CROSS REGIONAL DIFFERENCES IN THE RELATIVE PRICES FOR PUBLIC PROCUREMENT CONTRACTS IN RUSSIA: THE INFORMATION TRANSPARENCY EXPLANATION

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ABSTRACT. We show that higher level of information transparency in the region (the amount of information available through public procurement website) leads to lower relative prices on public gasoline market. Transparency of information influences prices in two ways: both through the number of potential bidders in the public market and strategic behavior of the regulator and the bidders within the auction.

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WHY INFORMATION TRANSPARENCY? AND OTHER FACTORS MIGHT INFLUENCE THE RELATIVE PRICES

Public procurement accounts for 5 to 15 % of the gross regional product for various Russian regions. Hence the efficiency of regional public procurement systems is an important issue. One of the measures of the efficiency of procurement is the price of the contract: for the given quality of the goods supplied, the state would prefer to spend less, as it will save the budget for other important missions. So one of the questions we should answer is what may influence the prices?

In his pioneer work "The economics of information" Stigler argues that "knowledge is power" and it has a significant impact on price dispersion in the market. He explains this link through consumers' search costs. If the search costs are low then firms establish uniform (and lower) prices. Search costs in public procurement market are different from those in the private market due to specific matching structure. Russian public procurement law prescribes the usage of sealed-bid or open-bid first price auctions for standardized goods with disclosure of information on reserve price, contract specifications and information on previous auctions, through special websites. The more information is available, and the easier it is to search through it, the lower are the search costs, and the higher is the information transparency. Does the transparency of information affect the results of public procurement?

It is possible to outline several ways in which transparency may influence the results of public procurement. First, the availability of information makes it easier for firms to participate in the procedure. Moreover, it will increase the participation of "honest" firms by signaling trust in the process (Boehm, Olaya, 2006, p. 438). One of the reasons for that is that information transparency decreases monitoring costs (Boehm, Olaya, 2006, Kolstad and Wiig, 2009) and makes it easier for controlling parties to reveal the facts of opportunistic behavior of bidders and procurers. Increasing the number of bidders in both sealed bid and open bid procedures should lower the price of the contract (Bulow and Klemperer (1996)). Even a simple open bid auction with $N+1$ bidders is preferred to any other procedure (including negotiations) with N bidders.

Second, the information transparency makes it easier for firms to collude and to sustain collusion, because the deviating behavior becomes visible, which makes it easier to punish deviators. It is especially crucial in case of the oligopolistic structure of the gasoline market which is prone to collusion that, in turn, is supposed to increase the price of goods procured by the government (Stenbacka, 1990). When the number of potential bidders is limited the choice of procedure should account for the market structure. For example, in the presence of collusive bidding sealed bid procedures should generate lower prices than the open bid procedures (Robinson, 1985).

Consequently, while increased competition is likely to lead to lower prices, collusion, on the contrary might result in higher prices. Thus, transparency of information influences prices for public contracts in two ways: both through the number of potential bidders in the public market and strategic behavior of the regulator and the bidders within the auction.

GASOLINE MARKET

The outcomes of public procurement procedure – that is the price of the procured good and the probability of contract breach (the quality of the good or the duration of the contract) – depend not only on the public procurement procedure and the procurement laws, but also on the characteristics of the market that may to a considerable extent influence the efficiency of public procurement. Among these characteristics we should list the number of potential suppliers and the level of concentration in the market, the type of the good, and the regulation of the market for this good.

The type of the good

The gasoline market was chosen for the analysis for several reasons. First of all, it is an example of the standard goods, which means that there is not much difference between the gasoline of certain type supplied by different companies. We may be sure that difference in price between different suppliers does not reflect the quality of the product or the variations in its characteristics. Moreover, that implies that the quality of the good may be controlled quite easily.

The number of suppliers

Both the situation with a few large suppliers as well as with too many small suppliers may constitute the possible threats to the efficiency. When the market tends to be oligopolistic (one or several large suppliers) the problems may arise because the firms are able to influence the price, and thus goods may be sold at higher prices. Conversely, when there are too many firms, there is a risk of awarding a contract to the firm, which is not able or not willing to supply the goods of required quality in due time. One of the reasons for that is the lack of the capacities required to fulfill the contract, for example, the small number of gasoline stations in the region.

According to the report[i] of the Federal Antimonopoly Service of the Russian Federation in more than 50 of the Russian regions the market share of the largest company in the region is more than 35%, and it is up to 50-60% in 30% of the regions. The number of the companies with a market share more than 35% in the selected regions reported by the Federal Antimonopoly Service, along with the total number of bidders in the gasoline procurement procedures and the largest public procurement market shares are presented in Table 1.

Table 1 Regional gasoline companies

Region	Number of companies with 35-50% market share	Number of companies with >50% market share	Total number of suppliers in the public procurement market	Largest shares of public procurement market
1	0	0	34	53%
2	1	1	14	63%
3	0	0	7	87%
4	1	0	14	82%
5	0	1	27	35% and 44%
6	1	1	118	39%
7	0	1	19	91%
8	0	1	54	23%
9	1	4 (different geographical markets)	30	17% and 16%
10	3	0	32	34%

The regulation of the market

In Russian Federation the gasoline prices are normally not regulated by the government (the mining, on the contrary, is regulated). However, as the gasoline is considered to be the socially important product, the Federal Antimonopoly Service (FAS) monitors the gasoline prices in Russian regions. The justification for such monitoring may be found in the structure and specific features of the Russian oil and gasoline production:

- The industry is vertically integrated: even a lot of the gasoline stations, which in many countries are independently owned, in Russia are operated by the large vertically integrated companies. As a result large companies have a lot of gasoline stations in different parts of the region that makes it easier for them to win expensive contracts.
- The distribution process is not transparent and the delivery chains may be very long and complicated[ii].

Thus, up to this moment, the main goal of the government regulation in gasoline sector was to promote competition at least at the retail level. When the level of competition was considered too low (and the resulting gasoline prices too high), the government was engaged in tacit price control of the market by issuing warnings to the companies. Recently, however, as these measures of promoting competition did not prove to be very effective, a move towards more regulation in the industry was planed. The proposed measures include the calculation of the standard price for the gasoline, which will be used for the public procurement contracts as well, as the basis for the estimation of the start price, and the limits on the share of regional retail market for a single firm.

RUSSIAN PROCUREMENT: DESCRIPTION AND PROCEDURES

Since Jan 1, 2006, Russian public procurement is regulated by the Federal Law #94. Procurement procedures on all the administrative levels (federal, regional and municipal) are regulated by the same rules and meet the same price thresholds. Small infrequent purchases that do not exceed the 60000 rubles

(~$2000) threshold and happening no more than once in a quarter, are not regulated by the law. The rest of the purchases should follow the strict procedural routine and be supported by publicly available documentation. In the attempt to promote uniformity and transparency and to hinder corruption, Federal Law #94 provides full disclosure of information, including calls for bids, chosen procedure, auction protocols and supporting technical documentation, through specialized web-sites[iii].

Purchases under 500000 rubles (~$17000) can be performed through first price sealed-bid auctions. Purchases over 500000 rubles along with the purchases of goods on the official "open-auction list" should be performed through first price open-bid auction. A highly restricted number of goods irrespective of contract price can be procured through "contests" or "open tenders", scoring auctions combining price and quality characteristics.[iv]

In sealed-bid auctions, the procurer publishes the call for bid, stating basic characteristics of the contract, reserve price and deadline for submitting bids. The bidders send their price quotations together with the specification of the goods they are going to supply and a number of supporting documents. The bids are opened together at the designated deadline, and the lowest bid (or the earliest bid in case there are two or more equal prices announced) wins. Open-bid auctions are conducted in two stages. At stage one, the procurer announces the specification of the good required, characteristics of the contract, reserve price, and two consecutive deadlines. By the first deadline all perspective bidders should provide a statement of interest, including a number of supporting documents and in some cases monetary deposits. Procurer may asses the statements of interest and exclude the firms that do not meet the basic legal requirements from the bidding stage. At the second deadline the surviving bidders show up at the auction and make descending open bid. The last remaining bidder wins the contract.

ESTIMATION AND TRANSPARENCY

As transparency of information may influence the results of public procurement, we would like to take into account the differences in transparency of public procurement across the regions we study. By transparency we will mean the availability and accessibility of

information on the rules of the public procurement (timing, start price, etc. for a certain procurement, and judicial issues, controlling bodies, etc. for all the procurements), on the characteristics of the goods and services that are procured, and on the results of the procurements (bids, prices, contracts, etc). To measure the transparency of regional procurement websites, we collected the data on the structure of each of 83 regional public procurement websites, as well as the information that was available before and after the implementation of the procurement procedure, and functions available for web site users[v]. We estimated the transparency of information on public procurement in the end of 2010. For every web site we tried to find information on any given procedure that was announced, on any procedure that was completed, tried to find links between the information on announcement and the results of the procedure when it is completed, and also tried to use the search function and estimate whether it works or not.

To sum up, we analyzed the regional procurement sites with the check list that includes three groups of parameters that are important from the information transparency perspective:

(1) information on current procurements (the availability of information on the type of procedure chosen by the procurer, organizational details (deadlines and requirements), the name and the contact information of the procurer, start price and specifications of the good, work, or service demanded etc.),

(2) information on completed procurements (in addition to the parameters of the first group available after the procedure, we have looked for the information on the bidders (names, contact information etc.), bids and winning bids, and characteristics of the contract),

(3) availability and operability of search engine (keyword search, good/work/service category search, search by the identification number of procedure, and search by the identification number of the government contract).

We build three indicators that summarize the availability of information and functions for each group of parameters. The resulting index of the information transparency is a weighted by relative quality of search sum of the first two indicators (current

and completed) described above. The summary statistics for the information transparency indicators for the Russian regional public procurement web-sites and the values of the indicators for the ten selected regions are presented in Table 2.

Table 2 Transparency index

	Current	Completed	Search	Index
For 83 regions				
Minimum	18.5	19.5	0	0
Maximum	40.5	42.5	8	81.5
Mean	33	29.5	4.3	34.97
Std. Deviation	3.95	5.08	2.04	18.96
Selected regions				
1	32	40	7.5	67.5
2	31	37	8	68
3	37	30.5	6.5	54.84
4	35	34.5	4	34.75
5	30	29	4.5	33.19
6	31	27.5	4.5	32.91
7	31.5	32	3.5	27.28
8	32.5	26.5	4	29.5
9	32	26	3	21.75
10	26	21.5	0	0

EMPIRICAL MODEL AND RESULTS

Hypothesis and model

We argue that higher level of information transparency in the region leads to lower relative prices on public gasoline market. Transparency of information influences prices in two ways: both through the number of potential bidders in the public market and strategic behavior of the regulator and the bidders within the auction. As the number of bidders is endogenous and may depend both on the characteristics of the procedure (auction type, contract details etc., Klemperer (2002), French and McCormick (1984), Samuelson (1985), McAfee and McMillan 1987)) and on the level of information transparency (through setting the entry

costs, Kjerstad E, Vagstad S. (2000)) we use 2SLS with both procedure-specific and region-specific instrumental variables. Our model can be written

$$Y = \alpha_1 + \alpha_2 X + \alpha_3 C + \varepsilon_1$$

$$X = \beta_1 + \beta_2 Z + \beta_3 C + \varepsilon_2$$

Where Y is a relative price on gasoline market of the selected regions, X is a number of bidders, Z is a vector of procedure-specific and region-specific instrumental variables and C is a vector of control variables, which in particular includes information transparency indicators and transparency index.

We are interested in the coefficients $\alpha_3$and β_3, which measure the influence of information transparency on relative prices and on the competition in the public procurement, respectively. We suppose to have negative effects on prices and positive effects on competition. Highly transparent regions are expected to face high level of competition and low relative prices.

Data

The database consists of 900 observations on all public procurements of gasoline, to be supplied through the gasoline stations, which took place in 10 Russian regions in 2009 and 2010. The data were collected from the documentation published at the regional public procurement websites. We also used data on population density in each region, the density of automobile roads in the region, and the retail prices of the gasoline, provided by Russian Federation Federal State Statistics Service (FFSSS), and the corruption perception index based on the results of the survey (for more details refer to table 3).

We use as an instrument variables population density in the region, the density of automobile roads in the region, and start (reserve) price of the contract. All selected variables have a significant impact on number of bidders in public procurement and do not influence relative prices.

Table 3 Variables and descriptive statistics

Variable	Description	Source	Min	Max	Mean	St.Dev.
RelPrice	The ratio of contract price to retail price. The contract price is available at the procurement websites. The retail	Based on: Regional public procurement web sites,	.537	1.468	.987	.0876

	price was calculated on the basis of the information on retail prices of the gasoline depending on the date of auction and the volume of the public contract, i.e. estimated how much the same quantity of gasoline would cost in retail prices.	FFSSS				
Sprice	Start (reserve) price: the information on start price is available for all the procurements published at the web site.	Regional public procurement web sites	15015	6240160	384769.3	619274.3
Open	The type of procurement procedure: the gasoline contracts were awarded via sealed bid auctions or the open bid auctions.	Regional public procurement web sites	0	1	.197	.3977
N	The number of bidders	Regional public procurement web sites	1	7	1.889	.9078
PopD	Population density in the region in 2008	FFSSS	.7	49.8	23.865	16.084
RoadD	The density of automobile roads in the region in 2008	FFSSS	3.6	198	90.406	72.204
Corr_2010	The level of perceived corruption estimated for 70 Russian regions in 2010	Survey by Russian public fund "Public Opinion" and Regional public fund "Informatics for Democracy"	.22	.572	.428	.0839
ExAnte	The amount of information available on current procurements	Based on: Regional public procurement web sites	26	37	31.027	2.287
ExPost	The amount of information available on completed procurements	Based on: Regional public procurement web sites	21.5	40	28.956	4.973

Index	Estimated as (ExAnte + ExPost) weighted on the quality of Search functions available at web site	Based on: Regional public procurement web sites	0	68	32.6	17.97

RESULTS

The 2SLS results are presented in table 5. The availability of information both on the future and past procedures reduces the relative prices of public procurement for gasoline (models (1) and (2) respectively). Increase in the number of bidders, as predicted by theoretical models, also reduces the prices. It is worth noting, that the number of bidders entering the procedure is lower for higher levels of information transparency. This could be explained by the highly concentrated structure of both private and public gasoline market in Russian regions: most of the regions have a private market leader, holding more than 35% of retail market, and the public procurement market leader, holding 20-80% of the market in the total value of awarded contracts. The availability of information on the public procurement procedures in this market can signal the participation of the market leader and hinder additional entry. In the table 4 we show that in 64% cases the single bidder is the market leader. Nevertheless, availability of information helps lower the prices of public procurement contracts, when endogenous participation is controlled for. Model (3) presents similar results for the cumulative transparency index, accounting for the quality of search functions.

Table 4 Participation of the market leader and number of bidders

	The winner is market leader	
Number of bidders	**Yes**	**No**
=1	243 (64%)	135
>1	218	422 (66%)

CONCLUSIONS

In this paper we estimate the relation of the prices of government contracts and the retail prices of the same amounts of gasoline. For our analysis we have used the data on relative prices of government gasoline contracts in Russian regions. We argue that

the main factor that determines the price ratio is the level of information transparency. Transparency of information influences prices in two ways: both through the number of potential bidders in the public market and strategic behavior of the regulator and the bidders within the auction. We have also taken into account the possible link between the relative price and the some of the characteristics of the market, procurement procedure and a contract at hand.

We show that higher level of information transparency in the region (the amount of information available through public procurement website) does not lead to higher competition for the contract but still results in lower relative prices on public gasoline market.

Table 5 2SLS: Relative prices and transparency

IV-Regressions. Dependant variable RelPrice			
	(1)	(2)	(3)
ExAnte	**-0.0120***		
	(0.00615)		
ExPost		**-0.00335*****	
		(0.00117)	
Index			**-0.00126****
			(0.000608)
Open	**0.0450*****	**0.0473*****	**0.0538*****
	(0.0122)	(0.0111)	(0.0146)
N	**-0.114*****	**-0.0939*****	**-0.129*****
	(0.0295)	(0.0182)	(0.0369)
Corr_2010	**-0.189***	-0.0565	-0.0322
	(0.107)	(0.0494)	(0.0577)
Constant	1.646***	1.276***	1.275***
	(0.282)	(0.0720)	(0.0942)
First stage 2SLS regression. Dependant variable N			
ExAnte	**-0.198*****		
	(0.0284)		
ExPost		**-0.0422*****	

		(0.00769)	
Index			**-0.0112*** **
			(0.00242)
Open	0.127	**0.317*** **	**0.293*** **
	(0.0974)	(0.0882)	(0.0905)
Corr_2010	**-2.780*** **	**-0.794** **	-0.363
	(0.485)	(0.363)	(0.371)
Sprice	-6.39e-08	-7.69e-08	-7.84e-08
	(5.50e-08)	(4.98e-08)	(5.07e-08)
PopD	**-0.0248*** **	-0.0111	-0.00804
	(0.00776)	(0.00756)	(0.00747)
RoadD	**0.00628*** **	**0.00508*** **	**0.00352** **
	(0.00145)	(0.00150)	(0.00138)
Constant	9.242***	3.225***	2.257***
	(1.089)	(0.324)	(0.197)
Observations	900	900	900
R-squared	0.149	0.143	0.133

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

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[ii] http://www.fas.gov.ru/analytical-materials/analytical-materials_22601.html

[iii] Prior to Jan 1, 2011, the information was provided through federal, regional or municipal web-site according to the administrative level of procurer and\or the source of budget funds. Starting Jan 1, 2011, all the information on federal and regional procurement procedures is published through a centralized web-site; the allocation of the information on municipal procurement is erratic and is performed through federal, old regional or remaining municipal web-sites.

[iv] Our analysis does not include open tenders, hence we omit them from further descriptions.

[v] The estimation of the transparency of public procurement in Russian regions is described in more details in Podkolzina, E.A., Pivovarova, S. and Balsevich, A., Information Transparency in Public Procurement: How it Works in Russian Regions (October 12, 2011). Higher School of Economics Research Paper No. WP BRP 01/EC/2011. Available at SSRN:http://ssrn.com/abstract=1998069 or http://www.hse.ru/data/2011/10/15/1269288146/Balsevich_Information_transparency.pdf