ANALYSIS STRUCTURE OF CUMULATIVE EXPENSES IN FORMING FINANCIAL CONTINUA OF THE COMMERCIAL BANK

Boboev Nozimjon, Tajikistan

Abstract. An important instrument of the increase of bank activity efficiency is its logistization. In the article we suggest the logistic model, where a bank is considered as a micro-logistic system and bank activity is considered as a set of different streams of useful resources (a material stream ($\vec{M}$); a financial stream ($\vec{F}$); an informational stream ($\vec{I}$); an energetic stream ($\vec{E}$); a stream of transport vehicles ($\vec{T}$); a manpower stream ($\vec{W}$); a service stream ($\vec{U}$); a stream of innovations ($\vec{N}$)), which interact, influence on each other, depend upon the present market conditions and evolve, corresponding to the changes of inner and outer conditions. In the article, we do the research of these streams' structure, using the logistical approach. In the research we represent a stream as a certain function, having two components: the scalar one (P_0 – a concrete kind of useful resources) and the vector one ($\vec{P}_0(t,z)$ – the orientation of the stream in space and time). Thus, a stream is: $\vec{P} = P_0 \cdot \vec{P}_0(t,z)$. A special attention is paid to the financial stream, its structure and process of forming. We represent, that the necessary condition of forming any kind of a stream is presence of other streams. Then, in order to provide a normal functioning of the financial stream in a bank we need the following vector components, which could assure its forming and circulation: financial, informational, energetic, manpower (personnel), innovational and service components. The mathematical expressions are worked out to describe this process and to give us the opportunity to define the source of costs and to optimize the cumulative expenses in order to minimize them.

Key words: commercial bank, logistic analysis, financial continuum, bank logistic system, cumulative expenses.

I. INTRODUCTION

One of the features of the development of the modern economy is the introduction of theoretical provisions and specific recommendations of logistics into the practical activities of firms and companies in many countries of the world. At the same time, logistics, as a scientific basis for managing flow processes, is used not only in industry, trade and transport, but also in the service sector, banking and insurance, organization of after-sales service, public utilities and tourism.

Analysis and management of flow processes, their transformation and integration are a new form of management that surpasses traditional ones both in terms of creativity and the degree of efficiency of the final results. At the same time, the optimization of flow processes to minimize total costs became possible only due

to the reorientation from quantitative criteria for assessing economic activity to qualitative ones.

To implement the strategic tasks facing enterprises, industries and regions of our country, it is necessary to create an adequate banking system that would act as a catalyst for economic processes in all areas of business. Therefore, the reform of the banking system should take place at a pace and in ways that satisfy the national and international interests of a country. An important tool for solving such problems is the logisticization of banking, which is based on a high potential for increasing its efficiency through the introduction of scientific methods for regulating economic flows not only in the structure of the bank, but also arising in the process of interaction between banks and subjects of the material sphere.

The logisticization of banking activity is a process of consistent implementation of techniques, methods and techniques related to logistics science, and can be simultaneously considered as a complex technological and managerial innovation, the introduction of which into real banking practice should be considered a necessary factor. This approach is due to the fact that Russian commercial banks are trying not only to increase the number of customers, but also to expand the range of services provided, without reducing the profitability of operations. An integrated scientific approach to solving such problems is due to the need to consider flows, the movement of which requires adequate methods of regulation from the point of view of banking logistics. At the same time, it is necessary to present the circulation of financial flows as a specific movement of funds, which are the same kind of property as goods and services.

To conduct research on the structure of financial flows in a bank, it is necessary to introduce the basic concepts of logistic analysis [1].

The works [1-3] show that the logistical analysis of economic systems (in particular, a bank) is carried out on the basis of three concepts: a logistics system (LS), useful resource flows (RPF) in LS, and logistics operations with LPR in LS.

II. RESEARCH BACKGROUND

The study of the processes of formation and functioning of logistics systems is devoted to a fairly large number of works, both domestic and foreign authors [4]. The concept of a logistics system is one of the basic concepts in logistics. Fundamentally, logistics systems are divided, according to the levels in the economy, into: micrologistics, mesologistics, macrologistics and global logistics systems [1,4].

One of the most important characteristics of logistics systems is the flow of useful resources (material flow ($\vec{M}$); financial flow ($\vec{F}$); information flow ($\vec{I}$); energy flow ($\vec{E}$); vehicle flow ($\vec{T}$); labor flow ($\vec{W}$); service flow ($\vec{U}$); innovation flow ($\vec{N}$)). The usefulness of resources is determined by the degree of implementation of control functions and ensuring the efficiency of the logistics system [3].

When considering the flow processes of a bank from a logistical standpoint, it is necessary to analyze the content, features and characteristics of the system in

which they exist, i.e. banking logistics system. The banking logistics system can be defined as a set of mutually ordered elements located in terms of the management hierarchy along vertical and horizontal lines, which, as a result of the use of logistics techniques and methods, ensure the implementation of the functions and tasks of the bank with the greatest economic effect, turns a credit institution into an organization of a higher management level. This system has almost all the properties of the logical systems of the material economy, including variability, complexity, adaptability, stability, structuredness, purposefulness. However, as mentioned above, quite a lot of work has been devoted to this issue, according to which the bank can be considered as a micrologistics system and the analysis of the features of the formation of the banking logistics system does not go into the tasks of this work.

Considering from a logistic point of view the flow processes characteristic of banking, we can distinguish two contours within which the movement of resources occurs:

- internal, covering a commercial bank, its structural subdivisions, as well as branches and a branch network;
- external, including clients, partners, participants in the currency and stock markets.

From a practical point of view, the introduction of logistics methods into banking practice requires the systematic and consistent implementation of a set of economic, technical, organizational and legal measures of a long-term and ongoing nature. As well as activities for the design, creation and maintenance of a rational functioning system for regulating flow processes. A reasonable combination of these two directions will make it possible to work out the best development strategy for both an individual bank and the banking system as a whole.

Logistic models consider a bank as a set of various resources (especially financial resources) and their flows that mutually influence each other, depend on current market conditions and evolve in accordance with changes in external and internal conditions, which makes it necessary to optimize the process of generating flows. Integrated performance indicators of a commercial bank are reflected in the bank balance sheet, depending on the level of detail of management procedures and tasks that arise in the process of managing the bank's financial flows, management objects can be specified. So, any operations inherent in the bank can act as such objects.

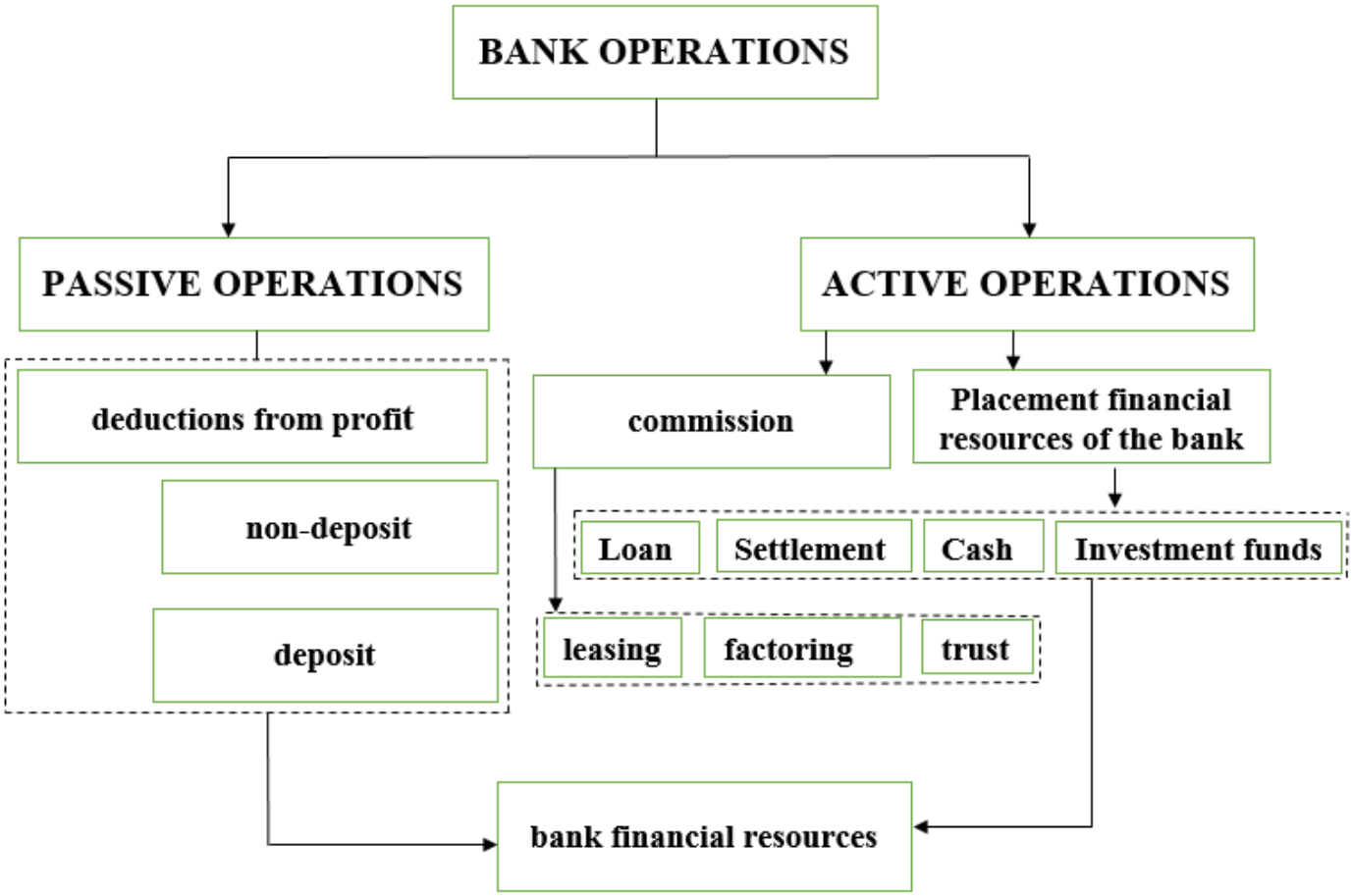
Features of the logistics of various types of banking business can, ultimately, be determined and characterized only in the process of developing and implementing practical measures to regulate the financial, material, informational and other flows of the bank. However, even today, the analysis of the above flows makes it possible to reveal the logistical nature of banking activities.

III. METHODOLOGY

Commercial banks can be considered from a logistic point of view as an object of management, the whole variety of forms of activity in which is based on the main stream - financial. The rest of the resource flows (material, informational, labor, etc.)

represent some form of direct or indirect provision of the movement of financial resources.

The structure of the process of formation of the bank's financial resources is shown in picture 1.

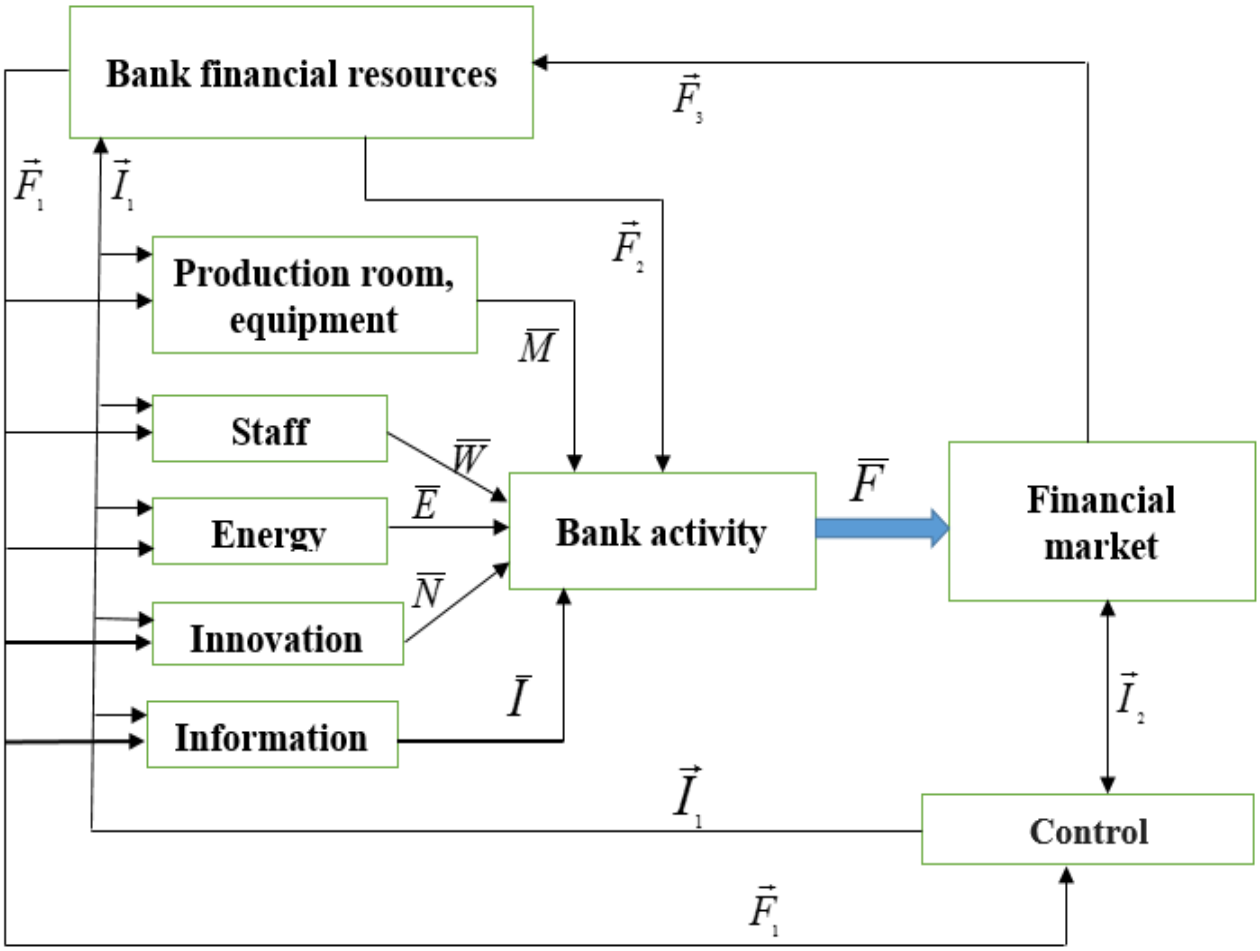


Picture 1. Formation of financial resources of the bank

It can be seen that the formation of financial resources is a complex process, consisting mainly of [5]:

- active operations (operations on placement of funds). As a result of active operations, banks receive debit interest, which should be higher than the credit interest paid by the bank on passive operations. The difference between debit and credit interest (margin) is one of the most important traditional items of bank income (banking profit is also formed from commission fees for banking services);
- passive operations (operations to raise funds: attracting loans, deposits (deposit, savings), obtaining loans from other banks, issuing own securities). The funds received as a result of passive operations are the basis of direct banking activities.

Picture 2 shows the structure of internal resources that ensure the activities of the bank, the movement of financial resources.



Picture 2. The structure of resources that ensure the activities of the bank

The following designations are additionally introduced in the picture: $\vec{F}$ - financial flow, which ensures the functioning of the bank's main resources (material, personnel, etc.); $\vec{F}_2$ - the financial flow that ensures the activities of the bank; $\vec{F}_3$ - financial flow that forms the financial resources of the bank; $\vec{I}_1$ – information related to the management of the bank's subsystems; $\vec{I}_2$ – information related to market analysis (market research).

In works [2,3], it is shown that any flow in the LS can be represented as a directed movement in space and time of a certain amount of useful resources:

$$\vec{P} = f(t,z)$$

where t is temporal, z is spatial coordinates. Proceeding from this, the flow is some function that has two components: **scalar** P_0 - a specific type of useful resources and **vector** $\vec{P}_0(t,z)$ - orientation of the flow in space. Then the flow is:

$$\vec{P} = P_0 \cdot \vec{P}_0(t,z) \quad \textbf{(1).}$$

Expression (1) is an elementary representation of the flow. Each stream of useful resources has its own elementary representation:

$$\vec{M} = M_0 \cdot \vec{M}_0;\ \ \vec{F} = F_0 \cdot \vec{F}_0;\ \vec{I} = I_0 \cdot \vec{I}_0;\ \vec{N} = N_0 \cdot \vec{N}_0$$

In the general case, in the formation of any type of flow, the necessary condition is the presence of other flows. Then, for the normal functioning of the financial flow in the bank, the following vector components are required to ensure its formation and movement: financial, information, energy, labor resources (staff), innovation and services. The absence of at least one of them translates the financial flow into a reserve, i.e. there is no movement in space, and the process develops only in time. At the same time, the qualitative or quantitative characteristics of the stock change.

IV. ANALYSIS OF THE PROBLEM.

Then, the expression for a stream having the same content P0 has the form:

$$\vec{P} = P_0 \cdot \sum_{i=1}^{L} \vec{P}_{0i}(t,z) \quad (2),$$

where L is the number of vector components that provide this flow.
Based on this, the structure of the classical financial flow can be written as follows [2]:

$$\vec{F} = F_{0F} \cdot f\left(\vec{F}_{0F}, \vec{I}_F, \vec{E}_F, \vec{W}_F, \vec{N}_F, \vec{U}_F\right) \quad (3).$$

According to (2), expression (3) is transformed into the following:

$$\vec{F} = F_{0F} \cdot \left(\vec{F}_{0F} + \vec{I}_F + \vec{E}_F + \vec{W}_F + \vec{N}_F + \vec{U}_F\right) = F_{0F} \cdot \vec{F}_{0F} + F_{0F} \cdot I_{0F} \cdot \vec{I}_{0F} + F_{0F} \cdot E_{0F} \cdot \vec{E}_{0F} +$$
$$+ F_{0F} \cdot W_{0F} \cdot \vec{W}_{0F} + F_{0F} \cdot N_{0F} \cdot \vec{N}_{0F} + F_{0F} \cdot U_{0F} \cdot \vec{U}_{0F}$$

Analyzing the situation in the commercial bank under consideration, we can say that the following flows provide the formation: input flow (Fig. 2), information ($\vec{I}$), energy ($\vec{E}$), material ($\vec{M}$), vehicle flow ($\vec{T}$), labor resources flow ($\vec{W}$), service flow ($\vec{U}$) and innovations ($\vec{N}$) (the flow of innovations is not in its pure form providing, it mainly increases the efficiency of the FP, so we will not take it into account in the future).

Then for this particular case we get:

$$\vec{F} = F_{02}\left(\vec{F}_{0F} + \vec{M}_F + \vec{I}_F + \vec{E}_F + \vec{T}_F + \vec{W}_F + \vec{U}_F\right) = F_{02}\vec{F}_{0F} + F_{02}M_{0F}\vec{M}_{0F} + F_{02}I_{0F}\vec{I}_{0F} +$$
$$+ F_{02}E_{0F}\vec{E}_{0F} + F_{02}T_{0F}\vec{T}_{0F} + F_{02}W_{0F}\vec{W}_{0F} + F_{02}U_{0F}\vec{U}_{0F}$$

We introduce the following notation:

$$M_F = F_{02}M_{0F}$$

$$I_F = F_{02}I_{0F}$$

Then:

$$E_F = F_{02}E_{0F}$$

$$\vec{F} = F_{02}\vec{F}_{0F} + M_F\vec{M}_{0F} + I_F\vec{I}_{0F} + E_F\vec{E}_{0F} + T_F\vec{T}_{0F} + W_F\vec{W}_{0F} + U_F\vec{U}_{0F} \quad (4)$$

$$T_F = F_{02}T_{0F}$$

Analysis of expression (4) allows us to make the following assumption: $\vec{F}_{0F}, \vec{M}_{0F}, \vec{I}_{0F}, \vec{E}_{0F}, \vec{T}_{0F}, \vec{W}_{0F}, \vec{U}_{0F}$ since vectors provide only financial flow and their direction is almost the same, then the data of the vector, in the general case, are collinear. Then it is possible to introduce, with a certain degree of conventionality, a generalizing direction vector for the financial flow , i.e.

$$W_F = F_{02}W_{0F}$$

$$U_F = F_{02}U_{0F}$$

$$\vec{F} = \vec{F}_{q0} \cdot (F_{02} + M_F + I_F + E_F + T_F + W_F + U_F) = F_{q0} \cdot \vec{F}_{q0} \quad (5),$$

$$F_{q0} = (F_{02} + M_F + I_F + E_F + T_F + W_F + U_F) \quad (6)$$

In expression (6) there is some uncertainty in understanding the real essence of summation, since the terms have a different quality content of the flow components (material component, informational, financial, etc.). You can understand the meaning of this expression if you go into the plane of costs i.e. expression (6) is the total costs (cost structure) in the formation of the financial flow.

Where in:

F_{02} - a certain amount of financial resources (for a certain period of time);

I_F – costs associated with the information support of the FP;

M_F - costs associated with the material and technical support of the FP;

E_F – costs associated with the energy supply of the financial flow;

T_F - costs associated with the transport support of the financial flow

W_F – costs associated with the provision of labor resources to the FI;

U_F - the costs associated with the maintenance of the FP;

F_{q0} - total costs for the formation of the financial flow.

Thus, the analysis of the process of formation and structure of the financial flow makes it possible to identify and classify the total costs, which makes it possible to accurately control the sources of costs and optimize costs in order to minimize them.

The resulting expression (6) for the total costs in the formation of the FP is, in the end, a trivial solution - there are main and supporting flows, which are the sources of costs. However, within the framework of this model, it is possible to determine the total, total costs ( ). In this case, it is necessary to take into account not only the costs for the formation of the FP, but also the costs for the formation of its supporting flows. Then:

$$\vec{Q}_F = \vec{F} + \vec{M}_F + \vec{I}_F + \vec{E}_F + \vec{T}_F + \vec{W}_F + \vec{U}_F \quad (7)$$

Let us write out the corresponding expressions for $\vec{F}$, $\vec{M}_F$ $\vec{I}_F$, $\vec{E}_F$, $\vec{W}_F$, $\vec{U}_F$, obtained in [3], taking into account the fact that all components are providing for the flow , i.e. it is necessary to change the designations in the indices, emphasizing their belonging to financial flows:

1. $\vec{F} = F_{02}\vec{F}_{0F} + \vec{M}_F\vec{M}_{0F} + I_F\vec{I}_{0F} + E_F\vec{E}_{0F} + T_F\vec{T}_{0F} + W_F\vec{W}_{0F} + U_F\vec{U}_{0F}$

2. $\vec{M}_F = M_{0F}\vec{M}_{0F} + F_{MF}\vec{F}_{0F} + I_{MF}\vec{I}_{0F} + E_{MF}\vec{E}_{0F} + T_{MF}\vec{T}_{0F} + W_{MF}\vec{W}_{0F} + U_{MF}\vec{U}_{0F}$

3. $\vec{I}_F = I_{0F}\vec{I}_{0F} + M_{IF}\vec{M}_{0F} + F_{IF}\vec{F}_{0F} + E_{IF}\vec{E}_{0F} + T_{IF}\vec{T}_{0F} + W_{IF}\vec{W}_{0F} + U_{IF}\vec{U}_{0F}$

4. $\vec{E}_F = E_{0F}\vec{E}_{0F} + M_{EF}\vec{M}_{0F} + F_{EF}\vec{F}_{0F} + I_{EF}\vec{I}_{0F} + T_{EF}\vec{T}_{0F} + W_{EF}\vec{W}_{0F} + U_{EF}\vec{U}_{0F}$

5. $\vec{W}_F = W_{0F}\vec{W}_{0F} + M_{WF}\vec{M}_{0F} + F_{WF}\vec{F}_{0F} + I_{WF}\vec{I}_{0F} + E_{WF}\vec{E}_{0F} + T_{WF}\vec{T}_{0F} + U_{WF}\vec{U}_{0F}$

6. $\vec{U}_F = U_{0F}\vec{U}_{0F} + M_{UF}\vec{M}_{0F} + F_{UF}\vec{F}_{0F} + I_{UF}\vec{I}_{0F} + E_{UF}\vec{E}_{0F} + T_{UF}\vec{T}_{0F} + W_{UF}\vec{W}_{0F}$

7. $\vec{T}_F = T_{0F}\vec{T}_{0F} + M_{TF}\vec{M}_{0F} + F_{TF}\vec{F}_{0F} + I_{TF}\vec{I}_{0F} + E_{TF}\vec{E}_{0F} + W_{TF}\vec{W}_{0F} + U_{TF}\vec{U}_{0F}$

Let us substitute into (7) the corresponding expressions:

$$\vec{Q}_F = \vec{F} + \vec{M}_F + \vec{I}_F + \vec{E}_F + \vec{T}_F + \vec{W}_F + \vec{U}_F =$$

$$= (F_{02}\vec{F}_{0F} + \vec{M}_F\vec{M}_{0F} + I_F\vec{I}_{0F} + E_F\vec{E}_{0F} + T_F\vec{T}_{0F} + W_F\vec{W}_{0F} + U_F\vec{U}_{0F}) +$$

$$+ (M_{0F}\vec{M}_{0F} + F_{MF}\vec{F}_{0F} + I_{MF}\vec{I}_{0F} + E_{MF}\vec{E}_{0F} + T_{MF}\vec{T}_{0F} + W_{MF}\vec{W}_{0F} + U_{MF}\vec{U}_{0F}) +$$

$$+ (I_{0F}\vec{I}_{0F} + M_{IF}\vec{M}_{0F} + F_{IF}\vec{F}_{0F} + E_{IF}\vec{E}_{0F} + T_{IF}\vec{T}_{0F} + W_{IF}\vec{W}_{0F} + U_{IF}\vec{U}_{0F}) +$$

$$+ (E_{0F}\vec{E}_{0F} + M_{EF}\vec{M}_{0F} + F_{EF}\vec{F}_{0F} + I_{EF}\vec{I}_{0F} + T_{EF}\vec{T}_{0F} + W_{EF}\vec{W}_{0F} + U_{EF}\vec{U}_{0F}) +$$

$$+ (W_{0F}\vec{W}_{0F} + M_{WF}\vec{M}_{0F} + F_{WF}\vec{F}_{0F} + I_{WF}\vec{I}_{0F} + T_{WF}\vec{T}_{0F} + E_{WF}\vec{E}_{0F} + U_{WF}\vec{U}_{0F}) +$$

$$+ (U_{0F}\vec{U}_{0F} + M_{UF}\vec{M}_{0F} + F_{UF}\vec{F}_{0F} + I_{UF}\vec{I}_{0F} + E_{UF}\vec{E}_{0F} + T_{UF}\vec{T}_{0F} + W_{UF}\vec{W}_{0F}) +$$

$$+ (T_{0F}\vec{T}_{0F} + M_{TF}\vec{M}_{0F} + F_{TF}\vec{F}_{0F} + I_{TF}\vec{I}_{0F} + E_{TF}\vec{E}_{0F} + W_{TF}\vec{W}_{0F} + U_{TF}\vec{U}_{0F})$$

We open the brackets and, grouping by vectors of the same type, we get:

$$\vec{Q}_F = \vec{F}_{0F} \cdot (F_{02} + F_{MF} + F_{IF} + F_{EF} + F_{TF} + F_{WF} + F_{UF}) +$$
$$+ \vec{M}_{0F} \cdot (M_F + M_{0F} + M_{IF} + M_{EF} + M_{TF} + M_{WF} + M_{UF}) +$$
$$+ \vec{I}_{0F} \cdot (I_F + I_{0F} + I_{MF} + I_{EF} + I_{TF} + I_{WF} + I_{UF}) +$$
$$+ \vec{E}_{0F} \cdot (E_F + E_{0F} + E_{MF} + E_{IF} + E_{TF} + E_{WF} + E_{UF}) +$$
$$+ \vec{W}_{0F} \cdot (W_F + W_{0F} + W_{MF} + W_{IF} + W_{EF} + W_{TF} + W_{UF}) +$$
$$+ \vec{U}_{0F} \cdot (U_F + U_{0F} + U_{MF} + U_{IF} + U_{EF} + U_{TF} + U_{WF}) +$$
$$+ \vec{T}_{0F} \cdot (T_F + T_{0F} + T_{MF} + T_{IF} + T_{EF} + T_{WF} + T_{UF})$$

Let us introduce the following notation:

$$\begin{cases} F_{\Sigma F} = F_{02} + F_{MF} + F_{IF} + F_{EF} + F_{TF} + F_{WF} + F_{UF} \\ M_{\Sigma F} = M_F + M_{0F} + M_{IF} + M_{EF} + M_{TF} + M_{WF} + M_{UF} \\ I_{\Sigma F} = I_F + I_{0F} + I_{MF} + I_{EF} + I_{TF} + I_{WF} + I_{UF} \\ E_{\Sigma F} = E_F + E_{0F} + E_{MF} + E_{IF} + E_{TF} + E_{WF} + E_{UF} \\ W_{\Sigma F} = W_F + W_{0F} + W_{MF} + W_{IF} + W_{EF} + W_{TF} + W_{UF} \\ T_{\Sigma F} = T_F + T_{0F} + T_{MF} + T_{IF} + T_{EF} + T_{WF} + T_{UF} \\ U_{\Sigma F} = U_F + U_{0F} + U_{MF} + U_{IF} + U_{EF} + U_{TF} + U_{WF} \end{cases}$$

Then the expressions for the financial flow by costs, has the form:

$$\vec{Q}_F = F_{\Sigma F} \cdot \vec{F}_{0F} + M_{\Sigma F} \cdot \vec{M}_{0F} + I_{\Sigma F} \cdot \vec{I}_{0F} + E_{\Sigma F} \cdot \vec{E}_{0F} + W_{\Sigma F} \cdot \vec{W}_{0F} + T_{\Sigma F} \cdot \vec{T}_{0F} + U_{\Sigma F} \cdot \vec{U}_{0F} \quad (10)$$

Analyzing expression (10), we make the same assumption as we did above, i.e. vectors $\vec{F},\vec{M}_F,\vec{I}_F,\vec{E}_F,\vec{T}_F,\vec{W}_F,\vec{U}_F$ provide only financial flow, then the vectors are $\vec{F}_{0F},\vec{M}_{0F},\vec{I}_{0F},\vec{T}_{0F},\vec{E}_{0F},\vec{W}_{0F},\vec{U}_{0F}$ collinear and, with some degree of conditionality, you can introduce a generalizing direction vector $\vec{F}_Q$, then:

$$\vec{Q}_F = \vec{F}_Q \cdot (F_{\Sigma F} + M_{\Sigma F} + I_{\Sigma F} + E_{\Sigma F} + W_{\Sigma F} + T_{\Sigma F} + U_{\Sigma F}) = \vec{F}_Q \cdot F_Q$$

The total costs for the formation of a financial flow, taking into account the costs for the formation of providing flows:

$$F_Q = F_{\Sigma F} + M_{\Sigma F} + I_{\Sigma F} + E_{\Sigma F} + W_{\Sigma F} + T_{\Sigma F} + U_{\Sigma F} \qquad (11)$$

Where:

$F_{\Sigma F}$ - full costs for the formation of the FP;

$M_{\Sigma F}$ − full costs for the material and technical support of the financial flow;

$I_{\Sigma F}$ - total costs for information about the financial flow;

$E_{\Sigma F}$ - full costs for energy supply of the financial flow;

$W_{\Sigma F}$ − costs of providing financial flow with labor resources;

$T_{\Sigma F}$ - the cost of providing vehicles;

$U_{\Sigma F}$ - Service costs.

F_Q - total costs for the formation of the financial flow, taking into account the costs for the formation of supporting flows:

The results of this analysis can be summarized in the following table 1.

Table 1.

Σ	**F_Q**	**F_Σ**	**I_Σ**	**E_Σ**	**W_Σ**	**U_Σ**	**M_Σ**	**T_Σ**
1	**$F_{\Sigma F}$**	F_{02}	F_{IF}	F_{EF}	F_{WF}	F_{UF}	F_{MF}	F_{TF}
2	**$I_{\Sigma F}$**	I_F	I_{0F}	I_{EF}	I_{WF}	I_{UF}	I_{MF}	I_{TF}
3	**$E_{\Sigma F}$**	E_F	E_{IF}	E_{0F}	E_{WF}	E_{UF}	E_{MF}	E_{TF}
4	**$W_{\Sigma F}$**	W_F	W_{IF}	W_{EF}	W_{0F}	W_{UF}	W_{MF}	W_{TF}
5	**$U_{\Sigma F}$**	U_F	U_{IF}	U_{EF}	U_{WF}	U_{0F}	U_{MF}	U_{TF}

6	**$M_{\Sigma F}$**	M_F	M_{IF}	M_{EF}	M_{WF}	M_{UF}	M_{0F}	M_{TF}
7	**$T_{\Sigma F}$**	T_F	T_{IF}	T_{EF}	T_{WF}	T_{UF}	T_{MF}	T_{0F}

In table 1, the value of FQ (total costs) is the sum of the values in the corresponding row or column. If by column, then this is expression (11). If by line, then:

$$F_Q = F_\Sigma + I_\Sigma + E_\Sigma + W_\Sigma + U_\Sigma + M_\Sigma + T_\Sigma \quad (12),$$

Where
$$\begin{cases} F_\Sigma = F_{02} + I_F + E_F + W_F + U_F + M_F + T_F \\ I_\Sigma = F_{IF} + I_{0F} + E_{IF} + W_{IF} + U_{IF} + M_{IF} + T_{IF} \\ E_\Sigma = F_{EF} + I_{EF} + E_{0F} + T_{EF} + W_{EF} + U_{EF} + M_{EF} \\ W_\Sigma = F_{WF} + I_{WF} + E_{WF} + T_{WF} + W_{0F} + U_{WF} + M_{WF} \\ U_\Sigma = F_{UF} + I_{UF} + E_{UF} + T_{UF} + W_{UF} + U_{0F} + M_{UF} \\ M_\Sigma = F_{MF} + I_{MF} + E_{MF} + W_{MF} + U_{MF} + M_{0F} + T_{MF} \\ T_\Sigma = F_{TF} + I_{TF} + E_{TF} + W_{TF} + U_{TF} + M_{TF} + T_{0F} \end{cases}$$

V. CONCLUDING REMARKS

Table 2 shows one of the options for the correspondence of indicators to real costs in the logistics system (according to expression (11)).

Table 2

The structure of total costs in the formation of the financial flow

Cost indicator	Components indicator	Correspondence of the indicator with real costs
$F_{\Sigma F}$ total costs for the formation of financial flows	F_{02}	Total financial flows (for a certain period of time)
	F_{MF}	Costs associated with the financial support of the material flow in the formation of the financial flow
	F_{IF}	Costs associated with the financial support of the IF in the formation of the FF
	F_{EF}	Costs associated with the financial support of the EF in the formation of the FF
	F_{TF}	Costs associated with the financial support of the traffic flow in the formation of the FF
	F_{WF}	Costs associated with the financial support of the flow of labor resources in the formation of FF
	F_{UF}	Costs associated with the financial support of PP in the formation of FF
$I_{\Sigma F}$ total costs for information support in the formation of financial flows	I_{0F}	Costs associated with information support of the FF
	I_{MF}	The costs associated with the information support of the MF in the formation of the financial plan
	I_F	The cost of a certain amount of information in the formation of FF
	I_{EF}	The costs associated with the information support of the EF in the formation of the FF

	I_{TF}	Costs associated with the information support of the TF in the formation of the FF
	I_{WF}	Costs associated with obtaining information about the flow of labor resources in the formation of FF
	I_{UF}	The costs associated with the information support of the PF in the formation of the FF
$E_{\Sigma F}$ total costs for energy supply of financial flows	E_{0F}	Costs associated with the energy supply of the FF
	E_{MF}	Costs associated with the energy supply of the EF during the formation of the FF
	E_{F}	The cost of EF (for a certain period of time) in the formation of FF
	E_{IF}	Costs associated with the energy supply of the information flow during the formation of the FF
	E_{TF}	Costs associated with the energy supply of the traffic flow during the formation of the FF
	E_{WF}	Costs associated with the energy supply of the flow of labor resources in the formation of the FF
	E_{UF}	Costs associated with the energy supply of the flow of services in the formation of the FF
$W_{\Sigma F}$ full costs of providing financial flows with labor resources	W_{0F}	Costs associated with providing labor resources to the FF
	W_{MF}	Costs associated with the provision of labor resources for the material flow in the formation of the FF
	W_{F}	The cost of labor resources (for a certain period of time) in the formation of a financial flow
	W_{IF}	Costs associated with the provision of labor resources for individual entrepreneurs in the formation of a financial flow
	W_{EF}	Costs associated with the provision of labor resources for the energy flow in the formation of the financial flow
	W_{TF}	Costs associated with the provision of labor resources for the transport flow in the formation of the financial flow
	W_{UF}	Costs associated with the provision of labor resources for the flow of services in the formation of FF
$T_{\Sigma F}$ full costs of providing vehicles with a financial flow	T_{F}	The cost of vehicles (for a certain period of time) in the formation of the financial flow
	T_{0F}	Costs associated with providing vehicles with a financial flow
	T_{MF}	Costs associated with the provision of material flow by vehicles in the formation of a financial flow
	T_{IF}	Costs associated with the provision of IF vehicles in the formation of a financial flow
	T_{EF}	Costs associated with the provision of energy flow by vehicles in the formation of a financial flow
	T_{WF}	Costs associated with the provision of vehicles for the flow of labor resources in the formation of the financial flow
	T_{UF}	Costs for transport support of the flow of services in the formation of the financial flow
$U_{\Sigma F}$	U_{F}	The cost of certain services (in a given period of time) in the formation of a financial flow
	U_{0F}	Costs associated with servicing the financial flow

total cost of services by financial flow	U_{MF}	The costs associated with the maintenance of the material flow in the formation of the financial flow
	U_{IF}	Costs associated with the maintenance of the information flow during the formation of the FF
	U_{EF}	The costs associated with the service maintenance of the ES in the formation of the financial flow
	U_{TF}	The costs associated with the service maintenance of the TP in the formation of the financial flow
	U_{WF}	Costs associated with the maintenance of the FWR in the formation of the financial flow

Thus, the analysis of the process of formation and structure of the financial flow makes it possible to identify and classify the total costs, which makes it possible to accurately control the sources of costs and optimize costs in order to minimize them.

References

1. Kovalenko L.V., Filonov N.G. Positioning of the logistic analysis in the management analysis. *Tomsk State Pedagogical University Bulletin*, 2011, no. 12 (114), pp. 166–172.
2. Filonov N.G., Daschinskaya S.K., Kovalenko L.V. Analysis of the structure of useful resources continua in logistics systems. // Problems of the modern economy. Eurasian international academic and analytical magazine. - St. Petersburg, 2007. - № 4 (24). - pp. 472-476.
3. Filonov N.G., Kovalenko L.V. Logistic analysis of the structure of cumulative expenses in forming the useful resources continua. // Materials of the Interregional Scientific and Practical Conference (VI South-Russian Logistics Forum "Current problems and prospects of development of regional logistics infrastructure") - Rostov- on-Don, RGEU "RINH " South - Russian Association of Logistics, 2009 . pp.189 -197.

   Bauersoks D. J., Closs D.J. *Logistics: the integrated chain of supply*. 2nd ed. (Russ. Ed.: *Logistika: Integrirovanaya tsep postavok*. Per. s angl. - Moscow: ZAO "Olympus - Business ", 2006. 640 p.)
4. Korobova. G.G. *Banking: the textbook* / ed. PhD, - Ed. rev. - M.: Economist, 2006.-766 p.