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WHAT IMPACT DOES ANTITRUST INTERVENTION HAVE ON COMPETITION? THE CASE OF PUBLIC DRUG PROCUREMENT IN RUSSIA

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In this paper we study antitrust intervention in long-term relationships between public procurer and his preferred supplier in one of the Russian regions. We presume that antitrust control of auctions held by affiliated procurer increases the risks of implementing long-term relationships with his preferred supplier. However we found out that after the intervention of antitrust agency the number of bidders in the auctions increased, but relative contract prices remained the same.
We argue that procurer and preferred bidder invited firm with passive bidding strategy to decrease the risks of antitrust punishment. Thereby, antitrust intervention led to fake competition, but not to honest non-corrupt behavior in public auctions.

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Keywords: public auctions, antitrust policy, pharmaceuticals, Russia.

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"Good people do not need laws to tell them to act responsibly, while bad people will find a way around the laws".

Plato

1. Introduction

In the private sector companies can choose different governance mechanism: anonymous market transactions, long-term relationships or hierarchy [Joskow, 1993]. In contrast, in public procurement range of possible mechanisms is quiet limited. Russian procurement legislation (94-FL) prohibits long-term relationships between public procurers and suppliers, because they are traditionally associated with restrictions of competition and corruption [e.g. see Banerjee et al., 2012]. As Cohen and Montoya (2001) mention, the large amounts of public spending make corruption very attractive for procurers in the pharmaceutical sphere. 94-FL fights against it, hence, against long-term relationships in public procurement.

The regulator (the antimonopoly agency) has to provide a high level of competition in public auctions. The more bidders participate in an auction, the lower their profits are, and the lower bids are submitted in descending auctions by the preferred supplier [McAfee, McMillan, 1987; Brannman et. al, 1987 and others]. To stimulate competition antitrust agency can use tools of traditional antitrust policy, such as prescriptions, fines and imprisonment.

In this paper we show that antitrust measures aimed only at increasing the number of bidders do not lead to lower prices, but generate new methods of law evasion. We illustrate it on a simple example in one Russian region (region X)[4]. We examine illegal long-term relationships in public drug procurement between one regional procurer and his preferred supplier. Affiliation of the preferred supplier with one senior official let us conclude that these relationships were to some extent corrupted.

The FAS found the breach of antitrust law by the procurer and ordered him not to restrict competition in public auctions. The expected result was the increase in the number of suppliers and the decrease in contract prices. In fact although more companies started to participate in procurer's auctions after antitrust intervention, the relative contract prices remained the same. This happened because procurer or the preferred supplier involved fake competitors instead of the real ones to participation in the auction.

Before the auction took place the procurer used his discretionally power in order to restrict competition, for instance, sending invitation only to affiliated suppliers, excluding their

[4] Hereinafter we do not mention names of public or private organizations or details of the public contracts for the sake of anonymity.

competitors from the pre-qualification list or modifying public contract for the needs of affiliated suppliers [Soreide, 2002; Boehm, Olaya, 2006]. Yokoo, Sakurai, and Matsubara (2004) described situation when procurer or supplier makes bids on behalf of various companies, which were slightly different from the winning bid. In considered case preferred supplier used similar mechanism. To make semblance of competition in auction the preferred supplier coordinated his actions with a fake bidder, which participated in public auctions, but did not bid. As the result, the long-term relationships were not terminated and the risk of antitrust punishment was decreased.

The structure of the paper is the following. In the second section we give a brief description of public drug procurement in Russia and long-term relationships of the procurer and the preferred supplier. In the third section we describe the dataset and methodology and in the fourth section we show that the decision of the FAS did not have the desired effect on the behavior of the procurer and his preferred supplier. The fifth section concludes.

2. Regional drug procurement in Russia

The pharmaceutical market in Russia consists of three interconnected segments. In the wholesale market pharmaceutical companies are sellers and pharmaceutical distributors are customers, who then sell drugs to pharmacies. Russian distributors can be divided into three groups ("national", "inter-regional" and "regional" distributors) on the basis of such indicators, as gross sales of the company, the number of subsidiaries or branches and the number of federal districts in which the company has certified warehouses. For example, in 2008, the "national" distributor had on the average 15-20 branches or subsidiaries, "interregional" - 5, and "regional" - not one[5]. 11 largest distributors were oligopolies in the commercial market in the majority of Russian regions.

Public drug procurement is the large part of the pharmaceutical market in Russia: 26.2% in 2008, 24.7% in 2009[6]. Different public health facilities (hospitals, clinics, etc.) and government agencies are procurers of drugs. They buy drugs from pharmaceutical companies and distributors. According to a survey of the wholesale regional pharmaceutical markets in conducted by the FAS, "pocket" companies affiliated with the regional authorities had stable position in public drug procurement.

Nowadays public procurement in Russia is under the regulation of 94 Federal law. Legislators quite often make changes and amendments to the law, including the changes in the available procedures. As information about quality of purchased medicines is not available, in

[5] http://www.pharmexpert.ru/
[6] http://www.dsm.ru/

this study we rely only on quantitative data. As a result we consider the 2008-2010, when drugs were purchased through three different procedures (e-auction auction, open auction and sealed-bid auction), and the only criterion for supplier selection was the minimum contract price. Prequalification of bidders was absent, but each pharmaceutical distributor must have obtained a license for wholesale trade of medicines. Public procurers could set additional requirements for the participants of auctions: bank guarantee and the absence of record of the company in blacklist (http://rnp.fas.gov.ru/). As well as the enlargement of lots, these methods could serve as barriers to entry, particularly for SMEs and pharmaceutical companies.

The Federal antitrust agency (the FAS) is responsible for encouraging competition in public procurement. The FAS can use various measures in order to stop limitations of competition, for instance, oblige the procurer to re-auction, pay the fine or to bring him to administrative responsibility. If the FAS returns procurer guilty for the restriction of competition in public procurement, he will punish this procurer more cruelly for repeated violations. Therefore, risks of unfair behaviour will rise. Any decision of the FAS may be appealed in Arbitration Court.

The FAS can monitor public procurement by himself and consider complaints from bidders. One of these cases took place in region X in 2009, when a small pharmaceutical distributor charged one procurer (hereinafter - analyzed procurer) with restriction of competition in public drug auctions. This procurer is a regional Health Committee, which annually buys drugs for regional clinics and hospitals (for more information about hospitals see Table 8 in Appendix). He control regional health facilities, manages their contracts and doesn't use the drugs he buys.

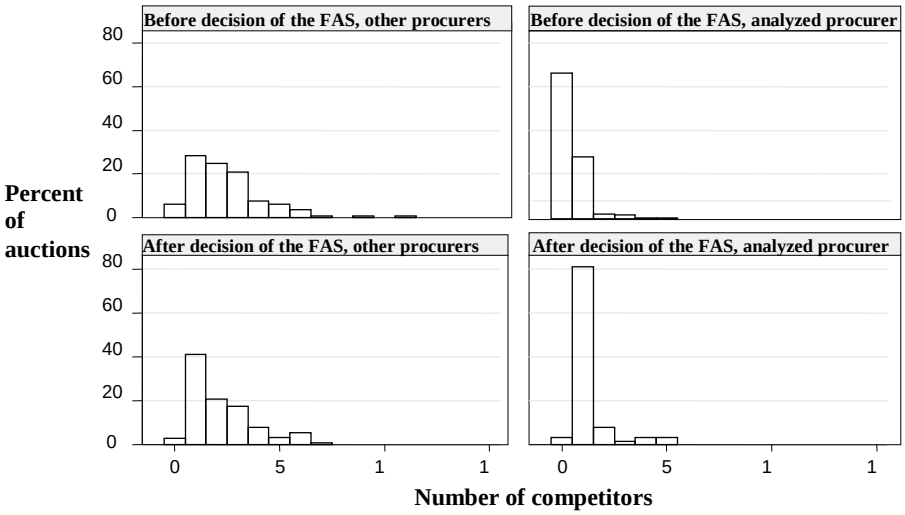
Pharmaceutical distributor who won this auction (hereinafter - preferred supplier) systematically made contracts with analyzed procurer. We consider their long-term relations as close due to two reasons. Firstly, in 2008-2010 the sum of transactions between them exceeded 99% of the total sum of transactions of both actors.[7] Preferred supplier stably won almost all centralized auctions organized by analyzed procurer and has posted information about this on his official web-site as a sign of his good reputation. Interestingly, the proportion of winning auction to auctions, where he participated, is much lower, if auction is organized by other regional procurers (compare 0.58 with 0.93). Secondly, level of competition measured both by the number of bidders and the decrease in reserve price was very low. In the majority of auctions only preferred supplier participated.

[7] Since drugs are very heterogeneous products, we define market boundaries on the basis of the assortment of goods delivered by the supplier (preferred bidder), but not the assortment of goods purchased by the considered procurer.

The FAS found the procurer guilty in violating competition law with the enlargement of the public contracts and warned him that in case of repeated violations stringent sanctions would be applied. Arbitration Court supported the decision of the FAS[8]. How antitrust decision could influence on the incentives of procurer and supplier? First of all, procurer could have strong incentives to stop limiting competition. Hence, more bidders participated in the drug auctions, decreased relative contract price more and public expenditures on drugs and the favorite's profit reduced. Trying to increase profit, preferred supplier could collude with other bidders and reduce the relative contract price less, than in case of fair competition. As far as the Russian Arbitration Court repeatedly found slight decrease in contract price and even passive bidding behavior legitimate, the risks of such dishonest behavior are low.

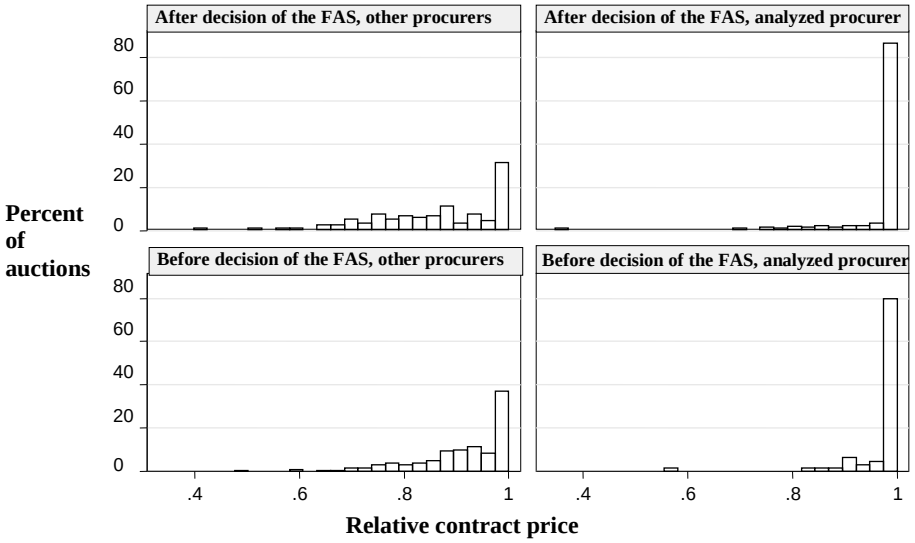
The methodology of our research is close to difference-in-difference method. We deal with two time periods: before (0) and after (1) the decision of the FAS. Unlike basic situation, when difference-in-difference method is implicated, in our research we do not have control group and treatment group, but have high-influence group and low-influence group. The former includes public drug auctions hold by analyzed procurer (1) and the latter - public drug auctions hold by other regional procurers (0). The preferred supplier participated in all considered auctions. We suggest that the FAS might have impact on the behavior of other regional procurers, but this impact is much less significant, than impact on the analyzed procurer. The figure 1 and 2 illustrate the change in the number of competitors and relative contract price in two groups before and after decision of the FAS.

Fig. 1 The number of preferred bidder's competitors before and after FAS intervention



[8] http://kad.arbitr.ru

Fig. 2 Relative prices in public drug auctions before and after FAS intervention



The data shows practically no significant changes in the number of preferred supplier's competitors and relative contract price of auctions held by other regional procurers. Meanwhile in the auctions organized by analyzed procurer the number of preferred supplier's competitors changed dramatically. Before the decision of the FAS the number of competitors equaled 0 in more than 60% and equaled 1 in almost 30% of the public drug auctions, while after the decision of the FAS it equaled 1 in 80% of the public drug auctions. However after the intervention of the FAS relative contract prices in these auctions remained the same. So according to the pictures, the intervention of the FAS led to positive shift in the number of bidders, but had no influence on the relative contract prices.

When procurer received a warning from the FAS, his incentives to limit competition must have reduced, hence, the number of bidders in auctions held by this procurer increased and the relative contract prices decreased. In fact in auctions held by analyzed procurer the number of bidders increased, but relative contract prices did not change. In our point of view, the decision of the FAS led to new schemes of avoiding the law, namely, fake competition. On the basis of this we formulate our hypothesis. We suppose that the decision of the antitrust agency raised the number of preferred supplier's competitors in public drug auctions organized by analyzed procurer, but did not change the readiness of preferred supplier to decrease contract price. The reason for this is the appearance of fake competitor, which did not decrease price and made preferred supplier win the action in one step.

3. Data and methodology

We collected data related to the public drug auctions conducted in the region X in 2008-2010. The preferred supplier participated in all these auctions. Thereby we singled out the part of pharmaceutical market in which the preferred supplier, as well as his closest competitors, was interested in. The source of the information was an official site of the region. The database consists of two main parts: 175 public auctions held by analyzed procurer and 350 public auctions held by other procurers in region X. One auction relates to one public contract.

We use two dependent variables reflecting the level of competition in public auctions: the number of bidders and the relative contract price (the ratio between the final bid and the reserve price of the contract). Ceteris paribus the more bidders participated in auction, the lower the entry barriers were. The relative contract price reflects the level of price competition in the auction: the more actively bidders compete, the lower is the winning bid [McAfee, McMillan, 1987].

The descriptive statistics of dependent and explanatory variables used in the estimations that follow are summarized in Table 2.

Table 2 Variables

Variable	Definition	Minimum	Maximum	Mean
Dependent variables				
COMPETITORS	= the number of the preferred supplier's competitors participated in the auction	0	11	1.810
RELATIVE PRICE	= the ratio between the final and reserve price of the lot (price ratio)	.345	1	0.926
Independent variables				
FAS	= 1, if the auction is organized after the decision of the FAS, = 0, if the auction is organized before the decision of the FAS	0	1	0.579
PROCURER	= 1, if the main procurer of the auction is the analyzed procurer, = 0, if the main procurer of the auction is not the analyzed procurer	0	1	0.333
PROCURER*FAS	= 1, if the main procurer of the auction is the analyzed procurer, and the auction is organized after the decision of the FAS, = 0, if the main procurer of the auction is not the analyzed procurer and / or the auction is organized before the decision of the FAS	0	1	0.121
Control variables				
RESERVE PRICE	= the reserve price of the contract, rubles	10084.14	1621884006.22	31286993.98
DRUGS	= the number of different drug items in the public contract	1	4841	129.5
DURATION	= the duration of public contract, days	4	365	198.91
E-AUCTION	= 1, if the form of the auction is e-auction, = 0, otherwise	0	1	0.326
OPEN	= 1, if the form of the auction is e-auction, = 0, otherwise	0	1	0.400

SEALED-BID	= 1, if the form of the auction is sealed-bid auction = 0, otherwise	0	1	0.274
PERIOD 1	= 1, if the auction is organized in 1st quarter of the year (from January to March) = 0, otherwise	0	1	0.232
PERIOD 2	= 1, if the auction is organized in 2nd quarter of the year (from April to June) = 0, otherwise	0	1	0.185
PERIOD 3	= 1, if the auction is organized in 3rd quarter of the year (from July to September) = 0, otherwise	0	1	0.200
PERIOD 4	= 1, if the auction is organized in 4th quarter of the year (from October to December) = 0, otherwise	0	1	0.383
Valid N (listwise)	525			

We suppose that after the decision of the FAS the risks of punishment for violations of antitrust law for the analyzed procurer and the preferred supplier increased. Therefore, from our point of view, the impact of the FAS on the number of competitors and the readiness of preferred supplier to decrease contract price was stronger in the auctions held by the affiliated procurer than in the auctions held by other regional procurers. We use OLS regression and difference-in-difference method to test this hypothesis. The information about all bids made by the bidders is not available, because the records of open auctions and electronic auctions contain information only about two last bids. Therefore for examining the impact of the analyzed procurer and the FAS on the readiness of preferred supplier to decrease contract price

The empirical relationships describing the interaction influence of procurer and the FAS on the number of preferred supplier's competitors and relative contract price of the preferred supplier may be written as

$$competitors_i = \alpha_0 + \alpha_1 \cdot FAS_i + \alpha_2 \cdot procurer_i + \alpha_3 \cdot procurer_i \cdot FAS_i + \alpha_4 \cdot control_i + \varepsilon_i, \quad (1)$$

$$price_i = \beta_0 + \beta_1 \cdot FAS_i + \beta_2 \cdot procurer_i + \beta_3 \cdot procurer_i \cdot FAS_i + \beta_4 \cdot competitors_i + \\ + \beta_5 \cdot control_i + \varepsilon_i, \quad (2)$$

where $competitors_i$ is the number of preferred supplier's competitors in the auction i[9]; $price_i$ is the relative price of the preferred supplier in the auction i; FAS_i is the dummy variable that equals 1, if the auction i took place after decision of the FAS and equals 0, otherwise; $procurer_i$ is the type of procurer who organized the auction i: analyzed procurer or other regional; $procurer_i \cdot FAS_i$ - the product of two previous variables; $control_i$ are control variables (type of

[9] The number of $bidders = competitors + 1$

the auction: e-auction, open or sealed-bid auction; the number of different drug items in the public contract; duration of public contract and date of auction).

The model includes several control variables, which also have an impact on the number of bidders and relative contract price. The type of the auction is connected with ex ante transaction costs of bidders that may influence their appearance in the auction and their readiness to decrease price. Electronic auctions are transparent and open procurement procedures. They are less costly than oral auctions, because they decrease travel costs and bidding costs of suppliers [e.g. see Garicano, Kaplan, 2000]. However despite of the fact, that more companies may participate in e-auctions, the relative contract prices may be higher because of the ample opportunities to collude. For instance, in e-auctions one company may submit multiple bids pretending that there are several bidders [Yokoo, Sakurai, Matsubara, 2004]. In Russian procurement one doesn't identify IP address of the bidders, therefore this strategy is rather plausible.

The number of different drug items in the public contract and contract duration reflects the risks of implementing a contract for supplier. The more drug items the public contract contains and the longer contract duration is, the more complex public contract is and the more efforts must be applied by the winner of the public contract to implement it successfully.

4. Empirical results

The number of competitors

We examine the impact of the FAS and the affiliated procurer on the number of preferred supplier's competitors in public drug auction. In the first specification of the model we test the impact of interacted actions of the analyzed procurer and the FAS on the number of the preferred supplier's competitors. Then in the next specifications we control for the type of auction (open auction, electronic auction or sealed-bid auction), the number of items in public contract, the duration of the contract and the date of the auction (quarter). We consider the results of the fifth specification of the model, because its explanatory power is higher and equals 0.315. All the coefficients examined below correspond to the coefficients in equation 1.

Table 3 Long-term relationships and the number of competitors (OLS) [10][11]

		# OF COMPETITORS				
		(1)	(2)	(3)	(4)	(5)
α_1	FAS	-0.070	-0.372*	-0.369*	-0.370*	-0.305
α_2	**PROCURER**	**-1.552******	**-1.079******	**-1.075******	**-1.069******	**-1.031******
α_3	**PROCURER*FAS**	**0.628*****	**0.842******	**0.852******	**0.843******	**0.736*****
α_{41}	SEALED-BID		0.292**	0.281**	0.331**	0.264
α_{42}	E-AUCTION		1.519****	1.510****	1.536****	1.456****
α_{43}	DRUGS			-7.50E-5	-7.77E-5	-0.000010*
α_{44}	DURATION				2.95E-4	7.20E-06
α_{45}	PERIOD1					0.062
α_{46}	PERIOD2					-0.028
α_{47}	PERIOD3					-0.296**
α_0	Cons.	2.291****	1.707****	1.719****	1.631****	1.752****
	R-squared	0.168	0.309	0.310	0.310	0.316
	Obs.	525				

* - p-value<0.10, ** - p-value<0.05, *** - p-value<0.01, **** - p-value=0.00

The first hypothesis is not rejected. Before the intervention of the FAS the number of preferred supplier's competitors was less by one (α_2), if the action was organized by the analyzed procurer. This negative link between the identity of the procurer and the number of bidders confirms the validity of antitrust intervention. After the decision of the FAS the situation changed: the number of bidders significantly increased by 0.431 in auctions held by the analyzed procurer ($\alpha_1 + \alpha_3 \approx 0.431 > 0$). Did the decision of the FAS have different impact on level of competition in auctions held by the other procurers? In our opinion, the answer is no. As we can see from the Table 3, the number of competitors did not significantly decrease in auctions held by other regional procurers (α_1). Additionally, we test the following hypotheses:

a) $\alpha_1 + \alpha_3 = 0$. $F(1,514) = 12.22, \quad \text{Prob} > F = 0.0005$.

b) $\alpha_1 = 0$. $F(1,514) = 2.20, \quad \text{Prob} > F = 0.1387$.

The hypothesis (a) is rejected, while the hypothesis (b) is not rejected. So the main finding for us is the different changes in the number of competitors in the two groups of auctions.

Therefore, antitrust intervention led to larger number of bidders participating in auctions organized by the analyzed procurer, but less than on the average in the regional procurement. Meanwhile the reasons for this are not clear. On the one hand, the analyzed procurer could have started behaving honestly and not limiting competition. On the other hand, he could have provoked horizontal collusion between the preferred supplier and other bidders. These bidders could have participated in auctions in order to show competition to the FAS, slightly decrease

[10] Here and after we run regressions with heteroskedasticity-consistent standard errors.
[11] The hypothesis about the equality of the period coefficients to zero (period1=period2=period3=0) was not rejected. Therefore, we do not include them in later specifications.

the reserve price of the contract and let the preferred supplier win the auction. To analyze whether the long-term relationship became 'honest' after the decision of the FAS, we examine the change in relative contract price of the preferred bidders after the decision of the FAS in two groups of auctions: auctions organized by the analyzed procurer or other regional procurers.

Relative contract prices

Further we examine the influence of the FAS and analyzed procurer on the relative contract prices established by a preferred supplier. As we have done in the previous regression, in the first specification of the model we test the interacted impact of the FAS intervention and procurer on the readiness of the preferred supplier to decrease price in public drug auctions. Since dependent variable is the ratio between winning bid and reserve price, changes in estimations of reserve price by public procurer after the decision of the FAS may be seen as changes in real prices. However, firstly, there were no complaints to the FAS about wrong estimations of the reserve price by any regional procurer, including analyzed one. Secondly, in this region at least in 2009-2010 maximum prices of drugs were established centrally.

In the following specifications we control the robustness of obtained results by adding to the model such variables as the number of competitors, the type of the auction (open auction, electronic auction or sealed-bid auction), the number of drug items in public contract and the duration of the contract. We do not control the period of the auction because it was insignificant in all the specifications of the previous model. We consider the results of the third specification of the model, because its explanatory power is higher and equals 0.403. All the coefficients examined below correspond to the coefficients in equation 2.

Table 4 Long-term relationships and relative contract price (OLS)

		RELATIVE PRICE		
		(1)	(2)	(3)
β_1	FAS	0.027*	0.023*	0.023*
β_2	**PROCURER**	**0.062******	**0.026***	**0.026***
β_3	**PROCURER*FAS**	**-0.014**	**-0.006**	**-0.007**
β_4	COMPETITORS		-0.042****	-0.042****
β_{51}	SEALED-BID		-0.019	-0.015
β_{52}	E-AUCTION		0.035**	0.037**
β_{53}	DRUGS			5,03E-6**
β_{54}	DURATION			4.05E-5
β_0	Cons.	0.907****	0.979****	0.973****
	R-squared	0.095	0.401	0.403
	Obs.	367		

* - p-value<0.10, ** - p-value<0.05, *** - p-value<0.01, **** - p-value=0.00

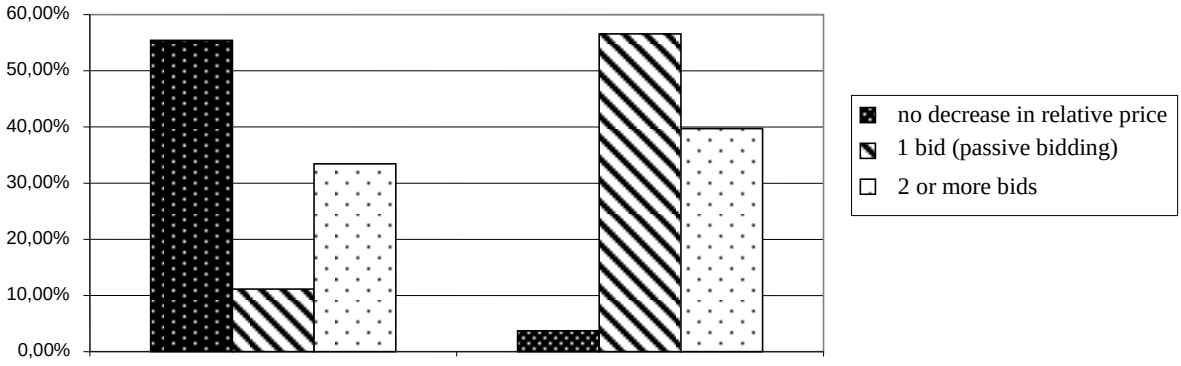
As we supposed, before the decision of the FAS relative contract prices paid by the analyzed procurer to preferred supplier were higher than relative contract prices paid by other regional procurers by 2.6% (β_2). Taking into account the average decrease in contract prices

(6.72%), this difference was rather large. Antitrust intervention did not significantly reduce the readiness of the preferred supplier to decrease price and after the decision of the FAS the relative prices of the auctions organized by the analyzed procurer were 1.9% ($\beta_2 + \beta_3$) higher, than the relative prices of the auctions organized by the other regional procurers. Interestingly, the decision of the FAS led to increase in relative prices in these auctions by 2.3% (β_1).

To examine the interacted influence of the FAS and the procurer on relative contract price more correctly, we tested following hypothesis: $\beta_2 + \beta_3 = 0.02$. $F(1,358) = 0.01$, $\text{Prob} > F = 0.4056$. The hypothesis is not rejected; hence, we may conclude that the antitrust agency did not achieve its goal. The decision of the FAS had no significant effect on the connection between the willingness of the preferred supplier to reduce price and the identity of the auctioneer. Regardless of the antitrust decision, the preferred supplier continued to make higher bids in the auctions held by the analyzed procurer.

Why did more bidders not lead to lower relative prices of preferred supplier? One possible explanation of it is the participation of fake bidders in the auctions. These bidders appeared at open and electronic auctions, but did not bid and as the result the contract prices were slightly decreased by the preferred supplier. In spite of the fact that price of the selected procurer's contract decreased more than when only the preferred supplier came to the auction, it decreased less, than in 'free' competition. The reason for creating the semblance of competition is the possibility of evading the decision of the FAS and decreasing the risks of being caught. Pic. 3 illustrates this situation.

Pic. 3 Open and e-auctions held by analyzed procurer and won by preferred supplier



Before the decision of the FAS the preferred supplier did not decrease the reserve contract price in more than half of all auctions. In all these auctions he was the only bidder. One bid was submitted in 10% of open auctions and e-auctions. After the decision of the FAS the situation drastically changed. There were two or more bids in the overwhelming majority of open

auctions and e-auctions, but in almost 60% of them there was only one bid made by the preferred supplier.

In sealed-bid auction passive bidding behavior is impossible, because bidders can make only one bid. Therefore in what follows we will not consider sealed-bid auctions and will examine only open auctions and e-auctions. So fake competition might be created in two steps through passive bidding. In the first step the procurer limits the participation of honest bidders in auctions in several ways, for instance, organizing auctions with oversized public contracts or adding specific requirements to auction documentation that could be met only by the preferred supplier. In the second step the preferred supplier makes arrangements with a fake bidder to substitute honest bidders. Therefore, several bidders appeared at the auction, but only the preferred supplier wins. Why do passive bidders participate in the auctions? In our opinion, the preferred supplier may let him win a smaller public contract or give him another payment in exchange for passive bidding.

We test it by adding the variable PASSIVE in the model (2) on the data, related to e-auctions and open auctions won by preferred supplier. Passive is binary variable that equals 1 in open or e-auctions, if there is only one bid made by the winner and equals 0 otherwise.

$$price_i = \beta_0 + \beta_1 \cdot FAS_i + \beta_2 \cdot procurer_i + \beta_3 \cdot procurer_i \cdot FAS_i + \beta_4 \cdot passive_i + \quad (3)$$
$$+ \beta_5 \cdot competitors + \beta_6 \cdot control_i + \varepsilon_i,$$

where $price_i$ is the relative price of the contract *i*; FAS_i is the dummy variable that equals 1, if the auction *i* took place after decision of the FAS and equals 0, otherwise; $procurer_i$ is the type of procurer who organized the auction *i*: analyzed procurer or other regional; $procurer_i \cdot FAS_i$ - the product of two previous variables; $competitors_i$ is the number of preferred supplier's competitors in the auction *i*; $passive_i$ is passive bidding in the auction *i*; $control_i$ are control variables (reserve contract price; type of the auction: e-auction, open or sealed-bid auction).

Since it is important to know whether the obtained dependences remain the same for auctions, and not for the whole sample, in the first and the second specifications of the model we examine the interacted influence of the FAS, procurer and passive bidding on relative price. We test it on the data related to all open and electronic auctions that were won by the preferred bidder. In the third and the others specifications we test the robustness of our findings by including in the control variables, namely, the number of competitors, the type of procedure (e-auction, sealed-bid or open auction), the number of drug items in the public contract, the duration of contract. We cannot test these specifications on the whole data set, because of the high significant correlation between passive bidding and the number of competitors. This link seems to be obvious: if the number of competitors equaled 0, there was always passive bidding

in the auction. To overcome this problem we test the influence of control variables on relative price on the data related to auctions with 2 or more bidders. In these auctions the link between the number of competitors and passive bidding behavior is not so clear, as in all auctions.

The results of the regression analysis presented in Table 5 are in accordance with our hypothesis. In all the considered specifications of the model passive bidding of competitors led to higher bids made by preferred supplier by 3.6 – 4.9%.

Table 5 Long-term relationships and relative contract price (OLS)

		RELATIVE PRICE			
		(1)	(2)	(3)	(4)
α_1	**FAS**	**0.026**	**0.027**	**0.026**	**0.026**
α_2	**PROCURER**	**0.082******	**0.062******	**0.072******	**0.077*****
α_3	**PROCURER*FAS**	**-0.038***	**-0.036****	**-0.041****	**-0.044*****
α_4	**PASSIVE (ALL)**		**0.052******	**0.033******	**0.031******
α_5	COMPETITORS			-0.031****	-0.031****
α_{61}	E-AUCTION			0.045**	0.043*
α_{62}	DRUGS				-1.47e-06
α_{63}	DURATION				-0.00003
α_0	Cons.	0.910****	0.896****	0.935****	0.955****
	R-squared	0.201	0.309	0.474	0.476
	Obs.	237		183	

* - p-value<0.10, ** - p-value<0.05, *** - p-value<0.01, **** - p-value=0.00

The quantitative and qualitative impact of antitrust intervention and the analyzed procurer on relative price remains practically the same. Let us consider the fifth specification, where the explanatory power of the model (0.492) is the highest. When we take into account the passive bidding behavior, the intervention of the FAS becomes statistically significant to auctions held by analyzed procurer. We suppose that this effect disappears in the auctions where all competitors are passive. So we test the following hypothesis: $\alpha_3 + \alpha_4 = 0$, where α_3 reflects the impact of the decision of the FAS and α_4 reflects the impact of passive bidding on the relative contract prices. As $F(1.171) = 0.68$, $\text{Prob} > F = 0.4099$, the hypothesis is not rejected. We can conclude that the reaction of the analyzed procurer and preferred supplier on the action of the FAS was equal and opposite to this action.

Meanwhile we should distinguish between passive bidding connected with strategic behavior of bidders and caused by other factors, for instance, low profitability of public contract for a certain bidder. To achieve it we have analyzed the data and found that one bidder (firm A) that started to systematically participate in auctions hold by analyzed procurer after the decision of the FAS. In our opinion, this firm A may collude with the preferred supplier creating fake competition in the auctions organized by the analyzed procurer. Firm A participated only in open auctions organized by the analyzed procurer and always tête-à-tête with the preferred supplier, while firm A was small company less than most of regional distributors. In addition to this, firm

A often did not make bids in open auctions at all or make bids, slightly deviating from the winning bid made by the preferred supplier.

We suppose that Firm A behaves as a fake competitor, therefore these conditions are met:

1. Passive bidding that led to the win of the preferred supplier positively depended on the participation of Firm A in the auction, negatively – on the number of competitors.
2. Passive bidding of Firm A was more frequent in the auctions with enlarged contracts organized by the analyzed procurer.
3. Passive bidding of other bidders did not depend on the numbers of items in the public contract and the identity of the procurer.

These hypotheses were tested on the data related to the drug auctions with 2 or more bidders won by the preferred supplier in 2008-2010 (see Table 6). First of all, we examine the impact of participation of Firm A on the passive bidding behavior in public drug auctions. The depended variable PASSIVE_BIDDING is binary variable, that equals 1, if there was passive bidding in the auction, and equals 0, if not. In first specification of the model we verify this hypothesis. To other specification of the model we also add control variables: the natural log of number of drug items in public contract, the type of the auction (open auction or e-auction).

Table 6 Participation of Firm A and passive bidding (Logit)

	PASSIVE BIDDING		
	(1)	(2)	(3)
FIRM A	**1.842******	**1.301*****	**1.593******
COMPETITORS		-0.886***	-1.061***
Ln (DRUGS)		0. 127	0, 104
E- AUCTION			.763
Cons.	-1.436****	-0.498	-.528
Pseudo R-squared	0.116	0.176	0.187
Obs.	201		

** - p-value<0.05, *** - p-value<0.01, **** - p-value=0.00

Obtained results are the following. In all specification of the model the appearance of firm A in the auction led to the passive bidding behavior and as a result the preferred supplier won the auction. This significant link between passive behavior of the Firm A and the win of the preferred supplier may indicate on collusion between them. It worth mentioning, that two huge drug auctions, where these bidders participated tête-à-tête, were won by firm A with the little price decrease. These public contracts could be the pay for the passive bidding in other auctions.

Because of the multicollinearity problems, we cannot run regression for testing the influence of procurer and terms of the public contract on the passive bidding by firm A and other participants. Therefore we made pairwise correlations that are presented in the Table 7.

Table 7 Correlations				
	PROCURER	Ln (DRUGS)	Ln (RESERVE PRICE)	DURATION
PASSIVE (FIRM A)	0.360**	0.227**	0.477**	0.363**
PASSIVE (OTHERS)	0.140*	-0.225**	-0.012	-0.348**

* - p-value<0.10, ** - p-value<0.05

These correlations partly support our suggestions. Passive bidding of firm A was more frequent in drug auctions organized by analyzed procurer. It was more probable, if the public contract was enlarged: there were more drug items in it, reserve price was higher and contract duration was more. All these terms of the contract are connected with the passive behavior of firm A under 1% significance level. In contrast, passive bidding of other companies was more probable in case of smaller public contracts and if analyzed procurer organized the auction. However the link between the analyzed procurer and passive bidding of other companies is weaker and is not as significant, as the link between the analyzed procurer and passive bidding of firm A.

5. Conclusion and discussion

After decision of the FAS more companies participated in the auctions organized by the analyzed procurer. Does this mean that the requirements of the FAS were fulfilled and that the FAS increased the level of competition in this sphere? No, unfortunately. Newton's 3rd law: "To every action there is always an equal and opposite reaction" describes well how quickly the considered actors responded to the decision of the FAS. The relative contract prices did not change significantly, because of the fake competition in drug auctions. The relationships between the analyzed procurer and the preferred supplier were not broken off, but the risks of their realization in initial form increased, because the FAS would severely punish them for repeated restrictions on competition. To lull the vigilance of the FAS the parties substituted the 'honest' competitors with fake competitors. The analyzed procurer continued organization of enlarged auctions prohibited by the FAS, and new bidder (firm A) started to participate in the auction, but did not bid. This passive bidding of the firm A made the preferred supplier win public contract with small decrease in price. By-turn, firm A won two public auctions that were not available for him without the help of preferred supplier.

In this paper we examine the effect of formal sanctions (decision of the FAS) on the dishonest behavior in public drug auctions. We wondered, what influenced more strongly on the behavior of the procurer and his preferred supplier: the threat of punishment or expected losses from discontinued relationships. What were the consequences of the FAS warning: honest behavior or new schemes of law evasion?

We used number of preferred supplier's competitors and relative contract price as the indicators of competition in auctions and examine how they changed after the FAS issued the decision in two groups (auctions organized by analyzed procurer and auctions organized by other regional procurers). The used econometric methods include regression analysis and difference-in-difference method. Interestingly, we found out that antitrust policy had significant effect on the competition and price strategy of the preferred supplier, although it was aimed at the behavior of the analyzed procurer. This indicates the close connection between analyzed procurer and the preferred supplier that takes the form of 'fundamental transformation'.

Our suggestions about connection between the preferred supplier and firm A are confirmed by the following facts. Firstly, the preferred supplier made an agreement with firm A, according to which he lend this company huge amount of money on favorable terms. This sum was almost equal to the total amount of financial guarantee that was necessary to participate in all procedures of multi-lots auction. Thereby these companies did know that they both would show off in the auction. Not surprisingly, in all these procedures the preferred supplier and firm A participated tête-à-tête, and all auctions were won by the preferred supplier. Other companies did not participate in auctions, because their public contracts could be too large, hence, the procurer continued to restrict competition in the bidding and the FAS did not reach his goal.

Secondly, in 2010 Federal Service on Surveillance in Healthcare and Social Development found that the preferred supplier bought, stored and shipped drugs together with the firm A. Moreover, in some cases the "other legal entity (company A) supplied goods instead of the licensee (preferred supplier) on his invoice." The participation of the two companies in the same auctions indicates coordinated actions and violations of antitrust laws.

We found that the preferred supplier behaved dishonestly not only in the region X. In 2009-2010 preferred supplier applied the same strategy (passive bidding) the neighboring region, as in the region X. Here his fake competitor was another supplier (firm B). The preferred supplier and firm B participated in drug auctions, but only one of them made bids. Regional FAS accused them in collusion, but this decision was challenged in the Arbitration Court. Interestingly, the preferred supplier came to the market in this region within a week after the FAS issued a decision about restriction of competition (see Fig. 5 in Appendix). The market share of firm B fallen sharply immediately after his entry, while their total revenue remained about the same in 2008-2010. All illegal connections among the key players in public drug procurement are shown in the Figure 4 in Appendix.

Why did analyzed procurer have week incentives to organize auction honestly? Firstly, this public entity performs only managerial functions and organizes centralized drug procurement for regional hospitals (for more details see Table 8 in Appendix). Bonaccorsi et al.

(2000) examine factors, which affects the choice of procurement procedure (auction or bargaining) in Italian hospitals. They conclude that the manager is more inclined to organize auctions then medical stuff, because quality of purchased products (medical equipment) is less valuable for him. Our conclusions are to certain extent in line with theirs: the quality of drugs does not matter for analyzed procurer. In contrast to the case considered by Bonaccorsi et al. (2000), manager does not seek to reduce hospital costs, but to increase his income. Therefore analyzed procurer chose de facto bargaining instead of auction.

Secondly, we suggest that analyzed procurer had informal relations with preferred supplier and firm A. The head of the health committee was a good friend of the governor of the region, which was affiliated with the preferred supplier, and the chairman of the board of the directors in firm A. Since December 2010 his deputy became the chairman.

What is the most unusual in this corruption soap-opera is the fact that all these actions are visible for anyone. We used only information in open access. We wonder if there is no public entity, which is able to analyze this information? Or, may be, there are no incentives for it? After the change of the governor the head of the health committee was dismissed due to the fact that he bought drugs at inflated prices. Next centralized auction consisted of numerous small lots, which could be easily executed by the SMEs. The share of the preferred supplier fell and regional media felt he had a serious competitor. However, this competitor was a firm A.

To sum up, the decision of the FAS did not lead to increase in competition and the termination of illegal relationships, but to the appearance of new form of law evasion. Fake competition induced by antitrust intervention was not “thing-in-itself”, but could be aimed at minimization of risks connected with the long-term relationships between the analyzed procurer and the preferred supplier. If regional authorities do want to fight illegal relations in public procurement, what should they do? In our opinion, essential measures include organization of auctions with low reserve price and number of purchased drugs, common document circulation of regional FAS and involvement of economists to participate in judicial process. The first measure will increase the number of bidders in auction; the latter two will make the punishment for economic crimes more inevitable.

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- http://www.pharmexpert.ru/

Appendix

The table 8 below includes the general statistics on three types of health facilities subordinated to the analyzed procurer: adult hospitals, children's hospitals and maternity hospitals. All of them provide medical services program of compulsory health insurance.

Table 8 Public procurers subordinated to the analyzed procurer (compulsory health insurance)

№	1	2	3	4	5	6	7
Adult hospitals							
1	1069	9.2	3.69%	2352.9	21604.9		3
2	270	11.5	4.55%	1545.6	17802.0		2.5
3	693	9.8	3.08%	1809.1	17744.5		3.4
4	217	11.8	0.08%	1528.1	37800.7		4.1
5	225	17.2	0.04%	1397.8	24048.8		3.7
6	994	9.9	3.10%	2107.2	20889.8		3.7
7	185	17.8	1.53%	1332.7	23667.2		3.9
8	405	9.9	0.86%	2327.4	22925.4	5	4.1
9	175	9.7	3.6%	1447.3	14002.1		2.5
10	568	10.8	2.24%	1844.5	19837.2	3	3.7
11	258	13.8	2.04%	2031.1	28037.6	5	2.5
12	110	14.9	0.73%	1433.4	21306.9		
13	186	7	0.41%	1970.5	13762.3	13	3.5
14	529	10.3	3.48%	1761.7	18086.7	1	3.1
15	1033	9.7	4.01%	2183.7	21230.4	2	4.1
16	819	8.9	1.59%	1887.0	16721.8		4.7
17	710	10.33	3.32%	2355.4	24277.0	3	3.9
18	1245	9.7	0.70%	2308.1	22325.2	23	4.4
19	614	11	2.58%	2226.2	24436.4		4.1
20	662	12	0.86%	1819.4	21843.3		
21	105	20.1	0.00%	1341.0	27002.2	7	
22	1063	14.4	6.83%	1916.9	27646.8		
23	761	9.9	3.86%	2979.9	29531.1		
24	56	15.5	2.65%	1991.4	30793.7		2.4
Children's hospitals							
25	574	9.4	0.31%	3411.1	32190.0		4.5
26	340	9.1	0.02%	2072.1	18887.0		4
27	100	7.9	0.05%	2417.7	19080.8		
28	284	9.4	0.08%	2524.7	23784.1		3.3
29	486	6.4	0.03%	2726.9	17569.4	9	
30	117	23	1.43%	4275.7	98547.6	8	4
31	360	7.8	0.06%	3095.3	24165.5		4.6
Maternity hospitals							
32	130	6	0.03%	3280.7	19582.0		2
33	183	4.8	0.00%	2784.9	13346.1		4.3
34	180	5.9	0.00%	2947.6	17516.8		3.8
35	105	6.5	0.00%	2964.0	16551.6		4.5

36	175	5.6	0.06%	3488.0	19223.7		4.8
37	265	5.5	0.04%	2650.8	13493.0		2.1

First five indicators are taken from the annual review of the Regional fund of compulsory health insurance (http://www.spboms.ru) in 2012. They are the following:

(1) The number of hospital beds

(2) The average duration of treatment

(3) Hospital mortality

(4) The cost of a bed per day

(5) The average treatment costs

The safety of drug use (6) is the number of messages about unwanted side effects from the health facilities to the district Monitoring Centre for Drug Safety. As analyzed procurer purchased drugs for all hospitals, perhaps, unwanted side effects of drugs appear with equal probability in all hospitals. Therefore this indicator reflects the openness of the health facilities, honesty and accuracy of their medical staff. As we can see from Table 8, the numbers are not big.

The quality of service (7) is taken from the Ranking of health facilities (http://www.drscore.ru/rating_scrubs.php). This index is calculated on the basis of self-reported information of patient who were treated in different regional hospitals. It includes the following indicators: quality of medical care, a wide range of available medical services, friendliness and quality of the staff, provision convenience of the location, quality of the interior decoration.

Table 9 What preceded the court decisions?

Court decision			03-04	dec 04	march 05	apr 05	may 05	dec 07	jun 09	dec 09	may 10	jul 10	aug 10	nov 10	feb 11	jun 11	aug 11	sem 11	nov 11
	Supervisory instance (FAS)																		
	Cassation instance	**FAS**					+ 1												
		Procurer											- 2		- 3				
	Appellate instance	**FAS**												+ 3				- 5	- 5
		Procurer									- 2								
	First instance					+ 1				- 2		+ 3					+ 5		
The FAS issued decision about restrictions of competition			0		1				2	3					4	5			
The procurer organized auctions and the supplier won it			0	1				2		3/ 4/ 5									
Time			*03-04*	*dec 04*	*march 05*	*apr 05*	*may 05*	*dec 07*	*jun 09*	*dec 09*	*may 10*	*jul 10*	*aug 10*	*nov 10*	*feb 11*	*jun 11*	*aug 11*	*sem 11*	*nov 11*

0-5 – numbers of the court cases: 0-4 –the FAS initiated the case against the procurer, 5- the FAS initiated the case against the preferred supplier

+ - the claim is satisfied, the previous decision of the court is canceled

- - the claim is not satisfied, the previous decision of the court remains

Table 10 Restrictions of competition found by the FAS			
№	**Type of restriction**	**The subject of restriction**	**Date of auction**
1	The enlargement of public contract	Pharmaceutical companies, small and medium businesses	2008
	Including the enlargement with high level of centralization (84 public entities)		2009
2	Contract modification for the purposes of the preferred supplier, including names of drugs, composition (the proportion of the active ingredient), packing	All companies, except for the preferred supplier	2009
3	The qualification requirements of the suppliers	New entrants	2005
4	The requirement for a license for wholesale trade	Pharmaceutical companies	2009
5	The requirement for information and communication technology with specific properties	All companies, except for the preferred supplier	2009

In the table above we summarized the restrictions of competition that led to the punishment from the side of the FAS. In all these auctions preferred supplier won.

Fig. 4 Connections inthe regional drug procurement

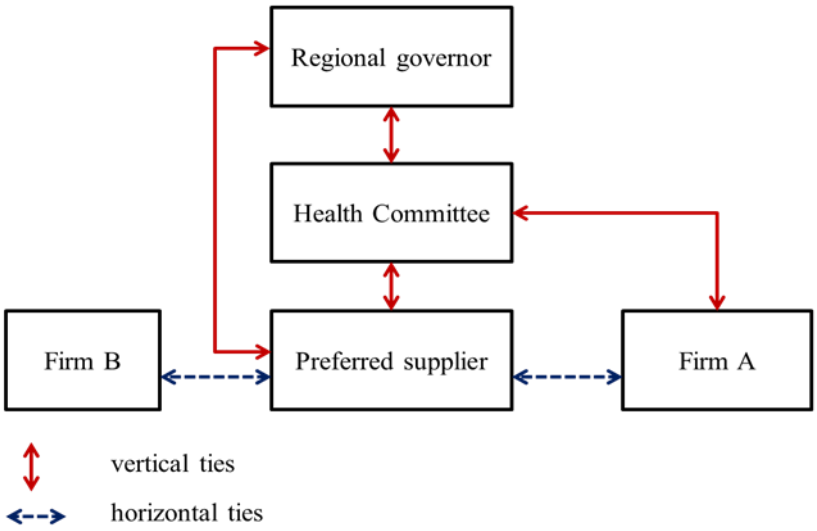
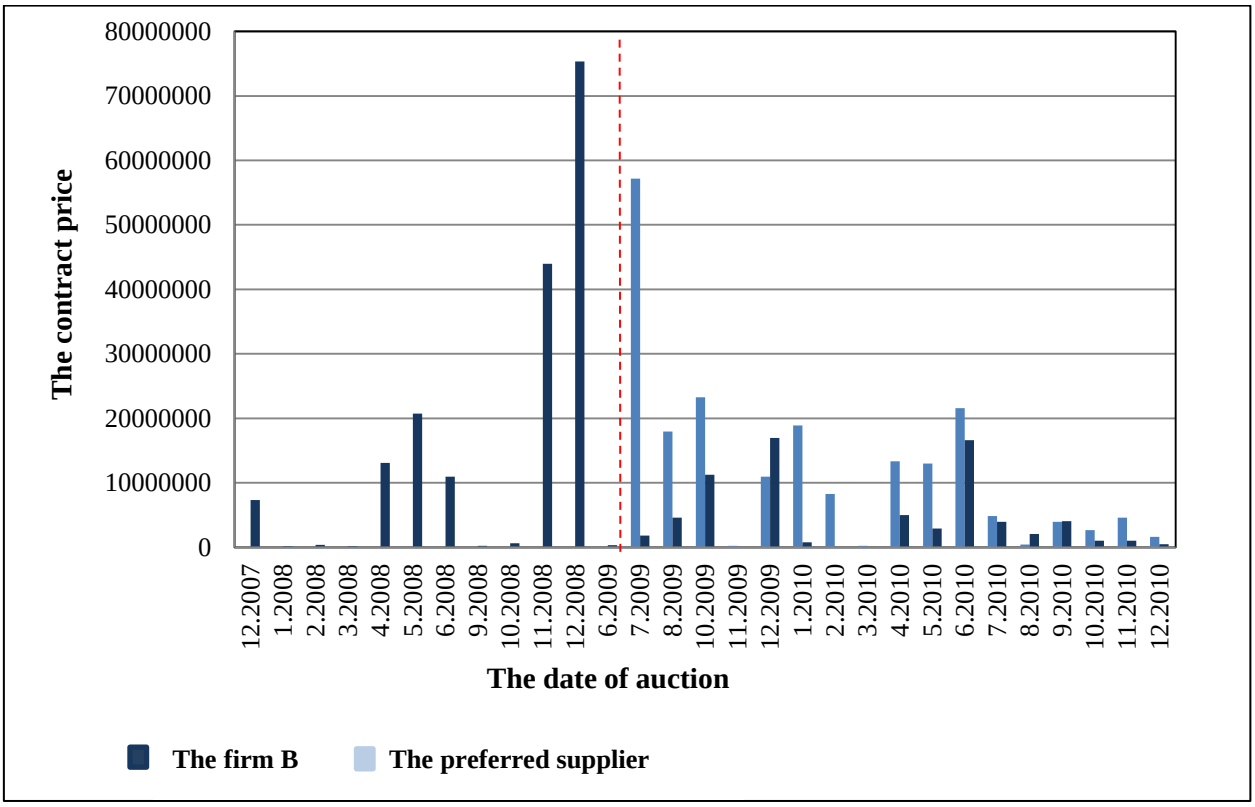


Fig. 5 The auctions won by preferred supplier and firm B in neighboring region



The dashed line indicates the date when the FAS issued a decision about restriction of competition by the analyzed procurer in the region X. The figure shows that the preferred supplier entered the public drug procurement the neighboring region after this decision. Interestingly, local revenue of the firm reduced by the amount of local revenue of the preferred supplier.

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