Favoritism in Russian public procurement: does e-auction format matter[1]

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Abstract Favoritism is a wide-spread problem in Russia, especially in public procurement. In order to decrease prices and to struggle favoritism the government introduced e-auctions. E-auctions are treated as a way to raise competition through increased transparency and lower participation costs. However there is still lack of evidence of their effectiveness. This project examines the impact of auction format (traditional oral auction or e-auction) on favoritism in Russian public procurement. We built a theoretical model that investigates how the type of the auctioneer (procurer or intermediary) influences the scope of favoritism and social welfare. This project contributes to the current corruption literature and literature on public procurement.

Keywords: Favoritism, Public procurement, Auctions
JEL codes: C7, D44, L5

1. Introduction

Public procurement constitutes 10-25% of GDP[4] and a significant share of domestic demand in most countries, and Russia is no exception[5]. These huge financial resources can be used to achieve various purposes: provision of goods and services, fostering innovation and small business development, etc. Corruption can hinder this, so it is one of the key problems of public procurement. Laffont and Tirole (1991a) have shown that a price auction can solve this problem. When the government cannot verify the quality characteristics of the bidders, the auctioneer can distort their evaluation and make a public contract with the bidder who gave the highest bribe. If the government purchases goods through the auction, the most efficient supplier will be the winner and there will be no corruption incentives.

However, the Russian practice does not support conclusions drawn from this model. In 2006 there was a reform of public procurement in Russia, and the auction became a priority procurement procedure. Although the scope of corruption in public procurement has decreased, favoritism is still prevalent. Russian media repeatedly covered the cases of favoritism in public

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[5] http://www.gks.ru/metod/torg.html

procurement. Illegal long-term relationships between the Moscow government and the company of Moscow ex-mayor's wife (Mironov and Zhuravskaya, 2011) are the most famous, but not the only example. Such cases take place in all Russian regions and at all levels of public administration. That is why we consider favoritism as a key form of corruption in Russian public procurement. Since 2008 the Federal antitrust service is promoting electronic procurement procedures[6]. The main pro argument is that transparent electronic procedures can mitigate corruption and hence fix part of the "wasteful procurement" problem[7]. The Federal antitrust service presumes that electronic platform (e-platform) that holds e-auctions is benevolent. However it is not always the case, as far as e-platform (the agent) is vulnerable to opportunistic behaviour towards the government (the principal) and take bribes in exchange for the assistance in e-auction. So the question how e-platform influences social welfare and interactions between procurer and bidders is still open. According to the new amendments to the law on public procurement, e-auctions should be widely adopted in Russia. These recent changes and the gap between economic theory and Russian practice motivate our paper.

The main goal of this paper is to examine which auction format is more efficient in terms of allocation efficiency, leads to higher social welfare and lower public waste: traditional auction or e-auction. We are going to show that the introduction of intermediary (e-platform) in e-auctions affects incentives to favoritism and total payoffs of economic agents. This paper is organized as follows. Section 2 briefly analyzes the literature related to our paper. Section 3 describes public procurement in Russia and summarizes key differences between e-auctions and traditional auctions. Section 4 proposes a theoretical model on favoritism in public procurement and considers its preliminary results. Section 5 concludes and summarizes ideas for the future research.

2. Short literature review

This paper is close to two strands of economic research. Firstly, we rely on the studies dedicated to corruption in public procurement. Søreide (2002), Boehm and Olaya (2006) show that public procurers have wide opportunities to restrict competition before the auction started and proposed transparency as an effective anti-corruption tool. Burguet and Che (2004), Compte et al. (2005) examine the effect of corruption on competition in public procurement. The main contribution of the latter paper is the notion that corruption raises the price of purchased product by more than the amount of a bribe.

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[6] http://fas.gov.ru/analytical-materials/analytical-materials_18387.html
[7] http://fas.gov.ru/fas-in-press/fas-in-press_28291.html

Secondly, as we compare the results of two auction formats (traditional auction and e-auction), empirical and theoretical literature analyzing different procurement mechanisms is also closely related to our paper. To our knowledge, the paper by Bulow and Klemperer (1996) comparing auction and negotiations is one of the first papers that started the theoretical discussion. In public procurement literature auctions are usually considered as an objective competitive mechanism, while negotiations, in contrast, are an extreme case of procurer's discretion. The subsequent empirical papers show that a choice between auction and negotiations depends on such factors, as the complexity of project, competency of a public procurer, competition among bidders (Bajari et al., 2007, 2009; Estache et al., 2009; Chong et al., 2010) and the level of political competition (Chong et al., 2011; Moszoro and Spiller, 2012). In 2000th first electronic platforms (e-platforms) emerged. Several papers are dedicated to several problems of e-auctions, such as new forms of rent-seeking behavior (Kauffman and Wood, 2003), redistribution of profit between buyer and seller (Chang et al., 2006) and unequal access of different types of bidders to e-procurement (Albano et al., 2008).

The article by Laffont and Tirole (1991a) is of particular importance for our project, because it addresses both considered topics. The authors research what auction format the government should use in order to eliminate favoritism in public procurement. In their model the government maximizes social welfare and can choose the ratio between price and quality on the basis of which procurer chooses the auction winner. Laffont and Tirole analyze four cases depending on whether the government can verify the quality and whether the auctioneer can take bribe from one bidder or two bidders. The last two situations are similar to the patriarchal corruption (favoritism) and market corruption described by Husted (1996). Laffont and Tirole conclude that if the government cannot verify the quality, they should choose price auction, because then procurer cannot distort the quality assessment and favoritism will not occur. However, according to Boehm and Olaya (2006), distortion of the quality assessment is not the only form of favoritism. Procurers typically have wide opportunities to restrict competition before the auction. So unlike Laffont and Tirole, we are going to model a situation when procurer sets requirement to the bidders in order to restrict competition and make a contract with the preferred bidder. The main question remains the same, but we focus on the impact of intermediary (e-platform) and participation costs on the auction outcomes.

3. Russian public procurement

Public procurement constitutes a significant share of Russian GDP and covers the purchase of various goods and services, from stationery to infrastructure projects. Numerous corruption practices, including favoritism and horizontal collusion, decrease the efficiency of public

procurement, and are in focus of legislators for the last decade. The strict choice of the procurement procedure was one of key elements of anticorruption strategy in public procurement. Traditional auctions were widespread in Russian public procurement in 2006-2010, since 2010 e-auctions gradually replaced them. The form of both auctions is reversed English auction with open reserve price. Procurement practices were changing in time, and in this section we describe the main features of two auction formats, when they were well established.

Traditional auctions were run in three stages, namely, registration, (dis)approval of applications and the auction itself. At the first stage procurer placed information about the auction at the official web-site, and then bidders applied for participation in the auction. Their applications contained a bidder's agreement to perform the contract (supply goods of certain quality) and private information about bidder (identity), which were put together. At the second stage auction the special commission of public procurer considered the applications of bidders. If the commission approved an application, a bidder could participate in traditional auction; if the commission rejected it, he could not. At the third stage the procurer held an auction with the approved bidders. The bidder who made the lowest bid won the auction, and procurer announced it on the regional web-site.

The process of e-auction is more complex because of the appearance of a new player - e-platform. The e-platform serves as an intermediary between public procurer and bidders: it registers them and exchanges information with procurer. E-auction consists of four stages and runs as follows. At the first stage procurer chooses any of five accredited e-platforms and provides her with the auction documentation. Then both procurer and e-platform placed information about the auction at the official web-site or web-site of e-platform, respectively. Then bidders apply for participation in the auction to the e-platform. In order to guarantee anonymity, bidders submit their applications in two separate parts (a bidder's agreement to perform the contract in one part, and private information about bidder in another). At the second stage the auction commission considers only the first parts of applications. As in traditional auction, if the commission approves an application, bidder can participate in the auction, otherwise he cannot. At the third stage the e-platform holds e-auction. When it finishes, the e-platform ranks bidders on the basis of their latest bid (from lowest to highest value) and gives procurer this ranking and second parts of applications. At the fourth stage procurer can reject the bidders whose second parts of applications do not meet certain criteria. Notice that procurer still does not know which bid corresponds to each bidder. At the fifth stage procurer shares the results of selection with e-platform that combines bidder's identities with their bids, selects and announces the winner of the auction.

In our opinion, the key difference between traditional auctions and e-auctions is the introduction of intermediary (e-platform) that can decrease transaction costs of other economic agents, but at the same time abuse her authorities. Garicano, Kaplan (2001) find out that e-auctions decrease the transaction costs of bidders. The lower transaction costs are, the more bidders participate in the auction and the lower price will be in reverse auction. Thus e-auctions encourage price competition of bidders.

However e-platform can behave opportunistically and take bribes in e-auctions. Since procurer can also take bribes, there are two possible corruption deals in e-auctions instead of one in traditional auctions. A public procurer can restrict competition by establishing requirements for bidders. For instance, these requirements can relate to the contract duration, quantity of goods or delivery periods. If a bidder meets these requirements, he can participate in traditional auction or e-auction; otherwise his application is rejected. So these requirements can restrict the participation of bidders. A public procurer can make a corrupt deal with one bidder, impose requirements that he surely meets and reject applications of other bidders, if they do not meet them[8]. The public procurer prefers one bidder (the preferred bidder) to others, for instance, a bidder with excellent reputation to newcomers, or a bidder from the same region to foreign bidders. The public procurer and his preferred bidder have successful long-term relations or informal connections that help to enforce a corrupt deal, and he does not accept a bribe from other bidders. In e-auction another type of corruption may also arise. As an intermediary between a public procurer and bidders, e-platform has unique access to the facilities, which allows her to block the actions of bidders, when they make bids. In order to maximize her payoff, e-platform can demand bribes from bidders in exchange for the assistance in winning e-auction. In contrast to the public procurer, e-platform does not have any preferences regarding the bidder; interaction between them is single and practically anonymous. Hence, e-platform can receive a bribe from each bidder and does not prefer one of them to others.

Table 1. How e-auction differs from traditional auction

	Differences	**Consequences**
1.	procurer holds traditional auction and delegates holding e-auction to the manager of e-platform	1. different mechanisms of discrimination a. procurer sets quality characteristics in traditional auction b. e-platform blocks bids in e-auction 2. different type of corruption (client)

[8] For instance, Søreide (2002), Boehm and Olaya (2006) describe that public procurers can manipulate public contract and restrict competition before the auction.

		a. traditional auction: favoritism (the preferred bidder) b. e-auction: favoritism and market corruption (the most efficient bidder)
2.	e-auctions decrease participation costs of bidders	1. more bidders => 2. lower prices in e-auction

Table 1 illustrates how the differences between traditional auction and e-auction influence the auction outcomes. In the next section we will build a theoretical model of favoritism in traditional auction and e-auction. Initially we concentrate only on the first difference between the auction formats, namely, if there is an intermediary between procurer and bidders or not. Then we add to the model the second difference and examine the trade-off between lower participation costs and more opportunities for corruption.

4. Model of favoritism in public procurement

Set up

The government gives public procurer money to purchase one indivisible product via traditional auction or e-auction. The main goal of the government is to choose the auction format that maximizes social welfare or minimizes public spending. Traditional auction is held by the procurer, e-auction is held by e-platform. The format of both auctions is reverse English auction. Two bidders out of X possible bidders, $i = 1, 2$, are randomly selected to participate in each auction. The type $(c_i; s_i)$ of a bidder i is his private information. For the sake of simplicity we consider situation when there are two values of c_i and s_i, which can belong to each bidder with probability 0.5, and that is known to all players. So there are four types of bidders and 16 combinations of bidders 1 and 2. A bidder i can carry out high costs $\overline{c}$ or low costs $\underline{c}, \overline{c} > \underline{c} > 0$, meets certain requirements S or does not meet them ($s_i = 0$). In order to participate in auction, bidders should register and confirm that they meet these requirements.

The procurer sets requirements s_p in order to maximize his expected utility:

$$EU_{proc} = Ev(s), v(S) > v(0) > 0,$$

where $v(s)$ is the utility that procurer obtains from interaction with a bidder of the certain type.

If procurer sets requirements S, he can get higher utility from the contract, but prohibits bidders, which do not satisfy these requirements, to participate in auction. If procurer sets requirements 0 (no requirements) all bidders can participate in auction, but procurer gets higher utility. For instance, the procurer can buy gasoline on two gas stations, one of which is situated in the different area of the city (0) and another - near procurer (S). The latter location of bidder is

more convenient for him, so he can prohibit gas stations that are situated in different areas to participate in the auction.

The auction goes as follows. Bidders sequentially make bids and the one who makes the lowest bid wins the auction. If bidders make equal bids, auctioneer (procurer or e-platform) randomly chooses the winner. If only one bidder participates in auction, he gets the contract at the reserve price r set by the government, $r > \overline{c}$. If both bidders cannot participate in auction, all agents get zero payoffs. Bidders maximize their expected profit:

$$E\pi_i = \sum_{k=1}^{16} p_k p_{ik} (P_{ik}(c_{ik}) - c_{ik}), i = 1,2, k = 1,2, \dots 16,$$

where k is combination of types of bidders that are in the market; p_k is the probability that the certain combination k occurs; p_{ik} is the probability that the bidder i wins in the auction with the certain combination k; P_{ik} is the final bid of the bidder i wins in the auction with the certain combination k; c_{ik} is production costs of the bidder i wins in the auction with the certain combination k.

Then public spending equals

$$EP = Emin\{P_{ik}\}, i = 1,2, k = 1,2, \dots 16.$$

First of all we analyze the first-best solution with the benevolent auctioneer. Then we consider situation when the public procurer can take bribe and finally situation when both the public procurer and e-platform can take bribes.

Benevolent auctioneer (first-best)

In this situation everybody is honest and bidders carry out zero participation costs, so corruption does not occur. Table 2 presents the timing of the game.

Table 2. Timing

1	**Nature assigns a type (c_i; s_i) to each bidder**
2	**Procurer sets requirements s_p and announces auction with $r > \overline{c}$**
3	**A bidder registers, if $s_i \geq s_p, i = 1,2$**
4	**If two bidders register, procurer holds reverse English auction.** **If one bidders registers, he gets contract at $r > \overline{c}$.** **If nobody registers, everybody gets zero.**
5	**Procurer purchases a product (service).**

After the nature assigns a type $(c_i; s_i)$ to each bidder, the procurer becomes aware of how the production costs of bidders are distributed and chooses requirements s_p. As the procurer wants to maximize his expected utility, he compares its values when $s_p = 0$ and $s_p = S$. When the procurer sets $s_p = 0$, he will conclude a contract with the bidder, which meets requirements

with probability 0.5, and conclude a contract with the bidder, which does not meet requirements with probability 0.5. When the procurer sets $s_p = 0$, with probability 0.5*0.5 both bidders do not satisfy requirements and he gets zero. Otherwise he will conclude a contract with the bidder, which always meets requirements. So the procurer chooses to set requirements S, if

$EU_{proc}(S) \geq EU_{proc}(0)$,

$0.75v(S) \geq 0.5v(S) + 0.5v(0)$,

$\boxed{v(S) \geq 2v(0)}$ – the expected utility in case of strict requirements is higher than in case of no requirements in two or more times.

Then the procurer announces auction with s_p and the reserve price r set by the government, and bidders register for participation in auction. If there are no requirements, two bidders always participate in auction. If there are strict requirements, two bidders participate in auction with probability 0.25, one bidder participates in auction with probability 0.5 and nobody participates in auction with probability 0.25. In the former case bidders compete with each other in the reverse English auction that goes as follows. Initially both bidders are ready to sell the product at the reserve price r. In order to decrease governmental spending, auctioneer gradually reduces the price. When the price equals production costs of a bidder, he drops out, and another bidder wins the auction at this price. If bidders have different costs, the less efficient bidder drops out when the price equals $\overline{c}$ and another bidder wins the auction making a profit $\overline{c} - \underline{c}$. If bidders have equal costs, let us assume for the sake of simplicity, that each of them drops out with probability 0.5 and another bidder wins the auction with zero profit. The results of all combinations of auctions are considered in the Tables 5.1-5.2 in Appendix 2.

Then the agents receive the following payoffs:

1. if the procurer sets strict requirements $s_p = S$,

   $EU_{proc} = \frac{3}{4}v(S)$,

   $E\pi_i = \frac{2r+\overline{c}-3\underline{c}}{8}, i = 1,2$,

   $EP = \frac{1}{2}r + \frac{3}{16}\overline{c} + \frac{1}{16}\underline{c}$– expected public spending.

2. if the procurer sets no requirements $s_p = 0$,

   $EU_{proc} = \frac{1}{2}v(S) + \frac{1}{2}v(0)$,

   $E\pi_i = \frac{\overline{c}-\underline{c}}{4}, i = 1,2$,

   $EP = \frac{3}{4}\overline{c} + \frac{1}{4}\underline{c}$ – expected public spending.

The social welfare is the total sum of all agents' payoffs minus public spending that equals $EW = EU_{proc} + \sum E\pi_i - EP$,

1. if the procurer sets strict requirements $s_p = S$,

$$EW = \frac{3}{4}v(S) + \frac{1}{16}\overline{c} - \frac{13}{16}\underline{c}.$$

2. if the procurer sets no requirements $s_p = 0$,

$$EW = \frac{1}{2}v(S) + \frac{1}{2}v(0) - \frac{1}{2}\overline{c} - \frac{1}{2}\underline{c}.$$

Traditional auction with favoritism

As we said before, the procurer sets requirements to the bidders that can restrict their participation in the auction. This discretion allows the procurer to provide a corrupt service: he can change requirements so that a bidder *i* will surely meet them ($s_p = s_i, = 1,2$) in exchange for a bribe[9]. In order to give a bribe to the procurer, a bidder has to carry out nonzero organizational costs (e.g. see Laffont and Tirole, 1991b). For instance, he should find procurer, assures him that he wants to give a bribe and secretly transfers him the money after the contract is concluded. Thereby a bidder should transfer to the procurer $1 + \alpha_i$€ in order to give him 1 €, when α is the value of organizational costs and i is the number of a bidder, $i = 1, 2$. Let us assume that the procurer has long-term relations with bidder 1 (the preferred bidder) on the basis of previous experience or informal connections. So if the latter does not cheat, the procurer does not agree to make a corrupt deal with another bidder (bidder 2). Hence, bidder 2 has to spend infinitely large organizational costs, if he wants to give a bribe to the procurer, and organization costs of bidders equal $\alpha_1 = \alpha, \alpha \in [0; 1], \alpha_2 = +\infty$.

First of all we analyze situation with zero participation costs. Table 3 presents the timing of the game.

Table 3. Timing

1	**Nature assigns a type (c_i; s_i) to each bidder**
2	**Procurer sets requirements s_p and discloses (r; s_p) to bidder 1.** **If $s_p \neq s_i$, they can make a corrupt deal.**
3	**Procurer sets requirements s'_p and announces auction with $r > \overline{c}$**
4	**A bidder registers, if $s_i \geq s_p, i = 1,2$**
5	**If two bidders register, procurer holds reverse English auction.** **If one bidders registers, he gets contract at $r > \overline{c}$.** **If nobody registers, everybody gets zero.**
6	**Procurer purchases a product (service) and gets a bribe (if he has made a corrupt deal)**

[9] Here we consider kickback as a certain type of a bribe, which is commonly used in public procurement.

For the sake of simplicity let us assume that the procurer and bidder 1 have equal bargaining power. They agree on the optimal amount of bribe that maximized the product of their expected payoffs:

$F = E\pi_1 \cdot EU \to \max_B$,

where $E\pi_1 = \sum_{m=1}^{4} p_k p_{1m}(P_{1m}(c_{1m}) - c_{1m} - B_{1m}(1+\alpha))$, $m = 1,2,3,4$,

$EU_{proc} = Ev(s) + \sum_{m=1}^{4} p_m p_{1m} B_{1m}(1+\alpha))$,

m is the type of bidder 1 $(c_1; s_1)$.

$$\text{S.e.} \begin{cases} E\pi_1(s_p = s_1; B^*) \geq E\pi_1(s_p \neq s_1; B = 0) \\ EU_{proc}\left(s_p = s_1; B^*\right) \geq EU_{proc}\left(s_p \neq s_1; B = 0\right) \\ B^* > 0 \end{cases}$$

First order condition: $\frac{\partial F}{\partial B} = 0$. Then we will find an optimal amount of bribe B^* and expected payoffs of economic agents.

E-auction with favoritism and market corruption

In e-auction e-platform can abuse her authorities and take a bribe in exchange for blocking the actions of another bidder. In order to organize this corrupt deal a bidder has to carry out nonzero organizational costs β_i $i = 1,2$. E-platform has one-shot relations with each bidders, therefore she can take a bribe from both of them, and their organizational costs of the corrupt deal equals $\beta_1 = \beta_2 = \beta, \beta \in [0;1]$. E-platform sets fixed amount of bribe b_i and announces it to bidders. If a bidder gives a bribe that equals or exceeds this amount, e-platform blocks the actions of another bidder and he cannot make a bid. Hence, the bidder that gives a bribe surely wins.

Table 4 represents the changes in timing.

Table 4. Timing

1	**Nature assigns a type ($c_i; s_i$) to each bidder**
2	**Procurer sets requirements s_p and discloses ($r; s_p$) to bidder 1.** **If $s_p \neq s_i$, they can make a corrupt deal.**
3	**Procurer sets requirements s'_p and announces auction with $r > \overline{c}$**
4	**A bidder registers, if $s_i \geq s_p, i = 1,2$**
5	**If two bidders register, intermediary holds English auction on bribe.**
6	**If two bidders register, the one who wins bribe auction gets contract at $r > \overline{c}$.** **If one bidders registers, he gets contract at $r > \overline{c}$.** **If nobody registers, everybody gets zero.**

7	**Procurer purchases a product (service) and gets a bribe (if he has made a corrupt deal). E-platform gets a bribe (if he has made a corrupt deal).**

If bidder 1 he has fewer chances to give a bribe to e-platform and win e-auction, if he continues to give a bribe to the procurer in case when two bidders register for participation in e-auction. This happens, when bidder 1 does not satisfy strict requirements and has the same or higher production costs, than bidder 2, and may happen, when bidder 1 has lower production costs, than bidder 2, but the difference between them is relatively small. In these cases e-auction leads to lower probability that bidder 1 gives a bribe and increases the expected utility of bidder 2.

5. Preliminary results and further research

Laffont and Tirole (1991) conclude that price auction is immune to favoritism. However in Russian public procurement the auctioneer can restrict competition and take a bribe. So other characteristics of auction format can influence favoritism. In this paper we investigate favoritism in public procurement and are going to compare the outcomes of traditional auction and e-auction. For the sake of simplicity we analyzed situation with two bidders and zero entry costs.

We assume that there are several significant differences between traditional auction and e-auction that have impact on public procurement efficiency, including favoritism. First of all, in traditional auction only the public procurer can restrict competition and take bribes, while in e-auction e-platform can also behave opportunistically. The corruption behavior of the public procurer and e-platform differs in the mechanism of bidders' discrimination (quality requirements or blocking the bids) and the type of a corruption client (the preferred bidder or more efficient bidder). In the further research we are going to analyze this situation and find out what auction format (traditional auction or e-auction) is better for the social welfare. We hypothesize that it is harder to sustain illegal long-term relations between the public procurer and his preferred bidder in e-auction, because of the e-platform that can block the actions of bidders in exchange for a bribe. There are two ways when the public procurer and his preferred bidder are managed to keep these long-term relations. First is the case when the preferred bidder is extremely effective and the public procurer establishes high requirements for the quality so that no one else can participate in e-auction. The allocation of contract is efficient, but the public spending is high and the society receives damage from corruption. Second is the case when the public procurer and the preferred bidder can collude with e-platform. In our opinion, current situation in Russia partly illustrates this case. Otherwise there is no favoritism in e-auction, however the market corruption may take place.

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Appendix 1

An auction without favoritism

In November 2012 the Ministry of Forestry of Tatarstan decided to buy 40 radio stations through an e-auction[10]. To determine an adequate reserve price, procurer asked three regional bidders (“Forest”, “Restechnika”, “Geodezia-Service”) to provide it with the necessary information. The reserve price of one radio station was the average of the provided prices (7’100.00 rub). Nine bidders participated in e-auction, including four who made bids. Private entrepreneur Timorshin L.F. won the auction, reducing the reserve price by 38.5%, to 4’364.65 rub. Given into consideration that the average price of radios in internet-shops[11] on 01.08.2013 was 5’408.00 rub., and there was no boom in the market, we can conclude that the final price was not high. The contract was successfully executed in a month after the auction. There were no complaints against the electronic platform, procurer or bidder.

Favoritism in traditional auction

St. Petersburg Health committee had long-term relations with one of the pharmaceutical distributor. He systematically restricted competition in traditional auctions, so that the preferred bidder was the only participant in the majority of them. In 2008-2010 the sum of transactions between then was more than 99% of the total sum of medicines procured by heal committee or sold by the preferred bidder in public procurement [Ostrovnaya & Podkolzina, 2013].

Several pharmaceutical distributors complained to the Federal antimonopoly service (FAS) about various restrictions of competition. For instance, procurer added qualification requirements to bidders and requirement for a wholesale trade license in public contract. He excluded some bidders from participation in traditional auction, while others even did not apply for participation, because they were sure that they would be excluded sooner or later. FAS found health committee guilty in restricting competition and warned him about stronger sanctions, if he continued doing it in the future.

Blocking bids in e-auction

In June 2011 one e-platform held e-auction on maintenance work. The reserve price was 8’471’400 rub. Two bidders (C and D) participated in e-auction, and only one of them (C) made a bid. Another bidder (D) could not make a bid in e-auction, because e-platform blocked all his

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[10] http://zakupki.gov.ru/pgz/public/action/orders/info/common_info/show?notificationId=4746509
[11] According to http://market.yandex.ru/, 13 price offers of VECTOR VT-44 Military #40 in Kazan, Tatarstan.

actions. As a result, bidder C decreased the reserve price by 0.5% and won e-auction[12]. Bidder D complained to the Federal antimonopoly service on e-platform, which declined to hold the auction again. Although e-platform stated that bidder D could not make a bid because of the DDOS-attack, the FAS decided that the e-platform broke the law and charged to hold this e-auction again starting from the final bid in the former e-auction.[13] DDOS-attack was not a good explanation to the situation, because bidder C could make bids. Perhaps, bidder C organized DDOS-attack or there was no DDOS-attack at all, and e-platform and bidder C made an illegal agreement. Bidder C won new e-auction decreasing the reserve price by 3.5%. Hence, the government saved more than 250’000 rub. by making e-platform to hold e-auction again.

Table 4 Comparison of auction results

Date and time of bids in e-auction	**Auction 1**		**Auction 2 (re-auction)**	
	Bidder	**Last bid (rub.)**	**Bidder**	**Last bid (rub.)**
15.08.2011 11:44:53	Bidder C	8’429’043.00		
	Bidder D	-------		
13.09.2011 12:03:52			Bidder D	8’217’258.00
13.09.2011 12:01:30			Bidder C	8’174’901.00

[12] http://www.sberbank-ast.com/purchaseview.aspx?id=317983
[13] http://docs.pravo.ru/document/view/27250127/

Appendix 2

Table 5.1 Auction results when the procurer sets strict requirements

		Requirements			
		$\boldsymbol{S_1 = S, S_2 = S}$	$\boldsymbol{S_1 = S, S_2 = 0}$	$\boldsymbol{S_1 = 0, S_2 = S}$	$\boldsymbol{S_1 = 0, S_2 = 0}$
Production costs	$\boldsymbol{c_1 = \overline{c}, c_2 = \overline{c}}$	$P_1 = P_2 = \overline{c}$, $p_1 = p_2 = 0.5$	$P_1 = r$, $p_1 = 1, p_2 = 0$	$P_2 = r$, $p_1 = 0, p_2 = 1$	$-; -$
	$\boldsymbol{c_1 = \overline{c}, c_2 = \underline{c}}$	$P_2 = \overline{c}, p_2 = 1$, $p_1 = 0$	$P_1 = r$, $p_1 = 1, p_2 = 0$	$P_2 = r$, $p_1 = 0, p_2 = 1$	$-; -$
	$\boldsymbol{c_1 = \underline{c}, c_2 = \overline{c}}$	$P_1 = \overline{c}, p_1 = 1$, $p_2 = 0$	$P_1 = r$, $p_1 = 1, p_2 = 0$	$P_2 = r$, $p_1 = 0, p_2 = 1$	$-; -$
	$\boldsymbol{c_1 = \underline{c}, c_2 = \underline{c}}$	$P_1 = P_2 = \underline{c}$, $p_1 = p_2 = 0.5$	$P_1 = r$, $p_1 = 1, p_2 = 0$	$P_2 = r$, $p_1 = 0, p_2 = 1$	$-; -$

Table 5.2 Auction results when the procurer sets no requirements

		Requirements			
		$\boldsymbol{S_1 = S, S_2 = S}$	$\boldsymbol{S_1 = S, S_2 = 0}$	$\boldsymbol{S_1 = 0, S_2 = S}$	$\boldsymbol{S_1 = 0, S_2 = 0}$
Production costs	$\boldsymbol{c_1 = \overline{c}, c_2 = \overline{c}}$	$P_1 = P_2 = \overline{c}, p_1 = p_2 = 0.5$			
	$\boldsymbol{c_1 = \overline{c}, c_2 = \underline{c}}$	$P_2 = \overline{c}, p_1 = 0, p_2 = 1$			
	$\boldsymbol{c_1 = \underline{c}, c_2 = \overline{c}}$	$P_1 = \overline{c}, p_1 = 1, p_2 = 0$			
	$\boldsymbol{c_1 = \underline{c}, c_2 = \underline{c}}$	$P_1 = P_2 = \underline{c}, p_1 = p_2 = 0.5$			