Sustainable Development of Methods for Assessing the Economic Efficiency of Enterprises under the Conditions of Business Intellectualization

Denys Vasylychev[a], Sergiy Tsviliy[b], Darya Gurova[c] and Olena Halan[d]
National University «Zaporizhzhia Polytechnic», Zaporizhzhia, Ukraine

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Abstract: The content and stages of business efficiency analysis were determined. It is established that for the purpose of assessing the business management of the enterprise, science and practice have developed economic indicators that model economic phenomena and are designed to assess the economic performance of an enterprise or its business activity under the conditions of business intellectualization. It is proved that business efficiency is measured in one of two ways, reflecting the performance of the enterprise in relation to either the amount of resources advanced or the amount of their consumption (costs). To assess the efficiency of a business, a system of indicators is used, it includes both private and generalized indicators of efficiency. The proposals on the formation of generalizing indicators of economic efficiency at the macro- and micro-level are considered. When building a model of economic efficiency of business using the resource approach, the concepts of advanced variable capital and applied variable capital are used. To calculate the economic efficiency of business using the resource approach, it is necessary to take the ratio of the result, which is commodity capital in monetary form, and the cost of resources of human and social labor.

1 INTRODUCTION

Assessment of business efficiency of an enterprise is the final stage of financial and managerial analysis. Analysis of overall business efficiency is the prerogative of the highest level of enterprise management. Efficiency (success) of private management decisions should be evaluated from the point of view of overall success of the enterprise, its long-term survival in the context of the intellectualization of business.

In modern conditions, in the period of high competition, the goal of enterprises is to maximize profits with minimal costs (Rzaev, 2011).

For the purpose of assessing the business management of an enterprise, science and practice have developed special tools, which are called economic indicators. Economic indicators model economic phenomena. They are designed to measure and evaluate the essence of economic characteristics, economic efficiency of an enterprise's business or its business activity.

Also, scientific research needs methodological approaches to the selection of components and criteria for assessing the economic performance of enterprises, identifying reserves and opportunities for their functioning, as well as the use of economic and mathematical methods for forecasting their further development.

Thus, the purpose of the article is to investigate the methods for assessing the economic efficiency of enterprises under the conditions of business intellectualization and growth of their profitability.

[a] https://orcid.org/0000-0002-5057-7575
[b] https://orcid.org/0000-0002-1720-6238
[c] https://orcid.org/0000-0002-3180-0348
[d] https://orcid.org/0000-0001-6061-5224

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2 THEORETICAL BASIS OF RESEARCH

Intellectualization of economy and business is a complex system economic category, the methodology and evaluation of which require both a systematic approach and a comprehensive approach because of the need to justify management decisions in the context of limited resources.

This situation is characterized, first, by the need for its characterization at different levels of management − individual, enterprise, sectoral, regional and national. Secondly, the need for monitoring and diagnostics not only in statics, but also in dynamics, in the structural aspect. Thirdly, the expediency of determining the measure of effectiveness of the use of unpopular capital as a realization of intellectual potential. Fourthly, the need to provide feedback on the effectiveness of public policy in the business environment. Fifth, the formation of conclusions about the role of intellectualization in the process of economic and business development.

2.1 Stages of Business Efficiency Analysis

Finding a solution to the problem of improving the performance of enterprises in the process of intellectualization of business can be achieved through the development of methods for analyzing the effectiveness of enterprise business processes. Therefore, this actualizes the research in the field of management of enterprise business intellectualization on the basis of the development of models for assessing the economic efficiency of enterprises.
Schematic content of business efficiency analysis is shown in Figure 1.

As can be seen from the scheme, which is presented by A.D. Sheremet, a comprehensive assessment of the economic efficiency of business is an integral part of the managerial and financial analysis (Sheremet, 2011). The article will focus on the analysis and management of economic efficiency of enterprise business.

The modern economy is distinguished by two features:

– complete economic isolation, independence and responsibility of enterprises as subjects of the market;

– uncertainty of market conditions, as a consequence of free establishment by the enterprise of business relations with partners, and free prices and tariffs for products.

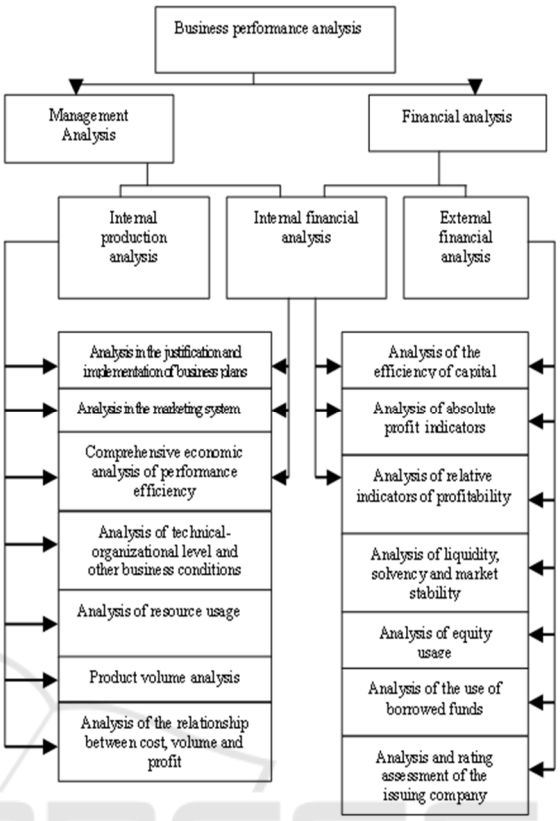

Figure 1: Scheme of the content of business efficiency analysis (Sheremet, 2011).

Under these conditions, the central task of management is to minimize business risks on the basis of the assessment of each decision in terms of the possibility of extracting economic benefits. This creates objective prerequisites for increasing the role of methods for analyzing the economic efficiency of an enterprise's business. This requires modernization of the methodology of this analysis, improvement of methods of enterprise business economic efficiency management.

For the purpose of assessing the business management of an enterprise, science and practice have developed special tools that are called economic indicators. Economic indicators model economic phenomena. They are designed to measure and evaluate the essence of economic characteristics, economic efficiency of an enterprise's business or its business activity.

Further we will consider indicators of business efficiency used in the enterprises of Ukraine. Economic efficiency penetrates all spheres of practical human activity, all stages of social production, is the basis for construction of quantitative criteria and value of decisions made.

2.2 Theory and Methodology of Performance Evaluation

Currently, the most complete and consistent study of economic efficiency of business (disclosure of the subject of analysis) is given in the theory of comprehensive economic analysis. All sections of current, prospective and operative analysis are devoted to efficiency analysis. It evaluates achieved business efficiency, reveals factors of its change, unused possibilities and reserves for increase (Mykytiuk, 2018).

Business efficiency is measured in one of two ways, reflecting the performance of the enterprise in relation to either the amount of resources advanced, or the amount of their consumption (costs) in business processes.

In the system of economic indicators, some characterize the effectiveness of a single type of product (vertical feature of management), others − all types of products or services (horizontal feature of management). There are generalized and private indicators of business efficiency. The first ones characterize the effectiveness of the use of total labor costs; the second ones characterize the effectiveness of the use of individual types of labor costs.

The ratio of the results of labor to the inputs of live labor reflects a subsystem of indicators of productivity or output of live labor. The ratio of labor results to past labor costs (production costs, equity capital, cost of production funds), which includes the overwhelming part of total labor costs, represents a subsystem of indicators characterizing efficiency of past labor (productivity of funds, productivity of materials, turnover of current assets). Finally, the ratio of the results of labor to the total expenditures of the enterprise is a subsystem of indices characterizing the efficiency of production of concrete products. Advantages and disadvantages of methods of measurement of each of efficiency indicators are caused by contradictory sides of indicators, which express the results of business (Babenko, 2010).

The most important indicator of efficiency is the productivity of live labor. The most obvious characteristic of productivity of live labor is an indicator equal to the ratio of the volume of output in kind, taking into account quality indicators, to the cost of live labor. Prices have a great influence on the indicator of the output of live labor, calculated in value terms by net or net output (Babenko, 2010).

Indicators of return on assets (cost of goods), material output (cost of materials), the level of profitability should be distinguished depending on whether they refer to the output of one type of product or its entire range. Thus, fixed assets, in some cases, it is difficult to attribute to the production of a particular type of product. Among them there are general-purpose fixed assets. Circulating capital is not subject to such a division at all. Therefore, turnover of current assets is determined in relation to all products.

In the indicators "productivity", "yield of funds", "productivity of materials", "turnover ratio" the overall result − the volume of output − is correlated with a business factor. The listed indicators can be multidirectional. Each of them characterizes the efficiency of inputs of live or past labor (Salyha, 2001).

The correlation between the dynamics of output and the dynamics of results (costs) determines the nature of economic growth. Business economic growth can be achieved both extensively and intensively. The excess of the growth rate of output over the growth rate of resources or costs indicates predominantly intensive economic growth.

To assess the efficiency of a business, a system of indicators is used – profitability of capital, resources or products. Business activity of an enterprise, in the financial aspect, manifests itself, first of all, in the rate of turnover of its funds. The profitability of an enterprise reflects the degree of profitability of its business. The analysis of business activity and profitability lies in the study of levels and dynamics of various financial ratios of turnover and profitability, which are relative indicators of enterprise financial results (Horodynska, 2008).

Thus a system of indicators is used to evaluate business efficiency. This system should include both private and generalizing performance indicators. A generalizing indicator should give an integral estimation, characterizing efficiency of usage of all kinds of resources (costs) of enterprise.

None of these economic indicators can be generalizing, because the result of activity does not meet the costs. The generalizing indicator should, by construction, meet the principles of business efficiency management.

Next, let us consider the proposals available in the economic literature on the formation of generalized indicators of economic efficiency at the macro- and microlevel.

2.3 The Theory of Formation of Economic Efficiency Indicators at the Macro Level

The foundations of the formation of the theory of production efficiency, which characterizes the ratio of

results and costs, should be attributed to the moment of analysis of the two factors of goods: consumer value and value, disclosed by K. Marx (Marx, 1983). Forming economic laws of time saving and growth of labor productivity per unit of consumer value K. Marx notes: "In general, the greater the productive power of labor, the less labor time required for production, the less labor mass crystallized in it, the less its value (Marx, 1983).

The mathematical interpretation of the law of economy of time, according to K. Marx's theory, can be represented by expressions:

$$\frac{t_1}{Q_{n1}} > \frac{t_2}{Q_{n2}} \quad (1)$$

$$\frac{c_1 + V_1 + m_1}{Q_{n1}} > \frac{c_2 + V_2 + m_2}{Q_{n2}} \quad (2)$$

where t_1/Qn_1; t_2/Qn_2 – the time required to produce a unit of use value Qn_1, Qn_2, in the base period and the new period; c_1, c_2 – permanent capital in the base period and the new period;

V_1, V_2 – variable capital in the base period and the new period;

m_1, m_2 – surplus value in the base period and the new period.

The law of the growth of the productive power of labor, in fact, is interrelated with the law of economy of time and can be represented by the expressions:

$$\frac{Q_{n1}}{t_1} < \frac{Q_{n2}}{t_2} \quad (3)$$

$$\frac{Q_{n1}}{c_1 + V_1 + m_1} < \frac{Q_{n2}}{c_2 + V_2 + m_2} \quad (4)$$

The mathematical representation of the laws of saving time, and the growth of the productive force of labor makes it possible to determine what constitutes an indicator of general and comparative economic efficiency (Marx, 1983).

The theory of efficiency was developed in the 20s of the twentieth century. It was conditioned by the solution of the problem of rational use of capital investments, comparison of options in the development of projects for the construction of power plants, railroads, land reclamation facilities. In the mid-20s of the twentieth century, the problem of efficiency began to be posed as a problem of determining the efficiency of capital investments for individual industries and industry as a whole. Over time, the problem of efficiency becomes a broader one, and finally, the debate about it develops into a dispute about economic efficiency (Salyha, 2001).

The subject of the discussions was the key issues – the content of the category of efficiency of social production, criteria and indicators of efficiency at the level of society and enterprise, ways to measure it, etc. H. Abezhauz, V. Akulenko, M. Barun, H. Burshtein, F. Vinnik, R. Holdberg, A. Kalmanovsky, V. Krasovsky, L. Litoshenko, Yu. Mitlyansky, P. Maslov, S. Rosentul, J. Rosenfeld, A. Segal, M. Smith-Falkner, S. Strumilin, Sh. Turetsky, H. Feldman, N. Shaposhnikov, L. Yushkov, etc. took an active part in the discussion. However, at that time economists failed to come to a common position. Many of their valuable thoughts were not understood by their contemporaries (Salyha, 2001).

It is not the purpose of this article to review the development of the theory of economic efficiency. These issues have already been addressed by some authors. The task is to identify when for the first time the authors put forward the idea of determining the relationship of private indicators of economic efficiency in a single integral or synthetic indicator.

At the macro level, as a generalizing indicator of economic efficiency, scientists suggest using the ratio (Vorst, 1994):

$$E = \frac{V}{L_{in} + M + \gamma F} \quad (5)$$

where V – pure product with regard to its composition and quality;

L_{in} – labour input;

M – current costs of material labor;

F – one-time investments in production assets;

γ – the coefficient of reduction to a single dimension, which allows to sum up the costs and investments.

This formula conceptually reflects the essence of the construction of the indicator. But it is impossible to use it in practice, because it is not clear how to express the coefficient of conversion. It is not clear what is the cost-of-living labor is. The formula differs in its construction from the mathematical expression of the law of productive labor force. There is no criterion (threshold standard) of judgment about efficiency.

The study of the efficiency of social production would be incomplete without considering production functions that characterize the dependence of output on production factors (Vasyl'yva, 2021). The first version of such functions is the Cobb-Douglas production function, which considers the dependence of output on only two factors − capital and labor:

$$V = A \cdot K^{\alpha} \cdot L^{\beta}, \quad (6)$$

where V – production volume;
K – production funds;
L – labor force;
A, α, β – parameters of the function;
A – coefficient of proportionality or scale;
α, β – coefficients of output elasticity by capital and labor, which characterize the increase in output per 1% increase in the corresponding factor of production.

This expression was improved by a number of researchers, including economists A. Solow, E. Denison, A.I. Anchishkin, S.M. Veshnev, P.F. Pochkin, Y.L. Shtern, O.O. Vasyl'yva who proposed to consider in the form of special coefficients such factors as qualification of workers, technical level of production, etc. As a result, the Cobb-Douglas function acquired the following generalized form (Holovenko, 2016):

$$V = A \cdot K^{\alpha} \cdot L^{\beta} \cdot e^{Rt}, \quad (7)$$

where: e^{Rt} – a factor that denies the impact of qualitative changes in production, including technological progress.

Expressed in terms of the average annual growth rate, the function is transformed and has the following form:

$$I_o = \alpha I_к + \beta I_{ch} + R \quad (8)$$

where: I_o, $I_к$, I_{ch} – the growth rates of production, production funds and labor force, respectively;

R – a complex index of growth of the total economic efficiency of all production factors (Holovenko, 2016).

According to the authors of this article, if we use the Cobb-Douglas production function, business efficiency can be expressed by the ratio of output (in value terms) to costs:

$$E = \frac{V}{AK^{\alpha}L^{\beta}} = 1 \quad (9)$$

The above considered mathematical models of the formation of economic efficiency indicator at the macro level.

2.4 The Theory of Economic Efficiency Indicators at the Micro Level

In theory and practice, the level of profitability of business processes is preferred as a generalizing one (Kudrenko, 2014). This statement is controversial for a variety of reasons. Firstly, profit is not the result only of the turnover of production assets. Secondly, this indicator (numerator) can increase due to the growth of prices, while other efficiency indicators can worsen. As a consequence, productivity of funds, material productivity, and productivity of live labor will decrease. Thirdly, during the period during which profits will be made, current assets will make many turns, and fixed assets will serve only a part of their service life. Fourth, the authors of this article believe that for purposes of measuring the business performance of an enterprise, fixed assets and current assets cannot be added up, despite the fact that these components are measured in cost units.

Thus, in order to evaluate the performance of an enterprise, Ohon C.H. proposes to introduce the coefficient of active costs, defined as the ratio of active costs to the cost of production (Ohon, 1996). In this case, active costs are understood as labor costs, the cost of introducing new technologies. Such an indicator has the right to exist. However, it cannot be classified as a generalizing indicator. It does not reflect the overall performance of the enterprise and the resources (costs) to obtain them.

Of scientific interest is the proposal of some authors to use the following ratio as a generalizing one (Salyha, 2007:

$$E = \frac{I_A + I_{zp} + P}{C_{Of} + C_{OC}} \quad (10)$$

where I_A – amortization charges;
I_{ZP} – labor costs;
P – balance sheet profit of the enterprise;
C_{Of} – average annual value of fixed assets,
C_{OC} – average annual value of current assets of the enterprise.

As a justification of this indicator the authors note that in this formula "depreciation charges represent the degree of use of fixed assets, while wages and profits represent the degree of use of current assets" (Salyha, 2007).

It is difficult to fully agree with the proposals of some authors for various reasons, namely:

having taken the economic efficiency indicator as a ratio of results to costs as the basis for formation, the authors substituted results for costs,

including depreciation, labor costs and profits. For example, the ratio of depreciation to the cost of fixed assets is an indicator that characterizes the rate of depreciation, i. e. the number of turns of fixed assets per year;

the authors' notion that wages and profits characterize the degree of use of current assets is controversial. After all, current assets are designed to ensure the circulation of material costs, remuneration of labor, and participate in the formation of profits. But profit is not a consequence of turnover of current assets only;

fixed assets and current assets are for all the costs of living and public labor, necessary for the production of products;

costs do not include intangible assets as an element of resources;

according to L.N. Drahun the most generalized assessment of production efficiency is given by the coefficient of the marginal level of net profit. It is determined by the ratio of net profit to the volume of commodity production. To solve the problems of intrafarm operational analysis offer the indicator of the specific reduced costs, determined from the ratio of the annual costs to the volume of marketable products. Reduced annual costs are calculated as the sum of production costs and the amount of fixed assets, current assets and labor, expressed with the coefficients of conversion. These coefficients are determined by the ratio of the value of taxes (VAT, profit tax, land tax, excise tax, etc.) to the cost of fixed assets, current assets and payroll with social charges, respectively (Drahun, 2000).

This proposal is controversial for the following reasons. First, there is no criterion for judging the effectiveness of the decision. Secondly, the coefficient of the marginal level of net profit (profitability of marketable output) is a private indicator, if only for the reason that profit is not the result (consequence) of marketable output (reason). Third, the authors lose sight of the fact that the annual cost should express the cost of labor and capital labor on output. Fourthly, they overlook the fact that circulating capital ensures the turnover of material costs, sales of products and labor remuneration. In other words, current assets contain part of the cost-of-living labor. Therefore, there is double counting in the assessment of labor resources.

R.M. Petukhov's proposal for assessing the efficiency (Petukhov, 1987):

$$E = \frac{V_B}{C} = \frac{V_B}{I + E_n \cdot (C_{of} + C_{OC} + K_b)} \quad (11)$$

where E – coefficient of economic efficiency of production;

V_B – annual gross output, calculated in comparable wholesale prices;

C – total reduced costs;

I – annual production costs of the given production unit;

E_n – normative coefficient of economic efficiency of capital investments;

C_{Of} – average annual cost of fixed production assets;

C_{OC} – current assets;

K – economic evaluation of human resources.

Here K_b is interpreted as the cost of professional training, as investment in the training of personnel.

R.M. Petukhov believes that the proposed indicator can be used to compare the economic efficiency of businesses in different sectors of the economy.

Let us give a critical assessment of this proposal. Essentially, the indicator reflects the ratio of the volume of gross output and the costs, which are necessary for the output. Consequently, the criterion for choosing the option should be the condition in which the numerator exceeds the denominator, i.e. the indicator is greater than or equal to one. But such a condition should be observed at every enterprise when business results exceed the present annual costs. If this condition is not met, the enterprise is operating at a loss. This conclusion leads to the following conclusion: firstly, this indicator is not suitable for comparing the economic efficiency of businesses. Secondly, the normative indicator of economic efficiency of investments is absent in the statistical and financial statements of the enterprise. Thirdly, the author overlooked the fact that the product $En(C_{Of} + C_{OC} + K_b)$ is a normative profit, expressed as a share of investment. Fourth, investments in personnel are already accounted for partly in current assets, so there is double counting in the estimation of costs. Fifth, the author's attempt to present the given annual costs as a resource-cost approach to assessing the economic efficiency of a business is inappropriate. This is a cost approach. Only part of the cost of live labor in the form of normative profit is expressed as a share of resources.

3 RESULTS AND DISCUSSIONS

Analysis of methods for measuring the economic performance makes it possible to draw the following conclusions:

1 In the economic literature, to assess economic efficiency, a system of particular indicators is used, which characterize the performance of the enterprise either the amount of resources advanced, or the amount of their consumption (costs).

2 In foreign sources there are general suggestions for the calculation of the generalizing indicator, reflecting the economy of the enterprise, which is defined as the ratio of the volume of output to the volume of consumed resources. For enterprises in Ukraine economists recommend using the level of profitability of products or sales as a generalizing indicator.

3 Economic indicators have different names. For example, the profitability of sales has names: profitability of turnover, commercial margin, profitability ratio. In this regard, the authors believe that it is necessary to create a state standard on economic terminology.

4 Employees, to ensure the long-term survival of the enterprise, are interested in business efficiency not only in terms of increasing income per unit cost due to internal factors, but also the influence of external factors. Thus, business efficiency is an economic category that depends on internal and external variables.

5 Since profit is the result of living labor with the help of means of labor and objects of labor, the question of determining the impact of each cost value (each resource) on the amount of profit received is considered relevant.

6 In assessing the business efficiency of an enterprise, scientists have not considered all options. The indicators proposed in the economic literature are private. In them, the entire result is transferred to one of the factors of production or not all costs are taken into account. The result is not the consequence, and the costs are the cause.

7 There are no or insufficiently substantiated threshold values of the considered indicators. The dynamics of changes in the calculated indicators indicates the improvement (deterioration) of the indicator. In the absence of a standard, recommendations to improve the efficiency of the business of the enterprise can be developed with the help of expert evaluations.

8 A certain difficulty for practice is a set of private indicators, to a certain extent duplicating information. In our opinion, it is necessary to allocate: a generalizing indicator; the main private indicators; additional private indicators of economic efficiency of business enterprise.

9 One of the disadvantages, which does not allow to comprehensively and accurately measure the effectiveness of the business of the enterprise is the lack of a generalizing or integral indicator. It would make it possible to measure the level or increase in efficiency at the macro- and micro-level. A wide set of individual indicators, because of their different orientation, allows to give an unambiguous assessment of the level or increase in business efficiency.

10 In a set of indicators there is no logical consistency, unity, interrelation, interdependence, consistency.

11 In the economic literature there is no distinction between the categories of "economic efficiency" and "economic efficiency of business".

To build a model of economic efficiency of business through the resource approach, the authors of the article use the concepts - advanced variable capital and applied variable capital. The advanced variable capital (capitalized wages) is understood as a part of current assets, which is in circulation and is spent on wages and unified social tax (UST). In essence it is a salary for one its turnover. Under the applied variable capital we understand annual expenses on a labor payment with UST.

There is a relationship between the categories in question. Annual labor costs with UST are equal to the product of variable capital (capitalized wages and salaries) by the number of turns it will make during the year. Consequently, the amount of variable capital (capitalized wages) can be found from the ratio:

$$C_{zp} = \frac{I_{zp}}{n}, \quad (12)$$

where C_{zp} – variable capital (capitalized wages and salaries), UAH;

I_{zp} – annual labor costs with UST, UAH/year;

n – the number of revolutions of variable capital per year.

The sum of labor costs and profits is the newly created value due to live labor. Live labor, as noted above, can be expressed in terms of the number of workers or in monetary terms (in resource terms as the sum of variable capital and capitalized profit, or in cost terms as the sum of annual labor costs and annual profit).

The relationship of live labor in the resource approach is supposed to be expressed as:

$$C_{zp} + C_n = K_{ch} \cdot Ch; \quad (13)$$

$$\frac{I_{zp}}{n} + \frac{P}{n} = K_{ch} \cdot Ch; \quad (14)$$

$$K_{ch} = \frac{I_{zp} + P}{Ch \cdot n}. \quad (15)$$

Consequently, the coefficient of the living labor inputs Kch is equal to the sum of types of created value per one worker and per one turn of capitalized wages (variable capital) and profits.

For clarity, let us present the relationship of living labor costs in the resource and cost form, understanding that the cost-of-living labor is a newly created value, i.e.:

$$I_{zp} + P = K'_{ch} \cdot Ch, \quad (16)$$

where I_{zp}, P – respectively, annual labor costs and profits, UAH;

K_{ch}' – the coefficient of resource and current costs of live labor, UAH/year person;

Ch – number of employees, pers.

From here we find:

$$K'_{ch} = \frac{I_{zp} + P}{Ch}. \quad (17)$$

There is a correlation between the coefficient of the input of live labor in the resource and cost form:

$$K'_{ch} = K_{ch} \cdot n; \quad (18)$$

$$K_{ch} = \frac{K'_{ch}}{n}; \quad (19)$$

$$n = \frac{K'_{ch}}{K_{ch}}. \quad (20)$$

Next, we determine the capitalized material costs. Capitalized tangible costs are the advanced part of current assets, which is in a turnover and is spent on material and other costs. The annual sum of material and other costs in business costs is the applied capitalized material costs. The applied costs are equal to the product of the advanced part by the number of turnovers for the year, i.e.:

$$C_m = \frac{I_m}{n}, \quad (21)$$

where C_m – capitalized material costs, UAH;

I_m – annual material and other costs, UAH/year;

n – number of turnovers of capitalized material costs per year.

The relationship between capitalized material costs and wages (variable capital) is due to three circumstances. First, the amount constitutes circulating capital. Second, the ratio of capitalized tangible costs to variable capital is equal to the ratio of tangible costs to labor costs. Third, the number of revolutions that advance material costs and labor costs are the same. This is due to the fact that the circulation of all elements of current assets occurs simultaneously.

In mathematical interpretation it is offered to represent these dependences as:

$$C_{o.к} = C_m + C_{zp}; \quad (22)$$

$$C_{o.к} = \frac{I_m}{n} + \frac{I_{zp}}{n}, \quad (23)$$

where $C_{o.к}$ – circulating assets.

It is necessary to draw a distinction between the categories of " circulating capital " and "current assets". It is necessary to define these theoretical concepts more clearly. circulating capital, according to K. Marx, is a part of fixed capital spent on the objects of labor (capitalized material costs) and variable capital spent to pay the labor force (capitalized wages) (Marx, 1983).

Circulating capital of enterprises, in principle, is also spent to finance material costs and labor remuneration, but its composition is designated by a different principle. Circulating capital includes: current assets (production inventories, work in progress) and circulation funds (inventories of finished goods, shipped products, cash on settlement accounts and in cash of the enterprise, accounts receivable).

Economic efficiency of monetary capital turnover Ек is proposed to be determined by the ratio of capital received with the newly created value to the cost of capital spent on the purchase of means of production and labor:

$$E_к = \frac{(C_{of} + C_{o.c}) \cdot (1 + \rho_n)}{C_{of} + C_{o.c}} = 1 + \rho_n. \quad (24)$$

where ρ_n – profitability of products, fractions of units.

Thus, the economic efficiency of the circulation of monetary capital is a value proportional to the ratio of the volume of products sold to the business costs. Capitalized profit, which is the amount of money in

circulation, is the source of payments at the expense of business profits.

The criterion for choosing the best business solution should be the condition that ensures a profit not lower than the norm, i.e.:

$$E_{\kappa} \geq 1 + \rho_{n.i}, \quad (25)$$

where $\rho_{n.i}$ – normative product profitability, which is the ratio of normative profit to business costs, fractions of units.

To calculate the economic efficiency of business using the resource approach, it is necessary to take the ratio of the result, which is commodity capital in monetary form, and the cost of resources of living and public labor. In other words, both the numerator and the denominator of the formula are proposed to be expressed in resource form.

A number of questions arise here:

1. Can commodity capital be expressed in natural form?

2 How can it be represented in monetary form?

3 When can commodity capital be represented in kind?

4 Are we making a methodological mistake by representing commodity capital received in a year, but expressing expenditures as resources? What does this mistake lead to?

5 What is the criterion for choosing the best business solution?

To answer these questions, let us again turn to the turnover of monetary capital. At the second stage of monetary capital turnover there is a connection of means of labor, objects of labor and labor force (living labor), productive capital turns into commodity capital, into production, which includes added value. Newly produced commodity capital, by its properties and external form, differs from the goods purchased for the production of products, with greater value.

Consequently, commodity capital can be represented both in kind (if one type of product is produced) and in money terms. Since in practice the volume of output is measured only for a certain period, let us represent commodity capital by the ratio of the annual volume of output to the number of turns of commodity (monetary) capital for the year.

This means that commodity capital is the volume of output (in kind or in money terms) for one turn of monetary capital.

In other words, the annual volume of output is equal to the product of commodity capital and the number of turns of commodity capital per year. Here we assume that all output (commodity capital) will be sold.

Thus, commodity capital can be represented both in physical and monetary terms. It should be presented in physical terms when we are talking about the economic efficiency of the production of one type of product. If we are talking about the economic efficiency of the business of an enterprise which produces a nomenclature of products, only a monetary representation of the result is appropriate.

Based on the above, the indicator of economic efficiency of business using the resource approach is proposed to be expressed by the ratio:

$$E = \frac{T}{C_{of} + C_m + K_{ch} \cdot Ch} = 1, \quad (26)$$

where E – indicator of the economic efficiency of the enterprise;

T – commodity capital, UAH;

C_{of} – average annual value of fixed assets and intangible assets, UAH;

C_m – capitalized material and other costs, UAH;

K_{ch} – the coefficient of resource and current costs of live labor, UAH/year person;

Ch – average annual number of personnel, person.

The criterion of choice is the condition E=1, assuming that the commodity capital is equal in value to the resources spent.

Let us represent this dependence using economic indicators, reflected in statistical reporting and used in practice, assuming that one type of product is produced:

$$E = \frac{v \cdot Q / n_0}{C_{o.f} + C_{o.c} + P_n / n_0} \geq 1. \quad (27)$$

where v – unit price, UAH/unit;

Q – the annual volume of marketable products (commodity capital), units/year;

n_0 – number of revolutions performed by cash capital per year;

$C_{o.c}$ – annual average balance of current assets, UAH;

P_n – annual volume of profit (normative profit), UAH/year.

By performing conversions in the formula, we obtain:

$$E = \frac{(v \cdot Q - P_n) / n_0}{C_{of} + C_{oc}} \geq 1; \quad (28)$$

$$E = \frac{v \cdot Q - P_n}{C_{of} + C_{oc}} \geq n_0. \quad (29)$$

The proposed mathematical models make it possible to:

– identify the relationship between private economic indicators of the use of certain types of resources;

– to calculate the amount of money (money supply) that is in circulation of the enterprise;

– to calculate the turnover rate of financial resources for the year.

Thus, if the annual volume of sales or other measures (net production, profit) is used as a result, and as costs the resources being advanced, one of the basic principles of construction of a generalizing indicator of economic efficiency of enterprise business is violated – matching costs and results (costs cause, results – consequence).

The proposed models for calculating economic efficiency under conditions of business intensification make it possible to: identify the relationship between private economic indicators of the use of certain types of resources; calculate the amount of money that is in circulation of the enterprise; calculate the rate of capital turnover for the year.

4 CONCLUSIONS

As a result of the research, it was found that for the purpose of assessing the business management of the enterprise, science and practice have developed economic indicators that model economic phenomena and are designed to assess economic efficiency in terms of business enterprise or its business activity.

It is proved that business efficiency is measured in one of two ways, reflecting the performance of the enterprise in relation to either the amount of resources advanced, or the amount of their consumption (costs) in business processes. To assess the efficiency of a business, a system of indicators is used, which includes both private and generalized indicators of efficiency. The proposals available in the economic literature on the formation of generalizing indicators of economic efficiency at the macro- and micro-level were considered. The task was to identify when the authors first put forward the idea of determining the relationship of private indicators of economic efficiency in a single integral or synthetic indicator.

The ratio of the results of labor to the inputs of live labor reflects a subsystem of indicators of productivity or output of live labor. The ratio of labor results to past labor costs (production costs, equity capital, cost of production funds), which includes the overwhelming part of total labor costs, represents a subsystem of indicators characterizing efficiency of past labor (productivity of funds, productivity of materials, turnover of current assets). The ratio of labor results to the total expenditures of the enterprise serves as a subsystem of indicators characterizing the efficiency of production of specific products.

When constructing a model of economic efficiency of business with the use of the resource approach, the concepts of advanced variable capital and applied variable capital are used. The advanced variable capital (capitalized wages and salaries) is understood as a part of circulating assets, which is spent on wages and unified social contribution (UST).

To calculate the economic efficiency of business using the resource approach, it is necessary to take the ratio of the result, which is commodity capital in monetary form, and the cost of resources of living and public labor.

The proposed models for calculating the economic efficiency of business under the conditions of business intellectualization make it possible to: identify the relationship between private economic indicators of the use of certain types of resources; calculate the amount of money that is in circulation of the enterprise; calculate the turnover rate of financial resources for the year.

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