

Structuring expenses of industrial enterprises in the evaluation process of its production and sales potential

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Abstract. The essence of supply-side potential of industrial enterprises and conceptual bases its evaluation. Determined the importance of structuring the company's expenses in carrying out its assessment of supply possibilities. A method of allocating costs that are not dependent on the range of enterprise, for its species. Filed analytical expressions modified index of relative level of costs and the marginal rate of return products. A method for optimizing the production program of industrial enterprises in the evaluation and implementation of its supply-side potential.

Key words: enterprises costs, structuring, supply-side potential, production program, allocation of costs, product range, marginal revenue, optimization.

STATEMENT OF THE PROBLEM

Nowadays the conditions of functioning domestic enterprises are greatly complicated that is caused by increasing competitive struggle, instability in demand, rising prices of certain productive resources etc. In this regard, increased requirements for the degree of justification industrial programs of economic entities regarding the list and amounts of those products, which is expected to produce. In its turn, the formation of enterprise production program should be based on a careful assessment of its level of supply-side potential, which ultimately determines the optimum nomenclature and volume of production and sales of various types of enterprise.

The need for optimization approach to the formation of industrial programs caused by the fact that to the vast majority of industrial enterprises there is a possibility of simultaneous production of different products, different technical and technological parameters of production, a set of consumer characteristics, quality level etc. Regarding economic indicators of manufacturing various kinds, in addition to the price level important indicators by which they undergo differentiation,

are the size and structure of the production costs of a particular type of product. The level and structure of costs in terms of each product that produces or intends to produce enterprise, particularly between direct and indirect costs, directly determine the level of profitability of different products and, therefore, have a significant impact on the supply-side potential capabilities of an economic entity. On the other hand, the optimization of enterprise production program allows, among other things, determine the best cost structure as by product, and also by elements of the operating costs at the level of the whole enterprise.

Thus, analysis and rationalization of the cost structure for manufacturing and marketing of products enterprise is a prerequisite and outcome evaluation of its supply-side potential, as only with proper structuring costs the company may set the following parameters of its assortment policy under which achieved the highest amount of financial results its activities.

ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

The problem of determining the nature and justification of methods for assessing the economic potential of enterprises, including their production and marketing opportunities at present is the focus of many researchers [1, 6-18; 2, 72-75; 3, 14-19; 15 and others]. At the same time the researchers noted the presence of a number of different types of potential business. Thus, in the work [4, 5-6] the author presents three-level model of the economic potential of the entity, which due to potential interaction of lower level components formed a higher level. Besides constituents enterprise potential third level, with the greatest degree of generality, the

author considers the current production and investment and innovation potential of the entity.

With regard to supply-side potential of the company, the majority of scientists, including the authors of papers [4, 5, 5, 49-52, 6, 9-16] see it as a description of the business opportunities on the manufacturing and marketing of its products a certain amount for a certain period of time. At the same time at present there is no single universally accepted approach to the evaluation of this potential. This is because the size of the economic potential of the company, including its production and marketing capabilities, affects a significant number of different factors that vary over time, while some of these factors are external to the enterprise. In this connection you can accept the views of the author's work [7], which states that potential of industrial enterprise should be regarded as a category "that reflects not only the current state of industrial, economic and financial activity, but also the dynamics and prospects of strategic development of entity management in view of influence changing factors internal and external environment " [7, 84].

In this way, increasing the validity of methods for quantitative evaluation of supply-side potential industry requires more complete account of the influence of factors that determine the size of this potential. Among these factors important place occupied by the size and structure costs. In other words, the size of the potential business of producing and marketing products largely determined by how effective and efficient is management system spending on it. As pointed in a number of scientific works devoted to the question of formation of such a system, in particular, in works [8, 9, 10 and others], reducing the relative level of corporate expenses and compliance management relationship between their types is a prerequisite for growth and competitiveness, respectively, increasing its shares on the markets of manufactured products.

At the same time, the existing methods in the current literature evaluating supply-side potential of the enterprise do not pay sufficient attention to counting of factors, size and cost structure of the enterprise. In this connection there is need to develop methods for assessment of supply-side potential of the entity based on a full consideration of these factors.

FORMULATION OF ARTICLE'S OBJECTIVE

The aim of this work is to develop theoretical and methodological principles structuring costs of industrial enterprise in the process of evaluating its supply-side potential.

THE MAIN MATERIAL

Our study showed that the quantitative evaluation of any kind of economic potential of industrial enterprise, including its supply-side potential can be achieved by

such a measure (or group of indicators), which is inherently more generalized than a direct characteristic of this type of economic potential of the entity. For example, if supply-side potential of the enterprise can be described as the ability of the company to manufacture and sell certain optimum output over time, the index evaluation of this type potential can serve the maximum possible size of its operating income for this period of time, or if make an assessment of supply-side potential in relative terms - the ratio of the maximum possible value of operating profit entity to actual or planned size of the profits.

Thus, evaluation of supply-side potential of the enterprise, as well as any other type of its economic potential (investment, innovation, labor, etc.) should be based on the use of the optimization approach. Particularly in the event of evaluating supply-side potential of the entity optimization criterion should be its maximum of operating profit. In this turn, one of the main ways to profit management entity is structuring its operating expenses.

When structuring costs proposed to understand our business direction of management, which involves the division of costs on a group (by type of expenditure, kinds of manufactured products, etc.) and establish the best balance between the size of the cost of the various groups in which maximized certain financial performance of a business entity. In particular, an important technique of structuring costs of the enterprise is the selection of the types of costs, the value of which varies with specific management actions in the context of a specific event management company profits.

Regarding the evaluation of supply-side possibilities of industrial enterprise, in the context of solving this problem all the costs of the company can be divided into two major groups, namely:

- the costs, the total amount of which does not change with the change of the structure of the product range, which makes the company;
- costs that are directly dependent on the structure of the product range.

Costs of the first group include the majority of conventionally fixed costs. However, under certain conditions (which is primarily due to the peculiarities of technological processes in the enterprise) this group costs may include certain types of variable costs, including salaries of key workers and charging for it. The last case is possible when the production capacity is limited by the overall complexity of manufacturing all its types, and pay depends on the amount of time spent by each employee.

As for the second group of costs, it primarily includes material costs. Under these conditions, the evaluation supply-side potential of the enterprise and, consequently, the formation of its production program should be based on the appropriate structuring of corporate expenses for each type of manufactured

products - namely, to establish the relationship between costs that vary and are not dependent on the structure product range. This structuring allows to determine the general direction of changes in the production of different products and, given the appropriate changes in their prices (which appear as a reaction of markets) in an iterative mode, set the optimal production program of the company. In this turn, this will allow for the structuring of the total operating costs of the enterprise in terms of products and components of these costs.

Generally, in conditions of a dynamic market environment ensuring proper level of competitiveness requires from businesses permanent, or at least periodically reviewing the composition and structure of the range of products they produce. In order for such a review was economically justified, the company should have information on what kind of revenue share in the total amount it provides a realization of a particular type of product. Only if this information can establish production which products should expand and which to cut.

Obviously, the determination of profits from sales of each type requires its calculation of the production costs of each type of product. The complexity of this calculation due to the presence of costs that cannot be directly (directly) attributed to each type of product that the company produces. In modern literature, in particular in works [11, 12, 13, 14], a number of different ways proposed for distribution of indirect costs by type of enterprise, however, these methods are often presented without proper theoretical justification.

In our opinion, the basic principle of classification of costs by type of products should consist of the following: assign costs to be considered properly executed if received as a result of cost performance and profit from the production unit of each product can make a reasonable assortment of formation of the business. In other words, the question is not about how "real" is resulting from the charging of the value of unit cost, and whether it allows information of value to accept management decision to change the structure of the range of products the company produces, to achieve maximum possible efficiency of its industrial and economic activity.

As indicators of selecting the best option changing the structure range of enterprise should be used primarily the following two points:

1. The absolute efficiency of production of certain types of products. This rate can be calculated, such as the ratio of profit from the production and sale of units of certain goods, produced venture, the cost per unit or share value of a limiting factor (e.g. labor per unit of output, if the limit on the size of the production program in favor of its overall complexity).

2. Index of marginal efficiency of manufacturing certain types of products. This index can be calculated, such as the ratio of growth of return on production and sale of an additional unit of a particular type of product

that the company produces, the cost per unit or share value of a limiting factor.

Under such conditions, to achieve maximum financial results (profits) will be feasible to increase production of those products enterprise for which the values of some indicators to select the best option changes the structure of the product range will be the largest, and the decline in the production of those products for which value is the smallest. It should be noted that the absolute efficiency of production of certain types of products, which does not require the evaluation of the changes in relevant indicators calculated more easily than in the marginal efficiency. At the same time, the use of the absolute efficiency is not always possible to determine the best direction changing the structure range of enterprise (as optimality criterion enterprise production program is the equality of the marginal efficiency of manufacturing all kinds of products).

To carry out further research, we assume that:

- firstly, the production capacity of the enterprise is a constant value (that is considered a short-term planning period);

- secondly, the enterprise has the ability to influence the size of the price of their products, changing the amount of production of one or another of its kind, but with little change in these amounts change in prices is not essential;

- thirdly, the production capacity of the enterprise is used in full and limited for the total labor input of manufacturing of all kinds.

Then the operating profits of the enterprise from the production of all kinds of products can be calculated by the formula:

$$\Pi = \sum_{i=1}^n (U_i - c_i) \times Q_i - C, \quad (1)$$

where: the U_i - the price-and the kind of enterprise without VAT, UAH; c_i - costs that are directly dependent on the structure of the product range, the i-fact type of product as per its unit, UAH; Q_i - current natural amounts of production i-type; n - number of products that enterprise produces; C - the total value expenses of the enterprise that do not depend on the range of products, UAH.

It must be made by the equation:

$$\sum_{i=1}^n t_i \times Q_i = T, \quad (2)$$

where: the t_i - labor input of manufacturing unit i-type, man-hours, T - total labor input of manufacturing all kinds of products, man-hours.

If the enterprise wants to increase the size of their income, slightly changing the structure of the range products that it produces, then as follows from formulas (1) and (2), it is necessary to calculate the ratio $(U_i - c_i)/t_i$ for each product. Then it is necessary to increase

production of the type of products for which this ratio is a maximum, and the decrease in production of those products for which this ratio is minimal. The amount of expenses that do not depend on changes in structure of the range as the value was not affected by decisions made.

In order to have information about the full cost of each product, which makes enterprise we should distribute costs that do not depend on the structure of the product range between its kinds so that the information obtained from such distribution, led to the adoption of the same optimal solutions to manufacturing production program of the enterprise that use the criterion:

$$Z = \frac{U_i - c_i}{t_i} \rightarrow \max. \quad (3)$$

For this purpose, we calculate this figure:

$$a = \frac{C}{\sum_{i=1}^n (U_i - c_i) \times Q_i}, \quad (4)$$

where: the a - the coefficient of distribution costs that do not depend on the structure of the product range, the share of unit. Using this coefficient will perform a cost sharing between the products in which one could reasonably determine areas of improvement of assortment policy the company.

Then:

$$C = a \times \sum_{i=1}^n (U_i - c_i) \times Q_i. \quad (5)$$

and, accordingly the formula (1) takes the form:

$$\begin{aligned} \Pi &= \sum_{i=1}^n (U_i - c_i) \times Q_i - a \times \sum_{i=1}^n (U_i - c_i) \times Q_i = \\ &= \sum_{i=1}^n (U_i - c_i - a \times (U_i - c_i)) \times Q_i. \end{aligned} \quad (6)$$

Thus, the total unit cost under the proposed approach will be calculated by the formula:

$$C_{mi} = c_i + a \times (U_i - c_i), \quad (7)$$

and the criterion of choice that type of products, which need to expand, will be as follows:

$$Z' = \frac{U_i - c_i - a \times (U_i - c_i)}{t_i} \rightarrow \max. \quad (8)$$

The solution obtained according to the criterion (8), will be fully coincide with the solutions obtained by the criterion (3).

It should be noted that the selection of the best content and structure assortment of products enterprise must ensure reaching the largest financial results for a given fixed amount of its production capacity. Clearly, this problem statement is correct only in the short term.

Obviously, under such conditions is a significant issue substantiation criteria select the best composition and structure of the product range. Particular interest is

the question of how adequate this criterion is a traditional indicator of the relative level of costs to production companies for its types, which is defined as the ratio between the total cost and price.

In our opinion, answering the question you need to consider separately the three most common cases of the situation on the market:

1. The enterprise produces (or can produce) simultaneously some products, prices are set by the market, and the enterprise cannot influence their level, changing the natural production amount. This case is typical, especially for a competitive market.

2. The enterprise produces (or can produce) simultaneously some products, prices at which it can adjust by changing the natural production amount. This case is typical in cases where enterprise has a significant market share of these types of products.

3. The enterprise produces (or can produce) simultaneously several interchangeable products, the price at which it can control by altering the natural production amount. In this case, unlike the previous one, the change in production of certain goods leads not only to a price change of this type product, but also to changes in prices of other products that enterprise produces.

4. First consider more detailed the first case. In general, in this case for the production of each product do not need separate equipment, the enterprise should produce only one type of product, which provides the highest amount of profit for a given value of its production capacity. In other words, in this case the simultaneous production of multiple products will not lead to an increase in profit compared with option making only one type of product, which gives a maximum profit compared with other types of products. This combined annual profits of the enterprise of manufacturing i - type of product will be determined by the formula:

$$\Pi_i = U_i' \times Q_{mi} - C, \quad (9)$$

where: the Π_i - the total annual profits of the enterprise from producing i - type of product, UAH. Q_{mi} - maximum annual natural production of i - that type of products (provided that the enterprise will produce only one given product); - unit price of i - type of products without VAT and the costs that vary with changing structure of the range of products (primarily material costs per unit i - that type product), UAH.

Formula (9) can be represented as follows:

$$\Pi_i = U_i' \times \frac{C}{c_{ei}} - C = C \times \left(\frac{U_i'}{c_{ei}} - 1 \right), \quad (10)$$

where: the c_{ei} - the amount of costs that do not change with the change of the structure of the product range per unit of output i - that type, UAH.

We call the correlation $\frac{U_i'}{c_{ei}}$ by modified measure of the relative level of costs for production i - type of

product (in fact, it is the ratio of added cost to value added products). As follows from expression (10), the profit Π_i is uniquely determined by the value of this indicator. At the same time, the total profits of the enterprise based on the above assumptions will be the largest in the manufacture of the type of product for which the modified index of relative spending is the largest (it should be noted that the use of traditional indicator of the relative level of costs do not allow for selection of the best type of product for the company).

Now consider the case where the enterprise produces several products simultaneously, the price at which it can control by altering the natural production of these products.

In this case, the enterprise is generally advisable to produce several products simultaneously and plan production program so as to provide for a given amount of production capacity maximum total profit from the sale of all products. In this formalized form a planning problem can be formulated as follows: to find the value of Q_i , in which the objective function is maximized:

$$Z = \sum_{i=1}^n (U_i'(Q_i) - c_{ei}) \times Q_i \rightarrow \max, \quad (11)$$

and the following conditions are satisfied:

$$\sum_{i=1}^n c_{ei} \times Q_i = B, \quad (12)$$

$$Q_i \geq 0, \quad (13)$$

where: the $U_i'(Q_i)$ price of i - that type products without VAT and expenses depending on the natural output of this type of product, UAH; c_{ei} - unit costs of i - that type products without material costs UAH.; B - the total value of the cost products enterprise without excluding the cost of materials, UAH.

It is important to note that when calculating unit cost excluding material costs under constraints on the total value of the complexity of the production program of the enterprise and the marginal efficiency of target, unlike the previous case, when, as the indicator of choice directions changing the structure assortment of products enterprise used indicator of absolute effectiveness of such calculations should include the following steps: 1) determining the complexity of manufacturing each product; 2) calculation of piece rates for each type of product that enterprise produces; 3) adding to the value of the size of piece-rate charges for social events and the calculation of this index for the entire amount of production of each product; 4) distribution of other costs that do not depend on changes in assortment of products enterprise (this is primarily a fixed cost) in proportion to labor costs of key workers including charges for social events and calculation of cost per unit of each product; 5) summation for each given product unit of labor costs with charges for social events and other costs that do not depend on changes in assortment of products enterprise per unit of output.

It should be noted that only the following sequence of calculations can provide the condition (12).

Suppose that under the current values of the function Q_i (11) still does not reach its maximum value. Under these conditions obviously need to increase the production of certain products (hence reducing their prices) and reduce production of other products (thus increasing their prices). To determine which amounts, primarily products should be increased and which reduce, it is advisable to take advantage of the marginal rate of return i - that type product.

In general, the marginal rate of return i - that type of product can be calculated by the formula:

$$P_i = \frac{d\Pi_i}{d(Q_i \times C_i)}, \quad (14)$$

where: the P_i - the marginal rate of return i - that type given product, the share of unit.

By carrying out a series of transformations, formula (14) can be represented as follows:

$$P_i = \frac{E_i}{P_{ei}} + \frac{1}{P_{ei}} - 1 = \frac{1 + E_i}{P_{ei}} - 1, \quad (15)$$

where: the E_i - elasticities unit price i - that type amount for this type of product, the share of units; P_{ei} - modified index of relative spending on manufacturing i - that type products, share unit.

Using the index (15), we can determine rational directions of assortment enterprise policy, namely: expedient to increase production of those products for which its value is the maximum and reduce production of those products for which the indicator value is minimal (and especially concise). Making such changes is expedient as long as the marginal index of return costs will not be the same for all types of products.

CONCLUSIONS

1. Supply-side potential of the enterprise can be described as the ability of the enterprise to manufacture and sell certain optimum output over time. An indication of potential of this type evaluation can serve the maximum possible size of its operating income for this period of time, or if make an the evaluation supply-side potential in relative terms - the ratio of the maximum possible value of operating profit entity to actual or planned size of the profits .

2. When structuring costs of the enterprise should understand the direction of management, which involves the division costs of the on a group (by type of expenditure, kinds of manufactured products etc.) and establish the best balance between the size of the cost of the various groups in which maximized certain financial performance of a business entity.

3. Assessment of supply-side potential of the enterprise should be based on the use of the optimization approach, with an optimization criterion should be maximum operating profits. A method of structuring

costs of industrial enterprises based on the account of the relationship between the relative level cost structure by product, as well as indicators of demand for it, and the total value of the company profits its operations. Under these conditions, according to the proposed rules regulating the composition and structure of the production program, the enterprise will be able to change the relative level and structure of costs and value prices for their products so as to achieve the maximum amount of profit from operations.

4. Further research on the structuring costs of industrial enterprise in the process of evaluation of its supply-side potential require more detailed consideration when the enterprise produces (or can produce) simultaneously several interchangeable products, the price at which it can adjust by changing the natural production amount.

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