, 2001), procurement corruption becomes a personal relationship-based phenomenon. The negative effect of governor or police head change shows that long-term networking between firms and bureaucracy matters for stable frequency and amount of illegal transfers. Firms with high-level political connections with previous regional elite, cannot predict their financial results (Chen et al., 2010) with a new elite. It forces them to cut the level of tunnelling. That likely decreases procurement corruption in regions until new connections will be established, or new elite will find new contractors (or create them).

Variance inflation factor shows that regressors do not have multicollinearity concern (see Table 3 Appendix). Individual effects of each year on tunnelling are most significant (see Table 4 Appendix), excluding government turn in 2002. Insignificant is a result of a large number of observations in the panel and rare effects on the whole period. The frequency of treatment

effect among other observations is low (see Table 5 in Appendix), but they effect on model's explanatory level.

5.1 INSTRUMENTAL VARIABLE ANALYZE

Possible omitted variable bias can be a problem for the identification of the net effect. In reasoning about procurement corruption from the local elite side, I assume it as unite system. However, it might include opposing groups. From the company's part, the decision to enter procurement corruption might be connected with the quality of management, financial problems, level of transparency and corruption profitability.

Reverse causality also can be the case when companies can dictate "rules of the game" to the local elite. However, statistically, that cases are insignificant (Mironov & Zhuravskaya, 2016).

Procurement corruption had a certain threshold for entrance, and new companies need time to establish connections. From Graph 2, we see that the same firms decrease tunnelling because of active regional elite turnover. Change of the governor erodes relationships between bureaucracy and politically connected firms.

A governor change in the region is not exogenous. It has different causal reasons and features:

1. The term limit of the governor office sets the political cycle in regions
2. Voters review the social and economic results. Poor results lead to a lower rating.
3. The regional elite should have economic and political gains from saving *the status quo*.
4. Changes in the political competition (new potential applicants)

Due to high-frequency data (weekly transfers), it is hard to find proper IV. If the applicant gains less than 50% of votes, regional elections supposed to have a second round, usually, it happens within one month (inside *election window*). In those cases, the second round means

the existence of political competition in the region or poor turnout. Moreover, poor turnout, which can lead to second round also indicates potential loss of acting governor.

Because elections are costly, the gains should cover the candidate costs. Two candidates elections are more likely under plurality rule (Osborne & Slivinski, 1996). That means the second round might play the role of a proxy of political competition in a region. I tested it as an instrumental variable for governor change.

TABLE 4. CORRELATION OF INSTRUMENTAL VARIABLE WITH REGRESSORS

	competition	*ewin_chng*	*tunel*	*proc_ratio*	*pol_chng*
competition	1.0000				
ewin_chng	0.1248	1.0000			
tunel	-0.0052	-0.0021	1.0000		
proc_ratio	-0.0090	-0.0016	0.0334	1.0000	
pol_chng	0.0294	0.0219	-0.0264	-0.0070	1.0000

Variable *competition* is a dummy, which takes one if in the regional election was the second round. Political competition has a causal effect on governor change and does not affect tunnelling. I will assume the second tour as an indicator of political competition. Correlation with governor change around 12,5% and close to 0 with other regressors.

I used *competition* variable as an instrument for interaction $ewind_r \times govch_r$ for fixed effect analyses in the panel (see Table 5).

TABLE 5. FIXED EFFECT WITH INSTRUMENTAL VARIABLE

VARIABLES	(1) tunel
$ewind_r \times bigproc$	0.000157***
	(4.16e-05)
$ewind_r \times govch_r$	-0.0129***
(**IV *competition***)	(0.00147)
$police\_change_r$	-0.00108***
	(1.43e-05)
$ewindow_r$	0.000338***
	(4.90e-05)
Constant	0.00177***
	(1.29e-05)
Observations	10,405,002
Number of id_firm	63,478

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Instrumented governor change harms normalized tunnelling near 1%, whereas elections window has a positive effect as in baseline model companies with procurement revenue bigger than 1% procure more. A fact of change superior in regional police management also gives a statistically significant negative effect.

6 DISCUSSION

Using open-source data, I organized a panel with a firm in a week as a unite of observation. I collected data about elite turnover: governor elections and head of the police change, to form the treatment variables.

Panel data allowed using a fixed-effect design, to find whether a change of the governor harms the level of tunnelling. I discovered that the turnover of the governor and head of police decreases tunnelling in regions slightly before and significantly after the election. To answer questions about causality and endogeneity concern, I used instrumental variable indicating political *competition* as a variable which indicates governor change, and it proved a negative effect on tunnelling. The model has low explanatory power since a lot of data make effect only in a few moments.

The complexity of studying corruption, as part of the shadow economy, lies in its hidden nature and illegality. Most studies rely on survey analysis and composite indices, but they do not allow for assessing the specific extent of corruption or damage that it brings to the economy. The usage of transaction data is a new way of tracking corruption in government purchase. From that perspective, banks which proceed procurement *transactions have all necessary information* about detecting corruption scheme. Interestingly, that leading banking operators in Russia are national. Providing possibilities for such shadow transfers, they become part of the procurement-corruption programme. An automatic system which indicates fly-by-night firms can be part of the solution in procurement corruption problem.

Political competition in regions might be an instrument for limiting of spreading local elite connections which inevitably leads to corruption. Regular change of the governor and other members should constrain the rooting of profitable relationships. Uncertainty about the

strength of future connection limits the ability of politically connected firms to set "rules of the game", which can be built in the business model.

Finally, there are two directions for policymaker's attention in the case of Russia. First, the liberalization of banking business or increase of independence from the government can help banks independently incept systems against illicit cash flows. For instance, the methodology of identification transactions to fly-by-night firms can be performed automatically by the banks' security department. Secondly, the direction on maintaining political competition in regions and favourable conditions for regular turnover of the elite. The only change of the governor can decrease the level of procurement corruption by 1%.

APPENDIX

TABLE 1. TURNOVER OF REGIONAL ELITE IN RUSSIA 2000-2005

code	Name of region (republic, oblast, krai)	Change of the governor					Change of the head of police (Ministr Vnutrennih del)					
		2000	2001	2002	2003	2004	2000	2001	2002	2003	2004	2005
1	Adygea, Republic of	0	0	1	0	0	0	0	1	1	0	0
4	Altai Republic	0	0	1	0	0	0	0	1	0	0	0
6	Ingushetia, Republic of	0	0	1	0	0	0	0	1	1	1	0
9	Karachay-Cherkess Republic	0	0	0	1	0	0	0	1	0	1	0
10	Karelia, Republic of	0	0	0	1	0	0	0	1	0	0	0
11	Komi Republic	0	0	1	0	0	0	0	0	1	0	0
12	Mari El Republic	0	1	0	0	0	0	0	0	1	0	0
14	Sakha (Yakutia) Republic	0	0	1	0	0	0	0	1	0	0	0
20	Chechen Republic	0	0	0	0	1	0	0	1	1	1	0
22	Altai Krai	0	0	0	0	1	0	0	1	0	0	0
23	Krasnodar Krai	0	1	0	0	0	0	1	0	0	0	0
24	Krasnoyarsk Krai	0	0	1	0	0	0	0	1	0	0	0
25	Primorsky Krai	0	1	0	0	0	0	1	0	0	0	0
28	Amur Oblast	0	1	0	0	0	0	0	0	1	0	0
29	Arkhangelsk Oblast	0	0	0	0	1	0	0	0	0	0	0
30	Astrakhan Oblast	0	0	0	0	1	0	0	0	0	0	1
32	Bryansk Oblast	0	0	0	0	1	0	0	0	0	0	1
36	Voronezh Oblast	1	0	0	0	0	0	0	0	0	0	0
37	Ivanovo Oblast	1	0	0	0	0	0	0	0	1	0	0
39	Kaliningrad Oblast	1	0	0	0	0	1	0	0	0	0	0
40	Kaluga Oblast	1	0	0	0	0	0	0	0	1	0	0
43	Kirov Oblast	1	0	0	0	0	0	0	0	0	1	0
46	Kursk Oblast	1	0	0	0	0	0	0	0	0	1	0

code	Name of region (republic, oblast, krai)	Change of the governor					Change of the head of police (Ministr vnutrennih del)					
		2000	2001	2002	2003	2004	2000	2001	2002	2003	2004	2005
49	Magadan Oblast	0	0	0	1	0	0	1	0	0	1	0
50	Moscow Oblast	1	0	0	0	0	0	1	0	0	0	0
52	Nizhny Novgorod Oblast	0	1	0	0	0	0	0	0	1	0	0
54	Novosibirsk Oblast	1	0	0	0	0	0	0	0	0	1	0
59	Perm Krai	1	0	0	0	0	1	1	0	1	0	0
60	Pskov Oblast	0	0	0	0	1	0	1	0	0	0	0
62	Ryazan Oblast	0	0	0	0	1	0	0	0	0	0	0
65	Sakhalin Oblast	0	0	0	1	0	0	0	0	1	0	0
67	Smolensk Oblast	0	0	1	0	0	1	0	0	0	0	0
69	Tver Oblast	0	0	0	1	0	0	0	0	1	0	0
72	Tyumen Oblast	0	1	0	0	0	0	1	1	1	0	0
73	Ulyanovsk Oblast	1	0	0	0	0	0	1	0	0	0	0
78	Saint Petersburg	0	0	0	1	0	0	0	1	0	0	0
87	Chukotka Autonomous Okrug	0	1	0	0	0	0	0	0	1	0	0

TABLE 2. COMPARISON OF MEANS TUNNELING / REVENUE 2003 IN REGIONS WITH AND WITHOUT GOVERNOR TURNOVER

Gov_chng = 0					Gov_chng = 1			
Distance in month	Mean	Std. Err.	[95% Conf.	Interval]	Mean	Std. Err.	[95% Conf.	Interval]
-12	0,00059	0,00001	0,00057	0,00062	0,00041	0,00003	0,00035	0,00047
-11	0,00063	0,00001	0,00060	0,00065	0,00040	0,00005	0,00030	0,00049
-10	0,00066	0,00002	0,00062	0,00069	0,00041	0,00003	0,00036	0,00046
-9	0,00075	0,00001	0,00072	0,00077	0,00036	0,00003	0,00029	0,00042
-8	0,00066	0,00001	0,00064	0,00069	0,00026	0,00002	0,00022	0,00030
-7	0,00077	0,00001	0,00074	0,00080	0,00028	0,00003	0,00023	0,00033
-6	0,00098	0,00008	0,00082	0,00115	0,00032	0,00003	0,00026	0,00038
-5	0,00092	0,00002	0,00088	0,00095	0,00051	0,00010	0,00032	0,00069
-4	0,00093	0,00002	0,00089	0,00096	0,00049	0,00007	0,00036	0,00062
-3	0,00085	0,00002	0,00081	0,00088	0,00052	0,00013	0,00028	0,00077
-2	0,00099	0,00002	0,00095	0,00102	0,00033	0,00003	0,00027	0,00039
-1	0,00095	0,00002	0,00091	0,00099	0,00044	0,00008	0,00028	0,00059
0	**0,00109**	**0,00002**	**0,00106**	**0,00113**	**0,00043**	**0,00010**	**0,00023**	**0,00063**
1	0,00097	0,00002	0,00093	0,00100	0,00012	0,00001	0,00010	0,00015
2	0,00089	0,00002	0,00086	0,00092	0,00017	0,00006	0,00006	0,00029
3	0,00093	0,00002	0,00089	0,00096	0,00012	0,00002	0,00008	0,00017
4	0,00104	0,00002	0,00099	0,00109	0,00015	0,00006	0,00004	0,00026
5	0,00079	0,00002	0,00076	0,00083	0,00011	0,00002	0,00007	0,00015
6	0,00104	0,00002	0,00099	0,00108	0,00016	0,00003	0,00010	0,00022
7	0,00105	0,00002	0,00101	0,00109	0,00024	0,00006	0,00012	0,00035
8	0,00107	0,00003	0,00101	0,00113	0,00027	0,00006	0,00016	0,00038
9	0,00101	0,00002	0,00097	0,00106	0,00011	0,00003	0,00006	0,00017
10	0,00112	0,00003	0,00107	0,00117	0,00011	0,00004	0,00003	0,00019
11	0,00122	0,00004	0,00113	0,00131	0,00008	0,00002	0,00003	0,00012
12	0,00113	0,00004	0,00106	0,00120	0,00004	0,00001	0,00002	0,00006

TABLE 3. VARIANCE INFLATION FACTOR

Variable	VIF	1/VIF
$ewind_r \times govch_r$	1.33	0.751439
$govch_r$	1.32	0.755231
$ewind_r \times bigproc$	1.02	0.985208
$police\_change_r$	1.01	0.990863
Mean VIF	1.17	

TABLE 4. FIXED EFFECT WITH YEARLY INDIVIDUAL EFFECTS

OF GOVERNOR AND HEAD OF POLICE CHANGE

VARIABLES	(1) tunel
big_proc	0.000150***
	(1.88e-05)
winner_votes	7.15e-06***
	(9.71e-07)
el_week	4.77e-06***
	(2.81e-07)
gov2000	0.000669***
	(5.08e-05)
gov2001	0.000284***
	(4.50e-05)
gov2002	-5.53e-05
	(0.000109)
gov2003	-9.51e-05*
	(5.05e-05)
gov2004	-0.000364***
	(5.01e-05)
pol_chng2000	-0.000762***
	(7.19e-05)
pol_chng2001	-0.000478***
	(6.76e-05)
pol_chng2002	-0.000195***
	(5.74e-05)
pol_chng2003	-0.000352***
	(5.38e-05)
pol_chng2004	-0.000256***
	(5.45e-05)
ewindow	2.22e-05***
	(4.44e-06)
Constant	7.55e-05
	(9.33e-05)
Observations	10,405,002
Number of id_firm	63,478
R-squared	0.002

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

TABLE 5. GOVERNOR CHANGE FREQUENCY

gov_chng	Freq.	Percent	Cum.	**police_chng**	Freq.	Percent	Cum.
0	10,345,985	99.43	99.43	0	1,770,586	17.02	17.02
1	59,017	0.57	100.00	1	8,634,416	82.98	100.00
Total	10,405,002	100.00			10,405,002	100.00	

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