



*Asesorías y Tutorías para la Investigación Científica en la Educación Puig-Salabarría S.C.
José María Pino Suárez 400-2 esq a Lerdo de Tejada. Toluca, Estado de México. 7223898473*

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TÍTULO: Utilizando modelos conceptuales de valor añadido para evaluar la eficiencia de la actividad de estructuras de empresas industriales.

AUTORES:

1. Ph.D. Nina V. Shashlo.
2. Ph.D. Viktor A. Osipov.
3. Ph.D. Alexey A. Kuzubov.

RESUMEN: En el presente artículo se resumen los aspectos teóricos del estudio de la categoría de "valor agregado" de la categoría económica. Se da la característica de los elementos constitutivos de los parámetros clave de valor económico agregado. También se revelan las condiciones de influencia sobre los elementos constitutivos de los parámetros clave de la producción y el valor económico agregado de las estructuras empresariales. Se ha evaluado el grado de control sobre los elementos constitutivos de los parámetros clave del valor agregado económico de las estructuras de producción y de negocios por parte de los temas de gestión.

PALABRAS CLAVES: producción y estructuras empresariales, valor agregado, valor económico añadido, valor agregado de mercado, modelo de retorno de inversión.

TITLE: Using conceptual models of added value to evaluate the efficiency of the activity of industrial enterprise structures.

AUTHORS:

1. Ph.D. Nina V. Shashlo.
2. Ph.D. Viktor A. Osipov.
3. Ph.D. Alexey A. Kuzubov.

ABSTRACT: In the present article, the theoretical aspects of the study of “value added” category of economic category are summarized. The characteristic of the constituent elements of key parameters of economic value added is given. The conditions of influence on the constituent elements of key parameters of the production and business structures’ economic value added are revealed as well. The degree of control over the constituent elements of key parameters of the economic value added of production and business structures by management subjects has been evaluated.

KEY WORDS: production and business structures, value added, economic value added, market value added, investment return model.

INTRODUCTION.

The subjects of the modern economy are production and business structures, and complete systems. Their purpose is to maximize the profitable activity and increase entrepreneurial income. Analysis of the effectiveness of their business and management activities in terms of decision-making are the key factors that influence the performance.

The search for methods for evaluating the effectiveness of business processes that reflect the effectiveness of the use of invested resources is the most important task of the modern economy. The use of classical economic indicators for evaluating the performance of production and business structures does not provide the results of using certain types of both materialized and invested resources. Accordingly, it does not allow to take object-oriented management decisions.

World experience shows the feasibility of using modern indicators to assess the effectiveness of the activities of production and business structures based on the use of a system of value-added indicators.

Accordingly, the implementation of the experience of global corporations and the search for effective assessment methods to obtain an effective and expedient result is the current direction of research.

The growing attention of scientists to the problems of formation of value-added products of production and business structures is not accidental. Since a high level of value added is a necessary condition for an enterprise to achieve sustainable development, one of the main factors of competitiveness in the markets.

Modern business conditions provide managers with unlimited autonomy in making any management decisions and problem-solving methods. Effective decisions made in a timely manner, appropriate strategies for the development of production and business structures are the basis of their successful operation. Most often, decision making is based on an analysis of the current work of the enterprise, as well as its results, achievements, and weaknesses.

In the Russian business, 90% of the methodologies for evaluating the activities of an enterprise are built on the net profit indicator [Petruk and Lutsenko 2016]. A more effective indicator used in the activities of international corporations is the value-added indicator. The managerial decision made on the basis of the results of this indicator allows the company to increase its investment attractiveness, as well as to develop in accordance with the chosen strategy.

The main approaches and available methods for calculating the value-added indicator are considered by many authors. Among them are the works of S. Head [2015], A. Davydov [2017], I. Ivashkovsky [2013], A. Mozenkova [2009], Latkina A.P. [2018], Prokhorov Ye.A. [2011], etc. However, to date, domestic practices have not yet developed methods for calculating enterprise value added, or adapted to the needs of various information users or business specifics. Therefore, the process of developing a methodology for calculating the value added of an enterprise, based on the best achievements of

economics and world practice and taking into account the national peculiarities of activity and the demand for management information, requires further development.

Based on the foregoing, the purpose of this article is to study the economic nature and features of the construction of value-added models of production and business structures within the framework of value-based management, as well as a theoretical synthesis and analysis of variable methods and models for calculating value added.

DEVELOPMENT.

Methodology.

These methods were used as the methodological base of the research: empirical methods (for the analysis of value-added models), a method of synthesis, analysis, induction, analogy (to clarify the essence of the category of value added), a method of grouping and generalization (for systematization of value-added models).

Results and discussion.

The variability of the authors' approaches to the essence of the concept of value-added definition, affects the complexity of the methodological support for their calculation. After analyzing a number of scientific positions and opinions of researchers, it is worth noting that value added is a necessary indicator for the effectiveness of an enterprise's activities' assessment. Figure 1 offers an interpretation of the essence of value added from the viewpoint of various scientific approaches.

Value added is a part of the value of products, which is formed by modifying the acquired raw materials and materials, using labor, technology, and innovation. It covers the costs incurred by the production and business structure in creating the product, ensuring profit. This indicator is a reflection of the varied interests of the stakeholders, and acts as an indicator of the development trends of the production and business structure.

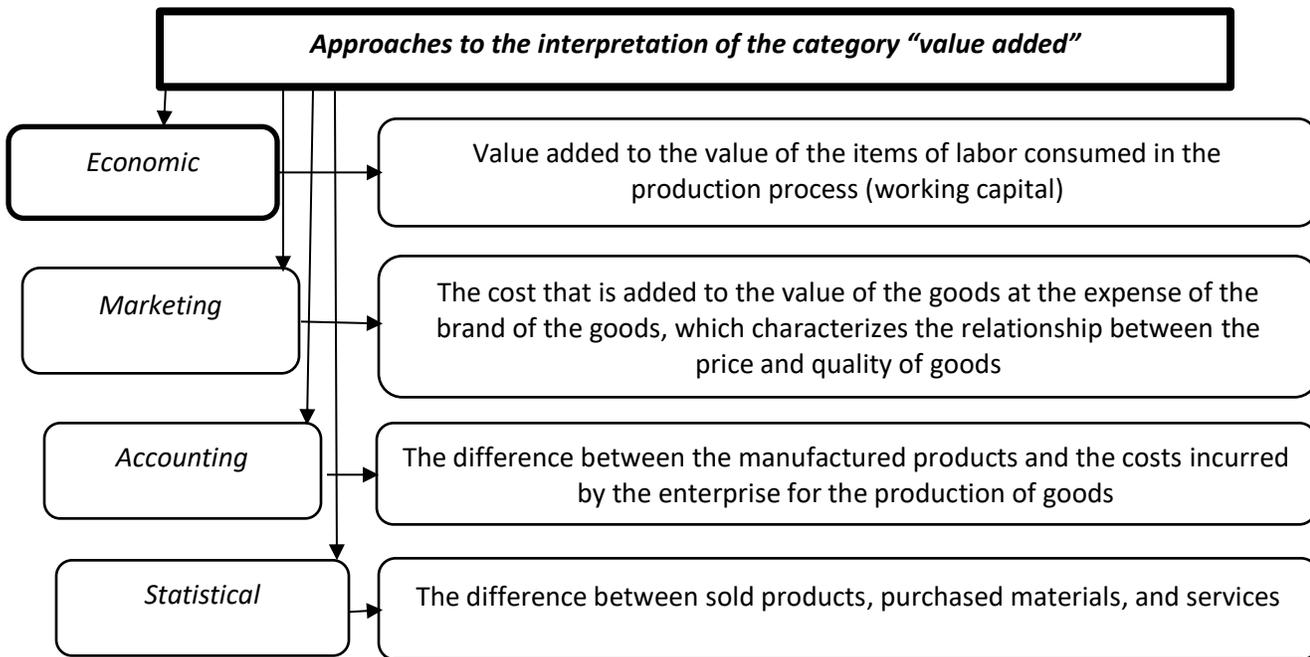


Figure 1 - The multiplicity of scientific approaches in the interpretation of the category "value added".

The cost increase is an indicator of the efficiency of the production and business structure. It also determines the vectors of strategic management decisions and actions of owners and managers. Owners, investors and managers have different goals and priorities in the management of an enterprise [Brovko and Petruk, 2017; Etcuban & Pantinople, 2018].

Figure 2 shows the integrated dependence of the types of enterprise value and business stakeholders. The investor is interested in the attractiveness of the production-entrepreneurial structure, in terms of its level of profitability (which must exceed the barrier rate of return of the investor), as well as the level of investment risk of the enterprise compared to others. Unlike the investor, the owner must constantly take care of increasing the profitability of the enterprise. He also sets himself the task of developing a business, increasing sales, and reducing costs. The long-term goal of the owner is to increase the value of the enterprise in order to profitably sell part of its share to the investor in the future.

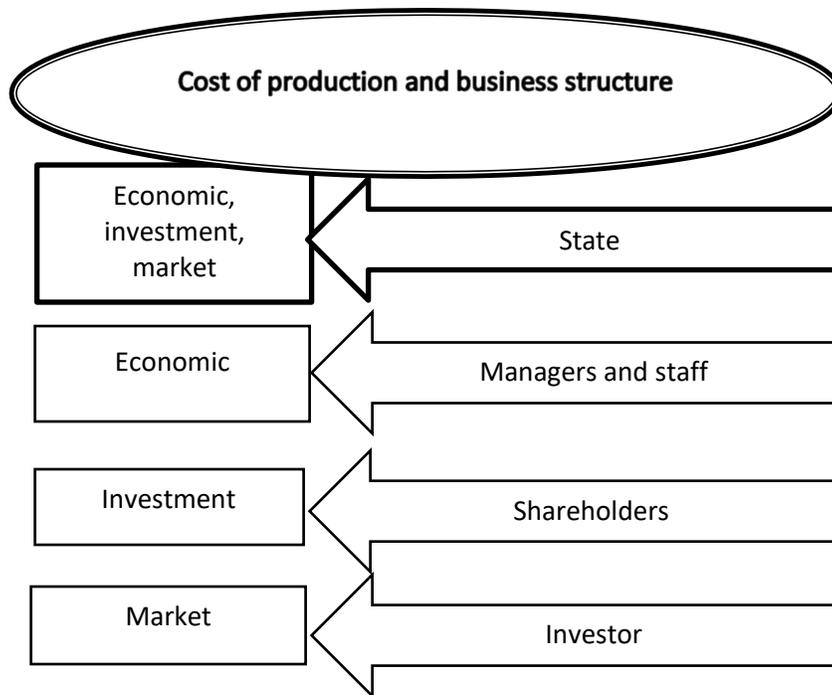


Figure 2 - Ratio of interests of stakeholders and types of value of production and business structure.

Thus, the owner is primarily interested in the problem of increasing the value of the invested capital. If we analyze the interests of all participants in entrepreneurial activity, it is obvious that their goals and ways of achieving goals are very different from each other. It is the economic value added that is generated by an enterprise, which is a factor that is designed to unite all interested participants in business activities.

Economic value added is the primary in the enlarged system of enterprise value. A new philosophy of cost management is the concept of economic value added, economical value added (EVA), which says that the value of an enterprise increases when an enterprise receives such a result from invested capital [Shashlo et al. 2017], which exceeds the cost of raising this capital.

In foreign practice, for the first time they began using and calculating the value-added indicator in France in the 1930s – 1940s. [Nedoluzhko, 2018] The calculation of value added was made on the basis of deducting the cost of consumed goods and services from the volume of goods produced. In

the mid-50s of the twentieth century, V. Suoyanen developed the concept of the enterprise. According to this concept, it was planned to compile a report on value added with information about its distribution among the participants in the process of its creation, and the shares aimed at business development. This aspect was put into practice in the 70s in Germany, France, Great Britain and South-African states [Nedoluzhko, 2018; Kuzubov et al. 2018; Osipov et al. 2017; Avazzadeh, 2015; Millanei et al, 2016]. The study of reports of corporations allows us to distinguish the following methodological approaches to the definition of value added. In Germany, value added does not include depreciation, but it contains all the income, indirect taxation, and leasing. In France, value added in most cases was calculated by adding components (profit, depreciation, staff costs, other operating and financial costs) or deduction (operating income minus the cost of raw materials and materials). In domestic practice, the latter method is the most common, because it generally reflects the concept of value added, and it is simple to calculate.

So, the presence of a large number of flaws and contradictions regarding the report of added value, led to their leveling. And the indicator of value added today is sufficiently studied in the literature and used in management accounting of enterprises and in the preparation of management reports. There are a number of indicators that reflect the conceptual essence of value added and vary depending on the end user, and the characteristics of the business.

The presence of variability in the models of value-added formation and its assessment implies the need to study the advantages and disadvantages of each of them. Economic Value Added (EVA) was patented by Stern Stewart & Co consulting company in the early 90s of the 20th century. This model is the most common one, and is used today by more than 300 companies, among which are the well-known TNCs (Coca-Cola, Siemens, Whirlpool, IBM).

$$\text{EVA} = \text{NOPAT} - \text{WACC} * \text{IC} \quad (1)$$

$$\text{EVA} = (\text{ROIC} - \text{WACC}) * \text{IC} \quad (2)$$

NOPAT (EBI) is net operating income after income tax, but before interest payments.

$$\text{NOPAT (EBI)} = \text{EBIT} * (1-T) = \text{NI} + i * (1-T) \quad (3)$$

Where EBIT - profit before interest and taxes,

T - the rate of income tax,

NI - net profit,

i - interest expenses,

ROIC - return on invested capital,

$$\text{ROIC} = \text{NOPAT} / \text{IC} \quad (4)$$

WACC is the weighted average cost of capital.

IC - invested capital,

WACC * IC - capital costs.

This model is based on the adjustment of the indicator of economic profit on the cost of invested capital. The idea of the indicator is the need to build the work of the enterprise in such a way, as to ensure the level of return on raised capital is higher than on the cost of attracting it. So, evaluating the results of the enterprise, it is necessary to take into account not only the operating activities, but also the missed opportunities (profits that the company could receive from alternative sources of capital investment). The EVA approach is based on discounting the indicators: growth in sales, operating margin, tax burden, and investments in a specific period. The main advantages and key aspects of this model are:

- Ease of calculation and use.
- Ease of interpretation of the results, and the ability to identify problems at the initial stages.
- Use as a base of employees' motivation.
- Use as a criterion of the need for M & A projects (by comparing the projected profitability of a new asset with the capital required to attract it).

- Use as a criterion for optimizing the capital structure (comparing the costs of using own and borrowed).

This model requires the use of related indicators and coefficients for determining performance. Also, it does not take into account cash flows (CF) and is difficult to calculate, because it requires a large number of adjustments to balance data. However, this indicator is a weighty alternative to the indicators used by domestic enterprises to evaluate activities due to the fact that the development of corporations leads to the need to apply a business valuation method adapted for the interests of both the owners and the management.

Further development of the concept of economic value added led to the emergence of the concept of market value and its assessment based on the MVA indicator.

$$MVA = MVD + MC - TC \quad (5).$$

Where MVD is the market value of the debt.

MC - market capitalization.

TC is the amount of capital.

This indicator is most often used to assess the satisfaction level of a capital supplier. The model is not widely used due to several disadvantages:

- Leveling the value of intangible assets of the company or their accounting at the minimum conditional value.
- The absence of adjustments to the value of assets with regard to time.
- The possibility of adjustments to the results of the indicator by the managers of the enterprise.

This model should be applied only to large enterprises that are capital market oriented.

The following value-added model estimates the return on investment based on cash flow (CFROI), and resolves one of the shortcomings of the economic value-added model.

$$CFROI = CF^{adj} / CI^{adj} \quad (6).$$

Where CF^{adj} - cash flows adjusted for inflation.

CI^{adj} - investments adjusted for inflation.

This indicator takes into account the time factor and inflation, i.e. all cash flows (including future periods and initial investments) are adjusted for current prices, and consequently, are reduced to one base, which minimizes the inaccuracy of the calculation. But this indicator is quite difficult in the calculations, because the calculation of the cash flows of the company, which are generated at this stage and will be generated in the future through the use of future assets, is a time-consuming task. Given the fact that the indicator is also based on forecasts, there is a possibility of errors and inaccuracies in the results.

The cash value added (CVA) model demonstrates the difference between the cash flow from strategic activities and the cash flow from current activities.

$$CVA = CBI_j - NA_0 * WACC \quad (7)$$

$$CVA = OCF - OCFD \quad (8)$$

Where CBI_j - net cash flow before interest payments; $CBI_j = EBI_j + Dep_j - ED_j$ (9)

NA_0 is the net assets at cost,

EBI_j - Operating profit,

Dep_j - accounting depreciation,

ED_j - economic depreciation,

$$ED_j = (GFA_j * WACC) / ((1 + WACC)^n - 1)$$

$$OCF = NS - OpEx - \Delta WC - MI \quad (10)$$

Where GFA is the depreciated non-current assets at historical cost,

OCF - actual operating cash flow,

$OCFD$ - required operating cash flow,

NS is the net sales revenue,

$OpEx$ - operating expenses,

ΔWC - increase in current assets,

MI - supporting investment.

This indicator not only affects cash flows, but also takes into account the costs of raising and maintaining capital. In fact, this model is based on a modification of the internal rate of return on investments. But under this approach, IRR is calculated for already invested capital, and not as a criterion of project efficiency (in the traditional use of IRR for future investments with a view to deciding whether a project is appropriate).

The complexity of the calculation of the indicator is explained by the fact that, it assumes the consideration of the company's activities as a combination of costs and investments that generate income and profit. Investments are divided into strategic and supportive ones. Strategic investments generate profits and increase the value of the company. Supportive refers to the cost of operating activities that do not create additional value, but are a necessary component of the production process, and maintain the current level of enterprise value.

This model demonstrates the timing of the enterprise's activities, taking into account all costs and investments for a certain period, subject to the creation of added value. In addition, the model's indicators (actual and required operating cash flow) demonstrate the totality of funds that an enterprise should receive to create value added (strategic investments). So, a model can be one of the tools for strategic enterprise management due to the possibility of differentiating input data and modeling the most favorable timing, provided that the value added is maximized.

The Shareholder Value Added Model (SVA) is an effective method for making operational and management decisions for the short term. The basis of the model is shareholder value added, which is defined as an increase due to the performance of a specific operation, and project implementation. The use of this indicator is effective in managing the development of an enterprise, because it gives

an idea of the effectiveness of the work of managers in a certain short-term period, but does not give an idea of the effectiveness of a business strategy.

The value-added model for stakeholders has two analysis vectors. I. V. Ivashkovskaya considers the correlation between the results of the enterprise's activities and the interests of the stakeholders through the use of the economic profit indicator. She believes that evaluation and interaction with stakeholders are the main conditions for building an effective business strategy and effective management in a modern economy. According to her model, the cost for stakeholders is formed in the process of creating streams of economic profits. This model refers to a new type of break-even analysis of the company from the standpoint of the company's financial model and its key criterion - economic profit [Ivashkovskaya, 2013; Ismail et al, 2018].

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$$RII = \sum_{t=1}^n P_{V_{RII}} / \sum_{t=1}^n PV_{INVE} \quad (11)$$

Where RII – index of accumulated economic profit.

$\sum_{t=1}^n P_{V_{RII}}$ - the present value of economic capital,

$\sum_{t=1}^n PV_{INVE}$ - present value of investment.

Another variant of the value-added model was developed by K. O. Prokhorov based on the resource approach of building interaction between the company and stakeholders.

$$V_i = \sum_{n=1}^N \frac{R_{in} - C_{in}}{(1 + d_0)^n}, \quad (12)$$

Where V_i - the value of the company created by the interaction of stakeholders,

R_{in} - cost of resources received,

C_{in} - cost of resources expended,

d_0 - discount rate,

N - duration of the forecast period.

The scientist notes that the participants' expectations of obtaining benefits at a level that is not less than the value of the costs incurred, necessitate the maximization of value added. With the growing positive utility of actions, there will be an increase in the volume of transactions up to the exhaustion of the available resources. In the case of diminishing marginal utility of resource flows, the subjects will increase the exchange until the marginal income of one of them becomes equal to marginal expenditure. Simultaneous maximization of the company's value and the value of its stakeholders, taking into account synergy, leads to maximizing the contribution of this system to the public welfare [E. Prokhorov, 2011; Feizuldayeva et al, 2018].

Thus, on the basis of generalization and systematization of scientific approaches to the justification of methods, approaches to the determination of the value added indicator, five methods for determining value added are distinguished: economic value added, shareholder value added, money value added, market value added, and return on investment based on cash flow value added for the stakeholders.

As noted earlier, it is the economic value added that is the unifying factor for all the interested participants in business activities. Summarizing the methodological approaches to the formation of the EVA factor system, in Figure 3 we present the main parameters of the EVA model (NOPAT, WACC and CE). Also, the factors that determine them, from the point of view of the influence of management and top managers of the production and business structure on them are shown.

As can be seen from Figure 3, only a few factors are not subject to complete control by the management. At the same time, the size and dynamics of most factors can -and should be- influenced, in order to maximize the value of EVA. In the case when none of the controlled factors can be changed, the business loses its attractiveness and is liquidated. A sound system of indicators can be integrated into strategic management [Terenteva et al. 2018; Carreto et al, 2018] and the system of analysis, planning and control in enterprises of various industries (as part of the cost management strategy), and also be used by external investors to provide analytical support for making financial decisions on investing in this industry.

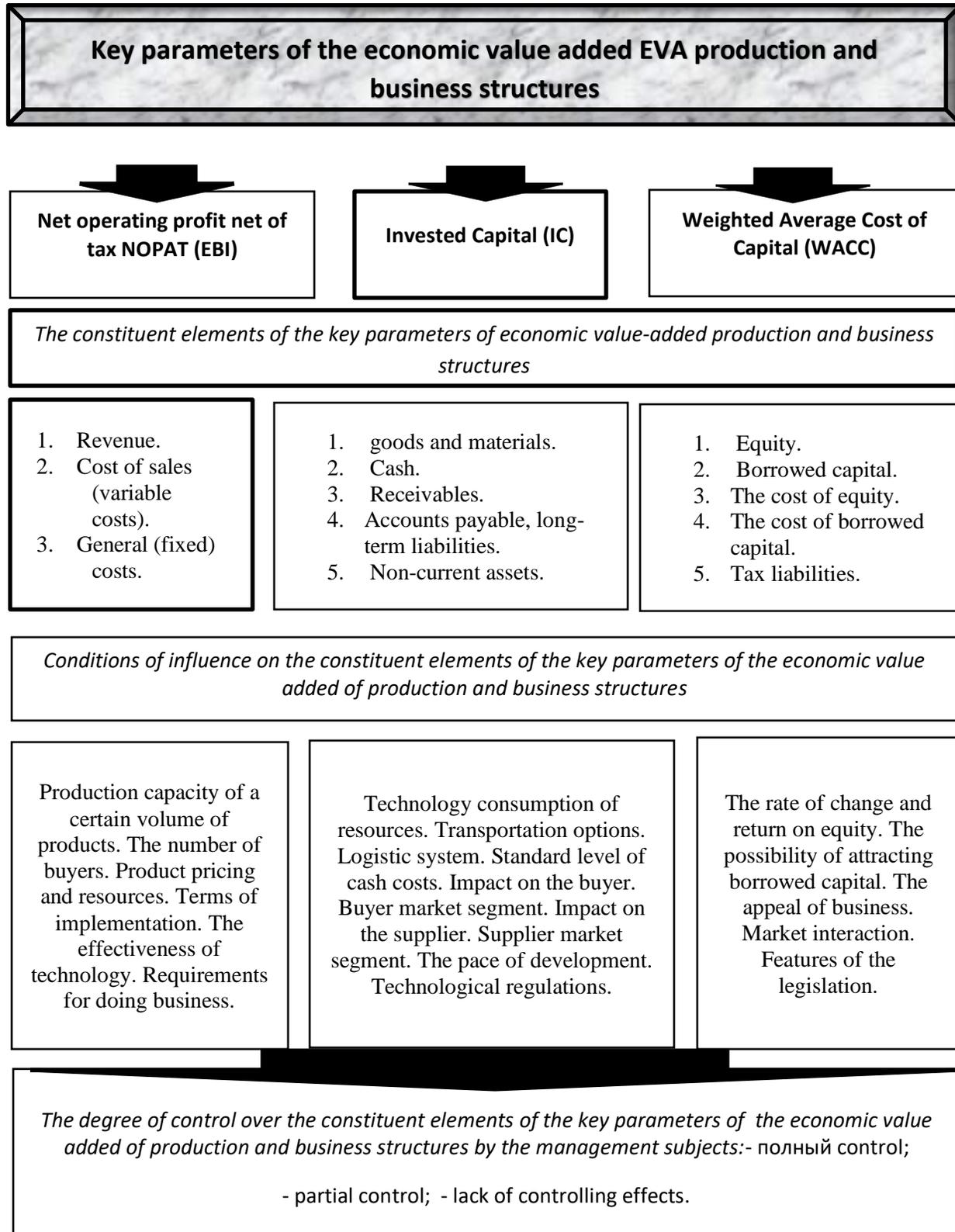


Figure 3 - Key parameters of EVA and the degree of influence of the management of the production and business structure on cost factors.

CONCLUSIONS.

This study made it possible to conclude that value added is part of the total cost of goods. It reflects the real contribution of the production and business structure to the creation of a specific product. Defining the factors that form the value added of the products, it was found that the material costs do not depend on the efforts of the producers and therefore they are included in the price of the goods. Such components as wages, profits, deductions for social events and depreciation are value added, since they are those parts of the goods' total value that are created at a particular stage in the production of goods.

The analyzed value-added models are characterized by a general focus on determining the value of increase in the value of enterprises within the framework of the implementation of the concept of value-oriented management. The value-added models evaluate the results of the enterprise, taking into account the relevant costs, reflect the interrelation of cost-forming processes in the enterprise with investment as one of the main factors of economic growth, take into account the efficiency of formation and use of the enterprise's capital.

The value-added models differ significantly from each other according to the methodology for assessing the final results of the enterprise's activities and the costs of achieving them, the information base for the calculations, and the degree of consideration of benefits for stakeholders. The theoretical generalization of models for determining value added allows us to note that each of them has advantages and disadvantages, and is effective for use only under certain conditions. Business analysis and the practice of applying these approaches to the calculation of the efficiency of production and business structures demonstrates the need to popularize the value-added indicator, and the need to calculate it on an ongoing basis. The drawbacks of each of the models could be leveled out by building a comprehensive assessment of the enterprise's activities using several approaches that maximize the strengths of each of the models and minimize the drawbacks. At the moment, in

our opinion, the most adapted models for estimating value added are the EVA, CVA, and SVA models.

The EVA model is relevant for assessing the effectiveness of running a business both from the perspective of the owner and the management. It also allows you to create a base for evaluating the results of staff, investment growth, and optimization of all business processes in an enterprise in accordance with the strategy. The CVA model allows for the most detailed consideration of the company's Cash Flow, which is an important basis for making management decisions for both the current and long-term perspective. It minimizes the risk of a lack of funds as well. The SVA model is effectively used in management decision making and business valuation in the short term. The combination of these models in changing business conditions and decision making is the most effective concept of strategic management.

Further research in this direction will be related to the adaptation of models to specific industries, and the current conditions of doing business in Russia and the development of their own indicators for calculating the efficiency of doing business within a combination of existing models and their modification.

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DATA OF THE AUTHORS.

1. Nina V. Shashlo. Candidate of Economic Sciences, Associate Professor of the Department of Economics and Management FSBEI of HE "Vladivostok State University of Economics and Service".

2. Viktor A. Osipov. Doctor of Economics, Professor of the Department of Economics and Management FSBEI of HE "Vladivostok State University of Economics and Service".

3. Alexey A. Kuzubov. Candidate of Economic Sciences, Associate Professor of the Department of Economics and Management FSBEI of HE "Vladivostok State University of Economics and Service".

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