JUSTIFICATION OF THE INITIAL CONTRACT PRICE FOR THE PURCHASE OF PRODUCTS ACQUIRED FOR STATE NEEDS WITH ACCOUNT OF THE EFFECT FROM ITS APPLICATION

M. V.Glubokov, A. S.Moshkin, E. V. Skubiy

Department of Economics, management and public procurement
The Academy of civil protection of EMERCOM of Russia, Moscow, Russia

ABSTRACT

Modern theoretical studies and instructional and methodological documents used in the territory of the European economic community (EEC) to justify the initial (maximum allowable) purchase price of products acquired to fulfill the tasks of state orders in the field of construction are based on the use of various economic and mathematical methods that do not allow to justify its value in direct dependence on the indicators of the effect of the use of these products for functional purposes. Thus, with the practical use of these methods, firstly, prerequisites are created for the inefficient use of budgetary funds in enterprises, industries and industrial complexes in accordance with the requirements of legal and subordinate laws applicable in the EEC, including Article 34 of the Budget Code Russian Federation. Secondly, with the practical use of these methods, it is impossible to quantify the impact of innovations on the development of technical systems used in modern construction in order to control their further development. This article is devoted to the development of proposals for the formation of methods for substantiating the initial price value, with the help of which this deficiency of modern theoretical studies and guidance documents used in the territory of the EEC could be eliminated.

Keywords: Products For State Needs; Effect; Efficiency, Purchase; Shadow Price; Initial Price; The Limit Price.

Purpose of article: Development and recommendation for use in the status of the guidance document of the method of estimating the initial price of products supplied for state needs, allowing to calculate this taking into account the data on the values of its quality indicators and economic efficiency.

1. INTRODUCTION

The introduction gives the basic terms and definitions used in the work. On the basis of a brief analysis of economic and mathematical methods used in modern theoretical studies and guidance documents used to justify the initial purchase price, the relevance of the chosen research topic is justified.

One of the most important problem issues to be solved in the practice of innovation management, industries and industrial complexes in modern conditions is the pricing of products manufactured for state needs (PGN). The importance of addressing this issue is due to the fact that the share of this, mainly innovative products, for example, in the Russian Federation only at the end of 2015 accounted for up to 4,2% of gross domestic product[1], and as of the end of 2016, its share reached a historic high of 22,3% of GDP [2].

Pricing for all types of PGN is currently carried out on the basis of [3,4], as well as various in-industry guidelines. The most well-known of these documents are [2].

Like any existing guidance document, [3] has advantages and disadvantages.

The main advantage [3] is the simplicity of methodological approaches used to determine the initial price of PGN.

The main disadvantage of most methods for determining the initial price of a new (eg, upgraded) sample of PGN, implemented in [3], is the lack of a direct justification of its value, depending on the values of quality indicators and the effect of the application of the product in question, which can be taken into account when using the economic category of its use value. Thus preconditions for inefficient expenditure of the budgetary funds allocated for acquisition of PGN according to requirements of Art. 34 of the Budget code of the Russian Federation (BC of the Russian Federation) are created. For example, according to [5], losses of the state from procurement of PGN, carried out with the help of calculation and other stipulated by the requirements of Federal legislation [3,4] methods of pricing at the end of 2010 alone amounted to 1 trillion. RUB., and at the end of 2014 – 278,2 billion rubles., which is 4.78 % more than last year's value (excluding inflation) [6].

One of the most important problem issues to be solved in the practice of innovation management, industries and industrial complexes in modern conditions is the pricing of products manufactured for state needs (PGN). The importance of addressing this issue is due to the fact that the share of this, mainly innovative products, for example, in the Russian Federation only at the end of 2015 accounted for up to 4,2% of gross domestic product[1], and as of the end of 2016, its share reached a historic high of 22,3% of GDP [2]. Pricing for all types of PGN is currently carried out on the basis of [3,4], as well as various in-industry guidelines. The most well-known of these documents are [2]. Like any existing guidance document, [3] has advantages and disadvantages. The main advantage [3] is the simplicity of methodological approaches used to determine the initial price of PGN.

The main disadvantage of most methods for determining the initial price of a new (eg, upgraded) sample of PGN, implemented in [3], is the lack of a direct justification of its value, depending on the values of quality indicators and the effect of the application of the product in question, which can be taken into account when using the economic category of its use value. Thus preconditions for inefficient expenditure of the budgetary funds allocated for acquisition of PGN according to requirements of Art. 34 of the Budget code of the Russian

Federation (BC of the Russian Federation) are created. For example, according to [5], losses of the state from procurement of PGN, carried out with the help of calculation and other stipulated by the requirements of Federal legislation [3,4] methods of pricing at the end of 2010 alone amounted to 1 trillion. RUB., and at the end of 2014 - 278.2 billion rubles., which is 4.78 % more than last year's value (excluding inflation) [6].

So, the search for new ways and methods of justification of the initial price of PGN is required. One of them is to improve the methods of qualimetry – the science of product quality assessment.

Used in qualimetry theory and practice of pricing of PGN in accordance with certain provisions [3] methods of determining the initial price of PGN does not allow to objectively assess its value because of the presence of the following defects, precluding the possibility of their direct use in the interests of the pricing of PGN:

- the impossibility of translation obtained using the methods of qualimetry dimensionless estimates of use value in monetary units;

- model instability of the weighting coefficients of the properties combined into one generalized (complex) indicator, which reduces the objectivity of the results of its determination.

- Under **the use value** of the sample PGN in accordance with [7] we understand the presence of its properties and qualities to meet the needs of the customer to achieve a certain value of the effect of the application.

Under **the cost estimate** of the use value of the sample PGN will understand that its cost, which provides the required value for the customer effect of its application.

Thus, provided by the requirements of the existing guidance documents and used in the theory of qualimetry methods for determining the initial price of IWT do not allow to objectively assess its value in direct dependence on the values of quality indicators and the effect of application, which indicates the relevance of clarifying the basic methods of its justification.

2. THE AUTHORS ' PROPOSALS AIMED AT ELIMINATING THE SHORTCOMINGS OF THE EXISTING METHODS OF JUSTIFICATION OF THE INITIAL PURCHASE PRICE OF PGN USED IN CONSTRUCTION WORKS

This section of the article presents the General content of the proposed method. The formalized statement of a scientific task on development of a method of estimation of the initial purchase price of PGN is executed. Graphic and analytical results of the problem solution on the development of the method of estimation of the initial purchase price of PGN are presented. The results of using the developed method are presented in relation to a sample of automotive equipment used for construction works.

As follows from the content of article 34 of the BC of the Russian Federation, indicators of the results of planned activities and the amount of funds provided by the budget to achieve them should be interrelated. It should be noted that in the domestic theory and practice of solving a wide class of economic problems there and you have previously used mathematical methods to determine the amount of the required financial resources in the form of mathematical dependence on the results of the implementation of the various programme activities. These methods in the early 80-ies of XX century were called methods of solving the allokative (dual) problems, which are now refined taking into account a number of provisions of the modern methodology of UNIDO and the national theory of economic analysis [8,9].

The method is based on the use of the condition of equality of indicators of results, expressed by the values of the limit price of PGN and the cost of implementation of investment projects carried out for public needs. (Procurement of PGN (including IWT) according to the requirements [8] is IP).

Under the **limit price** of a new sample of PGN in accordance with the achievements of the national theory of economic analysis [7,9] we agree to understand the cost at which the value of its efficiency is not lower than that of the base sample-analog.

Under the **effect of the use of a new sample of PGN** for functional purposes, we agree to understand the value characterizing the result of activity, regardless of what efforts it has been achieved (can be expressed in natural-real dimension) [10], in other words-the value of the indicator characterizing the final result of the use of the sample for functional purposes.

Under the **efficiency** of the customer's purchase of a new sample of PGN, in accordance with [7,8,9], we agree to understand the ratio of the effect of the purchase and the costs necessary to obtain it, provided the value of costs is fixed at a certain predetermined level (in the direct formulation of the problem of economic analysis [10]) or in a fixed range (in the reverse formulation [10]).

Fixing of costs at a specified level or within a range of values is thus necessary to eliminate the drawback of the fractional performance criteria, expressed in his modeling of instability, marked Wentzel E. S. in the work [11].

To use the condition of equality of results and costs of individual entrepreneurs, it must be assumed that the limit price of the product in question is equal to its contract price (which is theoretically possible). Accordingly, the limit price acts as an indicator of the result of work, expressing a comprehensive assessment of their use value for the customer. The contract price is the cost of the customer, it is necessary for the purchase of PGN. It is required to quantify those indicators in the composition of the limit price, which can be used to calculate the initial price of PGN.

At determination of the specified indicators we will consider that the initial purchase price of PGN from the point of view of the existing accounting rules shall have in the structure the cost price and profit.

In case of purchase of the sample of PGN at the contract price equal to limit, for determination of the limit price in the most General case the following equation will be fair:

$$C_H^{LP} = S_H + P_H,$$

<div align="right">(1)</div>

where:

C_H^{LP} - the limit price of the sample PGN;

S_H - the possible cost of a new sample of PGN in the case of its purchase at a contract price equal to the limit;

P_H - the possible profit formed in case of purchase of the new sample of PGN at the contract price equal to limit.

Value P_H as part of the limit price cannot be determined by the standard (that is, as a result of the amount S_H and calculated taking into account the industry standard return on regulatory profit P_H^{NR}). The fact is that the value of the use value of PGN does not depend on the amount of costs incurred by the manufacturer to create it.

In this case, for values P_H and P_H^{NR} the following ratio will be fair:

$$P_H^{NR} < P_H,$$

(2)

Accordingly, for the initial price, defined as the maximum value of the costs planned by the customer for the implementation of the investment project for the purchase of PGN, and the value of the limit price of the products under consideration, the following ratio will be fair:

$$C_H^{LP} > C_H^{NP},$$

(3)

Where C_H^{NP} - the initial purchase price of a new sample of PGN.

Thus, the verbal formulation of the problem of determining the initial price of a new sample of PGN can be written in the reverse formulation of the problem of economic analysis[10]:

Given:

$$\begin{cases} Э_H \rightarrow max \\ Э_H \in \left[Э_H ; Э_{H\,max} \right] \\ NPV_H^{ip} = 0 \\ S_H + P_H = C_H^{LP} \\ S_H + P_H^{NR} = S_H (1 + R) = C_H^{NR} \rightarrow const \\ P_H^{NR} < P_H \end{cases}$$

,

(4)

Where:

NPV_H^{ip} - net discounted income from the sale of SP for the purchase of the products in question, calculated on the condition that the purchase is carried out at a contract price equal to the limit;

$Э_H$ - the effect of the operation of a new sample of PGN, determined by the methods of simulation and analytical modeling;

$Э_{HMAX}$- the maximum permissible value of the effect of the application for the sample PGN, specified in the terms of reference for the performance of works on its modernization.

Find:

- the value of the initial price of the sample PGN (C_H^{NP}),which is the solution of the system of equations:

$$\begin{cases} S_H + P_H^{NR} = S_H (1 + R) = C_H^{NR} \\ P_H^{NR} < P_H , \\ Э_H \in \left[Э_H ; Э_{H\,MAX} \right] \end{cases}$$

,

(5)

Where R - the standard of profitability of products in the industry.

-the value of the cost price S_H as part of the limit price, provided that the purchase is carried out by the value of the contract price equal to the limit.

It is obvious that to find the value of S_H from (5) it is necessary to solve the following problematic issues: determine the value of the limit price of the sample PGN; to solve one more equation connecting the values S_H и P_H so that in (4) one of these two unknown variables can be expressed through another substitution method.

The solution of the first problem question, according to [7,8,9], can be obtained by solving the balance equation of efficiency of the form:

$$\frac{C_B^Z + C_B^{OTHER}}{Э_B} = \frac{C_H^{LP} + C_H^{OTHER}}{Э_H} \ , \tag{6}$$

where:

C_B^Z - the purchase price of the basic sample analog of PGN;

$C_B^{OTHER}; C_H^{OTHER}$ - the values of other planned costs associated with the operation of samples in solving the problem, necessary to achieve the desired effect of the application of the base and new samples, respectively.

If G_B - evaluation of the economic efficiency index for the base sample-analog:

$$G_B = \frac{C_B^Z + C_B^{OTHER}}{Э_B} \ .$$

Then we rewrite (6) as follows:

$$C_H^{LP} = G_B \, Э_H - C_H^{OTHER} \ , \tag{7}$$

In this case, taking into account (6) to determine the limit price, the following entry will be correct:

$$\begin{cases} C_H^{LP} = G_B \, Э_H - C_H^{OTHER} \\ C_H^{LP} = S_H + P_H \\ Э_H \in \left[Э_H \, ; Э_{H \ MAKC} \right] \end{cases} , \tag{8}$$

For the solution of the second problem question it is offered to use category of the shadow price of PGN.

Under the **shadowprice** of PGN in accordance with [8] we will understand the price reflecting the real economic value of the unit of the product in question from the point of view of society. The need to use the category of the shadow price for calculations to determine the initial purchase price of PGN is due to the requirements [8]. The peculiarity of shadow prices, according to [8] is the absence of transfer payments in their composition and the presence of externalities.

Under **externalities** (external effects) in accordance with [8] we agree to understand the economic and non-economic consequences arising in the external environment in the production and sale of goods and services, but not reflected in market prices of the latter.

At the same time, the limit and shadow prices of PGN have the following common features:

- The shadow and limit prices of the sample of PGN, can be defined by means of the same methods with that only difference that all cost indicators entering into function of the shadow price have to be cleared of transfer payments.

- Externalities can be calculated as part of the shadow, and as part of the limit price.

Thus, provided that externalities are taken into account in the composition of the limit and shadow prices (and, therefore, the values of these prices will differ only by the amount of the corresponding transfer payments) to determine the shadow price of the product under consideration, the following system of equations will be valid:

$$\begin{cases} C_H^{TP} = G_{B_{CLEAN}} \, \mathcal{Э}_H - C_H^{OTHER_{CLEAN}} \\ C_H^{TP} = C_H(1 - \delta_{CC}) + P_H(1 - \kappa_\Pi), \\ \mathcal{Э}_H \in \left[\mathcal{Э}_H; \mathcal{Э}_{H\ MAKC} \right] \end{cases}$$

(9)

where:

C_H^{TP} -shadow price of a new sample of PGN;

$G_{B_{CLEAN}}$ -the evaluation of the function of economic efficiency for the base of a sample-analogue, purified from transfer payments;

δ_{CC} -sum of taxes levied on cost of production of the new sample PGN, $\delta_{CC} = 0,80$;

κ_P -the amount of tax deductions levied on profits as part of the purchase price of a new sample of PGN, $\kappa_P = 0,20$;

$C_H^{OTHER_{CLEAN}}$ - the value of other planned costs associated with the operation of a new sample of PGN in solving the task required to achieve the desired effect, cleared of transfer payments.

As follows from the analysis (8) and (9), the equations for determining the limit and shadow prices differ only by the amount of transfer payments. In this case, it becomes necessary to prove the existence of a graphical solution for the following system of equations:

$$\begin{cases} C_H^{TP} = C_H(1 - \delta_{CC}) + P_H(1 - \kappa_P), \\ C_H^{LP} = C_H + P_H \end{cases}$$

(10)

Let us denote constants: $C_H^{TP} = C_1$; $C_H^{LP} = C_2$; $\delta_{CC} = C_3$; $\kappa_P = C_4$; $C_H = y$; $P_H = x$.

If $C_H = y$; $P_H = x$.

Then (10) will take the following form:

$$\begin{cases} C_1 = y(1 - C_3) + x(1 - C_4), \\ C_2 = y + x \end{cases}$$

$$\begin{cases} C_1 = y(1 - C_3) + x(1 - C_4), \\ C_2 = y + x \end{cases}$$

$$\begin{cases} y = \dfrac{(1 - C_4)}{(C_3 - 1)} x - \dfrac{C_1}{(C_3 - 1)}, \\ y = -x + C_2 \end{cases}$$

$$\begin{cases} y = -4x + \dfrac{C_1}{0,20}, \\ y = -x \end{cases}$$

Because $a_1 \neq a_2$, the lines must intersect. Here it should be noted, что $a_1 \neq a_2$ for all values δ_{CC} и κ_P, determining the value of the coefficient a for straight $y = \dfrac{1 - \kappa_P}{\delta_{CC} - 1} x + \dfrac{C_1}{0,20}$. Here it should be noted that the value of κ_Π can never be equal 1, because if the income tax is 100%, the economic activities associated with the execution of the order will not be beneficial to the enterprise. If δ_{CC} will be equal to 1, that $y \to \infty$, at the same time, the company will again not receive profit from the implementation of the order. In any case $a_1 \neq a_2$. The angle of

intersection of the lines is approximately 26 degrees and the point of intersection of the lines will always exist in the first quarter.

Display the solution to the problem of finding the indicator $C_H = y$.

Figure 1. Graphical solution to the problem of finding the CH index. Search for the solution point of the equations of limit and shadow prices.

Calculate the coordinates of the intersection point F, given that at this point $y_1 = y_2$.

Solve the equation $-4x + \dfrac{C_1}{0,20} = -x + C_2$ onxon $C_H^{LP} = 4829,595$ thousand rubles, $C_H^{TP} = 2800,200$ thousand rubles. Get that x=3056,801thousand rubles solving the equation $y = -x + C_2$, get that y=1772,794thousand rubles. Coordinate systemF (3056,801;1772,794).

Now graphically show, that $P_H^{NR} < P_H$.

Due to the fact that the adopted rate of return equal to, for example, 0.25 standard profit, resulting from the multiplication of the cost by the value of the profitability of the values will be equal to $\Pi_H^{HOP} = x = 0,25y$, add another line to the lines shown in figure 1, y=4x.

To comply with the terms $P_H^{NR} < P_H$ it is necessary that the coordinates of the points of intersection of the three lines X were less than at the point F.

Solve a system of equations with respect to X:

$$\begin{cases} 4x = -x + C_2 \\ 4x = -4x + \dfrac{C_1}{0,20} \end{cases}$$

Get that line y=4 intersects the straight lines in the points x=1609,865 thousand rubles and x=1628,023 thousand rub. both coordinates less than 3056,801 thousand rub.

$$\begin{cases} 4x = -x + C_2 \\ 4x = -4x + \dfrac{C_1}{0,20} \end{cases}$$

Get that line y=4 intersects the straight lines in the points x=1609,865 thousand rubles and x=1628,023 thousand rub. both coordinates less than 3056,801 thousand rub.
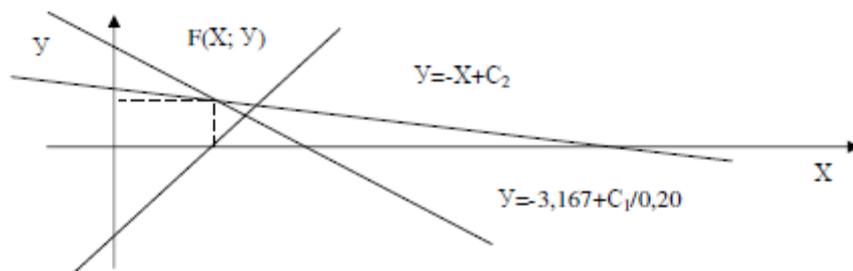
Figure 2 Graphical solution to the problem of determining the coordinates of the intersection of the line y=4 and the lines shown in figure 1.

For the development of ERM in the determination of initial rates of PGN, we assume the standard assumptions under specified in [7].

Solving (9) taking into account (5), we write down the following equation to determine the initial price of the state contract for the purchase of a new sample of PGN:

$$Ц_H^{HAЧ} = \frac{0,797\, C_H^{LP} - C_H^{TP}}{(\delta_{CC} - \kappa_П)}(1 + R)\, K_H^H ,$$ (11)

where:

K_H^H -the value of the deflator index, approved annually by the Ministry of economic development.

Reliability of the carried-out calculations is supposed to be checked by comparison of the size of the initial price of purchase of the sample of automotive equipment (at) calculated with use of the developed economic and mathematical methods (EMM) and value of the actual initial price of its purchase specified in the notice on carrying out the taken place tender for purchase. The choice of at from all types and types of PGN is caused by use of this production in all branches of a national economy and power structures.

The preference of the developed EMM for determining the initial purchase price of samples of PGN with respect to the currently used samples is checked by comparing the results of calculations carried out with its help and with the help of [3] with the assessment of the actual initial purchase price.

That is, from two estimates of the initial purchase price of the new sample of PGN received with use [3] and developed by EMM the most preferable from the point of view of the customer is that which will be as close as possible to the actual initial purchase price specified in the notice on carrying out already taken place tender.

Thus the size of the initial price determined by means of the given in Mr and the developed methods shall be within 15% of deviation from its size, that is within admissible limits of economy of budgetary funds according to requirements of modern domestic [12] methodical developments.

For example, consider the estimate of the initial price of works on the modernization of a sample of automotive equipment "URAL-4320-0710-31" at different values of road-ground conditions coefficient K_E, dgu.

First, we calculate the initial price on the example of the sample at "Ural 4320-0710-31" using the method implemented in [3]. Data on the actual value of the initial purchase price are presented in table 1 and are taken from sources [13,14,15].

Initial data for the calculation of initial prices for [3] are presented in tables 2 and 3.

Table 1 The initial prices for the purchase of at samples obtained from the auction in the second halfof 2018 according to [13,14,15].

№p/p	The name of the sample AT	ValueK$_{E\ DGU}$	The initial price (the fact) thousand rub.
1	"Ural 4320-0710-31"	1,12	1900,000
2	"Ural 4320-0710-31"	1,26	1940,000
3	"Ural 4320-0710-31"	1,80	1850,000

Justification of The Initial Contract price For The Purchase of Products acquired For State Needs with Account of The Effect From Its Application

Table 2 Initial data for the calculation of initial prices for the purchase of at samples using [3].

Nameofparameter	The name of the sample AT	Table of symbols the value of the parameter	Parametervalue	
			Min, Thousandrubles	Max, thousandrubles
The price of the basic analog sample [13,14,15]	URALS - 4320-31	$\overline{C}_{O\Pi}$	1300,00	1800,00
The coefficient characterizing the change in the customer's costs in the transition from the base sample to the estimated	URALS - 4320-31УРАЛ-4320-0710-31	k_C	1,10	
Number of samples delivered at the stage of production development	URALS - 4320-0710-31	N_{OP}	1,00	
The average cost of the analog sample at the stage of steady-state production	URALS - 4320-31	C_{UP}^{B} thousandrubles	1550,00	
The average cost of a sample-analog with $K_{Э ДГУ}=1,12$ at the stage of commercial production	URALS - 4320-31	C_{OP}^{B} thousandrubles	1400,00	
The average cost of a sample-analog with $K_{Э ДГУ}=1,26$ at the stage of commercial production	URALS - 4320-31	C_{OP}^{B} thousandrubles	1600,00	
The average cost of a sample-analog with $K_{Э ДГУ}=1,80$ at the stage of commercial production	URALS - 4320-31	C_{OP}^{B} thousandrubles	1570,00	
Number of supplied samples at the stage of production development	URALS - 4320-0710-31	$N_{O\Pi}$	1,00	
Number of supplied samples at the stage of steady-state production	URALS - 4320-0710-31	$N_{У\Pi}$	1,00	
Serialproductionratio	URALS - 4320-0710-31	k_{cep}	1,3	
The coefficient characterizing the ratio of the price of the sample at the established production to its price at the stage of development for the sample with $K_{ЭДГУ}=1,12$	URALS - 4320-0710-31	$k_{UP} = \dfrac{C_{UP}^{B}}{C_{OP}^{B}}$	1,1	
The coefficient characterizing the ratio of the price of the sample at the established production to its price at the stage of development for the sample with $K_{ЭДГУ}=1,26$	URALS - 4320-0710-31	$k_{UP} = \dfrac{C_{UP}^{B}}{C_{OP}^{B}}$	0,968	
The coefficient characterizing the ratio of the price of the sample at the established production to its price at the stage of development for the sample with $K_{ЭДГУ}=1,80$	URALS - 4320-0710-31	$k_{UP} = \dfrac{C_{UP}^{B}}{C_{UP}^{B}}$	0,987	

The results of the calculation of the boundaries of the range of initial prices of PGN [5] are given in table 3.

Table 3 The results of the calculation of the elementary price samples at "URAL-4320-0710-31" with a different value of K_E, dgu. Comparison of the calculation results with the actual initial trading prices conducted in the second half of 2018.

№p/p	The name of the sample	Sample-analog	value of K_E, dgu	Actual initial bid price, thousand roubles.	Initial Price by MP, thousand rubles		Deviation of actual initial bidding price from that calculated by the MP,%	
					MIN	MAX	MIN	MAX
1	Ural-4320-0710-31	Ural-4320-31	1,12	1900,00	2044,90	2831,40	+7,6%	+49,0%
2	Ural-4320-0710-31	Ural-4320-31	1,26	1940,00	1799,51	2491,63	-7,2%	+28,4%
3	Ural-4320-0710-31	Ural-4320-31	1,80	1850,00	1834,83	2540,00	-0,82%	+37,3%

Initial data for the calculation of the initial price of at samples using the proposed method and [3] include data on the cost of an analog sample (table 1) and a set of data to determine the effect of the application of a new at sample using simulation and analytical modeling techniques. The calculation results for the developed EMM are given in table 4.

Table 4 The results of the calculation of deviations of the initial price of samples at using developed by HIM from the actual values of the initial price for trading conducted in the second half of 2018.

| №p/p	The name of the sample AT	Valueof KE, dgu	The initial purchase price using the developed method of thousand rubles.	Actual initial purchase price, thousand rubles.	Deviation,%
1	Ural 4320-0710-31	1,12	2100,000	1900,000	+10,5%
2	Ural4320-0710-31	1,26	2189,000	1940,000	+12,8%
3	Ural4320-0710-31	1,80	1889,160	1800,000	+4,9%

For tables 3 and 4 with the "-" sign, the deviations of the calculated estimates of the initial prices from the actual values of the initial trading price according to [11,12,13] are indicated, in which the calculated estimates are less than the actual values, with the " + " sign - Vice versa.

The results of comparison of calculations to determine the deviation of the initial prices of samples of the Mr and EM from their actual initial prices at auction in the second half of 2018 are shown in table 5.

Table 5 Comparison of deviations of initial prices determined by Mr and using the developed method
from the actual value of the initial price at the auction in the second half of 2018

№ п/п	The name of the sample	ValueK$_E$ DGU	Deviation,%		Deviation of the initial price determined by the developed method from its actual values
			Deviation of the initial price determined with the help of Mr from the actual values of the initial price		
1	Ural 4320-0710-31	1,12	+7,6%	+49,0%	+10,5%
2	Ural4320-0710-31	1,26	-7,2%	+28,4%	+12,8%
3	Ural 4320-0710-31	1,80	-0,82%	+37,3%	+4,9%

A graphical illustration of the results is shown in figure 3.
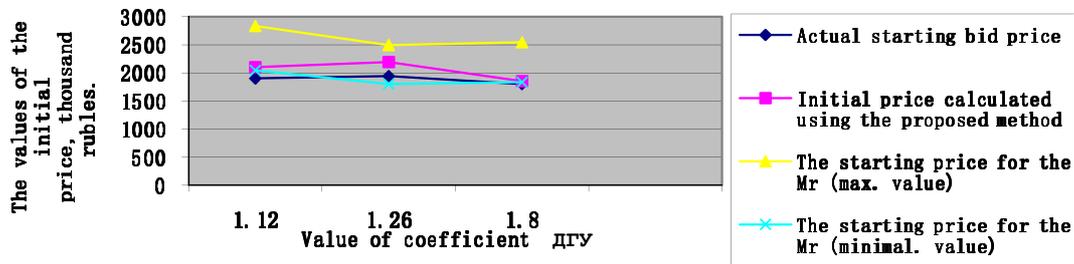
Figure 3. Graphic illustration of the results of the calculation of the initial prices of samples of PGN on
Mr and developed by HIM.

3. CONCLUSION

In conclusion, the characteristic of the results of using the developed method of estimating the
initial purchase price of samples of products purchased for state needs in comparison with the
results of using the methods implemented in the existing guidelines [3] is given.

- The results of the calculation of the boundaries of the ranges of the initial prices of PGN [3],
  exceed the permissible values specified in [12] (except for the minimum value of the initial
  price for the sample with K$_{E\ DGU}$=1,12).

- The results of the calculation of the initial prices of PGN according to the proposed method
  meet the requirements [12].

- We consider it expedient to clarify [3] with the inclusion of the developed EMM based on the
  methods of simulation and analytical modeling, taking into account the data on the magnitude
  of the effect of the use of PGN samples for their intended purpose.

REFERENCES

[1]   RTS – tender. Russian electronic platform. http://www.rts-tender.ru/Citizen.Seldon: Cut
        the state order?

[2]   "Rosstat: In 2016, the share of high technologies in GDP reached a maximum". February
        8, 2017. http://izvestia.ru/news/663180

[3]   Guidelines for the formation of the initial price of the contract. Deputy Minister of
        defense-chief of arms of the armed forces.Fabruary 9, 2008.

[4]   Federal law No. 44 of the Federal law "on the contract system in the procurement of goods, works and services for state and municipal needs" (with additions introductions). September 15, 2015.

[5]   Message from Russian President Dmitry Medvedev to the Federal Assembly of the Russian Federation. Nnovember 11, 2010. http://www.kremlin.ru

[6]   Miloslavsky, V.G., Dzhumagaliev, S.K., Kaziev, T.R., Sinitsyn, A.M. 2016. Tenders: state, trends and prospects.The Young Scientist, 27, pp. 452-458. https://moluch.ru/archive/131/34452/

[7]   Lvov, D.S. 1972. Economics of product quality. Moscow: Economy, 196.

[8]   Methodological recommendations for assessing the effectiveness of investment projects (second edition). Ministry of economy of the Russian Federation, the Ministry of Finance of the Russian Federation, №VK 477. June 21, 1999. Moscow: Economics, 2000, 421.

[9]   Kravchuk, P.V. 2002. Methodology and methods of economic evaluation, organization of distribution of technologies and dual-use products. Moscow: Military Publishing, 326.

[10]   Zhukov, G.P., Vikulov, S.F. 1987. Military-economic analysis and operations research. Moscow: Voenizdat.

[11]   Ventzel, E.S. 1964. Introduction to operations research. M., publishing house "Science".

[12]   Report on research work "Development of methods of calculation of economic efficiency of placing of orders for deliveries of goods, performance of works, rendering of services for state and municipal needs", the theme 2.7.2 "Development of methods of calculation of economic efficiency of placing of orders for deliveries of goods, performance of works, rendering of services for state and municipal needs" (interim)". JSC "INSTITUTE of COMPETITIVE TECHNOLOGIES", Moscow, 2006.

[13]   Cars, minibuses, buses. Tender # 181830. TENDERER.RU. Tenders and competitive bidding. http://www.tenderer.ru/tenders/7/tender181830.html

[14]   Goods and works of various (list in the text of the competition. Tender # 83319. TENDERER.RU. Tenders and competitive bidding. http://www.tenderer.ru/tenders/3/tender83319.html

[15]   Onlain-zhurnal o spectekhnike [Online Journal about special equipment]. http://www.ural-nak.EN/contacts spez-tech.com