

Implementation of the Marginal Approach to the Operational Costs Accounting in Railway Enterprises

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Abstract—In this paper the operational activities of the railway transport are characterized. Two groups of factors characterizing the operational activity of the railway transport are distinguished. The classification of operating costs is analyzed. The influence of time factor and technical equipment of railways on the behavior of operational costs is submitted. The necessity of using the marginal approach to operational costs accounting of railway transport is proved. The algorithm for compiling a report on financial results, formed using the “direct-costing” system is submitted. The proposed report on financial results in the form of step-by-step amounts of coverage allows distinguishing between the dependent and conditionally constant costs, identifying ways to optimize them, influencing of the structure of fixed costs by types on the rail transportations and in general.

Keywords—operational costs, operational activities, railway transport, the marginal approach, the accounting, report on financial results, “direct-costing”.

I. INTRODUCTION

Reforming the railway industry has been going on for more than 15 years. The creation of infrastructure conditions for the economic growth, reaching the world level of technological development and increasing the global competitiveness of Russian railway transport are the key objectives of the Strategy for the development of railway transport in Russia until 2030 [3]. In a competitive environment the management of railway transport costs becomes particularly important. In this regard the improvement of accounting procedures in the system of management accounting of the railway transport operational costs is becoming especially topical.

Operational costs are one of the most important indicators of the railway performance. They are a reflection of supply and demand for the transportation, the quality of the transportation process and transport services, the state transport policy, the level of prices for consumed resources and the conditions of the transportation.

The distinguishing features of the operational activities of railway transport can be grouped into two groups of factors:

- Objective factors. This group of factors includes the geographical distribution of the railway, the level of

development of the productive forces, the railway infrastructure

- Other factors. These factors include the quality management system and the management of labor resources employed on the railway; quality of production management and climatic conditions [5].

II. SPECIFIC FEATURES OF OPERATIONAL COSTS OF RAILWAY TRANSPORT

The operational activities of railway transport are an organized process of using all the technical means of railway transport in order to ensure transportation. The composition of the operational activities of the railway transport is shown in Fig. 1:

The main normative documents regulating the procedure for accounting the rail revenue and expenses are the Nomenclature of expenditures for the main activity of the railways of the Russian Federation (hereinafter referred to as the Nomenclature) and the Procedure for separate accounting of incomes and expenses by natural monopoly entities in the sphere of railway transport (hereinafter referred to as the Procedure) with the relevant annexes to this document.

The procedure takes into account the specific features of accounting of rail transport costs, which include:

- Principles of functional and cost analysis, which form the basis for accounting of railway transport income and expenses
- Maintenance of separate accounting of all components of the transport process according to the types of activity
- Allocation of classification indicators of expenditures: by cost elements; on articles of the nomenclature; on sectoral farms; on enlarged types of work; by type of activity; by tariff components; on communication with the production process in accordance with the requirements of functional and cost analysis
- Development of a method for the distribution of income and expenses by type of activity based on the use of different distribution rules [2].

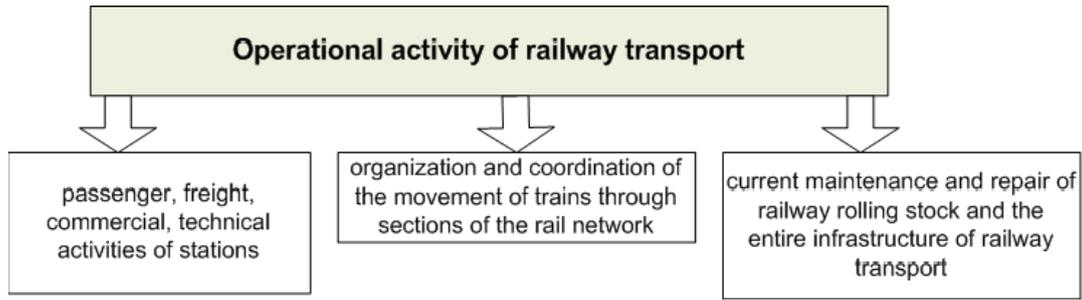


Fig 1. The composition of operational activities of railway transport

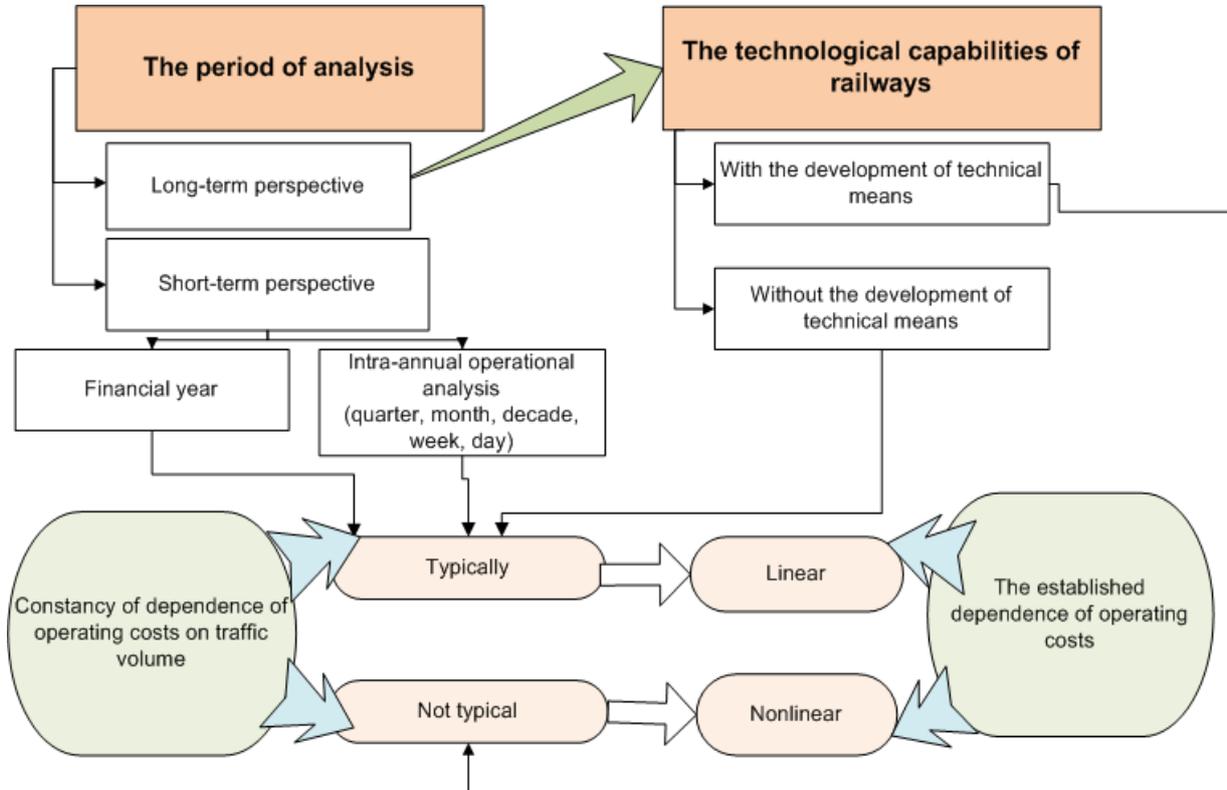


Fig 2. The influence of time factor and technical equipment of railways on the behavior of operational costs

III. USING OF THE MARGINAL APPROACH IN OPERATIONAL COSTS ACCOUNTING IN THE RAILWAY ENTERPRISES

An analysis of the classification of rail transport operational costs has shown that costs are recognized by the places where the costs had occurred and by the cost elements within the traditional Russian accounting system. In addition, there is a rationing of costs for material resources (fuel, electrical energy, overalls, etc.) in traditional cost-accounting system.

It is important to note that in a dynamic complication of market relations the main task of calculating is not simply the

calculation of the actual cost of services, but the calculation of such a cost that could provide the company a certain income. Therefore, it is advisable to avoid labor-intensive calculations of the indirect costs allocation and determine the actual cost price in the direction of forecasting cost calculations.

Specificity of the railway transport industry causes the presence of a large proportion of costs that do not depend on the amount of activities [4]. The railway transport key priorities, outlined above, require the solution of strategic management tasks, including the division of costs for fixed and variable. The marginal approach to cost accounting is the

most acceptable in those industries that go from the model of extensive development towards intensification of production.

Using of the marginal approach enables:

- To manage a profit on the basis of the relationship between the volume and structure of transfers, on the one hand, and expenses and incomes, on the other
- To avoid the distortions and incorrect conclusions that are unavoidable in the case of a fixed costs distribution and determination of the full cost price
- To make calculations of costs and results that will be objective and understandable for the units
- To determine the dynamics of changes in turnover on expenditure accounts in order to increase financial discipline
- To justify the level of tariffs, especially when penetrating new market segments, as well as the level of prices for products and services
- To strengthen the motivation of employees to increase their contribution to the realization of a common goal [1].

The operational costs of railways depend on the volume of traffic. The degree of dependence of some articles of operating costs is different. It develops under the influence of other factors and fluctuates within very considerable limits. The composition of the dependent and conditionally constant costs has a conditional nature, since the period of cost distribution is influenced by the period of the analysis of the cost behavior, as well as the technological capabilities of the railways. However, such a division of costs is of great practical importance. With the growth of traffic volume, some costs change in proportion to the dynamics of traffic volume. Other costs grow slowly or remain unchanged until the technological capabilities of the railways begin to change (Fig. 2).

It should be borne in mind that the analysis of the dependence of operational costs and costs on traffic volume provides three time options: the current analysis, the basic analysis and the forward-looking analysis. The current analysis takes into account the changes in expenses that are reflected in the financial reporting of this period. The main analysis assumes that the change in traffic volume occurs at constant values of the carrying capacity of railways, the qualitative indicators of the use of rolling stock, the norms for the consumption of fuel, energy and other types of resources. The entire list of costs related to the volume of traffic and changing when it changes in direct proportion to the volume of traffic refers to the volume-dependent costs [6]. The long-term analysis covers a long period of time and provides for the development of the throughput capacity of railways, as well as changes in the qualitative indicators of the use of rolling stock and expenditure norms. In this case a change is observed not only in the dependent costs, but also in the part of the conditionally fixed costs.

The marginal approach is advisable to apply with the current and basic variants of the analysis of operational costs. Using of the marginal approach makes it possible to

significantly expand the traditional toolkit that ensures the adoption of managerial decisions.

Cost center accounting using the “direct-costing” system negates the very notion of indirect costs, because indirect costs in the areas of costs become direct relative to the specific place where the costs occur. Thus, the management system “direct-costing” is logical to use in the analysis of costs in the places where the costs occur, where the costs are divided only into dependent and conditionally-constant. In other words, it is advisable to apply the marginal approach to structural units of the linear level, to directorates, railway departments, railway departments, road subordination subdivisions and subdivisions of the central office, functional branches, and also to functional branches that do not have structural subdivisions.

The modern system “direct-costing” offers two approaches to calculating the result:

1. Simple or two-step “direct-costing”: only variable costs (direct material and labor) are included in the cost. The result is calculated in two steps: the gross margin is determined at the first step of the calculation, the operating profit – at the second. The gross margin is the difference between the proceeds from the sale of products and incomplete cost, calculated at variable costs. Profit and fixed costs that are not included in the cost determine the gross margin. The difference between marginal income and fixed costs forms the operating profit of the enterprise [1,2].
2. Developed or multi-stage “direct-costing”: cost variables include direct variables and direct fixed costs. The multistage calculation of the result is determined by the differentiation of total fixed costs for a number of signs (by function, by level of management, by product or market segments). As a result, at each stage of calculation, an intermediate result is obtained, which makes it possible to assess the real contribution of the studied segment to the total result of the enterprise’s activity.

The use of the “direct costing” method will simplify the procedure for calculating the cost of services, as well as reduce labor intensity due to the lack of complex calculations for the allocation of fixed costs between activities.

The reporting, compiled using the “direct-costing” system, meets the needs of managers of different directions and levels of management. The report on financial results, formed with the use of the “direct-costing” system, allows identifying the contribution of individual structural divisions, sections, responsibility centers, segments of activity in obtaining planned financial results.

We recommend compiling the financial report on the “direct-costing” system on the freight and passenger traffic. The method for generating a report on financial results using the “direct-costing” system is reduced to the following:

- The variable production costs, including specific (direct) variables and general production variable costs are deducted from the revenue from operating

activities without VAT. This action leads to the marginal profit indicator

- The constant specific for individual branches of the economy costs are deducted from the marginal profit. This action leads to an indicator of the so-called semi-marginal profit
- All other fixed costs (general production, general economic, commercial) are subtracted from the semi-profit margin. The result is the operating profit from operation

The proposed report on financial results in the form of step-by-step amounts of coverage allows distinguishing between the dependent and conditionally constant costs, to identify ways to optimize them, the influence of the structure of fixed costs by types on the rail transportations and in general. The marginal approach facilitates the rapid control of costs and results at different levels of management and allows assessing the degree of assistance or difficulty in achieving an enterprise's goals by each division.

In addition, one of the areas for improving management accounting in railway transport enterprises is the introduction of the marginal approach to the formation of the operating costs budget. The operating costs budget, compiled on the basis of the marginal approach, contributes to an increase in the analytical nature of accounting information and the effectiveness of economic and managerial decisions.

The main feature of the budgeting of the main activities of the railway enterprises (freight and passenger traffic) is the use of "mixed" approaches, i.e. a combination of techniques adopted both in market (profit-oriented) enterprises and in state-owned enterprises. So, on the one hand, the railway enterprises are guided when planning for overcoming the break-even point, which, of course, refers to the market methodology. On the other hand, budgeting is conducted on an incremental basis, i.e. using financial indicators for past reporting periods, which has obvious similarities with the crushed "from the achieved" planning methodology used in almost all state-owned enterprises.

Undoubtedly, the mixed approach has certain positive aspects:

- Ensuring continuity in work
- Relatively low complexity of management costs for planning and budget works,
- Using simple, easily situationally adaptable extrapolation models.

However, it has some "deficiency" in the use of calculation methods of a feasibility study, often affecting the final result of the compilation of budget indicators, since automatic transfer-duplication of indicators from one period to another is not always effective. Recalling the economic literature of the past time, one can criticize the current approach about its apparent similarity with the "from achieved" planning methodology "defeated" at that time. Later it turned out that not only this particular method was crushed, but also the entire planning system.

Hence the need to improve the methodological approaches to budgeting at railway enterprises is substantiated.

The priority for budget of the core activities of railway enterprises should be budgeting operating costs and their results. In our opinion, the preparation of this budget should consist of five stages.

- Stage 1: forecasting the value of operating costs and net revenues and determining the minimum profit
- Stage 2: development of the project operating costs based on the specified traffic volumes
- Stage 3: comparison of the projected amount of revenue and project operating costs to obtain the difference characterizing the amount of project profits from the operation of railways
- Stage 4: comparison of the amount of project profits from the operation of railway transport with a minimum level of profit. If it is smaller, additional measures are being developed to make the operating costs more economical, but if not, then the transition to the fifth stage takes place - approval of the budget for operating costs.
- Stage 5: approval of the budget operating costs.

An example of the revenue part of the budget of operating costs and their results by railway enterprises facilities is presented in Table I.

TABLE I SAMPLE FORMATION OF THE REVENUE PART OF THE BUDGET OF OPERATING COSTS AND THEIR RESULTS OF RAILWAY ENTERPRISES FACILITIES

No	Name of railway farms	Net revenue
1.	Passenger facilities	6868848
2.	The department of freight and commercial work	2221467
3.	The department of transportation	5745897
4.	Locomotive facilities	44893688
5.	Carload facilities	10170311
6.	Track facilities	43934724
7.	The department of civil constructions	1491240
8.	The department of automation and telemechanics	4765502
9.	The department of communication	3733666
10.	The department of enterprise informatization	1520685
11.	The department of electrification and power supply	4725493
12.	Other facilities	7283352
	TOTAL RESULT	137354874

The expenditure part in the practice of budgeting railways is structured by economic elements (material costs, labor

costs, social contributions, depreciation and other costs) and by responsibility centers (facilities and departments).

At the same time, material costs are planned on the basis of current norms of resource consumption (basic costs) and by the number of structural subdivisions (overhead costs). Labor costs and social contributions are calculated on the basis of average values of the number of employees and the average monthly salary. Depreciation of fixed assets should reflect the amount of depreciation on the full restoration of fixed production assets, calculated on the basis of their book value and the standards approved in the established procedure.

The expenditure part of the operational expenses budget, as well as the revenue part, can be presented within the centers responsibility: for departments and facilities.

The budgeting process must comply with the following principles:

The principle of consistency in this context implies full coverage of all activities of the enterprise and its centers of responsibility, consideration of the operation of railway enterprises as a whole with the whole variety of internal and external communications, elements and subsystems.

Another prerequisite for effective budgeting is adherence to the principle of flexibility and adaptability, which is necessary for adapting to external and internal changes in economic, technological, organizational, regional and other conditions of transport work.

The principle of modernization is necessary to ensure budgeting conditions for the continuous improvement of the existing system of operational and financial planning of transport work, the principle of motivation is to financially stimulate the quality of work activities of railway personnel.

The principle of accountability should be incorporated in the budget process due to the need for strict control of budget execution, otherwise it can be considered as a formal process.

The principle of efficiency ensures the focus of budgeting towards getting the maximum financial result with minimum costs.

Adherence to this principle determines the iterative nature of the budget layout [7].

As a recommendation to improve the existing operational costs of the railway enterprises and their results, we propose to use the marginal approach to budget formation operating costs [8]. This method is reduced to performing the following actions:

1. The sum of direct material, direct labor costs and social contributions from the basic salary of the main staff is subtracted from the net proceeds from operational activities. The result is reflected in the marginal profit indicator.
2. General transportation costs, consisting of the management costs, the origin of which are the centers of responsibility for the performance of transport services (depreciation of passenger and baggage cars, current, capital and depot repair of buildings,

structures and equipment (including cars), as well as their maintenance in the process transport work) are deducted from marginal profit. The result is a gross profit indicator.

3. General expenses (salaries of managerial personnel, extrabudgetary contributions from managerial salaries, maintenance of general business tasks, travel expenses, etc.) and business expenses (advertising expenses, participation in exhibitions, brochures and representatives of other enterprises and etc.) are deducted from gross profit. The result is proposed to reflect the profit from sales (profit from the operation in relation to organizations of railway transport).

This approach to the budgeting of the main activities of railway enterprises, despite a slight increase in the complexity of calculations, will allow the use of information for the analysis "costs-traffic volume-financial results", tariff setting, making decisions on increasing the profitability of specific types and names of transport work, calculating the break-even point and etc. [9]. Consequently, there will be a real opportunity to increase management efficiency operational costs of railway enterprises.

IV. CONCLUSIONS

The marginal approach to the analysis of operational costs and the prospects for its implementation are primarily related to the search and development of modern management technologies aimed at improving the efficiency of railway transport enterprises in modern dynamic and harsh competition conditions [10].

The implementation of the above recommendation practice of the railway enterprises will reduce operating costs and, ultimately, improve business efficiency.

The introduction of the recommendations proposed above into the practice of the operation of railway enterprises will help reduce operating costs and, ultimately, improve business efficiency.

References

- [1] N.A. Burdacheva, Budgeting on the railway transport, Moscow: ROAT, 2010, pp. 56-57.
- [2] N.I. Loskutova, N.A. Kalmakova, "Modern problems of managing corporate costs according to the levels of organizational structure", *Fundamental research*, vol. 9-3, pp. 574-580, 2015.
- [3] The Strategy for the Development of Railway Transport in the Russian Federation until 2030.
- [4] A.S. Soglasnova, "Peculiarities of management accounting for railway transport enterprises", *Young scientist*, vol. 4 (108), pp. 499-501, February 2016.
- [5] O.V. Chupeeva, Improvement of management accounting of operating costs at Far Eastern railway enterprises, Moscow, 2013, pp. 18-20.
- [6] N.P. Tereshina, L.P. Levitskoy, L.V. Shkurinoy, *The economy of rail transport*, Moscow: UMC ZHDT, 2012, pp. 536-538.
- [7] O.Y. Ziboreva, "Accounting reporting in JSC "Russian Railways": segmentary approach", *Financial aspects of structural transformations of the economy*, vol. 3, pp. 71-75, 2018.
- [8] A.V. Basova, "Accounting-analytical model of innovation-active business entities", *Advances in Economics, Business and Management Research*, vol. 38, pp. 40-46, 2017.

- [9] L.R. Gazizova, "Margin approach in profit management", Bulletin of modern researches, vol. 10, pp. 38-40, 2018.
- [10] L.L. Lychagina, A.P. Golubenko, "Essence and efficiency of using the cost accounting system "direct-costing", Problems of accounting and finance, vol. 2 (18), pp. 73-78, 2015.