UDC 332.05:005

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SMALL ENTERPRISES IN THE CONTRACT PROCUREMENT SYSTEM OF THE ULYANOVSK REGION

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МАЛОЕ ПРЕДПРИНИМАТЕЛЬСТВО В КОНТРАКТНОЙ СИСТЕМЕ УЛЬЯНОВСКОЙ ОБЛАСТИ

The law says that 10—20 % of municupal procurement orders must be placed with small enterprises as a way to provide them with state support This paper presents an analysis of the participation rate of small enterprises in this procurement process. The analysis covers the municipal entities of the Ulyanovsk region and is based on the statistics for 2011—2012. Mathematical economic models were developed to estimate regularities and the existing differentiation of basic indicators that characterize the contract procurement system. The paper therefore discusses some proposals regarding the development of the new contract procurement system.

MUNICIPAL PROCUREMENT; MATHEMATICAL ECONOMIC MODELS; SMALL ENTERPRISES; MUNICIPAL ENTITIES; CONTRACT PROCUREMENT SYSTEM.

Законодательно установлена обязательность размещения части муниципальных заказов в размере 10—20 % среди субъектов малого бизнеса. На основе статистических данных за 2011 и 2012 гг. по муниципальным образованиям Ульяновской области приведен анализ уровня участия малых предприятий в соответствующих закупках. Для оценки закономерностей и сложившейся дифференциации основных показателей, характеризующих контрактную систему, разработаны экономико-математические модели. Рассмотрены предложения по развитию новой контрактной системы.

МУНИЦИПАЛЬНЫЕ ЗАКУПКИ; ЭКОНОМИКО-МАТЕМАТИЧЕСКИЕ МОДЕЛИ; МАЛЫЙ БИЗНЕС; МУНИЦИПАЛЬНЫЕ ОБРАЗОВАНИЯ; КОНТРАКТНАЯ СИСТЕМА.

Entrepreneurhsip development requires a substantial effort from authorities. One of the ways to provide systematic support to enterprises at the federal, regional and municipal levels is to secure their participation in the contact procurement system.

The experience gained in Russia and economically developed foreign countries today shows how important it is to set up a municipal procurement system as an effective tool of macroeconomic regulation and support of entrepreneurial activity. Municipal bodies or institutions act as customers: they represent the municipality and have the authority to make budgetary commitments. The municipal procurement order is to ensure a certain volume of high-quality procurement, the orderly and prudent manner of expending budgetary funds, the effectiveness of integrating different forms of enterprises and organizations to implement contracts, the openness and transparency of procurement, the enhancement of competitiveness, the reduction of corruption. The basic principles according to which small enterprises could participate in the municipal procurement process can be found in the Federal Law of 21 July, 2005, no. 94-FZ «On placing orders to supply goods, perform work or provide services for state and municipal needs» [1], which was in effect till 2014. The Ministry of Economic Development of the Russian Federation has repeatedly emphasized the need to expand the role of small busness in the federal and municipal procurement system. [2].

The regulatory framework that classifies a business enterprise as a small one was described in detail in the Federal Law of 24 July, 2007, no. 209-FZ «On developing small and medium scale entrepreneurship in the Russian Federation» [3]. The main criterion is the number of employees: it should not to exceed one hundred people for a small enterprise. According to Item 1 of Article

3 of the aforementioned Law, self-employed entrepreneurs, that is, individuals who are engaged in entrepreneurial activity, are to be regarded as small enterprises as well. Henceforth, the article also refers to small enterprises as small business entities or SBEs for short. The theoretical and applied aspects of federal and municipal purchases, especially the legal and organizational ones, are considered in the literature [4, 5, 6, 7, 8, 9, 10]. However, we can state that the assessment of the role that small business entities play in the implementation of contracts ensuring the needs of municipalities has been researched insufficiently.

In view of the above, the need for the relevant research has become quite obvious. The results of it are discussed in the present article.

The aim of this research was to develop methods and to analyze regularities characterizing the reached level of SBE participation in the municipal procurement process. At that, the following objectives have been achieved: the methodological approach and the research algorithm of the study have been substantiated, mathematical economic models have been developed that describe such indicators as the number and the cost of contracts per one SBE functioning in each municipality, the relative share of the number and the cost of contracts against the total number and the total cost of the contracts awarded following the results of tenders (lots) and requests for quotations, the proportion of successful tenders against the total number of SBE tenders and the average cost of one contract concluded by a SBE for municipal needs. The obtained models have been analyzed and the regularities that characterize the resulting values of these ndicators have been determined.

The research is based on reviewing the activities of small enterprises engaged in municipal procurement practices with municipal entities of the Ulyanovsk region.

The employment of such an approach results from a considerable differentiation in the values of the indicators throughout our country. The state procurement system has been implemented more vigorously in recent years in full compliance with the decisions of the President and the Government. But the process has moved in fits and starts. The level of SBE participation in the municipal procurement system is determined by a lot of objective and subjective factors. All this has brought about significant differentiation of indicators reflecting volumes of products, work and services commissioned by a municipal entity. A variety of mathematical economic models have been created (all the formulas and tables presented further in this article have been developed by the authors) in order to characterize the current state of differentiation in the level of SBE participation in the implementation of contracts. Normal density functions were used as the models. According to the earlier research, these functions describe the consistencies in the operations of enterprises in various regions of the country well enough [11]. The main advantage of such functions is that they allow for gaining unbiased estimators that determine both the average operating rate of enterprises and the intervals of the changes in the parameterstypical of SBEs in most regions of the country.

The authors' algorithm for analyzing the regularities in the achieved level of SBE participation in the municipal procurement contracts includes the following steps:
− establishing the database that describes the number and the cost of contracts that each municipality concluded with small enterprises for municipal needs;
− determining the ratio of the number and the cost of contracts that a municipality concluded with small enterprises for municipal needs against the total number and the cost of all the contracts it awarded;
− determining the number and the cost of contracts that a small enterprise concluded for municipal needs in each municipality;
− determining the average cost of a contract that small enterprises concluded for municipal purposes in each municipality;
− determining the share of successful tenders of a small enterprise against the total number of tenders submitted by small enterprises;
− constructing normal density functions by all the considered parameters;
− assessing the quality of the constructed functions in accordance with the accepted criteria;
− analyzing the models and determining the regularities that are descriptive of SBE participation in municipal contracts;

− preparing proposals for the development of the state procurement system.

When constructing the models, data on the contracts awarded to a small enterprise for municipal needs served as baseline information. Statictics on Municipality 21 of the Ulyanovsk region were considered. We used the data for each of the municipalities for two years (2011 and 2012). The rationale for this approach can be explained as follows: at the beginning of the 21st century the simultaneous consideration of both temporal and spatial data received widespread acceptance. Later spatial data became known as panel data. Methods of panel data analysis are presented in the works of such scientists as B. Baltagi, C. Baum, M. Nerlove, C. Hsiao [12−15]. Since panel data combine information about spatial characteristics of the objects being examined and the dynamics of their changes over some time, the developed models offer greater flexibility and content richness.

It has become apparent that a methodology based on the use of panel data has a number of significant advantages over constructing similar models covering one particular period (year):
− the whole modeling process involves a greater deal of observations;
− the effectivenesss of assessment is enhanced;
− deficiencies typical of both spatial and temporal models are excluded.

When developing the models, we made use of the data for 2011 and 2012 borrowed from the site of the Territorial Department of the Federal State Statistics Service of the Ulyanovsk region [16].

Tab. 1 shows a portion of the initial data (on the 6 municipalities of the region) describing the contracts concluded with SBEs for municipal needs.

The research was based on statistical analysis methods and mathematical economic modeling. To solve the problems and to process the information the computer programs Statistica and Microsoft Excel were applied. The functions were verified according to the Pearson criterion [17], the Kolmogorov-Smirnov criterion and the Shapiro-Wilk criterion [18].

The research process involved developing six normal density functions that reflected the regularities of SBE participation in the procurement system for municipal needs in different regions of the country in 2011−2012. The corresponding functions are given below.

The first function shows the distribution of the ratio of contracts awarded to small enterprises against the total number of contracts awarded subsequent to the results of tenders (lots) and requests for quotation (x_1, %)

$$y_1(x_1) = \frac{24}{0.98 \cdot \sqrt{2\pi}} \cdot e^{\frac{-(x_1 - 1.82)^2}{2 \cdot 0.96}}. \qquad (1)$$

The second function shows the distribution of the ratio of the cost of contracts awarded to small enterprises against the total cost of contracts awarded subsequent to the results of tenders (lots) and requests for quotation (x_2, %)

$$y_2(x_2) = \frac{73.33}{2.30 \cdot \sqrt{2\pi}} \cdot e^{\frac{-(x_2 - 3.67)^2}{2 \cdot 5.29}}. \qquad (2)$$

Table 1

Portion of the initial data on the contracts concluded with SBEs for municipal needs in 2012

Municipality	Number of contracts with SBEs, units.	Cost of contracts with SBEs, RUB millions	Number of tenders submitted by SBEs, units
Bazarnosyzgansky municipal district	28	3019	60
Baryshsky municipal district	21	1892	61
Veshkaymsky municipal district	38	3319	75
Inzensky municipal district	12	2243	33
Karsunsky municipal district	89	7757	207
Kuzovatovsky municipal district	23	2671	51
...	...	...	

The third function describes the distribution of the share of successful tenders submitted by a SBE against the total number of SBE tenders (x_3, %).

$$y_3(x_3) = \frac{285.71}{8.88 \cdot \sqrt{2\pi}} \cdot e^{\frac{-(x_3 - 44.42)^2}{2 \cdot 78.85}} . \quad (3)$$

The fourth function describes the distribution of the number of contracts awarded to small enterprises per SBE located in the respective municipality (x_4).

$$y_4(x_4) = \frac{1}{0.05 \cdot \sqrt{2\pi}} \cdot e^{\frac{-(x_4 - 0.09)^2}{2 \cdot 0.0025}} . \quad (4)$$

The fifth function describes the distribution of the average cost of one contract for municipal needs among small enetrprises (x_5, RUB thousand)

$$y_5(x_5) = \frac{1900}{61.75 \cdot \sqrt{2\pi}} \cdot e^{\frac{-(x_5 - 132.89)^2}{2 \cdot 3.81 \cdot 10^3}} . \quad (5)$$

The sixth function shows the distribution of the contract costs awarded to small enterprises per SBE (x_6, RUB thousand)

$$y_6(x_6) = \frac{100}{3.91 \cdot \sqrt{2\pi}} \cdot e^{\frac{-(x_6 - 8.87)^2}{2 \cdot 15.29}} . \quad (6)$$

The developed models allow for estimating the regions' average for the considered indicators and the variation ranges of these values that are typical of the majority of Russia's regions.

Logical and statistical analysis demonstrated that all the developed models approximate the initial data well on the whole range of their changes. Tab. 2 presents the calculated values of the basic statistics for the three quality criteria. The comparison of these calculated values showed that the statistics by the Pearson criterion is less than the tabular value [17]. Similarly, the calculated values by the Kolmogorov-Smirnov criterion is less than the tabular value. Statistics by the Shapiro-Wilk criterion is close to 1 [18]. Thus, the models considered by all the criteria are of high quality and can be used to describe the regularities under study.

T a b l e   2

Calculated values of statistics by the quality criteria

Number of the function	Calculated value by the quality criterion		
	Kolmogorov−Smirnov	Pearson	Shapiro−Wilk
(1)	0.06	0.77	0.97
(2)	0.08	1.04	0.96
(3)	0.07	0.43	0.94
(4)	0.09	0.64	0.93
(5)	0.08	2.08	0.95
(6)	0.04	0.72	0.98

Since all the developed mathematical economic models approximate the initial data well and are of high quality in regard to accepted criteria, we can conclude that using the normal distribution density functions for the description of regularities and the analysis of all the parameters considered in this article is expediential.

The developed models (1)−(6) help to establish regular patterns that reflect the level of SBE participation in the municipal procurement process in the regions.

A peculiar feature of normal density functions [19] is that they allow for determining the average values and variation ranges of the considered indicators for the majority (68 %) of the regions, while they do not require complex calculations. These intervals are calculated on the basis of the average quadratic deviations of the indicators. In this case, the interval boundaries for the mean are calculated by adding or subtracting the said deviation.

Tab. 3 shows the average values and variation intervals of the number and cost of contracts per 1000 small enterprises, the ratio of the number and cost of contracts against the total number and total cost of contracts awarded subsequent to the results of tenders (lots) and requests for quotation, and the average cost of one contract signed by municipalities with small enterprises as of 2012. The obtained values are based on the developed models (1)−(6).

Tab. 3 shows that an average of 9 % of all small enterprises participate in the state procurement system for municipal needs, i. e., the level of SBE participation in these purchases

Table 3

Characteristics of the contracts concluded with SBEs for municipal needs in 2011 and 2012

Indicator	Average values	Variation intervals
Number of contracts per 1 SBE, units	0.09	0.04−0.13
Ratio of contracts with SBEs against the total number of contracts, %	1.82	0.84−2.80
Contract cost per 1 SBE, RUB thousand	8.87	4.96−12.78
Ratio of the cost of contracts with SBEs against the total contract costs, %	3.67	1.31−5.97
Average cost of one contract concluded with a SBE, RUB thousand	132.89	65.14−200.64
Share of successful SBE tenders against the total number of the tenders submitted by SBEs	44.42	35.54−53.00

is significant. In most municipalities, the indicator varies from 4 % to 13 %, which implies a high level of its differentiation. However, in the total number of contracts, the ratio of contracts awarded to SBEs is quite impressive. Almost 18 % of them are implemented by small enterprises. The differentiation of this indicator for municipalities is relatively small and does not exceed one third of the indicator value.

The amount of municipal procurement in municipalities is quite insignificant. For most regions, this indicator lies within the range from RUB 5 to 13 thousand per year.

The ratio of SBE contracts against the total number of contracts is small and amounts to 1.8 %. It must be noted that this indicator was not specified in Federal Law No. 94-FZ [1]. The law featured the ratio interval of SBE contracts of 10 % to 15 %.

The ratio of SBE contracts against the total cost of contracts is considerably (3 times) higher than the ratio of all the contracts. This points to a large difference between the cost of SBE contracts and the contracts with other (mainly municipal) enterprises and organizations. It is important to state that the proportion of SBE contracts in the total annual procurement volume is substantially less than the minimum value of 10 % established under legislation in 2011−2012.

The average cost of an awarded contract is RUB 133 thousand. It is significant that the volume of production (services) per one SBE employee in the same year amounted to an average of RUB 2 million per year, which is more than ten times more than even the upper

limit of the variation interval for the average contract cost. This means that most enterprises performed these contracts not on the on-going basis and just for a limited period of time.

It is of particular interest to analyze the share of successful SBE tenders against the total number of tenders submitted by small enterprises. The value of the indicator is almost 45 %. And its differentiation among municipalities is relatively small. This may be due to two reasons: a high quality of submitted tenders or their small number.

In recent years, the established system of municipal procurement has been adapting to peculiarities in the operation of small enterprises. Thus, in 2012, an average of 34 contracts for one municipality was performed by SBEs.

Further development of the federal procurement system is related to the Federal Law of April 5, 2013, No. 44-FZ «On the contract system in the procurement of goods, works and services for state and municipal needs» [20] that came into force on January 1, 2014. It stipulates that purchases from small enterprises should not be less than 15 % of the total municipal procurement.

When tenders and auctions are held, restrictions allowing only SBEs to participate can be established. In addition, there can be mandatory requirements to the supplier of goods and services regarding the involvement of subcontractors or co-contractors from among SBEs in the implementation of a contract.

The starting price of a contract is set at RUB 20 million which is almost twice as much as the current average annual volume of production

and services per small enterprise. Thus, economic prerequisites will be created to make the share of small enterprises participating in municipal procurement quite significant.

Also, informing SBEs of impending tenders in advance should encrourage SBEs to play an active part in the procurement process. Procurement planning of purchases is to inculde 2 stages. The first stage is to plan procurement for the next 3 years, the second stage involves preparing a corresponding schedule for each coming year.

There is a provision for customers that they are to generate reports on the volume of procurement from small enterprises and to lay them out in the unified information system until April 1 of the year following the accounting year. Such reports should contain information on the awarded contracts and on the failed attempts to find suppliers.

It is essential that the functions of customers should be executed professionally, qualified specialists with theoretical knowledge and skills in the procurement area may be brought in.

Yet, there is a number of limitations in the examined federal law which may interfere with the planned transition of the procurement system to a new level, as far as small enterprises are concerned. They apply to financial guarantees for tender security at tenders and auctions and to the execution of contracts. The cost of SBE contracts is expected to increase substantially in the nearest future. And the amount of tender security will grow too. At the same time, for example, participation in online procurement auction is possible only after depositing monetary funds. A similar situation arises with contract performance security. There are two forms of security: depositing monetary funds and a bank guarantee. The amount of contract security is quite substantial for a small enterprise because it ranges from 5 % to 30 % of the initial contract price.

The new contract procurement system has some flaws and it does not refect the following aspects that are important for small enterprises:

− it is not statutorily prescribed that advance payments should be included in contracts, which complicates producing goods and rendering services. SBEs do not usually have any significant working capital and credit resources are very expensive;

− the standard wording in most contracts requires payment only after a customer receives funds from respective budgets. This approach often causes late payments for fulfilled municipal orders;

− the current law does allow several SBEs to jointly bid for one and the same lot. Yet, such a concession would seem reasonable, especially for those SBEs that form clusters, which have become quite common in Russia;

− it stands to reason that the requirements to the documents being submitted should be simplified. Small enterprises rarely employ highly qualified specialists in the area of municipal procurement and, thus, they experience difficulties in preparing and submitting their tenders and in finalizing and signing contracts if they have won. It, therefore, appears practical to authorize a simplified registration procedure when only small enterprises are allowed to participate in the bidding process.

The problems mentioned above can have a particularly strong influence on SBEs located on the territory of small municipal entities. As it happens, the analysis shows that in these cases SBEs are usually small-sized as well.

Further development of the contract procurement system aimed at encouraging small enterprises to take part in the bidding process involving the procurement of goods, services or works for municipal needs will improve the effectiveness of municipal contracts, will enhance bidding competition and thereby will minimize costs.

Overall, the following conclusions can be drawn from the present research:

− the possibility of employing normal density functions as mathematical economic models to characterize the level of SBE participation in municipal procurement has been demonstrated;

− the algorithm has been proposed and the models have been developed that describe the number and the cost of contracts per one small enterprise, the ratio of the number and the cost of contracts against the total number and the total cost of contracts awarded subsequent to the results of tenders (lots) and requests for quotation, the share of successful SBE tenders and the average cost of one contract;

− all the designed density functions approximate initial data well and are of high quality in regard to accepted criteria;

− the average values for the regions and the variation intervals for the considered indicators that are typical of the majority (68 %) of the municipalities have been defined;

− the existance of differentiation among all the considered indicators in different municipalities has been proven;

− the indicators characterizing SBE contracts for goods and works have been analyzed;

− it has been demeonstratedt that the level of SBE participation in municipal procurement in the Ulyanovsk region is considerably lower than the statutory level;

− the main strengths and weaknesses of the new contract procurement system introduced in 2014 have been described;

− proposals and recommendations to encourage small enterprises to participate in the municipal procurement process have been formulated.

The obtained results are of certain theoretical and practical importance. More specifically, they facilitate the motivation for proposals on the development of state support of small enterprises. The designed models and the resulting regularities can be used to solve a wide range of problems related to monitoring SBE participation in procurement for municipal needs, development planning and forecasting the future of this aspect of municipal administration.

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