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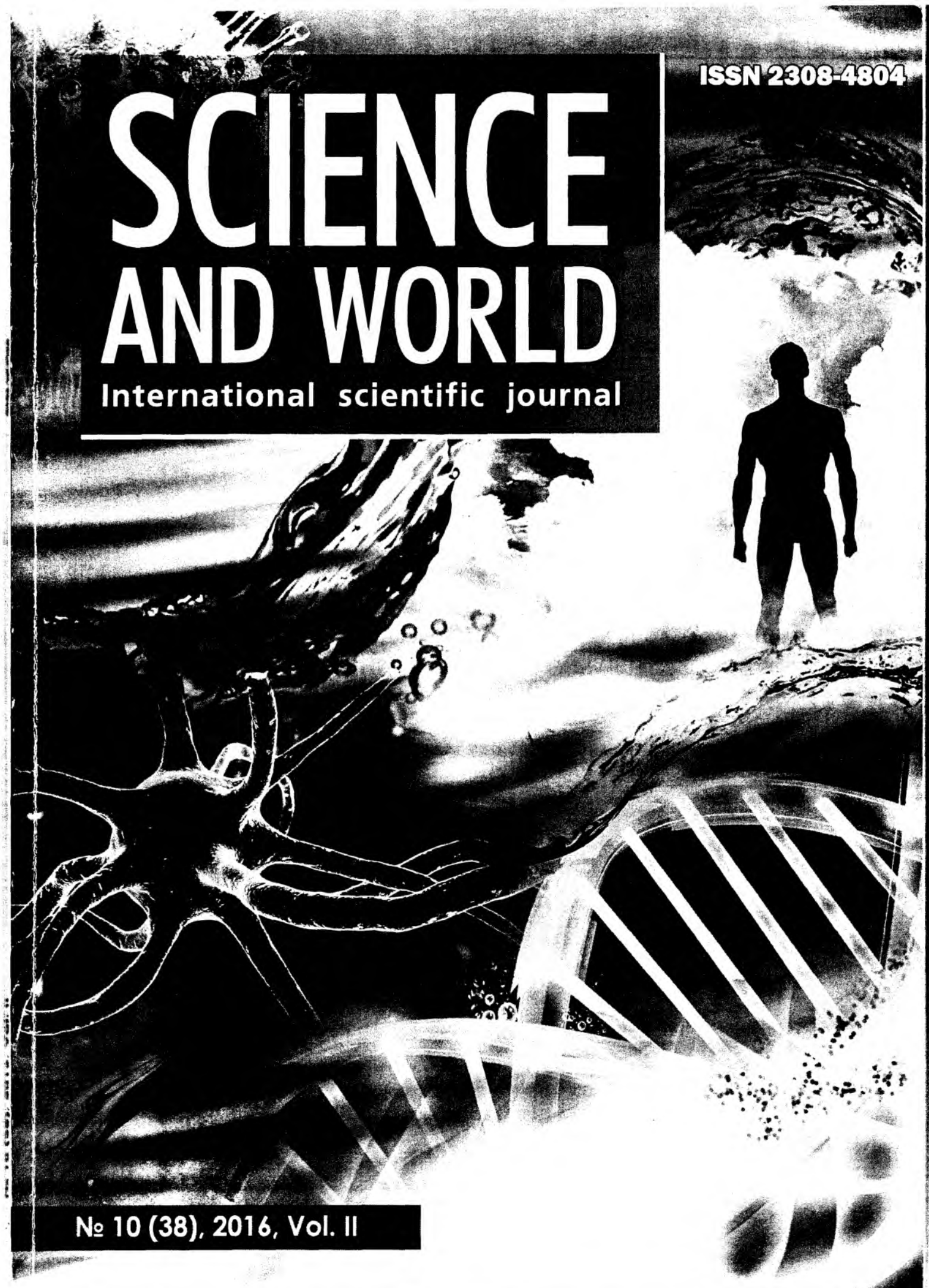

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THE ISSUES OF ECONOMIC EFFICIENCY OF THE FIXED ASSETS REPRODUCTION PROCESS IN INVESTING ACTIVITIES OF RAILWAY COMPANY

A. Gulamov, Ph.D., Prorector
Tashkent Institute of Railway Engineering, Uzbekistan

Abstract. *The article deals with the modified method of calculating fund expenses by major traffic using known accrued calculation principles, presupposes the existence of data on the distribution of costs for households and industry group of fixed assets in the [illegible]fferentiation value of fixed assets by groups and subgroups.*

[illegible]d assets, capital intensity in railway transport, fund expenditures, differentiation value of fixed [illegible]ubgroups.

1. INTRODUCTION

[illegible] of the upcoming costs and benefits in determining the effectiveness of the reproduction process is [illegible]e settlement period, the duration of which depends on such factors as the duration of the operation, [illegible]t of fixed assets. It also assumes the calculation of important performance indicators, as the dis-[illegible]ted revenue, internal rate of profitability, profitability and payback period.

[illegible]ne of these criteria is not an important indicator by itself and evaluation for a decision on investing

[illegible]e function value of investments, based on the characteristic of the minimum and maximum, can be [illegible]tput: at least the cost of production; the maximum annual income; maximum performance; using

[illegible]ns for maximum and minimum targets for different functions chosen from the above list, may [illegible]decision.

[illegible] for selection of the objective function do not exist. The decision is made with the full assessment [illegible]s at this time, which characterizes the state of the system to be set up as a result of investments.

[illegible]. PROCESS OF REPRODUCTION OF FIXED ASSETS IN RAILWAY TRANSPORT

[illegible] the reproduction of fixed assets in the "output" of the production system is formed by an addi-[illegible]its, caused by investments in the "input" of the system. Thus, we can consider the ratio "cost – [illegible] absolute efficiency: gain release one sum investment $\frac{\sum pl_{gain}}{I_{sum}}$ and return on investment a sum

[illegible] evaluating the economic efficiency of the process of reproduction of fixed assets of the railway [illegible]assess the efficiency of the process and reproduction management of fixed assets.

[illegible] of reproduction of fixed assets in a market economy is important, because it determines their [illegible]e state.

[illegible] of reproduction of fixed assets is a set of targeted management actions on specific subjects of [illegible]ffect the intensity of the reproduction, size and structure of fixed assets. As specific control objects [illegible]e process of updating of fixed assets; the existing system of depreciation of fixed assets in rail [illegible] assessment and reassessment of the value of the various elements of fixed assets; structure of [illegible] assessment of the status and effectiveness of the use of fixed assets; evaluation of financial and

[illegible]e need to control the reproduction of fixed assets in rail transport caused by the fact that it is an [illegible]mic process, and in this sense (as well as all other elements) needs to be regulated. The process [illegible]uction of fixed assets includes the achievement of strategic and tactical goals.

[illegible]e strategic goals suggests a course of action that leads to well-defined and relatively stable course [illegible]ety long historical time interval. Such a course of action develops within a certain system of [illegible]rities that lead to circumstances of place, time, cause, method and objective action [2]. The [illegible]evelopment of the enterprise ideology.

[illegible] the main purpose of the strategic management of the reproduction of fixed assets in the rail [illegible] railway infrastructure asset in the necessary quantitative and qualitative composition, keeping

[illegible] 2016

Management certainly affects the results and the cost is a sphere for social work, which includes the requirements of efficient use of resources. "They rightfully assume – V. Tomilov, A. Robotov, A. Zubarev – that a more effective management of production leads to an increase of its production... But such a correspondence can not be, since the production efficiency can depend on many factors beyond the influence of the control system", "... in view of the weak sensitivity of the consolidated general indicators of social production to certain changes in the management system. These figures are difficult to use for solving the problem of measuring the effectiveness of management systems" [3]. Also, scientists have recognized that the management of all inherent uncertainty of causal relationships between the decision and its outcome. This approach is called resource.

It is widely believed that the state of the system should be assessed through indicators characterizing the activities of the managed object (for the final results of the operation).

We share the view of [1] that in relation to the management reproduction process performance evaluation must be based on a common methodology for determining the economic efficiency of production and at the same time take into account the specifics of the operation of the system.

Achieving a high level of functioning of the railway company in the market requires the introduction of mechanisms for effective management of the processes of reproduction of fixed assets. Effective management of the renovation of fixed assets of the railway company is reduced to continuous measurement and calculation system of interrelated indicators, analysis of relevant indicators formulized goals and take appropriate corrective actions to optimize the functioning of the processes of production (services). System performance management process of reproduction of fixed assets can be represented as follows (Figure 1).

The main purpose of cost efficiency of fixed assets reproduction process of the railway company is to identify possible management of the reproduction of fixed assets, which are in the company, to provide an immediate response to external economic entity "challenges". Indicators of economic efficiency of reproduction process of capital assets needed to determine the weaknesses in the economic and technical processes of the company and the causes of these weaknesses. Enough current value causes inconsistencies can select corrective actions, and then to evaluate their effectiveness in the enterprise as a whole.

The recommended system is the cost-effectiveness of fixed assets reproduction process of the railway company – a model that covers all units and processes in the company and counted their company's strategic goals, such as increased capitalization, increased profits and reduced output per unit of invested funds.

The proposed approaches should be presented in economic and mathematical model to optimize the process of reproduction of fixed assets of the railway company.

3. ADEQUACY OF THE ECONOMIC MODEL

The adequacy of the economic and mathematical modelling of real economic processes manifested primarily in the ability of such models take into account the best probabilistic nature of the object and with a high degree of certainty to predict the nature of its development and perspective period.

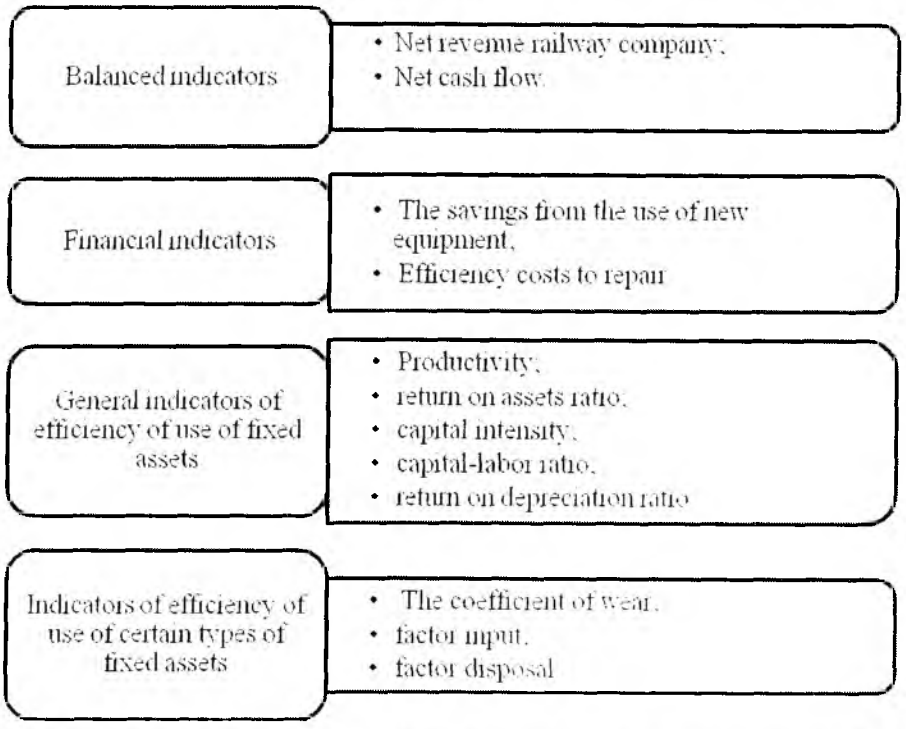

Fig. 1. The recommended system of indicators of economic efficiency of capital assets reproduction process of the railway company

performance criteria of the investment process is sufficient to make a decision on the implemen-
type of reproduction by itself. This determines the need and feasibility of formulating and solving
problems of vector optimization).
that each investment decision $x \in M$ x characterized scalar values (as a result of a generalization
$\sum\sum P_j^i \to \max_{x \in M_x}$, $\sum\sum pl_{gain_j}^i \to \max_{x \in M_x}$ and investment costs $I_{sum} \to \min_{x \in M_x}$, we can
ing concept to the choice of the best options $\bar{x} \in M_x$. It should be noted that in the case of vec-
s and costs, this approach also remains valid.
of optimality. Solution $\bar{x} \in M_x$ is optimal if:

$$\bar{x} = \arg \underset{x \in M_x}{extr} F(x)$$

function that determines the interaction of benefits and costs $\left(\frac{\sum_{i=1}^{m}\sum_{j=1}^{n} pl_{gain_j}^i}{\sum_{j=1}^{n} I_j}, \frac{\sum_{i=1}^{m}\sum_{j=1}^{n} P_j^i}{\sum_{j=1}^{n} I_j}\right)$,
investment project (x, j∈ [1;n]); i – number of factors of production, i$^{\in}$ [1;3].
of non-uniqueness of solutions $\bar{x} \in M_x$ as the best decision can be made any decision of $\bar{x}$ based
optimality criterion or the result of random selection.
the task of assessing the technical level of production and the study of possible ways to increase
mulated as follows: it is required to find an analytical expression for the dependence of common
duction efficiency of the technical level of production determined by the magnitude and dynamics of
s: net cash flow, capital-and-labor productivity, the there is need to find a function:

$$F^{NCF} = f(z_1, z_2, z_3, \dots, z_n);$$

$$F^{CF} = f(z_1, z_2, z_3, \dots, z_n);$$

$$F^{CP} = f(z_1, z_2, z_3, \dots, z_n),$$

F^{CF}, F^{CP} – function expressing the efficiency of production (net cash flow, capital-labor productivi-

ting the efficiency of production;
t of capital assets;
ate of fixed assets;
depreciation ratio;
al growth of fixed assets;
working railway company;
depreciation ration of railway transport.
timate goal of the program to develop an optimal reproduction management of fixed assets of the rail-
s to select the objects of reproduction, i.e. the optimization program with the help of economic-
ethods:

$$\frac{\sum_{i=1}^{m}\sum_{j=1}^{n} pl_{gain_j}^i}{\sum_{j=1}^{n} I_j} \to \max_{x \in M_x}$$

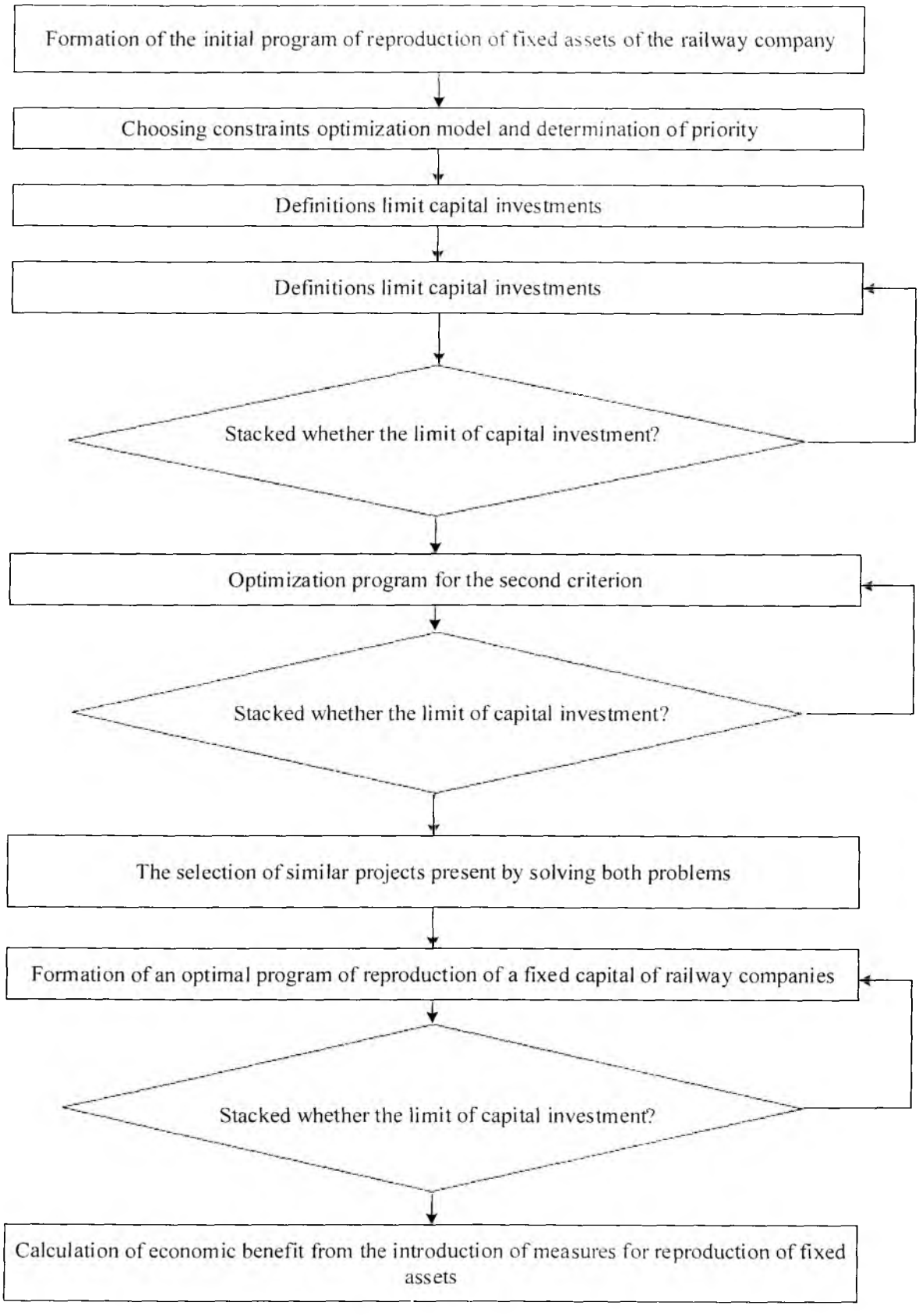

Fig. 2. The algorithm for generating the optimal program of reproduction of a fixed capital of railway companies

$$M_x = \begin{cases} F_j^{NCF} \geq F_{act}^{NCF} \\ F_j^{CF} \geq F_{act}^{CF} \\ F_j^{CP} \geq F_{act}^{CP} \end{cases}$$

e propose an iterative procedure for selecting projects based on this model.

he first stage, we can optimize reproduction of fixed assets of the railway company in one of the previously
ts of optimality models over the discounted net flow.

the second stage, the program of fixed assets reproduction of the railway company in charge of other re-
del of optimal is maximizing capital-and-labor productivity.

he third stage of the program of formation is figure out the optimum reproduction of fixed assets associated
way companies of similar projects xj, ie projects that are present at the same time as a result of the decision
al problems – maximization of net cash flow, capital-and-labor productivity. Homonymous project forms the
rogram of fixed capital reproduction of the first level. Further clarification is made by the criterion of max-
ther reduced in comparison to the work-expended investments to railway company.

general, the procedure for the formation of an optimal program of reproduction of a fixed capital of railway
s presented above in Figure 2.

4. CONCLUSIONS

he resulting economic and mathematical model of the proposed criteria allows you to create an optimal pro-
oduction of fixed assets in the investment program (strategy) of the railway company (transport), the appli-
ich will make it possible to increase the efficiency of the company by increasing the technical level of ser-
determining the reserves of the company.

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ВОПРОСЫ ЭФФЕКТИВНОСТИ ВОСПРОИЗВОДСТВЕННОГО ПРОЦЕССА ОСНОВНЫХ ФОНДОВ В ИНВЕСТИЦИОННОЙ ДЕЯТЕЛЬНОСТИ ЖЕЛЕЗНОДОРОЖНОЙ КОМПАНИИ

А. Гуламов, кандидат экономических наук, проректор
Ташкентский институт инженеров железнодорожного транспорта, Узбекистан

Аннотация. *В статье рассматривается модифицированная методика расчета фондозатрат по ви- перевозок, использующая известные калькуляционные принципы расчета, предполагает наличие определении расходов по хозяйствам отрасли и группировки основных фондов в разрезе базовой ции стоимости основных фондов по группам и подгруппам.*

Ключевые слова: *основные фонды, капиталоёмкость железнодорожного транспорта, фондовые за- дифференциация стоимости основных фондов по группам и подгруппам.*