

Incentives for Repeated Contracts in Public Sector: Empirical Study of Gasoline Procurement in Russia⁵

Abstract: This paper analyzes the phenomenon of repeated procurements made by public sector customers from the same supplier. The previous surveys of “relational contracts” gave different explanations for the possible implications of such repeated procurements, but those surveys dealt mostly with goods and services, with quality difficult to verify at the point of delivery. This work studies the impact of repeated procurements on the price of a simple homogeneous product. We presume that the downward price shift of such a product during repeated procurements can be the consequence of transaction costs reduction in the framework of the bona fide behavior of a customer and supplier. An upward shift in the prices as compared to the market average can, on the contrary, be interpreted as an indirect indication of corrupt collusion between them. Using a huge dataset on procurements of AI-92 gasoline in Russia in 2011, we show that the price difference between repeated and one-time contracts can be explained by the type of procurement procedures providing different opportunities for corrupt behavior. Less transparent procedures (single-sourcing and requests for quotations) are more suitable for corrupt collusion. This might explain why the prices of repeat contracts in this case were higher. On the contrary, the prices of repeat contracts were lower compared to one-time procurement in the case of more transparent e-auctions.

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Key words: public procurement, repeated contracts, relational contracting, corruption, e-auction

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Introduction

One of the most important questions of governmental policy in the field of public procurement regulation is the question of the dominating motivations of public sector customers. The initiators of public procurement reform in Russia in the mid-2000s (following the implementation of 2005 Federal Law on public procurement #94-FL) believed that corruption motives were dominant among public sector customers. This is why supporters of 94-FL came out for strict control and detailed regulation of public sector customer activity. However, the opponents of this law argued that excessive regulation of procurements and supplier selection on the basis of the lowest price criterion generated multiple problems in contract implementation. As a result, even good faith customers are sometimes compelled to manipulate procurement rules to prevent dishonest suppliers from participating in the auctions and to ensure the necessary quality of the procured goods, works and services.

We proceed from the assumption that both the manipulation of contractual terms for the purposes of gaining corruption proceeds and the creation of preferences for good faith suppliers is easier to detect in cases of “repeated” procurements – i.e. procurements made several times from the same supplier. In this paper, we analyze the data on procurements of one specific product comparing the parameters of “repeated” contracts with characteristics of similar one-time procurements.

Section 1 provides a brief overview of previous studies on the topic and justifies the choice of AI-92 gasoline as a simple and homogeneous product for the analysis. Section 2 contains a general description of the gasoline market in the Russia and analyzes the role of public procurements in that market. Section 3 presents initial empirical data and describes the main variables used in the econometric analysis. Section 4 discusses the main findings, and the conclusion provides an overview of the main results as well as policy advice for regulatory authorities and participants in the procurement process.

1. Previous Studies on Repeated Procurements

The multiple transactions between two counterparties mean that those counterparties already know each other and certain connections and relationships have formed between them. Within this context the analysis of “repeated” procurements definitely constitutes part of a wider issue of

relational contracting which explores the causes and consequences of repeated interactions between the consumer and the supplier or between partners in certain projects. Many works are devoted to this problem, but for purposes of our narrower subjects we can highlight two areas of research.

The first one is related to efficiency evaluation of long-term contracts with certain counterparties. The advantage of such long-term contracts is lower transaction costs and greater trust among partners (Gulati, 1995). At the same time, sustainable contractual relations can generate incentives for opportunistic behaviour. For example, Parker and Hartley (2003) use the case study of UK defense procurements to show that the customer's willingness to conclude long-term contracts requires major investments from potential suppliers into specific assets to enable them to fulfill their obligations. However, since such assets can be available only to a limited number of manufacturers, such customer policy in the following period limits the number of potential suppliers and facilitates possible collusion between them. In addition, supplier bargaining positions become stronger and the risk of opportunism on their part increases.

One of the possible responses to these problems is the strategy of dual- or multi-sourcing with simultaneous placement of identical orders with several suppliers (Klotz & Chatterjee, 1995). Later works showed that generally the use of this strategy is caused by the emergence of the problem of quality control of incumbent suppliers, but ultimately multi-sourcing can lead to a considerable reduction in the customer's overall expenses (Lyon, 2006).

Nevertheless, on the whole, such strategies are more applicable to large customers interested in performance guarantees under big long-term contracts and disposing of sufficient financial resources for creating relevant incentives in their relationships with suppliers (typical examples of such contracts are related to R&D and defense procurements). However, most customers who need to make regular procurements of goods, works or services do not dispose of such resources. Therefore they can either make their regular procurements through suppliers they had already worked with (incumbent bias) or contract any supplier offering the most profitable terms (new entrant bias).

Held (2011) analyzes the factors predetermining the choice of each of these strategies. In particular, he shows the significance of the relative level of costs on the preparation and submission of a bid and the amount of effort required for the supplier to execute its contractual obligations. If the bidding involves considerable costs for the supplier whereas subsequent execution of the contract does not cause big problems (if the contract is awarded to the supplier), new entrant bias is preferable for the buyer. If the preparation and submission of a bid does not

involve substantial costs but meeting contractual deadlines and delivery of high quality requires considerable effort from the supplier, this increases the risks of opportunism in supplier behavior and incumbent biasing is reasonable for the buyer.

Finally, Calzolari and Spagnolo (2008) note that by using repeated procurements the buyer can penalize or exclude in future procurements suppliers that performed poorly in the past. They show that when non-contractible quality has moderate importance for the buyer, a general tradeoff between reputation for quality and collusion emerges, as shorter contract duration (more frequent re-auctioning) and restricted participation (smaller number of eligible suppliers) facilitate non-contractible quality provision, but also supplier collusion. When quality is very important, optimal procurement requires selecting only one supplier and sticking with him ('efficiency price' contract). And finally when auctions are compulsory (as for many public administrations) and non-contractible quality is important, collusion between few eligible sellers may be desirable for the buyer and welfare maximizing.

All findings described above are based on the assumption that the customer makes a decision on the models of interaction with suppliers and selects suppliers. However, in reality, decisions on procurements and the rules of supplier selection are often made by auction organizers and, according to Laffont & Tirole (1991), this fact is often ignored in theory. Personal interests of such procurement officials ('agents') may not coincide with the interests of the customer (the 'principal'). This difference in interests may have different forms – from preference of procurement methods more comfortable for the agent (but less efficient for the principal) to situations of corrupt collusion of the auction organizer with one of the suppliers.

The analysis of collusion models between suppliers and representatives of the customer, as well as their manifestations and implications, constitutes the second area of research in 'relational contracting' significant for our topic of 'repeated procurements.' A bribe giver and a corrupt official bear additional expenses to monitor the execution of obligations. As any corrupt agreement is illegal, its participants cannot go to court or use other legal conflict settlement methods if obligations are not kept. This problem can be solved by splitting the bribe into 'tranches' – with the payment of a certain amount in advance and the transfer of the main portion of the 'reward' only after the 'service is rendered.' Nevertheless, risks remain high in the corruption market, therefore their participants need additional guarantees of obligation fulfillment.

According to Lambsdorff (2007), one of the informal mechanisms of this sort of guarantee is the reputation of the corruption market participants. This reputation is based on previous experience

of participating in corrupt agreements. Fulfillment of the parties' mutual obligations creates the conditions for their mutual trust. As a result, new agreements involve a lower level of uncertainty and require lesser monitoring expenses. Thus, the agents involved in corrupt schemes develop incentives for repeating deals with 'tested partners'. Various options of such deals are possible not only in procurement but also in other fields of business. One example is corruption at the customs office, where it is safer for a dishonest customs officer to take a bribe from an importer he had already 'worked' with before, given equal other conditions. Regular procurements of certain goods, works or services from a single supplier accompanied by a 'kickback' in favor of representatives of the customer are another example of such corrupt practice.

A consequence of such corruption agreements in the procurement sphere is relative overpricing, as the supplier should compensate for the 'kickback' he paid to representatives of the customer for winning the contract. But, as we saw before, from a formal point of view higher prices in 'repeated procurements' can be characteristic of a 'good faith customer' acting in its own interests. This generates the problem of distinguishing between good faith and corrupt incentives which may underlie repeated procurements from the same supplier.

However, there is a difference between the two situations described above. Corrupt collusion in the procurement sphere will always be accompanied by overpricing, whereas for a 'good faith customer' the increase in prices of contracts with regular suppliers is justified only if the quality of the procured goods is not verifiable at the point of delivery. Therefore if we will consider the procurement of simple homogeneous product the price of 'repeated contracts' can be an informative indicator.

Specifically, we may presume that if good faith incentives dominate in the repeated procurements of simple homogeneous products from the same supplier, the prices of relevant contracts should be *lower* than the market average. This effect can have the following explanation: an incumbent supplier who already has a positive experience of interaction with a given buyer encounters less uncertainty in respect to payment for its supplies and therefore, with other conditions equal, can offer a lower price during the auction as compared to new entrants. On the contrary, if corrupt incentives dominate the behavior of officials of the buyer organization, the prices of repeated contracts should be higher than the market average – in order to compensate supplier expenses on the payment of bribes for conclusion of the contract. But procurement procedures are suitable for corrupt collusion between suppliers and representatives of a buyer entity (or auction organizer) in different degrees. For instance single-sourcing or closed procedures provide more potential space for collusion. On the contrary, open procedures (like e-auctions) create more constraints for such opportunistic behavior.

Below, following this logic we will test the price difference between repeated and one-time contracts using the data on public procurement of a simple homogeneous product – AI-92 gasoline. We selected this particular product because it is the most popular gasoline brand in Russia and information on a large number of contracts and a large number of customers located in different regions of Russia was available for the analysis. An important factor predetermining the choice of this product is, inter alia, the weekly monitoring of retail prices of gasoline in every region performed by Russian statistical agency Rosstat. Using this data allowed us to distinguish the price effects of repeated procurements from the effects of overall market fluctuations.

2. Gasoline Market Description and the Role of Public Procurement in Russia

The principal role in the Russian market of motor fuel is played by vertically integrated oil companies (VIOC) operating at all stages of the production chain – from oil production and processing to fuel sale (Sagers, Didenko & Kryukov, 1999; Avdasheva, Goreyko & Pittman, 2012). VIOCs own 25 out of 28 major oil refineries. In 2010, the share of VIOCs in the overall oil production was 87%, and nearly 89% in 2011. The total volume of gasoline production in Russia was equal to 36.0 million tons in 2010 and 36.7 million tons in 2011. Relevant numbers for consumption were 33.1 and 33.5 million tons. Over 70% of gasoline is consumed in the European part of the country. The gasoline market is characterized by significant seasonal fluctuations and a wide scatter of prices between regions. Specifically, gasoline prices traditionally fall from February-March and then increase in the summer and at the end of the year.

The AI-92 gasoline is the most popular brand in the Russian market. The dynamics of average consumer prices of AI-92 gasoline in Russia in 2011 as a whole had an upward tendency. The growth of this parameter from January 2011 to December 2011 totaled 9.24% (from 24.25 rubles to 26.49 rubles per liter). The lowest prices of AI-92 gasoline in 2011 were registered in the Kemerovo Region (January – 21.73 rubles per liter; December – 22.26 rubles per liter). The region with the highest consumer prices of this brand of gasoline was the Chukotka Autonomous District (37.7 and 40.4 rubles per liter, accordingly).

According to Rosstat data, consumer prices of AI-92 gasoline were approximately 20% higher than the gasoline purchasing prices by the enterprises (as wholesale buyers).

The main consumers of motor gasoline in Russia are the owners of private passenger cars. In 2010, according to Rosstat data, over 87% of motor gasoline was sold through gasoline refuelling stations and only 13% accounted for wholesale purchases by private and public economic entities.

The government is one of the largest consumers of motor fuel in the Russian Federation. Public procurements in 2011 were conducted in accordance with requirements of Federal Law 94-FL. By decision of the Russian Government, AI-92 gasoline was included in the List of Goods (Works, Services) procurable through e-auctions. This means that only the following three procurement methods were possible:

- (1) Electronic auction – for procurements exceeding 500,000 rubles in value (about USD 17,000 in 2011);
- (2) Request for quotations – if the contract price does not exceed 500,000 rubles and with restrictions on the volume of ‘identical products procurement’ during one quarter of the year (article 42 (3) of 94-FL);
- (3) Single-source contracting to the value less than 100,000 rubles (about USD 3,000 in 2011), and in cases specially stipulated by articles 55, 55.1, 55.2, 55.3 of 94-FL.

It should be noted that e-auctions can also be used for procurements where the contract value is less than 500,000 rubles and requests for quotations are possible for contracts to the value less than 100,000 rubles (the choice of the procedures in this case is made at the customer’s discretion). If less than two suppliers participated in an e-auction, this auction was recognized void and the customer could make the relevant procurement from a single source (on the condition that the contract price is not higher than the price declared at the auction).

According to our calculations based on Russian Federal Treasury data, public expenses for the procurement of fuel and lubricants at the federal and regional level were close to 116 billion rubles in 2011.⁶ Taking into account the structure of fuel and lubricant procurement contracts disclosed by public buyers, about 43 billion rubles of this amount accounted for the procurement of gasoline, including approximately 26 billion rubles for the purchase of AI-92 gasoline. This figure equals 5.5% of the total production of AI-92 gasoline in Russia in 2011.

3. Initial Empirical Data, Main Hypotheses, and Research Methodology

Our empirical analysis is based on public procurement data of AI-92 gasoline from the Unified Register of State and Municipal Orders (available at www.zakupki.gov.ru). Before proceeding to a more detailed description of these data, we should make two important remarks.

⁶ This figure is close to the estimates by FAS experts noting that the share of oil products in 2010 did not exceed 2% of consolidated public procurements and their value was under 100 billion rubles – see “Government Work. Changing the System of Oil Products Procurement” (http://fas.gov.ru/fas-in-press/fas-in-press_30977.html)

First, public contracts for procurement of fuel and lubricants to the value not exceeding 41.5 billion rubles were placed on the website www.zakupki.gov.ru in 2011. This figure is much lower than the above estimates based on statistics of the Federal Treasury. This difference can be explained by the fact that starting from 2011, all data on regional and municipal procurements had to be published on the Russian national website; and we suppose that some customers preferred to make their procurements in December 2010 in accordance with the old, less transparent procedures. In addition, a number of major customers apparently lobbied to use closed procedures – information about this was not available on the Russian official website. In particular, according to the information of the Federal Treasury, in 2011 the Russian Defense Ministry used budget funds for the procurement of fuel and lubricants to the amount of 51.6 billion rubles. However, according to the Russian official website, this ministry placed public contracts for the purchase of fuel and lubricants worth 3.9 billion rubles (or 7.5% of the volume of used budget allocations).

Second, the data on procurements of gasoline has one characteristic feature – when gathered using a key word search, the brand of gasoline can be established for only one third of all the contracts.⁷ Merely 22.7% of the remaining contracts concluded in 2011 were so-called “simple contracts” where the only subject of procurement was AI-92 gasoline. In the rest of the contracts, gasoline of this brand was procured in one lot together with other products, where the prices were set for the lot rather than for each particular product item. Nevertheless, as we were interested only in the analysis of factors influencing the level of prices during gasoline procurement, we had to exclude this sort of contracts from the sample.

As a result, our analysis includes a sample of 4716 contracts for procurement of AI-92 gasoline concluded from 1 January, 2011 to 31 December, 2011. However, 412 of those contracts had data gaps, and in 16 contracts an excessive price decrease was registered (which we qualified as a type error). Therefore these observations were excluded from the sample.

The main parameters of the final sample are shown in Table P.1 of the Annex. As we can see, our analysis included 4288 contracts to the amount exceeding 1.7 billion rubles. The average value was about 400,000 rubles and the average contract duration was 80 days. Out of these contracts, 300 were single-source contracts, 2477 were placed through requests for quotations, and 1511 through electronic auctions. As a matter of fact, only 210 of these auctions were held

⁷ Naturally, this does not mean that two thirds of contracts on supply of gasoline are concluded without specifying its brand. But relevant specifications are not indicated in the basic parameters of the contract, but only in its terms of reference which are very difficult to gather and analyze.

with the participation of two or more bidders and were recognized as valid. In this connection, we hereinafter analyzed void auctions as a separate procurement procedure.

Due to strong time variation in AI-92 price dynamics, we used in our analysis relative prices calculated as the ration of prices in public procurement contracts to the average price of this brand of gasoline in Russia during the week of the procurement procedure. This approach helped us to eliminate the influence of general fluctuations in market prices.

Characterizing the resulting sample we have to note that the aggregate sample of contracts used in our analysis is classified into two categories. The first includes contracts for delivery of gasoline to a storage facility situated on the customer organization's territory. The customer later uses it to fuel its vehicles on its own. According to the data presented in Table P.1, this group accounts for 80% of our sample and 85% of the supplied gasoline. The price of such contracts includes the cost of delivery (which may vary depending on the location of the customer's storage facilities and the amount of the purchase). Therefore the final price of one liter of gasoline may vary substantially.

The second group includes contracts for the supply of gasoline to fixed-site gasoline filling stations. Under such contracts the supplier usually provides the customer with a certain quantity of fuel vouchers for filling cars with gasoline at the supplier company's gas filling stations. Therefore the terms of supply envisaged by such contracts are maximally close to standard conditions of the retail market of gasoline and in the event of inspections by regulatory authorities it would be more difficult for the customer to explain any differences in the prices of such contracts and the average level of market prices.

At the same time, not every supplier can participate in the procurement procedure for the supply of gasoline to fixed-site gasoline filling stations – only major companies disposing of a wide network of filling stations can compete for such contracts. It is not surprising therefore that practically one third of the contracts concluded with a single source and through void auctions are in the second group.

Due to the differences in pricing, we focused our empirical analysis on contracts envisaging delivery to storage facilities, as in this case the customer had more potential opportunities for price manipulations during repeated procurements from particular suppliers. Following the evaluation of models on the basis of the first group of contracts (3438 observations) we used the full sample (including contracts envisaging the filling of cars at gasoline filling stations) for a robustness check.

As we were interested in price effects of repeated procurements from the same supplier, we divided our sample into one-time and repeated contracts (see Table 1). Contracts were ‘repeated’ when a particular customer made procurements from the same supplier *three or more times*. We used this approach because procurements made from the same supplier twice could be accidental, but this could hardly be the case for triple repetition of procurements over one year.

As we can see, repeated contracts account for a little less than a third of the sample: their average volume is larger, supply terms shorter, they are concluded most frequently upon the results of void auctions and are relatively more seldom through requests for quotations. At the same time, according to data of Table 1, the average price for repeated and one-time contracts was practically the same.

Table 1. Characteristics of repeated and non-repeated contracts

Procurement method	One-time contracts	Repeated contracts	Total
Number of contracts	2312	1126	3438
Share of contracts	67.25%	32.75%	100%
Total procurement volume (million liters)	34.21	22.07	56.28
Total procurement value (million rubles)	898.64	569.82	1468.46
Average price (rubles)	26.179	26.213	26.19
Average price decrease as % of the starting (maximum) contract price	2.32%	1.86%	2.17%
The difference between contractual price and regional retail price (as %)	3.27%	3.50%	3.34%
Median number of participants	2	1	2
Average contract duration	81	73	79
Average contract volume (liters)	14 795	19 603	16 369
Average contract value (rubles)	388 686	506 054	427 126
Number of single-source contracts	129	78	207
Number of contracts placed through requests for quotations	1479	555	2034
Number of contracts placed through valid auctions	123	70	193
Number of contracts placed through void auctions	581	423	1004
Number of contracts placed by medical institutions	773	458	1231
Number of contracts placed by educational institutions	419	84	503
Number of contracts placed by law enforcement agencies	463	319	782
Number of contracts placed by other entities	657	265	922
Number of contracts concluded with private enterprises	2288	1119	3407
Number of contracts concluded with public enterprises	24	7	31
Number of contracts concluded in the 1 st quarter	420	209	629
Number of contracts concluded in the 2 nd quarter	710	385	1095
Number of contracts concluded in the 3 rd quarter	843	388	1231
Number of contracts concluded in the 4 th quarter	339	144	483

However, more a detailed examination of the contract prices in terms of procurement methods (including void auctions as a separate category) and using the average regional price as a benchmark reveals certain differences (see Table 2). In particular, the normalized price for all auctions is on average slightly lower for repeated contracts. On the contrary, if contracts are placed through requests for quotations or from a single source, the price of repeated contracts is higher.

Table 2. Average normalized price of repeated contracts for different types of procurement methods

Contract value	Single-source supplier	Request for	Valid auction	Void auction	Total*
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		quotations			
Simple contracts	1.027	1.028	1.010	1.043	3.061%
Repeated contracts	1.038	1.044	0.980	1.027	3.323%
Total	1.031	1.032	0.999	1.036	3.147%

* Excess of the procurement price over the average price in Russian market, percent

As a result, proceeding from the preliminary analysis of descriptive statistics and considering theoretic arguments on possible positive and negative consequences of making repeated procurements from the same supplier discussed in Section 1, we formulated the following hypothesis for our empirical study:

- The type of procurement procedure defines the price differences between repeated and one-time contracts in public procurement.

We used two dependent variables. The first variable was the price of one liter of AI-92 gasoline normalized to the average Russian retail price at the week of procurement procedure. The second dependent variable was the difference (as percentage) between the contractual price of one liter of AI-92 gasoline and the retail price in the same region at the week of procurement procedure. Our main explanatory variable is the dummy for repeated contracts.

Based on earlier studies of public procurement of simple homogeneous products (MacDonald, Handy & Plato, 2002; Yakovlev, Bashina, Demidova, 2014), we included in our models the following set of control variables:

- contract volume (in kind and in value terms)
- the number of bidders (for competitive procedures – quotations and valid electronic auctions) and the square of this number
- duration of contract (in days)
- normalized average retail price of AI-92 gasoline in the region at the moment of procurement
- the supplier being a state enterprise (a dummy)
- type of the customer organization
- contracting month

The main descriptive statistics on our variables are presented in Tables P.2 and P.3 of the Annex.

When choosing the regression analysis models we had to decide whether the functional dependence is identical for four types of procurement procedures – single-source contracting, requests for quotations, valid auctions and void auctions. As in the case study of granulated sugar procurement efficiency (Yakovlev, Bashina, Demidova, 2014), preliminary analysis of descriptive statistics for these procedures prompted the assumption that dependence is not

identical. Therefore we performed a Chow test with null hypothesis about identical dependence for all types of procurement procedures. This hypothesis was rejected and the regressions were estimated separately for each type of procurement procedures. In further analysis we used the multiply linear regression models. However, the tests for residuals revealed the presence of disturbance heteroscedasticity. So, the White estimates, consistent in cases of heteroscedasticity, were used for calculating the standard errors. The results and their interpretation are presented in the following section.

4. Empirical Results

The results of the models estimation with *the normalized contractual price of one liter of gasoline* as a dependent variable are presented in Table 3. As we mentioned before we estimated our models separately for each type of procurement procedures. Models 1.1, 1.2, 1.3, and 1.4 correspond to single-source contracting, request for quotations, valid auction, and void auction. The coefficient at the dummy variable for repeated contracts in all models was significant at the level of 1% or 5%. This result confirms our hypothesis on significant differences between repeated and one-time contracts.

Table 3. Modeling the normalized contractual price of one liter of gasoline (as the ratio of the contractual price to the average price in Russia)

Regressors	Model 1.1	Model 2.1	Model 3.1	Model 4.1
	Single-source contracting	Request for quotations	Valid auction	Void auction
Contract volume logarithm	-0.000436 (0.00271)	-0.00706*** (0.00158)	0.000587 (0.00306)	0.00384** (0.00159)
Number of bidders		0.0143** (0.00703)	-0.0510 (0.127)	
Square number of bidders		-0.00529*** (0.00151)	0.00266 (0.0231)	
Contract duration (days)	0.000101** (5.11e-05)	4.90e-05* (2.80e-05)	0.000135 (9.80e-05)	0.000173*** (3.65e-05)
Dummy-variable for repeated contracts	0.0272*** (0.00901)	0.0116*** (0.00324)	-0.0220** (0.0109)	-0.0127** (0.00507)
Dummy-variable for a public sector supplier	0.0266 (0.0162)	0.0516 (0.0318)	Dropped	-0.00573 (0.0171)
Normalized average retail regional price	0.917*** (0.0529)	0.977*** (0.0361)	0.626*** (0.169)	0.986*** (0.0426)
Dummy-variables for the contracting quarter	Yes ^a	Yes ^a	Yes ^a	Yes ^a
Dummy-variables for the customer type	Yes ^b	Yes ^b	Yes ^b	Yes ^b
Constant	0.0977* (0.0550)	0.115*** (0.0386)	0.491* (0.264)	0.00781 (0.0431)
Number of observations	207	2,034	193	1,004

R-square	0.699	0.449	0.264	0.371
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Robust standard errors in parentheses

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

^a the hypothesis on simultaneous equal-zero of all coefficients at quarterly dummy-variables was rejected

^b the hypothesis on simultaneous equal-zero of all coefficients at dummy-variables characterizing the customer type was rejected

However, the impact of repeated procurements on the contract price was diverse for different procurement methods. The conclusion of a contract with a supplier who had already fulfilled orders for the given public sector customer through valid and void auction procedures led to a relative price reduction by 2.1% and 1.3%. On the contrary, repeated procurements from the same supplier through single source procedures and requests for quotations led to an increase in the price of one liter of gasoline by 2.7% and 1.2%.

The results of the models estimation with the difference between contractual price and regional retail price as a dependent variable are presented in Table 4. Models 1.2, 2.2, 3.2, 4.2 corresponds the single-source contracting, request for quotations, valid auction and void auction.

It should be noted that as in the previous case, the coefficients at the dummy variables for repeated contracts were significant in all models. In cases of valid and void auctions relevant coefficients were estimated as negative, and for contracts placed through requests for quotations and for single-source contracts – positive.

Table 4. Modeling the difference between contractual price and regional retail price at the week of procurement procedure (as % of retail price)

Regressors	Model 1.2	Model 2.2	Model 3.2	Model 4.2
	Single-source contracting	Request for quotations	Valid auction	Void auction
Contract volume logarithm	-0.0804 (0.269)	-0.677*** (0.156)	0.0569 (0.307)	0.376** (0.162)
Number of bidders		1.509** (0.694)	-5.782 (12.73)	
Square number of bidders		-0.545*** (0.150)	0.373 (2.297)	
Contract duration (days)	0.0104** (0.00517)	0.00479* (0.00275)	0.0129 (0.00980)	0.0172*** (0.00364)
Dummy-variable for repeated contracts	2.764*** (0.899)	1.066*** (0.316)	-2.277** (1.125)	-1.246** (0.508)
Dummy-variable for a public sector supplier	3.476** (1.617)	4.858 (3.031)	Dropped	-0.495 (1.718)
Normalized average retail regional price	-11.14** (5.119)	-3.849 (3.061)	-40.18** (18.63)	-6.111 (4.170)
Dummy-variables for the contracting quarter	Yes ^a	Yes ^a	Yes ^a	Yes ^a
Dummy-variables for the customer type	Yes ^b	Yes ^b	Yes ^b	Yes ^b
Constant	12.93** (5.205)	12.72*** (3.394)	53.01* (28.04)	5.622 (4.202)
Number of observations	207	2,034	193	1,004
R-square	0.140	0.050	0.188	0.060

Robust standard errors in parentheses

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

^a the hypothesis on simultaneous equal-zero of all coefficients at quarterly dummy-variables was rejected

^b the hypothesis on simultaneous equal-zero of all coefficients at dummy-variables characterizing the customer type was rejected

The robustness of results was tested for all the models under survey by inclusion of a set of dummy variables for the contract value instead of the contract volume logarithm. This did not change the main results. The robustness of results was also tested on the basis of an extended sample including contracts for servicing motor transport through a network of gasoline filling stations. The significance and signs of practically all coefficients did not change except the dummy variable for the repetition of contracts in cases of single-source contracting – this variable loses its significance.⁸ Moreover, the coefficients at all the other variables used as control ones match the results received earlier during the analysis of public procurement of granulated sugar (Yakovlev, Bashina, Demidova, 2014).

5. Main conclusions

This paper compared the prices of repeated contracts with the same supplier with prices of one-time procurements of a simple homogeneous product using public procurement data on AI-92 gasoline in Russia in 2011.

It should be mentioned that 4288 contracts for procurement of AI-92 gasoline considered by us represent only some 7% of the total value of public procurement of this gasoline brand. This proportion can be explained by the fact that direct identification of the brand of the procured gasoline was possible for only one third of all contracts for the purchase of gasoline placed on the website www.zakupki.gov.ru, and the price of gasoline of this brand could be determined for only one quarter of all contracts.⁹ Analysis of Federal Treasury data showed that law enforcement agencies and Ministry of Defense made a considerable part of their procurements in 2011 through closed procedures without publishing the relevant information on the internet. Nevertheless, our sample can be regarded as complete for simple procurement contracts of AI-92 gasoline with publicly available information, and it reflects the typical tendencies of this market.

Building on the previous studies of ‘relational contracting’ and corruption in public procurement, we proposed the hypothesis that the type of procurement procedure can define the price

⁸ The estimation results of all relevant models including robustness tests are available by request from the authors at: oleg_vyglovsky@mail.ru

⁹ In the other cases gasoline was procured by lots together with other products, with pricing of the whole lot, which did not allow us to analyze the price effects of repeated procurements from one and the same supplier we were interested in.

differences between repeated and one-time contracts in public procurement. Taking into account the differences in transparency of procurement procedures, we expected that open procedures (like e-auctions) would be associated with relative decrease in prices of repeated contracts and closed procedures (like single-sourcing and requests for quotations more suitable for some sorts of manipulations) would lead to a relative increase in the prices of repeated contracts.

As our analysis revealed inconsistency in pricing patterns of different procurement methods envisaged by the Russian legislation, we evaluated our regression models for each procurement method – including auctions, requests for quotations, and single-source contracting. In addition, as most auctions were held with only one bidder, we classified such void auctions as a separate group.

In the end we received opposite results for different procurement methods. Specifically, in cases of requests for quotations and single-source contracting, the price of one liter of gasoline under repeated contracts was higher than under ordinary (one-time) contracts. In all auctions – both valid and void ones – the prices of repeated procurements were, on the contrary, lower than under ordinary (one-time) contracts. These results were robust when tested against a large number of additional factors (including competition at valid auctions and requests for quotations, procurement volumes, month of supply, type of the customer organization, etc).

We suppose that our findings can be interpreted in the following way. Despite very detailed regulation of procurement procedures by Russian legislation, public buyers are left with a choice of procurement methods when they make a decision on the procurement of the necessary goods, works and services. In particular, public buyer always can use more competitive and transparent e-auction instead of requests for quotations and single-sourcing. Also it is possible to use requests for quotations for small procurements.

Under these circumstances our findings may signal that public officials striving to receive bribes for renewing a contract would prefer less competitive or non-competitive procedures such as requests for quotations and single-sourcing. On the contrary, officials making repeated procurements of gasoline in an attempt to minimize the transaction cost of their public entity rather than to receive personal gains would prefer electronic auctions. In this case the renewal of contracts with a supplier, which had previous cooperation experience with a given customer, may be explained by the readiness of these incumbent suppliers to grant a more significant price decrease during the auction. They find such price decreases reasonable as they can trust the customer on the basis of positive previous cooperation experience and the level of risks included in their total cost evaluation would be lower.

On the whole, with the procurement of simple homogeneous products these results are more in tune with the arguments of supporters of 94-FL suspecting the presence of corrupt incentives on the side of public customer officials and insisting on wider use of electronic auctions. However, thinking about possible policy advice, it is feasible to take into account the evaluation of the total corruption-induced losses through the resumption of contracts with incumbent suppliers. In particular, the value of coefficients in our models for requests for quotations suggests that these losses totaled about four million rubles over 2011 for 2,000 contracts under review, which is approximately \$70 per contract. But who is ready to take risks for such a ‘kickback’?

In our opinion, such marginal bribes can hardly be of interest to senior managers of public entities. But, as fairly pointed out by Laffont & Tirole (1991), many scholars ignore the fact that the rules of public procurement auctions are often made by the auction organizer (or agent), rather than by the principal, and this organizer can enter into collusion with one of potential suppliers. Perhaps in the case of gasoline procurement in Russia we can see the evidence of ‘grassroots’ corruption, most probably involving the staff of procurement departments (without the participation of senior managers of the public entities). Under these circumstances intensifying control over procurement procedures by regulatory authorities (traditionally recommended by supporters of 94-FL for anticorruption purposes) would mean ‘using a sledgehammer to crack a nut.’ It may be much more effective to introduce the responsibility of senior managers of budget-funded organizations for their overall performance outcomes combined with more effective internal control mechanisms (including those used in business practice).

The second economic policy implication concerns the general efficiency of the existing public procurement mechanisms. According to Rosstat data, the prices of AI-92 gasoline procurement by commercial enterprises in 2011 were approximately 20% lower than consumer (retail) prices. However, accounting for all the significant differences between auctions and requests for quotations revealed by us, on the whole, AI-92 gasoline was procured in 2011 by public sector customers in our sample at prices exceeding the retail prices by an average 3% (but we considered wholesale supplies with the average volume of 16,400 liters per contract!). In addition, more than 86% of the 1511 auctions (as the most important channel of AI-92 gasoline procurements both in kind and in value terms) were recognized void, as only one bidder took part in them. All this points to the inefficiency of public procurements of such a simple homogeneous product as AI-92 gasoline and the presence of system-specific problems in that market requiring more detailed future research.

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Annex

Table P.1. Characteristics of contracts for supply of gasoline to the supplier's storage facility and on filling the customer's motor transport at the network of gas filling stations

Procurement method	Supply to a storage facility	Gasoline voucher-based supply	Total
Number of contracts	3438	850	4288
Share of contracts	80.18%	19.82%	100.00%
Total procurement volume (million liters)	56.28	9.94	66.22
Total procurement value (million rubles)	1468.46	256.96	1725.42
Average price (rubles)	26.190	25.728	26.099
Average price decrease*	2.170	2.251	2.186
Difference between contractual price and regional retail price at the week of procurement procedure (as % of retail price)	3.342	3.897	3.452
Median number of participants	2	1	1
Average contract duration (days)	79	86	80
Average contract volume (liters)	16 369	11 695	15 443
Average contract value (rubles)	427 126	302 305	402 383
Number of single-source contracts	207	93	300
Number of contracts placed through requests for quotations	2034	443	2477
Number of contracts placed through valid auctions	193	17	210
Number of contracts placed through void auctions	1004	297	1301
Number of contracts placed by medical institutions	1231	228	1459
Number of contracts placed by educational institutions	503	91	594
Number of contracts placed by law enforcement agencies	782	282	1064
Number of contracts placed by other entities	922	249	1171
Number of contracts concluded with public suppliers (FGUP)	31	1	32
Number of contracts concluded with private suppliers	3407	849	4256
Number of contracts concluded in the 1 st quarter	629	140	769
Number of contracts concluded in the 2 nd quarter	1095	316	1411
Number of contracts concluded in the 3 rd quarter	1231	296	1527
Number of contracts concluded in the 4 th quarter	483	98	581

* As % of the starting (maximum) contract price.

** As % of the average price in Russia.

Table P.2. Main descriptive statistics of continuous variables

Variable	Number of observations	Average	Standard deviation	Minimum	Maximum
Normalized contractual price of one liter of gasoline	3438	1,031	0,087	0,732	1,619
Difference between contractual price and regional retail price at the week of procurement procedure (as % of retail price)	3438	3,342	6,76	-34,2%	+59,5%
Contract volume, liters	3438	16 369	44 000	20	1 385 800
Contract volume logarithm	3438	8,759	1,313	2,995	14,141
Contract duration	3438	79	69	0	428
Number of bidders, request for quotations	2034	1,811	0,679	1	6
Number of bidders, valid auction	193	2,16	0,404	2	4
Normalized average retail regional price	3438	0,997	0,057	0,824	1,619

Table P.3. Main descriptive statistics of discrete variables

Variable		Number of observations
Dummy-variable for repeated contracts	Repeated contract	1126
	Non-repeated contract	2312
Dummy-variable for a public supplier	Public supplier	31
	Private supplier	3,407
Value groups of contracts	Contract up to 100,000 rubles	1161
	Contract from 100,000 rubles to 500,000 rubles	1751
	Contract over 500,000 rubles	526
Type of customer organization	Medical institution	1,231
	Educational institution	503
	Law-enforcement agency	782
	Others	922
Contracting month	January	34
	February	155
	March	422
	April	231
	May	130
	June	468
	July	293
	August	213
	September	472
	October	277
	November	251
	December	492
Contracting quarter	1 st quarter	611
	2 nd quarter	1122
	3 rd quarter	1213
	4 th quarter	492