Risk-based approach to the monitoring system for the implementation of state and municipal procurement of transport services

Elena Karanina¹ and Ksenia Kartavyh¹

¹Vyatka State University, 36, Moskovskaya str., 610000, Kirov, Russia

E-mail: Kartavyh12@mail.ru

Abstract. The issues of control in the contract system are worked out in the article: the types and mechanisms of control in the field of state and municipal procurement of transport services are analyzed and systematized, the subjects of control and supervisory authorities are identified, the goals and objectives of control are formulated. A model of the system of state and municipal procurements assessment is proposed for assessing the system of state and municipal procurements of transport services based on a risk-based approach, which involves detection a set of elements of the identified risks of the procurement cycle and allowing to fully disclose the nature of the risks of procurement procedures, identify options for the development of events in order to choose a way to minimize losses, and expand the possibilities for improving control from the perspective of ensuring economic security in the field of state procurement of transport services.

1. Introduction

The state procurement market is one of the most important factors in the country's economic development. According to the current legislation, the contract system affects the entire cycle of acquiring products and services: identifying the needs of state customers, procurement forecasting and planning, directly procurement procedures, contract execution, procurement result evaluation.

Currently, the share of public expenditures of all the developed and developing countries in GDP has grown by at least 700 times. The state has become the largest consumer in the market of goods and services. This, in turn, has caused corruption problems and inappropriate, inefficient spending of budget funds, which pose a threat to economic security.

The contract system has a multi-level structure in which each stage has inherent tight control, which is necessary to achieve transparency, as well as the legitimacy of procurement. The state control is carried out by certain departments whose responsibilities include checking the effectiveness and target nature of budget expenditures, actions of customers and operators of the electronic trading platform in the procurement process, etc.

Corruption is the main problem of the state procurement, especially in the procurement of transport services. The number of criminal conspiracies between customers and bidders is growing from year to year. That is why, the main task of supervisory authorities is to identify corruption factors and ensure appropriate preventive, precautionary measures.
2. Materials and Methods
The rules of state control in the field of public procurement are regulated by Chapter 5 of the Federal Law “On the Contract System in the Sphere of Goods Procurement, Works, and Services to Ensure State and Municipal Needs” dated 05.04.2013. № 44-FL (hereinafter referred to - Federal Law № 44-FL). There are three types of the state procurement control: compliance control, public and departmental checks.

Each type of control implies its own specific goals, objectives and subjects. Article 99 of Federal Law № 44-FL stipulates a complete list of inspection bodies which control the sphere of the state procurement [1].

In Russia, the main bodies that control procurement are: the treasury, the antimonopoly service, and Federal Service for Financial and Budgetary Supervision of the Russian Federation.

The monitoring is carried out through regular inspections of a planned and unscheduled nature. The data in table 1 demonstrate the multilevel supervision in the contract system.

Table 1. Elements of a public procurement control system.

| Type of control under 44-FL | Governing authority |
|-----------------------------|---------------------|
| Total control in the procurement contract system (p. 1,2,3 p. 1 Article 99 44-FL). The subjects of the control are: | - the supervising body in the field of the state defense order; |
| - customers; | - government executive bodies, an authorized person to carry out control in the field of procurement; |
| - contract services; | - an authorized person to carry out control in the field of procurement; |
| - contract managers; | - government executive bodies of the constituent entity of the Russian Federation |
| - procurement commissions and their members, | - the local government authorities at the municipality and city levels. |
| - authorized bodies; | - financial authorities of the constituent entity of the Russian Federation and municipal entities; |
| - authorized institutions; | - government executive bodies, performing law enforcement functions in cash servicing budget execution of the budget system of the Russian Federation; |
| - specialized organizations; | - bodies in charge of management of the state extra-budgetary funds; |
| - operators of electronic sites | - bodies of internal municipal and state financial control, in accordance with the Budget Code of the Russian Federation |

Departmental control in the contract system in the field of procurement (Article 100 44-FL).

The subjects of control are subordinate customers in the order prescribed by the Government of the Russian Federation, the highest executive body of the state power of a constituent entity of the Russian Federation, the local administration.

The state corporation «Russian Atom»; - governing bodies of state extra-budgetary funds; - state and municipal authorities
Customer internal control in the field of procurement (Art. 101 44-FL)

The subjects of control are the contractors:
- suppliers (contractors, performers);
- subcontractors;
- co-executors.

Public control in the field of procurement (Article 102 44-FL).

The subject of control are the norms and requirements of the legislation.

Thus, there are many authorities which monitor and verify the legitimacy of transport services procurement for public needs, which, in its turn, should ensure the efficient spending of budget finances, as well as the supply of high-quality and competitive services which meet the needs of customers.

In order to increase the effectiveness of supervisory measures and facilitate the process of control activity planning in the contract system, it is proposed to use a risk-oriented model for evaluating the public procurement system (Tables 2, 3).

The process of identifying of supervision objects without taking into account a risk-oriented approach is questionable. Often, representatives of supervising authorites during the check do not detect existing violations, but at the same time they spend certain (labor, time, material) resources. [2]. The use of risk-oriented monitoring in the activities of supervisory authorities, with the aim of preliminary risk identification using the indicators presented in table 2, is aimed at achieving the efficiency of budgetary fund spending at minimal costs.

It is proposed to apply a three-level model of procurement risk assessment, where low risk level (there is no reason to include institutions in the inspection plan); medium risk level (possible violations of the legislation in the procurement activities of the institution); high risk level (high probability of violations of the legislation by the object of the control).

Table 2. Risk-oriented model of the state and municipal procurement system assessment.

| Procurement cycle risks                                | Risk indicators                                                                 | Unit  | Threshold (limit) value | Risk consequences                                                                                                                                 |
|---------------------------------------------------------|--------------------------------------------------------------------------------|-------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Back-log of the government or municipal customer’s need  | The availability of cases of non-agreement of the bid with the founder and supervisory authorities | pcs.  | 0                       | The customer cannot qualitatively, fully and timely fulfill his functions and solve the tasks assigned to him of a non-commercial nature. for the common good and development of citizens. |
|                                                         | Availability of cases of the procurement cancellation                          | pcs.  | 0.66% from the total volume |                                                                                                                                                   |
|                                                         | Availability of cases of the contract cancellation (unilaterally. in court. by agreement of the parties) | pcs.  | 9.75% from the total volume |                                                                                                                                                   |
|                                                         | Availability of cases of the contract evasion                                  | pcs.  | 0.02% from the total volume |                                                                                                                                                   |
|                                                         | Availability of cases of failed tenders (no applications for participation in the tenders have been lodged) | pcs.  | 49.01% from the total volume |                                                                                                                                                   |
| Non-utilization of the allocated financial funds in the accounting period | Availability of cases of the procurement procedure extension | pcs. | 0.73% from the total volume | -acknowledgement of the subsidy as ineffective; -unreclaimed financial assets are returned back to the appropriate budget; -there is a high probability of funding cuts in the next reporting period. |
| --- | --- | --- | --- | --- |
|  | The availability of changes in the documentation eliminating contradictions with the legislation | pcs. | 0.07% from the total volume | --- |
|  | Availability of USAIS. ETF failures | pcs. | 0 | --- |
|  | Availability of cases of the procurement failure | pcs. | 0 | --- |
|  | Availability of cases of the contract conclusion evasion | pcs. | 0.02% from the total volume | --- |
|  | Availability of cases of failed tenders (no applications for participation in the tenders have been lodged) | pcs. | 49.01% from the total volume | --- |
| Restriction on competition | Availability of clarification requests | pcs. | 15.13% from the total volume | -cutdown in the number of suppliers at a particular goods market -unjustified decrease or increase of the product price; -refusal of suppliers to operate independently; -unreasonable demands from authorities to the products or suppliers of these products; -management responsibility of a Customer. |
|  | Availability of validated complaints | pcs. | 30.31% from the total volume | --- |
|  | Availability of cases of unjustified admission/rejection of the bidder's request | pcs. | 0.01% from the total volume | --- |
| Choice of unfair supplier (contractor. executor) | The availability of dumping in the tender | pcs. | 17.18% from the total volume | -improper performance of the contract; -trials; -termination of a contract; -back-log of needs of a Customer. -inefficient budgetary spending; -non-fulfillment (low-quality performance) of the state state tasks. -inefficient budgetary spending |
|  | The necessary requirements for bidders are not set | pcs. | 0 | --- |
| Risk of the poor contract execution due to the undercharge | The low-quality monitoring of the relevant market of goods (works. services) | pcs. | 0 | --- |
| Risk of concluding the contract at the overcharge price due to | The winner in a particular market segment is one and the same company | pcs. | 0 | --- |


| Risk Description |
|------------------|
| Collusion among suppliers |
| Penalties for the nonperformance of the contract |
| Availability of cases of reduced quality of contract execution | pcs. | 1.24% from the total volume | - claim work; - financial and time losses; - inefficient spending of financial assets |
| Availability of cases of violation of the terms of the contract execution | pcs. | 32.43% from the total volume | |
| Availability of cases of failure to timely pay under the contract | pcs. | 0 | |

| Risk Description |
|------------------|
| Administrative proceedings |
| Complaints to supervisory authorities | pcs. | 0.57% from the total volume | - fine administrative liability - inefficient spending of financial assets. |
| Unqualified personnel | people | 0 | |

Table 3. Risk-oriented model of the state and municipal procurement system assessment.

| Procurement cycle risks | Risk management methods |
|-------------------------|-------------------------|
| **Back-log of the governmental or municipal customer’s need** | **Organizational methods:** |
| | - selection of qualified employees; |
| | - a clearly defined order of interaction at all stages of the procurement; |
| | - modern methods of planning, forecasting and financial analysis; |
| | - qualified elaboration of procurement documentation. |
| | **Economic methods:** |
| | - Provide maximum security for the execution of the contract, application; |
| | - administrative liability (fines, penalties). |
| | **Administrative Methods:** |
| | - preliminary selection of state order executors for compliance with the requirements of the legislation; |
| | - stipulate a requirement to procurement participants: absence of unfair suppliers in the register. |
| | **Economic methods:** |
| | - Stipulate maximum security for the execution of the contract, application; |
| | - administrative liability (fines, penalties). |
| | **Organizational methods:** |
| | - selection of qualified employees; |
| | - a clearly defined order of interaction at all the stages of the procurement; |

5


3
- modern methods of planning, forecasting and financial analysis;
- qualified elaboration of procurement documentation.

**Organizational methods:**
- study of the relevant market of goods, works, services;
- selection of a procurement object from a market segment where there is a competition;
- exclude from the procurement documentation provisions restricting competition;
- selection of employees with appropriate qualification;

**Economic methods:**
- fines on employees for improper performance of duties

**Restriction on competition**

| 5 |

| **Choice of unfair supplier**  |
| (contractor, executor) |

- stipulate maximum enforcement of the contract;
- Provide fines and penalties for the improper performance of the contract.

**Organizational methods:**
- selection of qualified employees;
- a clearly defined order of interaction at all the stages of the procurement;

**Economic methods:**
- fines on employees for improper performance of the duties

| 5 |

| **Risk of the poor contract execution due to the undercharge** |

- modern methods of market analysis of goods, works, services;

**Economic methods:**
- fines on employees for improper performance of the duties

| 4 |

| **Risk of concluding the contract at the overcharge price due to collusion among suppliers** |

- study of the relevant market of goods, works, services;
- selection of a procurement object from a market segment where there is a competition;
- exclude from the procurement documentation provisions restricting competition.

**Economic methods:**
- stipulate maximum enforcement of the contract;
- stipulate fines and penalties for improper performance of the contract

| 2 |

| **Penalties for the nonperformance of the contract** |

**Organizational methods:**
- Procurement making only with availability of funding;
- Introduction of modern methods of planning, forecasting and financial analysis.
Administrative proceedings

*Organizational methods:*
- selection of qualified employees;
- a clearly defined order of interaction at all the stages of the procurement;
- the introduction of modern methods of planning, forecasting and financial analysis;
- qualified study of the terms of the contract.

*Economic methods:*
- fines for employees for the improper performance of duties.

For example, we shall consider the procurement of transport services for healthcare institutions in the Kirov region for 2018, while by the risk threshold limit value we shall consider the average value of the risk indicator in the Kirov region (Table 4).

**Table 4.** The procurement activity indicators of customers of the Kirov region for 2018.

| Risk indicators                                                                 | Unit | Kirov region | Health institution |
|---------------------------------------------------------------------------------|------|--------------|--------------------|
| The number of procurement procedures                                            | pcs. | 459          | 21                 |
| The number of concluded contracts                                               | pcs. | 55           | 19                 |
| Number of complaints to the supervisory authorities                             | pcs. | 5            | 0                  |
| The availability of cases of non-agreement of the bid with the founder and supervisory authorities | pcs. | 0            | 0                  |
| Availability of cases of the procurement cancellation                            | pcs. | 2            | 0                  |
| Availability of cases of the contract cancellation (unilaterally, in court, by agreement of the parties) | pcs. | 13           | 1                  |
| Availability of cases of the contract evasion                                    | pcs. | 2            | 0                  |
| Availability of cases of failed tenders (no applications for participation in the tenders have been lodged) | pcs. | 7            | 0                  |
| Availability of cases of the procurement procedure extension                     | pcs. | 5            | 0                  |
| The availability of changes in the documentation eliminating contradictions with the legislation | pcs. | 0            | 0                  |
| Availability of USAIS, ETF failures                                              | pcs. | 0            | 0                  |
| Availability of cases of the procurement failure                                 | pcs. | 0            | 0                  |
| Availability of clarification requests                                           | pcs. | 72           | 0                  |
| Availability of validated complaints                                             | pcs. | 1            | 0                  |
| Availability of cases of unjustified admission/ rejection of the bidder's request | pcs. | 3            | 0                  |
| The availability of dumping in the tender                                        | pcs. | 94           | 0                  |
| The necessary requirements for bidders are not set                                | pcs. | 0            | 0                  |
| The low-quality monitoring of the relevant market of goods (works, services)     | pcs. | 0            | 0                  |
| The winner in a particular market segment is one and the same company             | pcs. | 0            | 0                  |
| Availability of cases of reduced quality of contract execution                   | pcs. | 2            | 0                  |
| Availability of cases of violation of the terms of the contract execution         | pcs. | 27           | 0                  |
| Availability of cases of failure to timely pay under the contract                | pcs. | 0            | 0                  |
| Unqualified personnel                                                            | people | 0            | 0                  |
A certain number of scores is assigned for each parameter of the studied control object (risk indicator), for this it is necessary to determine the deviation of the risk indicator value of the health care institutions in the Kirov region from the threshold (limit) value by means of the data in Table 5. The score significance \( s \) is determined in accordance with an expert assessment, presented in Table 3.

**Table 5.** Information on the score number \( s \) awarded for each risk indicator by risk-oriented monitoring of transport services purchases.

| Risk indicator value                          | The score number |
|-----------------------------------------------|------------------|
| \(<0\)                                        | 0 scores         |
| \(<\) risk indicator threshold                | 1 score          |
| \(\geq\) risk indicator threshold (a slight deviation is allowed no more than 5\%) | 2 scores         |
| \(>\) risk indicator threshold (deviation 5 and more \%) | 5 scores         |

The total score for each risk indicator can be determined by means of the following formula (1):

\[
I_j = \sum (x_n * y_n),
\]

where \( x_n \) – the parameter significance;

\( y_n \) – the score, characterizing the parameter.

The higher the final score, the higher the risk probability in the event that the object of control does not comply with the mandatory legal requirements.

After calculating the final score to obtain the correct results and ensure the highest efficiency of the carried out calculations, it is possible to determine the average weighted final score calculated by the formula (2), for this we divide the resulting final score indicator by the total sum of the selection parameter value, according to table 7 it is 86:

\[
S_r = \frac{I_j}{\sum w_n} = \frac{I_j}{86}
\]

Then, in accordance with the obtained values of the average weighted total score points, it is necessary to distribute each object of the control into risk categories. The distribution system of objects subjected to control according to the obtained values of the average weighted total score points is presented in Table 6.

**Table 6.** The average weighted total score and the corresponding risk category.

| Average weighted total score | Risk category |
|------------------------------|---------------|
| More 3.0                     | High          |
| 1.5– 3.0                     | Average       |
| 0 – 1.5                      | Low           |

The objects of control which fall into the high-risk category are included in the audit plan of the relevant supervisory authorities primarily.

The objects with an average level of purchasing risk are included into the audit plan in accordance with its content in descending order of the values of the average weighted total score points.

A low level of risk indicates that the customers do not need verification on the part of the supervisory authorities in the field of public procurement.

**3. Results**

In accordance with the results of risk-oriented procurement monitoring of transport services purchases in healthcare institutions of the Kirov region in 2018 (Table 7), the average weighted final score is determined by the formula (3).
Table 7. Results of risk-based monitoring and evaluation of transport services purchases by healthcare institutions in the Kirov region for 2018.

| Procurement cycle risks | Risk indicators | Unit | Kirov region | Health institution | Deviation from the threshold value | Score points | The validity of the points | Total score |
|-------------------------|-----------------|------|--------------|--------------------|-----------------------------------|--------------|--------------------------|-------------|
| Back-log of the governmental or municipal customer’s need | The availability of cases of non-agreement of the bid with the founder and supervisory authorities | % | 0.00 | 0.00 | 0.00 | 0 | 5 | 0 |
| | Availability of cases of the procurement cancellation | % | 0.50 | 0.00 | 0.50 | 1 | 5 | 5 |
| | Availability of cases of the contract cancellation (unilaterally, in court, by agreement of the parties) | % | 23.00 | 5.20 | 17.80 | 1 | 5 | 5 |
| | Availability of cases of the contract evasion | % | 3.60 | 0.00 | 3.60 | 1 | 5 | 5 |
| | Availability of cases of failed tenders (no applications for participation in the tenders have been lodged) | % | 4.80 | 0.00 | 4.80 | 1 | 5 | 5 |
| | Availability of cases of the procurement procedure extension | % | 1.00 | 0.00 | 1.00 | 1 | 3 | 3 |
| | The availability of changes in the documentation eliminating contradictions with the legislation | % | 0.00 | 0.00 | 0.00 | 0 | 3 | 0 |
| Non-utilization of the allocated financial funds in the accounting period | Availability of SAIS. ETF failures | % | 0.00 | 0.00 | 0.00 | 0 | 3 | 0 |
| | Availability of cases of the procurement failure | % | 0.00 | 0.00 | 0.00 | 0 | 3 | 0 |
| | Availability of cases of the contract conclusion evasion | % | 0.00 | 0.00 | 0.00 | 0 | 3 | 0 |
| | Availability of cases of failed tenders (no applications for participation in the tenders have been lodged) | % | 0.00 | 0.00 | 0.00 | 0 | 3 | 0 |
| Restriction on competition | Availability of clarification requests | % | 15.70 | 0.00 | 15.70 | 1 | 5 | 5 |

\[ S_r = \frac{I_j}{\sum w_n} = \frac{47}{86} = 0.55 \] (3)
### Table 1: Analysis of Risk Factors

| Category                                                   | Description                                                                 | %  | 0.20 | 0.00 | 0.60 | 0.00 | 20.40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | TOTAL |
|------------------------------------------------------------|-----------------------------------------------------------------------------|----|------|------|------|------|-------|------|------|------|------|------|------|-------|-------|
| Choice of unfair supplier (contractor, executor)           | Availability of validated complaints                                        | %  | 0.20 | 0.00 | 0.20 | 1    | 5     | 5    |
|                                                            | Availability of cases of unjustified admission/rejection of the bidder's request | %  | 0.60 | 0.00 | 0.60 | 1    | 5     | 5    |
|                                                            | The availability of dumping in the tender                                    | %  | 20.40| 0.00 | 20.40| 1    | 5     | 5    |
|                                                            | The necessary requirements for bidders are not set                           | %  | 0.00 | 0.00 | 0.00 | 0    | 5     | 0    |
| Risk of the poor contract execution due to the undercharge - | The low-quality monitoring of the relevant market of goods (works, services) | %  | 0.00 | 0.00 | 0.00 | 0    | 4     | 0    |
| Risk of concluding the contract at the overcharge price due to collusion among suppliers | The winner in a particular market segment is one and the same company         | %  | 0.00 | 0.00 | 0.00 | 0    | 4     | 0    |
| Penalties for the nonperformance of the contract           | Availability of cases of reduced quality of contract execution              | %  | 9.10 | 0.00 | 9.10 | 1    | 2     | 2    |
|                                                            | Availability of cases of violation of the terms of the contract execution    | %  | 49.00| 0.00 | 49.00| 1    | 2     | 2    |
|                                                            | Availability of cases of failure to timely pay under the contract           | %  | 0.00 | 0.00 | 0.00 | 0    | 2     | 0    |
| Administrative proceedings                                | Complaints to supervisory authorities                                        | %  | 0.00 | 0.00 | 0.00 | 0    | 2     | 0    |
|                                                            | Unqualified personnel                                                        | %  | 0.00 | 0.00 | 0.00 | 0    | 2     | 0    |
|                                                            | **TOTAL:**                                                                  |    | 86   | 47   |      |      |      |      |

**4. Discussion**

Analyzing the results obtained, we can conclude that the procurement of transport services of health care institutions in the Kirov region is characterized by a low level of risk, therefore, is not a high priority target of the planned control measures of the surveillance authorities in the field of procurement for public needs.

**5. Conclusions**

Summing up, it should be noted that the control effectiveness over the procurement activities of state procurers, based on a risk-based approach system, is significantly higher due to the fact that the audit plans in this case mainly include those institutions whose actions carry certain risks. Thanks to risk-oriented monitoring of the customers' procurement activities, supervisors even before the start of supervisory activities have sufficient information to identify the problems of the organization and its areas of activity, where there is a high probability of deviations from the law.
References

[1] 2013 On the contract system in the field of procurement of goods, works, services to meet state and municipal needs: Federal Law №44-FL http://www.consultant.ru/document/cons_doc_LAW_144624/

[2] Bezdenezhnykh V M, Rodionov A S 2017 Economics. Taxes. Right 10(6) 76

[3] Karanina E V 2016 Economic Security at the State, Region, and Enterprise Levels (Kirov: FSBEI HE "Vyatka State University") p 389

[4] Mironova O A 2016 Innovative development of the economy 6(36) 266

[5] Karanina E, Sapozhnikova E, Loginov D, Holkin A, Sergievskaya E, Zurakhovskii A 2017 MATEC Web of Conferences 106

[6] Karanina E, Kartavyh K 2018 MATEC Web of Conferences 170 01003

[7] Domracheva L, Karanina E, Bakhtimov A, Kochetkov M 2018 MATEC Web of Conferences 193 05067

[8] Karanina E, Ryazanova O, Gritsuk N 2018 MATEC Web of Conferences 193 01031

[9] Grzyl B, Siemaszko A 2018 MATEC Web of Conferences 44 00047

[10] Karanina E, Kartavyh K 2019 MATEC Web of Conferences 110 02090

[11] Minnullin R, Minnullina A, Kosyakova I 2019 MATEC Web of Conferences 91 08016

[12] Zotova E, Tebekin A, Yastrebov O, Alexandra B 2019 MATEC Web of Conferences 110 02053