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Research Article

COMPROMISE BETWEEN PRICE AND TARIFF SETTING AS THE BASIS TO DEVELOP THE RURAL HOUSING SERVICES

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Abstract:

The method of tariff formation in housing and communal services for a long time remained one of the most serious problems of the industry in Russia especially in rural areas. The traditional method of tariffs' calculation for housing and communal services provided to the population and enterprises, the so-called "cost plus" approach was applied. Its meaning lies in a simple summation of the cost price of a service with a premium that was set directly by a particular housing and communal enterprise within the maximum and minimum values. The analysis of this approach made it possible to draw a conclusion about its nonoptimality. It also became obvious that it is necessary to develop an integrated methodology for tariff formation in the housing and communal services. Such methodology should make it possible to increase the investment attractiveness of the industry, take into account all the features of its functioning and help to achieve the optimal amount of tariffs for all participants in housing and communal services relations. All these factors can be taken into account using compromise approach for price and tariffs formation.

Key words: *housing and communal service, tariff formation, compromise prices and tariffs, social demand, rural areas.*

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INTRODUCTION:

The formation of generalized interests is characteristic of all economic entities of various levels, and the applicability of the compromise (trade-off) theory is universal [1-3]. In the light of this, the study of the issues of formation of generalized interests and compromise prices and tariffs, to which this work is dedicated to, has a current interest. In the paper, the process of compromise tariffing in the housing and communal sector will be considered as an example. The authors propose to use the developed complex methodology at housing and communal enterprises to optimize the process of tariff's formation.

Development of tariff formation effective methods becomes essential for rural areas: its housing and communal complex is in the worst condition at the moment (compared with the average in Russia) [10-12]. Due to the fact that ensuring the effective functioning of the agro-industrial complex is one of the most priority tasks, methodological support of its activities (including creation and maintenance of a sustainable housing and communal system) has a particular importance. Developers also require issues of subsidizing the population and agro-industrial enterprises.

MATERIAL AND METHODS:

The authors found that none of the current pricing and tariffs' setting methods fulfills the requirements for an effective and economically founded tariff policy in the housing and communal services sector [4, 5]. In this regard, the development of a new methodology which will ensure the receipt of compromise tariffs for housing and communal services is required. Compromise analysis, the main purpose of which is to obtain optimal prices, can be used as a basis of such methodology. Features of com-promise price [6] modeling will be considered further.

Parameters that determine his competitiveness and profit (the highest possible) are the most important for the seller. The buyer is interested in the parameters that characterize his solvency and satisfaction as a consumer. Thus, the satisfaction of the interests of the seller and the buyer depends on the following parameters of the transaction: the good's price and the amount of purchase and sale. The state of the commodity market is characterized by the parameters indicated above, i.e., the transaction (P, Y) , where P is the average price of a unit of the good, Y is the total amount of the purchase and sale of the good. In the equilibrium economic system, the nature of the transaction can be

defined as follows:

$$D = P \times Y, \quad (1)$$

D – the amount of buyers' payments/the amount of received by the seller payments.

It makes sense that a market transaction can take place only with mutual benefit, and therefore, a mutual compromise between the seller and the buyer. Their interests are balanced in such the way that provides the highest competitiveness to the seller and the highest solvency in the prevailing conditions to the buyer [7, 8].

The result of trades between the seller and the buyer is the aggregate transaction (P^*, Y^*) , that forms the generalized interest of both the seller and the buyer at the good's compromise price P^* and sales volume Y^* .

The seller aims to recover all of his costs; in addition his interest is in maximizing profit. In the case when the transaction results for the seller in obtaining cash in an amount sufficient to recover all costs, he will be able to withstand competition, i.e., will be «competitive»:

$$PY' \geq D' + aY', \quad (2)$$

D' – the cost of factors' compensation; a is costs per unit of good; Y' is the volume of the competitive offer.

The consumer should stay within the limits of his consumer budget:

$$PY'' \leq D, \quad (3)$$

Y'' – the volume of solvent demand; D is the amount that the buyer can allocate for the good's purchase.

The consumer is interested in maximizing the good's purchase with a fixed value of D , or minimizing D for a fixed purchase volume.

The «compromise» transaction can be realized only when concessions are made by both the seller and the buyer. The model of such compromise mechanism can be realized on the basis of the concept of «stock market potential», within which the interests of the seller and the buyer are matched at a specific price of goods P . There is a price P^* at which the realized transaction secures the maximum reserve of market potential:

$$P^* = \arg \max_{(P,Y) \in M} \Delta Y(P), \quad (4)$$

RESULTS AND DISCUSSION:

Relations between market subjects are realized in value form. It reflects the interests of both sellers and buyers of goods and services. As it was revealed earlier, the cost of the added value (D') has the greatest interest for the former, and the cost of the goods or services itself (D) – for the latter.

On the single-commodity market, the following parameters can be distinguished: P (unit cost of goods), a (unit costs per unit of the good), P' (value added per unit), Y'' (maximum possible demand for goods), Y' (the minimum possible offer).

For a fixed added cost of a good or service for each value of the price (P), only one volume of the supply of products can be determined. This volume of supply is the minimum necessary for the competitiveness of the seller (manufacturer):

$Y'(P) = \frac{D'}{P'} = \frac{D'}{P-a}$. The only limitation of this condition is the manufacturer's production capacity ($Y'(P) \leq \bar{Y}$).

There is also a maximum cost of the good (service) D , which the buyer is ready to allocate for its purchase. Using this value, the maximum possible customer demand can be determined ($Y''(P) = \frac{D}{P}$).

Purchasing demand, as well as supply, is limited: buyers will purchase goods (services) until their needs are met ($Y''(P) \leq \bar{Y}$). Considering these features, we can obtain the following relationship: $Y' = Y'' \frac{D'P}{D(P-a)}$. To present these conditions graphically we can take as a basis the A. Marshall's model of demand and supply factors' interaction. The resulting construction is shown on Figure 1.

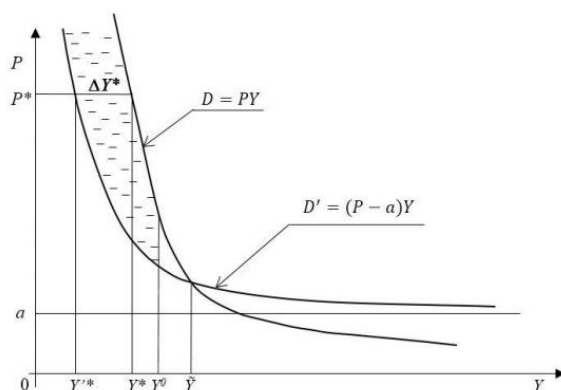


Figure 1: Compromise of sellers and buyers on the basis of «Marshall's shears»

The range of commensurability of economic forces of sellers and buyers of goods (services) is the following:

$$M = \{(P, Y): P, Y > 0, PY \leq D, (P - a)Y \geq D', Y \leq Y''\}$$

The stock of the seller's and buyer's economic forces can be expressed as

$$\Delta Y(P) = Y''(P) - Y'(P) = \frac{D}{P} - \frac{D'}{P-a}$$

The price at which the seller and the buyer realize the maximum of their economic forces is a compromise-equilibrium:

$$P^* = \arg \max_P \left(\frac{D}{P} - \frac{D'}{P-a} \right) = a \frac{D + \sqrt{DD'}}{D - D'} = a \frac{1}{1 - \sqrt{\varphi}}$$

$\varphi = D' D < 1$ is the fixed part of the marginal added cost in the total marginal cost of the goods.

A compromise-equilibrium transaction can be achieved by realizing it with the parameters P^* and Y^* . Y^* is a compromise-equilibrium volume of purchase and sale:

$$Y^* = \frac{D}{P^*} = \frac{D(D - D')}{a(D + \sqrt{DD'})} = \frac{D}{a} (1 - \sqrt{\varphi})$$

The compromise-equilibrium price depends on the product's cost per unit, the fixed part of marginal added cost in the total marginal cost of the goods; the compromise-equilibrium proposal – on unit's cost, fixed part of marginal added cost in the total marginal cost of goods and the direct cost of goods (services). Thus, the total value of the goods (D) can be expressed through the volume of the goods' (services') demand Y . Since the amount of purchase and sale, as was previously revealed, is limited by the producer's production capacity and the saturation volume of consumers' demand, the trade-and-equilibrium volume of purchase and sale can be expressed as follows: $Y^* = Y^0 = \min(Y, \bar{Y})$. Then for a fixed value of Y^0 we obtain:

$$D = \frac{D'}{4} \left(1 + \sqrt{1 + 4 \frac{aY^0}{D'}} \right)^2$$

From the formula (4) we obtain:

$$\varphi = \frac{D'}{D} = 4 \frac{1}{(1 + \sqrt{1 + 4 \frac{aY^0}{D'}})^2}.$$

The total added cost of the goods can be determined in the following way:

$$D' = sY' + D_H,$$

D_H – the total normal profit of the seller (producer);

Y' – the volume of the produced and sold goods (services);

s – unit costs of remuneration.

Using the previous conclusions, we get:

$$D_H = (P - (a + s))Y' = (P - c)Y',$$

$c = a + s$ – the unit's cost.

The amount of normal profit includes the cost of reimbursing the retirement of fixed assets.

ces) a value that equals J , while the rate of return on capital in the economic system is at the level of μ , we can assume that $D_H = \mu J$, while D_H is the amount of profit that is necessary for the manufacturer to ensure its competitiveness, as well as determining the border of its economic strength with the minimum supply of goods on the market $Y' \geq \frac{D_H}{P - c}$.

Taking into account that D is the maximum amount of payment that the buyer is able to allocate for the purchase of goods (services), with $Y(P) \leq \frac{D}{P}$, the range of commensurability of economic forces represented by the set $M = \{(P, Y): P, Y > 0; P, Y \leq D; (P - c)Y \geq D_H = \mu J; Y \leq Y^0\}$, and also $\Delta Y = \frac{D}{P} - \frac{D_H}{P - c}$ we will get the following:

$$P^* = c \frac{1}{1 - \sqrt{\varphi}} \text{ or } P^* = c + P^* \sqrt{\varphi} = c + c \frac{\sqrt{\varphi}}{1 - \sqrt{\varphi}},$$

where $\varphi = \frac{D_H}{D - a}$ fixed part of the minimum necessary profit in the total cost of the goods; $c \frac{\sqrt{\varphi}}{1 - \sqrt{\varphi}}$ is the profit of the seller (producer) per unit of goods in the conditions of the compromise-equilibrium transaction (P^* , Y^*).

In this case:

$$Y^* = \frac{D}{P^*} = \frac{D}{c} (1 - \sqrt{\varphi}).$$

The necessary amount of money, which is formed in the conditions of a compromise-equilibrium commodity market with a fixed volume of purchase

and sale, can be defined as follows:

$$D = \frac{D_H}{4} (1 + \sqrt{1 + 4 \frac{cY^0}{D_H}}).$$

From the formulas (8-10) we obtain:

$$\varphi = \frac{4}{(1 + \sqrt{1 + 4 \frac{cY^0}{D_H}})^2}.$$

CONCLUSION:

Within the housing and communal complex of rural areas, the use of the compromise pricing method in its pure form becomes rather problematic mainly because of the methodology orientation on purely market transactions, while transactions in the sphere of housing and communal services are social-market [9].

The social orientation of the housing and communal system imposes its imprint on the formation of tariffs. System's «players» (service providers, service consumers, public authorities and private investors) as well as in market systems pursue their own interests.

From the point of view of entrepreneurs, management effectiveness implies economic efficiency: the ratio of costs for the production of goods and services and revenues from their sale, expressed through profit. It should be noted that in a free market, entrepreneurs can achieve reasonable profit maximization only if the bid price does not exceed the demand price. Otherwise, people will refuse the supplied services or even stop paying them. However, within the framework of housing and communal relations, the population cannot refuse services due to the fact that housing and communal services are vital for them.

People are interested in receiving the maximum amount of housing and communal services at their lowest cost and best quality. The state and territorial authorities exercise their authority in various ways, depending on their interests and capabilities. Potential investors in the housing and communal services in Russian Federation are interested in the high return on their capital invested in the industry and in the following characteristics of the tariff policy: predictability of tariffs and their stability; liquidity of investments; unlimited access to this economic sector.

After identification of the positions and needs of participants in housing and communal transactions, we can begin to study and analyze the methodology

for achieving budget-market (social-market) trade-offs.

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