International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

COPY RIGHT

ELSEVIER
SSRN

IJIEMR Transactions, online available on 21th October 2021.
Link: https://ijiemr.org/downloads/Volume-10/Issue-10
DOI: 10.48047/IJIEMR/V10/I10/19
Title: **ASSESSMENT OF THE EFFICIENCY OF THE CONTROLLING SYSTEM TO ENSURE THE ECONOMIC SUSTAINABILITY OF INDUSTRIAL ENTERPRISES**
Volume 10, Issue 10, Pages: 103-110
Paper Authors: **Kadirov Abdumalik Matkarimovich**

USE THIS BARCODE TO ACCESS YOUR ONLINE PAPER

To Secure Your Paper As Per UGC Guidelines We Are Providing A Electronic Bar Code

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

ASSESSMENT OF THE EFFICIENCY OF THE CONTROLLING SYSTEM TO ENSURE THE ECONOMIC SUSTAINABILITY OF INDUSTRIAL ENTERPRISES

Kadirov Abdumalik Matkarimovich

PhD, Fergana branch of TUIT

Abstract: The article presents methodological approaches to assessing the effectiveness of the controlling system in ensuring the economic sustainability of industrial enterprises. It is argued that the assessment of economic sustainability based on a controlling system is based on a number of principles and consists of a number of stages. Based on the introduction of a controlling system, taking into account the system parameters selected at the target stage, management modeling, secondly, the current assessment and forecasting of goals, taking into account the environment and uncertainty, and thirdly, allows you to perform space-time analysis. The essence of assessing the effectiveness of the introduction of controlling systems in ensuring the economic sustainability of industrial enterprises is based on a graphical model of the coefficients of economic efficiency, which reflect the relationship between the introduction of management systems, the growth of cash flow and the costs of the implementation of this system.

Keywords: controlling, economic sustainability, conjuncture, inflation, evaluation, forecasting, management modeling, tactical and strategic goals, management, financial accounting, organizational structure, graphic model.

Introduction

It is known that the development and implementation of almost any measures aimed at developing or improving the activities of business entities incurs additional costs. The introduction of a control system in the oil and gas industry is no exception. Expenditures may vary depending on the planned complex measures and their sources of funding. In particular, these costs may include:

– additional costs associated with the introduction of the position of head and specialist of the control service in the enterprise;

– costs of implementing an automated management system;

– costs associated with the involvement of consulting services for the introduction of control system mechanisms in the enterprise, etc.

However, the head and specialist of the control service do not just keep a management account. It also performs the function of budgeting and their implementation in planning and practice. The controller, who has planned and current information on assets, liabilities, private capital, income, expenses, financial liabilities to the centers, and the planned and current information, calculates, studies the differences in the plan and informs the top management about it [1.172].

The emergence of additional costs associated with the design and implementation of control systems in the oil and gas industry necessitates a detailed analysis of their possible options in terms of efficiency. In making the final decision on the introduction of one or another variant of the control system in the oil and gas industry, it is expedient, first of all, to rely on the effectiveness of the enterprise as a result of the implementation of the proposed set of measures. It is known that the projected amount of efficiency should fully cover all the

costs incurred by the enterprise in the development and implementation of the control system [11.41].

Therefore, it is necessary to develop methodological approaches to assessing the effectiveness of the control system in ensuring the economic stability of enterprises in the oil and gas industry. However, the use of a mass and widely used formula for calculating profitability does not allow to obtain a very precise amount, enterprises, as noted above, operate in an environment with a high level of uncertainty, and therefore performance indicators are random in entering and exiting the economic system and cannot be determined by a single indicator [11.41].

Analysis of the scientific literature. However, the principles of evaluating the effectiveness of the introduction of the control system, which are currently reflected in the scientific work of local [6.28], [13] and foreign scientists, do not take into account the randomness of the parameters to be introduced. Including L.P. Popular methods of evaluation are widely described in Korolyova's research [8.24]. The authors also divide them into two groups: quantitative methods and qualitative methods.

Examples of indicators used in the quantitative methods are: value added dynamics, enterprise market value growth, labor productivity dynamics, market share growth, turnover growth, profitability change, tax savings, risk reduction [10.135]. Quality methods are characterized by the following indicators: the quality of production equipment, the competitiveness of the enterprise, changes in the level of motivation of workers, etc. [8.24].

Today, many scientists believe that it is almost impossible to quantify the effectiveness of the introduction of a control system in the context of external instability in the operation of the enterprise.

A number of researchers [3.216, 2.5, 9.68, 5.128] use vague, subjective computational methods to assess the effectiveness of introducing a controlling system in an enterprise, inviting experts to evaluate how effectively the controlling service operated during the reporting period. However, in these cases, the evaluation of effectiveness,

first, it is conditionally quantitative because the verbally expressed ideas move to quantitative indicators;

secondly, it is often suggested that these methods be used to evaluate subsequent performance, and thirdly, the uncertainty environment of the enterprise's operations should only be taken into account indirectly, with the help of expert sentiments.

Also, some economists [8.24, 7.190] evaluated and analyzed the cost-effectiveness of the introduction of a control system in the enterprise on the basis of investment analysis, taking into account such indicators as net discounted income, profitability index, payback period.

However, in this case, the uncertainty environment of the enterprise is taken into account indirectly by analyzing the level of sensitivity to changes in the discounted cash flows or the input parameters of the project performance indicator.

But even in these cases, as a result of the efficiency assessment, there will be only one definite amount of the performance indicator - net discounted income. However, due to changes in the operating environment in the enterprise practice, the business entity is less likely to achieve a clearly defined amount of performance with a full guarantee.

All this necessitates the development of methods for assessing the effectiveness of the introduction of a control system that allows to take into account the insurmountable uncertainties in the operating environment of

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

the oil and gas industry.

The main part. One of the possible solutions to the problem of taking into account uncertainty in evaluating the effectiveness of the introduction of a control system is that it can be a method based on the use of uncertain logical thinking.

Suppose that the cost of implementing a control system in ensuring the economic stability of enterprises with a certain degree of dependence by calculation or expert Z: [z_1, z_2] and the additional cash income of the industrial enterprise as a result of the introduction of the control system - ⟦CF⟧ _ (mining.): [⟦CF⟧ _ (con.1,) ⟦CF⟧ _ (con.2,)] can be evaluated in the interval [11.41].

Based on the above, the assessment of the effectiveness of the introduction of control systems in ensuring the economic stability of enterprises in the oil and gas industry can be used as follows:

$$[s_1, s_2] = \frac{[CF_{con.1,} CF_{con.2,}]}{[z_1, z_2]} \quad (1).$$

where, ⟦CF⟧ _ (con.) - additional cash receipts as a result of the introduction of the control system;

Z: [z_1, z_2] - the cost of implementing the control system.

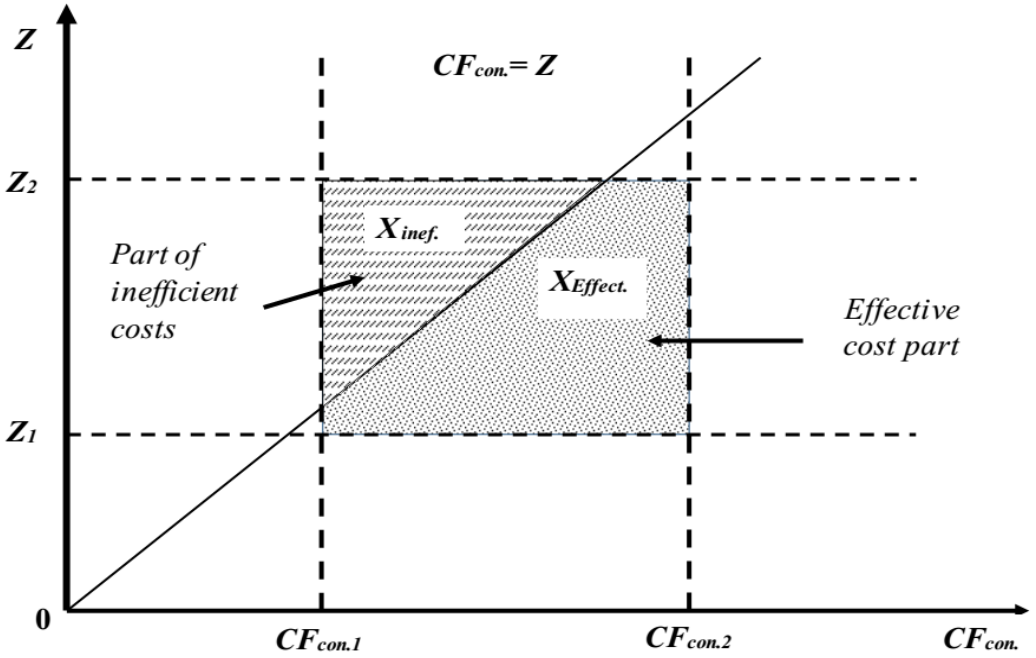
Then the effectiveness of the introduction of a control system in ensuring the economic stability of the oil and gas industry can be expressed by the amount of uncertainty S: [s_1, s_2].

Hence, the effectiveness of the introduction of a control system in ensuring the economic stability of the oil and gas industry can be assessed as intermediate. Due to the fact that all the parameters of the expression are defined in the interval, there is a need to develop mechanisms for calculating the effectiveness of the implementation of the control system based on the principles of logical thinking.

The essence of evaluating the effectiveness of the introduction of a control system in ensuring the economic stability of an industrial enterprise can be demonstrated through a graphical model (Figure 1).

The graphical model shown in Figure 1 is based on the intermediate assessment of the cash flow of the enterprise as a result of the introduction of the control system and the cost of its implementation, and (⟦CF⟧ _ (con.) = Z) corresponding to the lower limit of project efficiency Z0CF_ (con.) the bisector of the angle, i.e., the costs formed by the cases corresponding to the financial results conditioned by them. It is known that if the increase in cash flow increases the costs incurred by this (⟦CF⟧ _ (con.)> Z) flow, the project to introduce a control system will be effective. If the increase in cash flow (⟦CF⟧ _ (con.) <Z) is lower than the increase in costs, the project will be inefficient [11.41].

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org



Graphics 1. Graphical model of evaluating the effectiveness of the introduction of control systems in ensuring the economic stability of industrial enterprises [11.43]

The cost of implementing a stability control system of Figure 1 X_ (s-li) (effective cost part) and the ratio of the rectangular area formed by the intersection of intermediate numbers of cash flow growth of the industrial enterprise as a result of the introduction of this system provides efficiency [11.41].

There may be different ratios between the cost of implementing a control system in ensuring the economic stability of an oil and gas industry and the growth of cash flows in an industrial enterprise, so the following formula can be used to assess the effectiveness of ensuring economic stability in an industrial enterprise.

$$R = \begin{cases} 1, & z_1 < z_2 \le CF_{con.1} < CF_{con.2} \\ 1 - \frac{(z_2 - CF_{con.1})^2}{2\times(CF_{con.2} - CF_{con.1})\times(z_1, z_2)}, & z_1 < CF_{con.1} < z_2 \le CF_{con.2} \\ \frac{(2CF_{con.2} - z_2 - z_1)}{2\times(CF_{con.2} - CF_{con.1})}, & CF_{con.1} \le z_1 < z_2 \le CF_{con.2} \\ \frac{(CF_{con.2} - z_1)^2}{2\times(CF_{con.2} - CF_{con.1})\times(z_1 - z_2)}, & CF_{con.1} \le z_1 < CF_{con.1} \le z_2 \\ \frac{CF_{con.1} + CF_{con.2} - 2\times z_1}{2\times(z_1, z_2)}, & z_1 \le CF_{con.1} \le CF_{con.2} \le z_2 \\ 0, & CF_{con.1} < CF_{con.2} \le z_1 < z_2 \end{cases} \quad (2).$$

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

It is expedient to use our evaluation proposal based on Harrington's "acceptability" task [4.54] to explain the effectiveness of the introduction of an economic stability control system in an industrial enterprise. The indicator we have generated is significantly reminiscent of indicators of the probability of ensuring the economic stability of an industrial enterprise in terms of its characteristics, according to which we have proposed a methodology for estimating and comparing quantitative and linguistic quantities.

Thus, it is proposed to quote a quantitative estimate based on the scale calculated by Harrington's analysis in accordance with the probability. For the purpose of qualitative assessment, it is necessary to classify the levels of efficiency of ensuring economic stability in the oil and gas industry on the basis of the control system, which, in turn, is associated with management decisions on cost recovery.

However, despite the possibility of setting intervals for efficiency levels using Harrington's "acceptability" tasks, the limits of these intervals are very wide in terms of ensuring economic stability. Therefore, if the level of efficiency in ensuring the economic stability of the oil and gas industry on the basis of the control system differs from the "absolutely inefficient" and "absolutely effective", then we propose to use another indicator: "cost-effectiveness coefficient". This indicator is calculated as the ratio of effective and inefficient costs:

$$k_s = \frac{X_{s-li}}{X_{s-siz}} \quad (3).$$

where, k_s is the justification coefficient of the cost of implementing a control system to ensure economic stability;

X_{s-li} – effective cost part (Figure 1);

X_{s-siz} – part of inefficient costs (Figure 1).

In order to obtain a regulated formula for the coefficient of justification of the costs of implementation of the control system, which reflects the growth of cash flow in the oil and gas industry as a result of the introduction of the control system and the cost of implementing this system, formula 2 should be amended as follows:

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

$$k_s = \begin{cases} +\infty, & z_1 < z_2 \le CF_{con.1} < CF_{con.2} \\ \dfrac{2}{(z_1 - CF_{con.1})^2} - 1, & z_1 < CF_{con.1} < z_2 \le CF_{con.2} \\ \dfrac{(2 \times CF_{con.2} - z_2 - z_1)}{(-2 \times CF_{con.1} + z_2 + z_1)}, & CF_{con.1} \le z_1 < z_2 \le CF_{con.2} \\ \dfrac{2 \times (CF_{con.2} - z_1)^2}{2 - (CF_{con.2} - z_1)^2}, & CF_{con.1} \le z_1 < CF_{con.1} \le z_2 \\ \dfrac{(CF_{con.2} - CF_{con.1}) \times (z_2 - z_1)}{(z_2 - CF_{con.1})^2} - 2, & z_1 \le CF_{con.1} \le CF_{con.2} \le z_2 \\ 0, & CF_{con.1} < CF_{con.2} \le z_1 < z_2 \end{cases}$$

(4).

The rationale for the cost of control can be explained economically as follows: the ratio of the probability of occurrence of a cost-effective situation, how much the cost exceeds the probability of an inefficient control situation, or, in other words, the uncertainty of the additional cash flow , shows how much they have spent on its implementation.

Thus, the coefficient of justification of the costs of implementing the resulting control system can be expressed as follows:

$k_s > 1$ – part of potentially effective costs;

$k_s = 1$ – undamaged part;

$0 \le k_s < 1$ – part of inefficient costs.

The higher the justification coefficient of the cost of implementing a control system, the more efficient these costs will be. Conversely, the smaller the amount of justification coefficient of the cost of implementing a control system, the less effective these costs are.

Thus, based on the above, the development of a system of performance

indicators, including cost-effectiveness and cost-effectiveness ratio, for the implementation of economic stability in order to make management decisions between the rationale for the costs of ensuring the economic stability of the oil and gas industry. should (Table 1).

Table 1

Explain the level of effectiveness of the introduction of control systems in ensuring the economic stability of enterprises in the oil and gas industry

Limits of efficiency	Efficiency level	Limits of cost justification coefficient	Note
0	Absolute inefficiency	0	The cost of implementing a control system is considered inefficient.
(0; 0,2]	Low efficiency	(0; 0,25]	The cost of implementing a control system is considered inefficient.

(0,5; 0,8]	High efficiency	(1,50; 2,00]	Costs are justified.
1	Absolute efficiency	+	To introduce a control system the costs incurred are fully justified.

The proposed support to assess the effectiveness of ensuring the economic stability of enterprises of the oil and gas industry on the basis of the control system meets the requirements for the effective operation of enterprises in an environment of uncertainty:

First, indicators can also be used to assess the level of economic efficiency of an enterprise.

Second, the indicators allow to take into account changes in the input and output parameters of the control system, which is relevant in the context of economic crises.

Third, the indicators included in the methodology for evaluating the effectiveness of the introduction of control systems can be quantified, which means that they can be used to optimize the process of ensuring economic stability of oil and gas enterprises based on the use of precision and control.

Fourth, the proposed support is a science-based method of interpreting the results obtained, which allows to determine the level of efficiency of ensuring the economic stability of oil and gas enterprises on the basis of a control system with practical and cost-effective recommendations in management decisions.

Results or final section. Based on the above, it can be concluded that the control system is an effective model for ensuring the economic stability of oil and gas companies, and its widespread introduction is relevant in the context of uncertainties in the environment of oil and gas companies. It is also envisaged that the system for evaluating the effectiveness of ensuring the economic stability of enterprises in the oil and gas industry on the basis of the control system will meet the following requirements related to the effective operation of enterprises in an environment of uncertainty.

- Indicators can also be used to assess the level of economic efficiency of the enterprise.
- the indicators allow to take into account changes in the input and output parameters of the control system, which is relevant in the context of economic crises.
- the indicators included in the methodology for evaluating the effectiveness of the introduction of control systems can be quantified, that is, they can be used to optimize the process of ensuring the economic stability of oil and gas enterprises based on the use of precision and control.
- the proposed support is a science-based method of interpreting the results obtained, which allows to determine the level of efficiency of ensuring the economic stability of oil and gas enterprises on the basis of a control system with practical and cost-effective recommendations in management decisions.

References

1. Bellman, R. Decision-making in vague conditions / R. Bellman, L. Zade // Issues of analysis and decision-making procedures. - M .: Mir, 1976. - pp. 172–215.
2. Bendikov M.A., Sakharova I.V., Khrustalev E.Yu. Financial and economic stability of the enterprise and methods of its regulation // Economic analysis: theory and practice. - 2006. - No. 14 (71). - with. 5-14.
3. Burxanov A.U. Strategy for ensuring

financial stability of industrial enterprises. T .: Fan. 2009. - 216 p.
4. Vasileva, G.A. Indications of the effectiveness of the work of the subdivision of control / G.A. Vasileva // Control. - 2002. - № 2. - p. 54–56.
5. Zetkina O.V. About enterprise sustainability management. - M .: Audit, UNITI, 2003, p. 128
6. Karlibaeva R.X. Ways to effectively organize the financial management system in joint stock companies. Author's abstract of the dissertation of the doctor of economic sciences (DSc). Tashkent. 2018. - p.28.
7. Kidaeva, E.E. Formation of controlling as a system tool for managing an industrial enterprise: dis. ... Cand. econom. Sciences: 08.00.05 / Kidaeva Erzhena Erdem-Bairovna. - Ulan-Ude, 2007 .-- 190 p.
8. Kozin M.N. A dynamic model for assessing the production and economic sustainability of a defense enterprise / M.N. Kozin // Audit and financial analysis. - Moscow, 2007. - No. 4. - with. 24-31.
9. Korotkov E.M., Anti-crisis management. M .: INFRA-M, 2007 .-- P. 68.
10. Khudyakova, T.A. Principles for determining the effectiveness of costs for the introduction of a controlling system at an industrial enterprise / T.A. Khudyakova // Bulletin of SUSU. Series: Economics and Management. - 2014. - No. 4 (8). - S. 135-138.
11. Khudyakova, T.A. Principles of assessing the level of financial and economic sustainability of an enterprise based on the use of probabilistic and statistical models / T.A. Khudyakova // Bulletin of SUSU. Series "Economics and Management". - 2015. - T. 9. - No. 3. - P.41–43.
12. http://www.biznes-daily.uz/ru/birjaexpert/41342-mamlakatimiz-banklarida-kontrolling-tizimini-joriy-qilish-masalalari
13. http://www.iqtisodiyot.uz/sites/default/files/maqolalar/16_%20F.A.Mirbabayev.pdf