TÍTULO: Técnica de determinación del precio óptimo de los componentes comprados.

AUTORES:

1. Il'nur I. Farkhoutdinov.

2. Aleksei G. Isavnin.

RESUMEN. Entre las restricciones importantes y generalizadas del desarrollo de la subcontratación de la producción en Rusia está la posición de monopolio del proveedor, razón de la aparición del aumento incontrolable de los precios y la mala calidad de los componentes comprados de un producto. Los autores desarrollan la técnica de determinación del precio aceptable y económico del componente comprado futuro de un producto teniendo en cuenta las entregas seriales. Los resultados del trabajo son de interés para los jefes de grandes empresas industriales, y útiles para las investigaciones científicas en el campo del abastecimiento. Este trabajo es aplicable para la determinación del precio óptimo del futuro componente comprado de un producto y para la determinación del precio aceptable para productos de proveedores alternativos.

PALABRAS CLAVES: subcontratación industrial, fijación de precios, efecto económico, gastos de inversión.

TITLE: Technique of determination of the optimum price of purchased components.

AUTHORS:

1. Il'nur I. Farkhoutdinov.

2. Aleksei G. Isavnin.

ABSTRACT: Among the important and widespread restrictions of the development of production outsourcing in Russia is the position of supplier monopoly, reason for the appearance of the uncontrollable increase in prices and the poor quality of the purchased components of a product. The authors develop the technique of determining the acceptable and economic price of the future purchased component of a product taking into account serial deliveries. The results of the work are of interest to the heads of large industrial companies, and useful for scientific research in the field of supply. This work is applicable for the determination of the optimal price of the future purchased component of a product and for the determination of the acceptable price for products from alternative suppliers.

KEY WORDS: industrial outsourcing, subcontracting, pricing, economic effect, investment expenses.

INTRODUCTION.

One of the most main and widespread restrictions of development of production outsourcing in Russia is the monopoly position of the supplier [Farkhoutdinov I.I., 2012]. This restriction is the reason of emergence of such risks as uncontrollable price increase and poor quality of purchased components of a product [Isavnin A.G., Farkhoutdinov I.I., 2012].

Instability of prices for products of the outsourcer directly influences a financial solvency and competitiveness of the enterprise. This problem is especially actual at the initial stage of production of a product or by transfer of the new designed component to outsourcing. Therefore, for increase of efficiency of application of outsourcing at the enterprise, it is necessary to determine the

optimum prices of purchased components of a product of completion stages of design and the beginnings of preparation of production.

The purpose of this work is to develop a reliable technique of determination of the acceptable and economic price of future purchased component of a product, taking into account serial deliveries.

DEVELOPMENT.

Methods.

One of the effective ways of determination of the optimum price of future purchased component is the application of a method a target-costing.

Target pricing allows cooperating expenses of future product already at a stage of its design [Yakubov I.Z., 2007]. However this method is focused on a ready-made product, but not on a product component which design can be connected not only with creation of a new product, but also with change of a design of the existing. Therefore, there is a need for a universal technique of determination of the acceptable price for products of the outsourcer focused as well as on a product component, and on a product in general. For this purpose we will consider the existing methods of pricing and we will define the most objective method allowing determining precisely the optimum price of future purchased component.

Today, there are many methods of pricing, but all of them can be divided into three main groups [Krjuchkova O.N., Popov E.V., 2002]: 1. Expensive methods; 2. Market methods and 3. Parametrical methods.

Each enterprise chooses this or that method, depending on that, on what more is guided: on costs of production, on market condition or on standards of costs of the technical and economic parameter of production.

For definition of more suitable method of calculation of the target prices of purchased components of a product it is necessary to characterize each of the listed above groups from the point of view of the creation of optimum price for products of the outsourcer (table 1) [Isavnin A.G., Farkhoutdinov I.I., 2013].

**Table 1. Characteristics of methods of pricing.**

	Expensive methods.	Market methods		Parametrical methods.
		With orientation to the consumer.	With orientation to competitors.	
Characteristic	Methods allow to calculate objectively and precisely the component price.	Methods are subjective as are based on valuable preferences of consumers by each type of a component.	Methods are applicable for some components taking into account the developed competitive situation in the market.	Methods are subjective and labor-consuming as are based on expert estimates of consumer properties of a component.

In works of some authors, the following classifications of methods of pricing meet [Baseem Khan and Ganga Agnihotri, 2013; 4 Basic policies recognized for pricing decision making in international market.

Fig. 1. Classification of pricing methods by Baseem Khan and Ganga Agnihotri.

http://www.yourarticlelibrary.com/decision-making/4-basic-policies-recognized-for-pricing-decision-making-in-international-market/5818
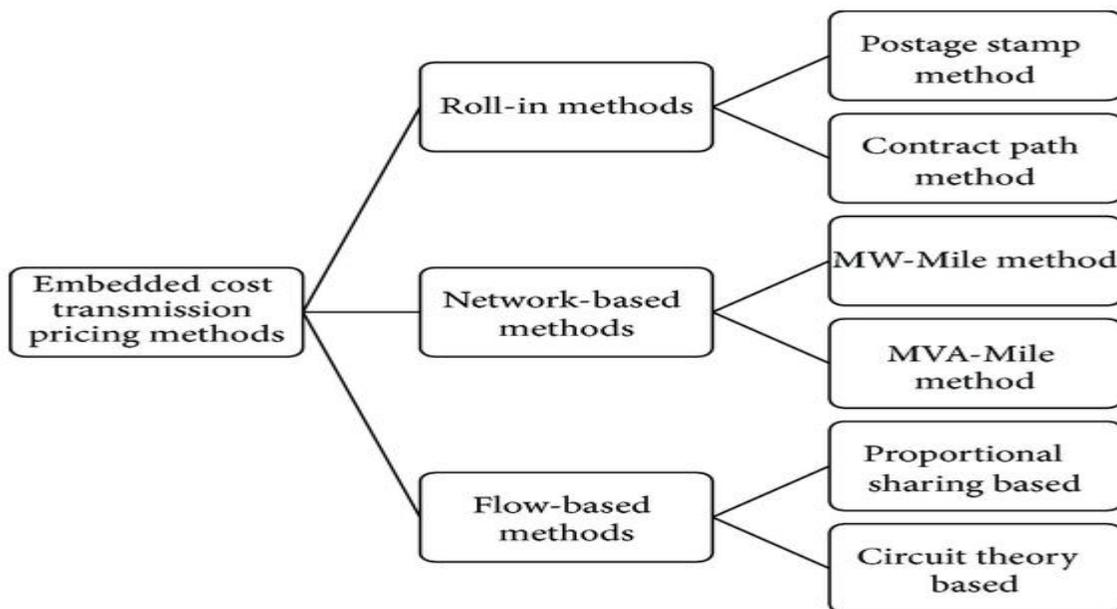
Fig. 2. Classification of pricing methods by Smriti Chand.
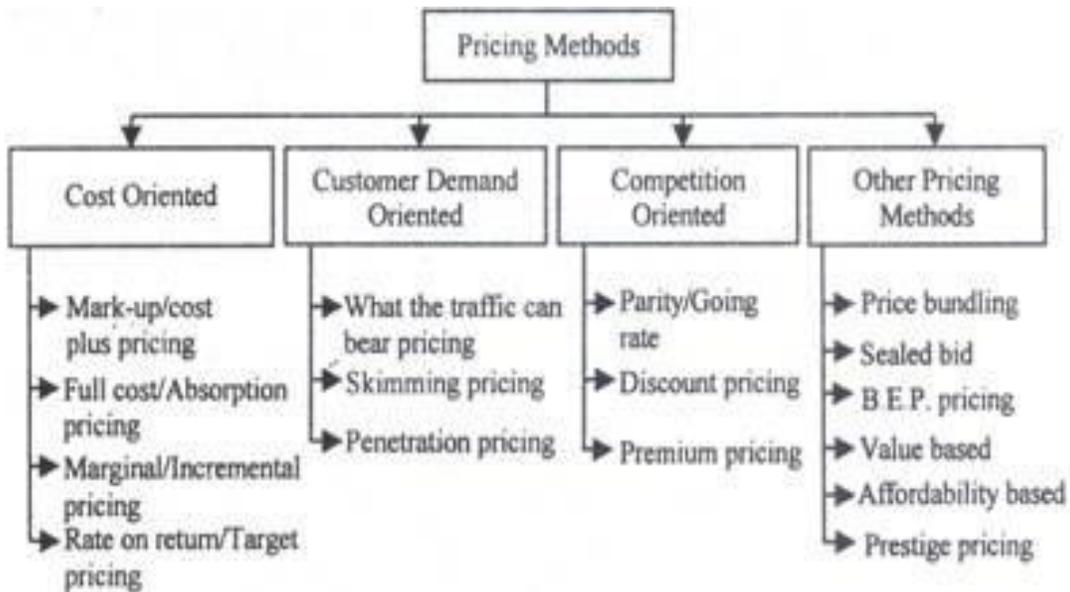
In our opinion, the majority of methods are subjective, we consider it expedient to create a technique of determination of the optimum price of future component of a product, using expensive methods of pricing as the most objective and exact. In particular, we will choose a method of full expenses as today, this method is the most widespread among the majority of the enterprises of Russia.

Calculation of the target price of a purchased component of a product is carried out on the basis of design documentation. The essence of a method of full expenses consists in summation of variables and constant expenses and net profit which the enterprise expects to receive. However, in this case, the net profit isn't considered as the target price is equal to planned prime cost of a component that is only the expensive component considered. For descriptive reasons, we will present an example of how the structure of the target price on a purchased component (table 2) can look.

Table 2. Conditional example of determination of the target price by method of full expenses.

№	Name of article	Measurement unit.
1.	Raw materials and materials	rub.
2.	Purchased accessories	rub.
3.	**Total material inputs**	**rub.**
4.	Main salary	rub.
5.	Additional salary	rub.
6.	Assignments on social insurance	rub.
7.	**Total variable expenses**	**rub.**
8.	Constant expenses	rub.
9.	**Production prime cost**	**rub.**
10.	Business expenses	rub.
11.	**Full prime cost / Target price**	**rub.**

At creation of accounting, it is necessary to consider desirable quality of future purchased component, as this criterion directly influences labor input of production of a product and other articles of expenses.

As for production of the new designed component, it is necessary to buy the new equipment, in the article "Constant Expenses", depreciation charges have to be considered. Today the most widespread way of charge of depreciation is the linear method; therefore, for determination of the sum of depreciation charges on unit of a component, we will use the following formula:

$$A = \frac{S_E * (\frac{1}{n} * 100\%)}{V}, \qquad (1)$$

A – the sum of depreciation charges on component unit; S_E – initial cost of the equipment; n – useful service of the equipment (advanced in years); V – the planned annual volume of orders of a component at the outsourcer.

Having determined the target price of a purchased component of a product, it is necessary to define a limit of a tolerance of the price of the outsourcer from this target price.

For definition of a limit of a tolerance of the price of the outsourcer from the target price of a purchased component the indicator "Investment costs of component unit" which is defined by the following formula is offered to enter:

$$S_{IC} = \frac{S_E}{V_R} - A \ ,$$

(2)

S_{IC} – investment costs of component unit; V_R – the planned volume of orders of a component at the outsourcer during a target payback period of investments. The target payback period represents the period for which the enterprise plans to pay back the enclosed investments into the equipment. Value of this indicator defines each enterprise for itself individually. As in planned prime cost of a component depreciation charges, an indicator "Investment costs of component unit" are considered doesn't consider value of an indicator (1). Thus, the maximum planned prime cost of a component (taking into account investment expenses) during return on investment can look as follows:

Fig. 3. Investment costs per unit of component.
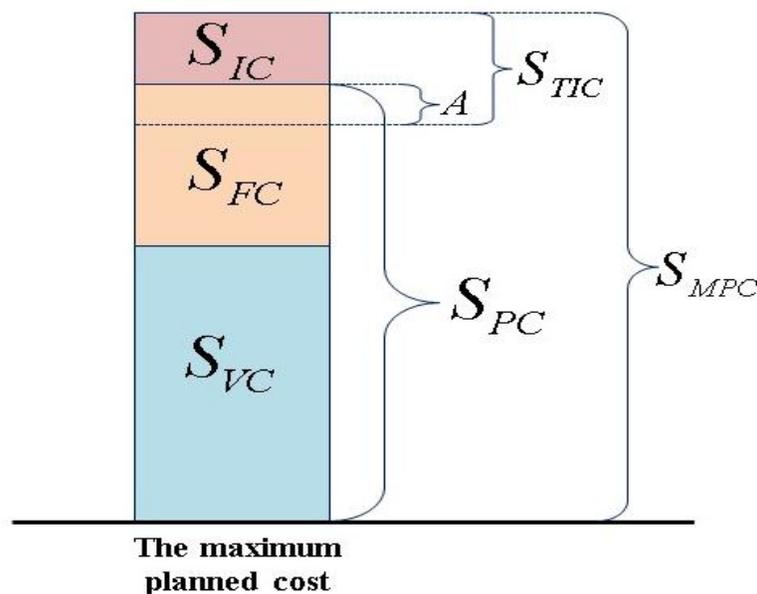
In figure 3: S_{MPC} – the maximum planned prime cost of a component (taking into account investment expenses) during return on investment; S_{PC} – planned prime cost (target price) of a component; S_{VC} – variable costs of component unit; S_{FC} – constant costs of component unit; S_{TIC} – full investment costs of component unit.

Results and Discussion.

Having defined an indicator "Investment costs of component unit", it is possible to allocate four main scenarios of a deviation of the price of the outsourcer from the target price:

The price of the outsourcer is lower than the target price.

This scenario is the most economic for the enterprise transferring production of future component of a product to outsourcing:

Fig. 4. The price of outsourcer is below the target price

The maximum
planned cost
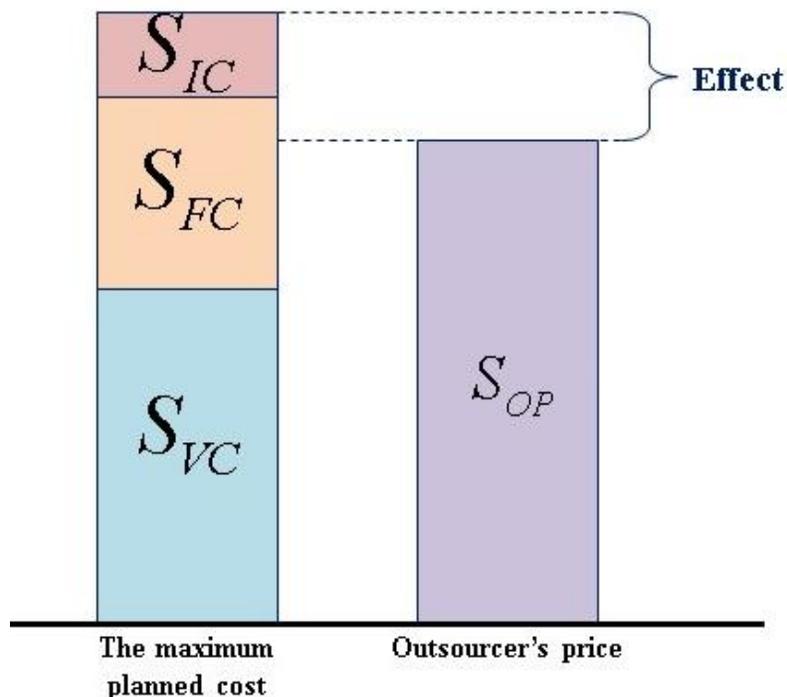
Outsourcer's price

In figure 4:

S_{OP} - the outsourcer's price taking into account serial deliveries.

Assessment of economic effect of transfer of future component to outsourcing, it is possible to present on the basis of a ratio:

$$E = S_{MPC} - S_{OP},$$ (3)

where E – economic effect of transfer of future component to outsourcing.

The price of the outsourcer is equal to the target price.

In this case, the price of the outsourcer "fits" into the target price (equal to planned prime cost) a component (fig. 5): $S_{OP} \approx S_{PC}$. Therefore, economic effect is equal to value of an indicator
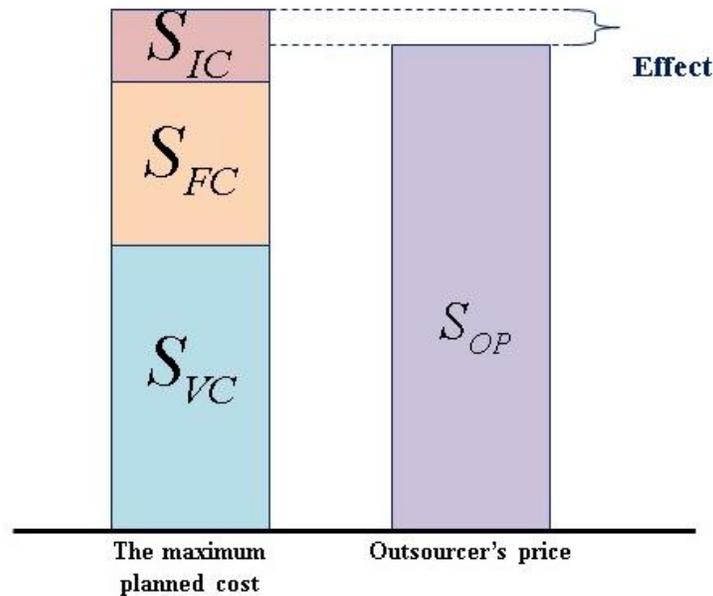
"Investment costs of component unit", that is $E \approx S_{IC}$.

Fig. 5. The price of outsourcer is equal to target price.
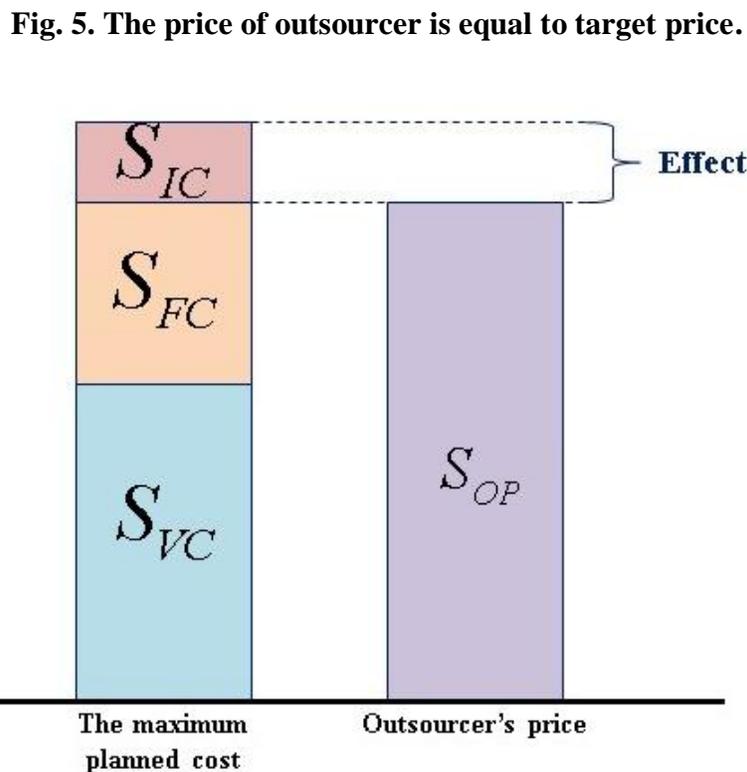
The price of the outsourcer is higher than the target price, but below the maximum planned prime cost.

This scenario also is economic for the enterprise and can look as follows:

Fig. 6. The price of outsourcer is higher than target price, but below maximum planned cost price.

The assessment of economic effect is also carried out by means of a formula (3). In this case, economic effect is less than value of an indicator "Investment costs of component unit", that is

$$E < S_{IC} .$$

The price of the outsourcer is equal or exceeds the maximum planned prime cost.

Here excess of an admissible limit of a deviation of the price of the outsourcer from the target price is observed. The scenario is economically unprofitable for the enterprise as even at $S_{OP} \approx S_{MPC}$ it is expedient to master production on own squares is, will allow to lower expenses and to earn additional marginal profit.

At excess of an admissible limit of a deviation of the price of the outsourcer from the target price, it is possible to achieve also acceptable price from the supplier by carrying out joint talks.

Today the Russian industrial enterprises are characterized by limited resources which don't allow investing in a full complex [Sheluhin I.S., 2003]. Therefore, release and redistribution of resources is the main reason for application of production outsourcing.

The main advantage of the presented technique is opportunity to determine the optimum price of future purchased component taking into account economy on investments into the equipment for production of nonbasic components of a product.

In summary, it is presented in this work a technique, applicable not only for determination of the optimum price of future purchased component of a product, but also existing. If the outsourcer for one reason or another stops delivery of a component which was never made on own squares, there is a need for change of the supplier. In this case, it is possible to use also offered technique for determination of the acceptable price for products of alternative suppliers [Isavnin A.G., Farkhoutdinov I.I., 2013].

It should be noted that efficiency of application of outsourcing is reached not only delivery of purchased components at the optimum and economic prices, but also gradual decrease in these prices with time and with growth of volumes of the order at the outsourcer [Isavnin A.G., Farkhoutdinov I.I., 2012]. This requirement is connected with that after a target payback period of investments, the limit of a tolerance of the price of the outsourcer from the target price is compared to planned prime cost of a component. Therefore, it is necessary to actualize periodically the target price and to carry out monitoring of a deviation, and at identification of negative deviations, it is necessary to apply measures for their elimination.

CONCLUSIONS.

Results of this work can be of interest to heads of the large industrial enterprises, and also can be useful to further scientific researches in the field of sourcing.

It is presented in this work a technique, that is applicable not only for determination of the optimum price of future purchased component of a product, but also existing, in particular, for determination of the acceptable price for products of alternative suppliers.

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DATA OF THE AUTHORS.

1. Il'nur I. Farkhoutdinov. Kazan Federal University. Email: ilnour1986@inbox.ru

2. Aleksei G. Isavnin. Kazan Federal University. Email: global@prescopus.com