

Governmental Support and Efficiency Management of JSC “Russian Railways” Investment Activity

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Abstract—The article deals with the development of approach to the efficiency management analysis of investment activities of JSC "Russian Railways" on the basis of optimal management tasks and construction of socio-ecological-economic models of the regions to ensure their sustainable development due to the implementation of industry investment projects. The object of research is the investment activity of Russian Railways, taking into account its governmental support. The subject of research is the optimal control of investment activity performance.

Keywords—efficiency, investment activity, governmental support, sustainable development, optimal control

I. INTRODUCTION

The concept of "efficiency" is associated with the development of economic science. For the first time it is mentioned in the works of William Petty and Francois Quesnay for assessment of effectiveness of these or those government or private actions. Another classic of political economy David Ricardo uses the term "efficiency" in his work.

At the end of the 19th century the representative of neoclassical school of political economy Vilfredo Pareto formulated efficiency as a state of the economy at which it is already impossible to make any changes in favor of one actor of economic process without worsening situation of another while resources are used most effectively, and the result provides the greatest possible utility for consumers. According to Pareto the efficiency is reached when all benefits of the exchange are exhausted.

One of the modern management founders Harrington Emerson, the author of the book "Twelve principles of efficiency" (1912), considered the effectiveness to be the main task of management and expanded the content of this concept, having for the first time found the connection between efficiency and functionality.

Modern ideas of efficiency of the organization in Western management thought were influenced by the work of Peter Drucker, which differentiates the concepts of productivity (as an economic category reflecting production efficiency) and efficiency (as a socio-economic category reflecting the impact of organizing labor ways on the level of results achieved) [1].

In relation to the planned centralized economy in the 80s (under the leadership of academics S. Shatalin, L. V. Kantorovich, N. So. Lapin) the theoretical foundations were laid for using the forms and methods of program-target strategic management to solve complex cross-sectoral problems, to support the national economy, and the concept of coordination and contractual forms of inter-sectoral management organization was developed, as well as comprehensive forecasts of industrial infrastructure development were constructed for a long-term outlook (transport, communications, logistics, water supply and engineering infrastructure).

II. METHODS AND DATA

The theory of functional systems, which was developed in 1932–1933, was adopted by the socio-economic systems in the USSR as the methodological basis for the strategic development. Soviet scientists, academician P.K. Anokhin and in subsequent years developed in the framework of the general

mathematical theory of functions Academician A.N. Kolmogorov.

As a general prerequisite in the theory of the functional system, P.K. Anokhin proposed a fundamental idea about the integrity and unity of the world, about the harmony between the whole "universe" and separate details, parts. He was the first to formulate general principles for the development of a systematic approach to the studied research object.

The modern approaches to efficiency management offer methods based on the concept of sustainable development, optimal control theory to non-linear models of development of a diversified economy based on inter-sectoral balance V.V. Leontiev, big data processing software on super-powerful computers, applied system analysis. Thus, a group of Russian scientists under the leadership of Professor V.I. Gourman, a well-known expert in the field of management theory and system analysis, was developed and experimentally successfully tested in a number of regions of Russia a comprehensive socio-ecological-economic model describing a regional system. This model, which is a set of interrelated social, environmental, economic and management parameters, including the synthesis of still shared operational, investment and financial activities, can be successfully applied to the analysis of the effectiveness of investment projects [2].

This article focuses on the investment projects and investment activities in general of JSC "Russian Railways" (RZD).

Railway transport plays a significant role in the country's transportation maintenance and tariff stimulation, and at the same time makes a significant contribution to the formation of regional and local budgets of the country. According to experts, it is expected that the contribution of Russian Railways to the country's gross domestic product (GDP) will increase from 5.1% in 2018 to 5.4 - 5.6 % in 2025.

In order to improve the efficiency of the investment program in 2019 - 2025, it is planned to implement modern innovative technologies, including information modeling technologies by designing and constructing the infrastructure facilities, which will improve the quality and accuracy of the design documentation under development.

In the Russian Railways Development Program for the period 2019-2025 years the investment costs have been presented in the baseline scenario in the amount of 4671.4 billion rubles (optimistic scenario 5786.5 billion RUB), and with the funds of other investors 8658.1 billion rubles (optimistic – 9773.3 billion) [3].

The investment program is a part of the long-term Russian Railways development program until 2025 and consists of two sections: projects implementing the orders and instructions of the Russian Federation President and Government (the founder) and Russian Railways investment projects[4]. The aggregate indicators of the investment program are presented in tables I and II.

At present, pilot projects for the development of railway infrastructure have been identified, the design of which is provided using digital modeling techniques.

TABLE I THE RUSSIAN RAILWAYS CAPITAL INVESTMENTS TO INVESTMENT AREAS (BILLION RUR, WITHOUT VAT)

Period, year, investment areas					
2013	2014	2015	2016	2017	2018
<i>Fact</i>					<i>Plan</i>
<i>Total</i>					
467,2	396,0	365,5	376,3	479,5	549,6
<i>including the projects implementing the instructions of the Russian Federation President and Government</i>					
96,0	68,3	138,9	173,7	194,4	210,9
<i>the Russian Railways investment projects</i>					
371,3	327,6	226,6	202,7	285,1	338,7
<i>including railway infrastructure development projects</i>					
-	-	-	-	-	9,9
<i>ensuring the railway transport safety</i>					
56,1	46,9	44,3	41,7	114,8	97,5
<i>eliminating infrastructure restrictions and barrier in the Russian regions</i>					
161,4	140,3	74,3	45,2	62,5	108,3
<i>increasing transport accessibility for the population</i>					
17,2	12,4	8,2	12,2	15,6	9,6
<i>rolling stock upgrade</i>					
118,7	104,4	88,8	91,4	77,0	104,6
<i>other projects</i>					
17,8	23,6	11,0	12,2	15,3	8,8

In addition, the measures are foreseen increasing the carrying capacity of the Baikal-Amur and Trans-Siberian Railways to 180 million tons by 2024. At the same time, by the end of 2025, 210 million tons will be transported to the East.

TABLE II THE RUSSIAN RAILWAYS INVESTMENT PROGRAM UNDER THE BASELINE SCENARIO (BILLION RUR, WITHOUT VAT)

Period, year investment areas						
2019	2020	2021	2022	2023	2024	2025
<i>Total</i>						
682,9	823,6	745,0	734,1	739,6	511,6	435,7
<i>including the projects implementing the instructions of the Russian Federation President and Government</i>						
276,4	328,1	209,1	207,7	152,2	116,3	40,2
<i>the Russian Railways investment projects</i>						
406,5	495,5	535,9	526,4	587,4	395,3	395,5

Also, some measures will be implemented increasing the carrying capacity of the railway infrastructure to the ports of the Azov-Black Sea basin. In addition, the investment program provides for measures increasing the capacity of the railway infrastructure to ensure the growth of containers transit traffic by 4 times, including reducing the transportation time for containers by rail from the Far East to the Western border of the Russian Federation to 7 days. One of the important issues is to create the basis for the development of express and high-speed rail links between major cities.

There are some measures upgrading the infrastructure in order to ensure readiness for the growth of cargo transportation volumes in the long term above 4 percent per year and to increase the capacity of the railway network by eliminating infrastructure restrictions and barrier sections, as well as minimizing the risks of their occurrence in the future.

The investment projects effective implementation involves the achievement of the project planned key indicators. It means that the project management is an activity focused on the effective interaction of modern scientific knowledge, technologies, methods and tools aimed at extracting the planned result [5].

In general, investment activity is stimulated by the state of the technical base, the profitability of investments in fixed assets, the demand for services provided.

III. RESULTS

The main funds sources for the Russian Railways investment projects are still the federal and regional budgets, funds of the Fund for National Development, net profit of JSC "Russian Railways", pension savings of the Russian Pension Fund.

In 2018, the Russian Railways investment program was approved in 549.6 billion rubles, the financing of which is provided by state support. Major projects are mainly financed in the ratio of 50/50 at the expense of the investor and the

Investment Fund of the Russian Federation. The goal is to increase passenger and freight traffic, as well as to improve intra-city rail traffic.

From 2013 to 2016, capital investments in areas of investment have decreased significantly. Thus in 2013, 467 billion rubles were invested, and in 2016 - 376 billion rubles. In 2017, the volume of investments in Russian Railways amounted to 479 billion rubles. A part of the projects is connected with the instructions of the Government of the Russian Federation. The amount of investments in such projects has increased since 2014. This means that the Government is increasingly taking part in the activities of the company, ordering certain projects [6].

The practice of budget expenditure management in Russia dates back to 1907. According to some sources, this year the Ministry of Railways of the Russian Empire prepared the first in Russia five-year plan [7].

The state policy of the Russian Federation in the sphere of transport is aimed at creating conditions for solving the problems of socio-economic development. It ensures the constitutional rights of citizens and sets free resources for personal development. The state policy is defined in the orders of the President of the Russian Federation, the President's messages to the Federal Assembly of the Russian Federation, the Concept of long-term socio-economic development of the Russian Federation for the period up to 2020, approved by the order of the Government of the Russian Federation of November 17, 2008. № 1662-R, Transport strategy of the Russian Federation for the period up to 2030, approved by the order of the Government of the Russian Federation dated November 22, 2008 № 1734-R, other sectoral strategies and concepts [8].

Long-term priorities of the state policy in railway transport established by the State program of the Russian Federation "Transport System Development" approved by the order of the Government of the Russian Federation of 15.04.2014 N 319 "On the approval of the state program of the Russian Federation "Transport System Development" include:

- balanced and effective transport infrastructure development based on increasing the capacity of the core transport network, eliminating gaps and bottlenecks, developing major transportation hubs, creating and developing port special economic zones;

- transport support of complex development of the territory of the Russian Federation, including the development of railway lines, which are the key in the development of Russian regions;

- implementation of major transport projects, including within the public-private partnership, ensuring the development of mineral deposits in new production areas, mainly in Siberia, the far East and the continental shelf;

- formation and distribution of new transport (transportation) and logistics technologies that improve the quality and availability of transport services, including the organization of express and high-speed passenger trains on the railway network priority areas, the introduction of advanced

commodity transport technologies, including the logistics systems;

- ensuring comprehensive safety and sustainability of the transport system, including improving transport security, reducing the harmful effects of transport on the environment and the transfer of transport to new fuels [9].

The state policy of the Russian Federation subjects in the sphere of transport complex is an integral part of the Russian Federation state policy in the sphere of transport and should be based on the general principles and approaches defined by the state strategic documents, taking into account:

- maximum consideration and reflection of the features of socio-economic development and transport needs of Russian regions;

- transport infrastructure development planning on the basis of transport and economic balance, which should be formed at the federal, regional and municipal levels;

- synchronization of plans for the transport infrastructure development in the regions of Russia with the goals and objectives of long-term development of the country, as well as the mechanisms for their implementation, mentioned in the Transport Strategy of the Russian Federation for the period up to 2030;

- separation powers in the field of transport between Federal and regional authorities.

The priorities of the state policy of the subjects of the Russian Federation in the field of transport complex are the following:

- development of public passenger transport (suburban railway transport), including the development of urban agglomerations transport systems, the creation of a modern system of high-speed passenger transport, transport hubs and intercepting parking lots;

- maintenance and development of transport infrastructure owned by the Russian Federation subjects;

- improving the environmental and safety of the road transport complex, including road safety, improving the operational status of road network dangerous sections, ensuring the activities and improvement of automatic control systems for compliance with road traffic rules of the Russian Federation, approved by the Council of Ministers (the Government) of the Russian Federation dated October 23, 1993 № 1090;

- introduction and use of the GLONASS satellite navigation system for the transport complex navigation support and security.

The analysis of the state program implementation results and the effectiveness of state support measures showed the following.

Financial support of expenses for the implementation of the state program is carried out from several sources: from the federal budget, consolidated budgets of subjects of the Russian Federation, legal entities and extra-budgetary sources.

According to the consolidated annual report of the Accounts Chamber of the Russian Federation at the end of 2016, there is a low level of funding for the state program activities at the expense of extra budgetary sources, which amounted to only 21.5% of the planned amount. The financing level of the state program activities at the expense of legal entities amounted to 94.7 percent [10].

Unfulfilled purposes by the state program were in the amount of 22.47 billion rubles (66,4% in the structure of unfulfilled expenses), including the subprogram “Main Line Railways” - 1,03 billion rubles (3%) that have impacted on the achievement of targets.

Thus, out of 73 main indicators (indicators) of the state program in 2016, the planned values were met only by 32 (43.8%). At the same time, it was noted that the targets (indicators) for 2016 presented by the Ministry of Transport of Russia do not correspond to the values approved in the state program.

At the same time, the planned values of some targets (indicators) specified in the Revised Annual Report of the Ministry of Transport of Russia do not correspond to the planned values of targets (indicators) established in the state program, which in some cases leads to a distortion of the assessment of their implementation [10].

Thus, the planned value for 2016 of the target (indicator) “Transport mobility of the population in railway transport (in relation to 2011)” according to the approved state program is 108.6%, in the Revised Annual Report is 83.4%. The actual value of the indicator was 86.9% and should be estimated as non-fulfillment of the planned value set in the state program, by 21.9 percentage points, however, according to the Revised Annual Report, exceeds the target by 3.5 percentage points.

According to the approved state program, the planned value of the target indicator of the subprogram “Main Line Railways” amounted to 1.09 billion people, according to the Revised Annual Report is 1.02 billion people. As a result, the actual value (1.04 billion people) should be estimated as a failure to meet the target set in the state program by 4.6%, however, according to the Revised Annual Report, exceeds the target by 1.9 percent.

According to the Ministry of Economic Development of Russia, the degree of efficiency of the state program in 2016 amounted to 87.7%, which corresponds to the level of “Implementation efficiency of above the average level”. This was determined on the basis of four indicators: the degree of targets achievement (88.9%), the key measures implementation (97.2%), the level of cash execution of federal budget expenditures (96.8%) and the efficiency of the executive actor (66.7%).

Taking into account that the share of indicators for which actual values are not presented was 12.8% (more than 10%), the state program, according to the Accounts Chamber of the Russian Federation, is not subject to efficiency assessment for 2016.

At the same time, the level of implementation of all targets (indicators) of the state program and its subprograms amounted

to 66% (low level), the level of dynamics of indicators achievement for 2016 compared to 2015 — 54.6% (low level), the level of implementation of control events on detailed schedules — 93.2% (high level), the level of cash execution of the state program to the consolidated budget list — 96.1% (average level), the level of management of the state program — 83.3% (high level).

In 2017, the main reason for the budget allocations non-fulfillment established by the consolidated budget list with the changes is the incomplete use by the main managers of the budget allocations provided for the implementation of the state program activities (23.4 billion rubles, or 3.9%). Mainly due to the non-fulfillment by contractors of obligations under state contracts for the construction of transport infrastructure facilities, low rates of work in the absence of proper control by the recipients of federal budget funds; the duration of the terms of approval of documentation and decision-making on the seizure of land and other real estate for state needs [11].

Thus, despite the fact that the main sources of funds for investment projects of railways are the state and regional budgets, there are facts of incomplete use of these funds, and as a result – not achieving the targets (indicators), which leads to an insufficient level of efficiency of the state program and indicates the lack of proper control by the main managers and recipients of budgetary funds.

IV. DISCUSSION

The concept of investment efficiency is mainly associated with the assessment of the impact of production efficiency on the financial and economic, which is thus artificially isolated from the effectiveness of a whole socio-economic system. Official methods of assessing the effectiveness of investment projects mainly provide tools for calculating the financial and economic efficiency, besides limiting the assessment of the economic effect (income minus expenses) by the organizational framework of the structural unit, legal entity or holding company as a whole, implementing the project. As a rule, if the state does not participate in co-financing, then the choice of the investment solution option is carried out exclusively on the criterion of “maximum NPV (net present value)”, i.e. “internal” efficiency, and the remaining parameters are considered only as inevitable legal restrictions on the way of increasing NPV.

This does not fully correspond to modern ideas about sustainable development, i.e. about balanced growth of production and well-being of the whole society, a complex consisting of categories and criteria of technological, industrial, financial, economic, social, environmental and innovative efficiency of the entire economy and the transport industry as its part.

Thus, the analysis of existing methods for assessing the efficiency of investment activity shows that the criteria that are proposed there can not provide a comprehensive assessment of the effectiveness of economic activities, especially in the regional aspect, taking into account the priorities of sustainable development [12]. In officially operating second edition of “Methodical recommendations on investment projects efficiency assessment” of 1999 and unapproved third edition of 2008 the concept of “investment project public efficiency” is introduced

to identify the compliance of the project with the goals of socio-economic development of society, but no clear criteria for assessing this efficiency are proposed[13].

If the investment program includes the state program, as the projects implemented by Russian Railways, the preview control of investments efficiency is based on the recommended official methods of the evaluation criteria predominantly “internal” efficiency of investment projects, and the subsequent control is carried out according to the criteria of achievement of target indicators and the degree of development planned funds state program, i.e. on financial criteria only. No one will finance something at a loss.

An urgent task is to create a system of indicators to assess the effectiveness of investment and improve the quality of the justification for the distribution of the investment budget, taking into account the factors of sustainable socio-economic development of territories. It should also take into account not only financial, i.e. “internal” effects of the project, but also “external” effects arising in related sectors of the economy, associated environmental, social and innovative effects both in this territory and abroad. On the scale of investment and in the unity of the transport system, these effects tend to be interdisciplinary and interregional. Thus, the limited priority of financial criteria in the selection and adoption of investment decisions as a serious obstacle to the sustainable development of the industry and its territory of activity is overcome.

Modeling of interregional and regional processes.

The assessment of external efficiency can be obtained using socio-ecological-economic model, which is successfully used to solve the problems of forecasting regional development, including calculations for areas with special natural conditions, such as the Baikal Lake Region[14].

The dynamic socio-ecological-economic model includes the following vector relation based on the well-known model of intersectoral balance:

$$v = A v + Bu + A(z)z + B(z)w + p(r) + \beta (v - A v)(1)$$

where v - n-output vector by economy branches; u - n-investment vector; r - m-vector intensity of the production impact on the environment and society; AuB -matrix of the main production and fund-making costs; Z and w - m-vectors characterizing production and investment in supporting and restoration activities for ecology and society;

$A(z)$ и $B(z)$ -corresponding matrices of direct and fund forming costs; $p(r)$ - m-charge vector for excessive violations of ecology and society; β - n-profit tax vector.

Other relations of the model describe the elements interaction processes in the environmental and social blocks, the impact of the economy on the state of environmental and social indicators, the dynamics of fixed assets, restrictions, etc. The economic block of the model also takes into account innovation.

For calculations using the model, a quality criterion (value added - welfare functional) is formed, aimed at maximizing final consumption as an economic effect while minimizing violations in the environment and society.

The application of this model and based on its prediction algorithms, scenario calculations, searching for optimal solutions provides the following opportunities to assess the effectiveness of investment in transport infrastructure, complementing the recommendations of existing techniques:

- practicing the analysis of investment projects of external efficiency criteria in a complex with internal efficiency criteria on which estimate both growth of the monetary capital and payback periods of private investments, and financial interests of the budget (payback of budget financing of projects due to expansion of tax base);

- taking into account the influence of the structural shift in the economy within the framework of the inter-sectoral balance, which inevitably arises as a result of the implementation of a sufficiently large-scale project;

- ensuring connection with the dynamics of consumer demand as the ultimate goal of investment and the most important criterion of well-being;

- taking into account the social consequences of the project;

- taking into account the direct impact of the project on the ecology of the region, while the project cost estimate for environmental activities is only indirect information;

- reasonable criteria for evaluating the result of innovation

- long-term projects analysis of national economic scale and the value of the payback horizon in decades, which in terms of existing methods, based on the criteria of "internal" efficiency, are often deliberately losing.

Thus, it becomes possible to take into account the associated economic, social, environmental effects in the region and beyond it, in the economy sectors – suppliers of resources and services for transport industry projects, consumers of cargo transportation, at enterprises - competitors and in the sphere of final consumption – passenger transportation and in a broader context, taking into account the scale of "Russian Railway" JSC activities and its impact on the entire economy.

The model takes into account the systemic factors of sustainable development and intensive economy, but some of these factors require additional emphasis in the model parameters and scenarios for calculations. Thus, to take into account the employment model, this indicator can be directly introduced into the system of indicators of the state of society. Moreover, it is desirable to introduce not one, but several indicators characterizing employment in various sectors of the economy, which will allow taking into account structural changes in employment in the innovative economy through appropriate regulatory coefficients of the model, forming a kind of "intersectoral balance of employment". This will take into account such effects as the loss of employment in competing enterprises, the increase in employment in enterprises - suppliers of resources and the increase or decrease in enterprises – users of transport services. The corresponding indicators of the social block of the model will allow taking into account the development of the infrastructure of reproduction of labor resources - health, education, pension and social security

(increase in life expectancy, reduction of morbidity against the background of income growth and reduction of treatment costs, etc.). Here - improving the quality of training through the processes of formation and training of employees.

The total growth of employment and wages, structural shifts in employment and wages through innovation, changes in the quality (skills) of the workforce - these factors together provide growth in private demand as the leading conditions for economic growth. Wages can be considered average, in dynamics. The cost of training (prof. training, additional education) should be linked to the level of wages. Sources of expenses for training can be: the state budget - at the expense of taxes, the salary of the employee - at his own expense.

The strategy for the railway transport development in the Russian Federation until 2030 defines the social sphere as an important component of the company's life and sustainable operation. Investments in the social sphere are considered not only as the fulfillment of obligations to employees and veterans, but also as a tool to improve the production and economic efficiency of JSC "Russian Railways".

Socio-ecological-economic model combines both natural and cost parameters, allows taking into account the mutual influence of various effects, additional costs of the economy on the restoration and maintenance of society, depending on the degree of damage, shortage and rise in price of raw materials due to environmental violations. In addition, the introduction of the price factor into the model makes it possible:

- take into account the growth of productivity (gross output) in physical and value terms: $\langle \text{total costs} \rangle$ — $\langle \text{function of output (productivity)} \rangle$;

- take into account the regularity that the basic tariffs with the growth of production productivity objectively should be reduced, but not proportionally (due to the presence of fixed costs that do not change with the change in the volume of output), but with a certain reduction factor.

The structure of the investment program of JSC "Russian Railways" in the areas, as well as reports on the implementation are favorable conditions for the application of socio-ecological-economic model to the existing information database. However, research is needed to complement existing data to analyze the past and enrich scenario calculations for the future.

In addition, the proposed socio-ecological-economic model has a rich opportunity to assess investment risks at the stages of scenario calculations, study the sensitivity of the project to possible deviations of the estimated parameters, as well as the subsequent analysis of completed projects. We are talking about the whole set of risks: economic, social, environmental and innovative.

The lack of investment in infrastructure development is assessed as a critical economic risk with an average probability of occurrence. Among the economic risks, non-compliance with the planned terms of implementation of the investment program projects may also have the greatest impact. To minimize these risks, it is planned to optimize technical solutions and improve the management system of investment projects.

Among the social risks, personnel risks are singled out,

namely, the lack of qualified personnel due to the insufficient level of competitiveness of JSC "Russian Railways" as an employer and the increased competition in the labor market due to the negative dynamics of the working population of Russia in the medium term. These risks are assessed as significant with an average probability of occurrence.

It is planned to minimize personnel risks and:

- maintain the wages of workers at the level of higher nationwide and providing competitive level;
- personnel development based on modern approaches to training and education;
- implementation of social target programs;
- the formation of a social package that meets the needs of the employee.

Environmental risks accompany economic risks at all stages of investment project management. The choice of priorities of JSC "Russian Railways" in the field of environmental management and environmental safety until 2025 is determined by the principles of state policy in the field of environmental development of the Russian Federation for the period up to 2030, approved by the President of the Russian Federation on April 30, 2012, and the decree of the President of the Russian Federation dated May 7, 2018 № 204 "On national goals and strategic objectives of the Russian Federation for the period up to 2024".

Taking into account the priorities of the state policy in the field of environmental protection, the goal of JSC "Russian Railways" in the field of environmental activities was announced to increase the level of environmental safety, environmental management and conservation of natural systems.

With regard to the innovative efficiency of the transport industry, it is also appropriate to consider both internal and external aspects. The internal efficiency of innovation in the transport sector - improving productivity, growth and quality, saving current and capital expenditures, profit growth and profitability. The external efficiency of technological innovations is manifested in the reduction of the base tariff due to the reduction of the cost of traditional transport services. External efficiency of product innovations (innovative services) is manifested in reducing the cost of operation of the consumer. In this case, the probable growth of the basic tariff for a fundamentally new service of the transport industry is paid off by saving time and operating costs for the consumer, and as a consequence, by reducing the total costs in the social system as a whole. It should also be borne in mind that the subject of innovation in the investment project in transport can be not only technology or services, but also associated with the industry environment and society.

V. CONCLUSION

The investment program of JSC "Russian Railways" is aimed primarily at the development of the transport

infrastructure of Russia. When justifying the projects efficiency that make up the program, the priority criterion for evaluation is the return on investment and the associated cost parameters. We offer optimization of investment projects efficiency management based on system modeling and scenario calculations, expanding the composition of the parameters taken into account, covering a wide range of indicators of the economy, environment, innovation and society. This together describe and allow assessing the social efficiency of both individual investment projects and the projects of JSC "Russian Railways" investment program.

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