

## Increase in economic efficiency of enterprise due to fixed assets upgrading

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**Abstract:** This paper suggests using “value-oriented approach” or maximization of market value of an operating enterprise (MVOE). This calls for theoretic reconsideration of a number of fundamental statements of the economic science, solution to methodological problems, related with development of principles for economic efficiency formation, parameters, defining its value, assessment criteria and influencing factors, creation of economic efficiency management mechanism. The latter should become an efficient system of management of production, material, human and intellectual assets, which generate income, and ensure management decisions aimed at value maximization of an enterprise in the conditions of present resource limitations, high uncertainty of modernization process, investment in new technology and probabilistic nature of the forecast parameters.

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### Introduction

The problem of enterprise economic efficiency aggravates, when fixed assets are being modernized and production assets are being restructured, considering the system innovation implementation and introduction of modern management methods, and it has the following specific features:

- presence of a big number of alternative options for development and technical and technological facilities of industrial production, which ensure increase in its social and economic efficiency;

- existence of a complex system of economic assessment, which is used for taking management decisions when modernizing the production and investing into the system innovation plus necessity for accounting future achievements in different fields of knowledge, science and technology, prospects of innovation and scientific-technical progress;

- long-term plans for production development in order to boost competitiveness of Russian industry require considerable capital cost (investment, venture capital, address and targeted investment programs of production modernization and development). Such plans feature risks and uncertainty of achievement (non-achievement) of the expected technical and technological plus socio-economic results when complying with the planned terms of its achievement;

The present paper suggests using “value-oriented” approach or maximization of the market value of an operating enterprise (MVOE).

Currently, the concept of risk only as a negative factor in asset management is not quite correct. Since risk is seen as a possible additional competitive advantage it is directly linked to the development of the concept of real option in practice. Shift to

evaluation, and management of value added become of greater importance.

Optimization of the company’s asset management during investment involves creating conditions to increase the value of the enterprise, and includes the following activities:

1. Improved operating activities due to the production factors, intangible assets, new technologies, innovation as a whole.

2. Choosing investments with ROI higher than the costs to attract the capital required for their implementation.

3. Improved asset management, e.g., due to sale or liquidation of non-core, secondary, unprofitable assets, decreased periods of accounts receivable turnover, stocks (so-called "disinvestment); the management of institutional factors of development

4. Improved governance structure of the capital.

Literature review is used to define an evaluation system for value chain management and to apply the evaluation system to the company. The article research served both the interest of the organization performance, which was to measure how profitable the company’s supply chain was, and the interest of science, namely to produce knowledge about new ways of looking into supply chain performance measurement (Gummeson, 2000, Coughlan and Coughlan, 2009, Yin, 2003). EVA® is a modified version of residual income or economic profit where the modifications consist of accounting adjustments designed to convert accounting income and accounting capital to economic income and economic capital. Many authors (e.g., Stewart (1991); Young and O’Byrne, 2001; O’Byrne, 1996; Biddle, Bowen, and Wallace, 1997 and 1999; Martin and Petty, 2000; Feltham et al., 2004; D.J.Obrzycki, R. Resendes 2000, Holler, 2009) have described the EVA® for

explaining the value of a enterprises. EVA® estimates by major firms, e.g., Goldman Sachs, First Boston, and Stern Stewart (Weaver, 2003), Delloitte.

**Fundamentals for efficiency assessment according to the value approach**

Value approach transforms conventional concepts of efficiency, value, efficiency indicators of business activities of an enterprise: from relative indices of performance (productivity, profitability) towards market value assessment. The economic mechanism of efficiency of an industrial enterprise should be understood to mean the process of target-oriented formation of production and economic activities' results which satisfy, to the fullest extent, both public needs and goals of the enterprise during modernization [1].

When defining EE (economic efficiency) of EIA (enterprise innovation activity) as economic category, it is worth bearing in mind that, in its general meaning, efficiency characterizes developed systems, processes and phenomena. Efficiency becomes an indicator of development of an enterprise and the most important stimulus for its modernization, growth and development [2]. Striving for boosting efficiency of a certain type of activity or project results in designing some measures which encourage development process and cutting off the activities which result in regression.

Today the current capital value of an enterprise (current value of an enterprise  $PV$ ) is used as the complex index of operating efficiency. According to I. Fisher, "cost of a capital asset is equal to the sum of the current (present) costs of all future incoming cash flows, generated by this asset". Normally, the market value of an enterprise is the market value of the company's capital. Internal value of an enterprise, according to I. Fisher is calculated by formula:

$$PV = \sum_{t=1}^{t=T} \frac{CF_t}{(1+r)^t} \quad (1),$$

where  $CF_t$  – is an expected value of the free cash flow in  $t$  period;  $r$  – the rate of the required return of the invested capital or discount rate;  $T$  – economic life span of an enterprise.

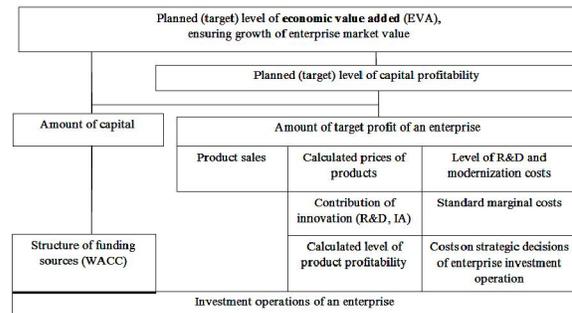
A complex method of efficiency assessment of investment into new technology or modernization of enterprise funds is closely related to the methods of SWOT analysis of development strategy options and resource facilities for their implementation in the enterprise [3]. According to the classical approach to assessment, the value of the enterprise ( $V$ ) can be defined as the total of the balance sheet value of the enterprise ( $BV_0$ ) and the value of growth prospects:

$$V = BV_0 + K * NOPAT \frac{ROCE - WACC}{WACC(WACC - g)} \quad (2),$$

where  $K$  – is reinvestment coefficient;  $NOPAT$  – operating profit after tax;  $ROCE$  – return on capital invested;  $WACC$  – weighted-average cost of capital;  $g$  – growth rate of an industrial enterprise.

As may be inferred from the formula, the major factors of enterprise value are profitability of the invested capital; price of the invested capital; growth rate of the enterprise. They are defined by supply and demand factors. The principal model of interrelations between target values of EIA performance and new product costs can be represented in a simplified form [4] (Fig. 1). At the same time, MVIA (Market Value based on Income Approach) is characterized with low operational mobility in relation to the tactic decisions of an enterprise, which is determined by high volatility of the free cash flow index.

So, in the methodology it is common to use the concept of economic profit ( $EP$ ) or economic value added ( $EVA$ ). Apart from important factors, influencing MVIA [5], which implements modernization and innovation (such as life cycle of an enterprise, technology or product) the major role is played by costs of new products and R&D. The contents and structure of costs affect direction and choice of definite methods of cost management.



**Fig.1. Scheme of main relations between return on equity and return on investment projects**

According to the theory, the economic profit  $EVA$  [6] is net operational profit of an enterprise after deduction of interest on all used capital at the rate, defined by weighted-average cost of capital (WACC) :

$$EVA = NOPAT - WACC * CE \quad (3),$$

where  $CE$  – is capital employed;  $WACC$  – weighted-average cost of capital;  $NOPAT$  – net operational profit after corporate tax (profit tax), but before

financial expenses on bank credit/loan:  

$$NOPAT = EBIT^{adj} (1 - T^{adj})$$

$$NOPAT = EBIT(1 - T)$$
 where  $EBIT$  – earnings before interest and tax, including corrections on capitalized costs for R&D, leasing, writing-off methods,  $T$  – corporate tax rate [7].

Value added of an enterprise is created when there is increment or when  $EVA > 0$  index is positive. The same as the book-keeping index,  $EVA$  index gives an idea about economic efficiency for a certain time period and, contrary to the traditional profit,  $EVA$  does not only cover explicit costs on investment attracted, but cover alternative costs on capital [8].

Let us define the amount of  $EVA$  by the following formula through direct capitalization (capitalization rate is also equal to WACC):

$$PEVA = \frac{EVA}{WACC} = CE * \left( \frac{ROCE}{WACC} - 1 \right) \quad (4)$$

The given amount of future  $EVA$  can be both a positive and negative figure, which means either creation or destruction of value as a whole and in each line of activities or discount /premium on the used capital and efficiency/inefficiency of its use [9].

According to the  $EVA$  model, market value of an enterprise is defined as the amount of capital invested for the beginning of the period and discounted value of the projected  $EVA$  (normally for the economic life span of an industrial enterprise):

$$V = CE + PEVA \quad (5)$$

As long as there is no growth (change) of  $EVA$ , market value of an enterprise can be calculated by formula 4 and 5:

$$V = CE + \frac{EVA}{WACC} = CE + CE * \left( \frac{ROCE}{WACC} - 1 \right) = \frac{CE * ROCE}{WACC} = \frac{NOPAT}{WACC} \quad (6)$$

In order to choose directions for development of an enterprise when it is being modernized, to assess efficiency of alternative capital investment in case of different options for modernization or development of an enterprise, it is worth defining, on the bases of  $EVA$  [10], threshold amount of return on the enterprise own equity (both for the forecast and accounting period), which represents a criterion for decision-making:

$$ROE_{EVA} = \frac{EAT}{k_e} + \frac{EAT * (r_e - k_e)}{r_e * k_e} * \frac{g}{k_e - g} \quad (7)$$

where:  $EAT$  – earnings after tax ( $EAT = NOPAT - Int - T$ ),  $Int$  – financial expenses on borrowed capital;  $(r_e - k_e)$  – efficiency

spread,  $r_e$  – return on own equity for new investment;  $g$  – growth rate;  $k_e$  – required return on own capital.

## Conclusion

In this way, current operating indices transform into the analytical index  $EVA$ , and further on into the index of an enterprise's value, which accounts for "cost of previous investment" [11, 12]. In other words, the value of an enterprise is defined with the help of operating indices of corrected profit (but not generated projected cash flows), which reflect efficiency of management of investment activities of an enterprise and make it possible to assess it on the basis of operating activities of an industrial enterprise: change of return on all equity invested into the enterprise; change of profitability of new investment in R&D and intangible assets; change of increment rate of new investment (primarily due to increase of reinvested profit share, cost reduction, cost redistribution); attraction of additional financing sources of investment (disinvestment) etc.

So, assessment of value on the basis of factor decomposition of economic value added index makes it possible to consider the greatest number of key factors for creation (destruction) of an enterprise's value and investment activities. Such an approach assesses strategic and current tactic management decisions complexly.

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