

Optimization of Financial Flows of the Enterprise based on Logistical Approach

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Abstract

Background/Objectives: Actual problems of optimization of the company's financial flows are considered. A fundamental factor in the financial flows management is the use of logistics tools for the development and formation of the enterprise's competitive behavior. **Methods/Statistical Analysis:** The logistic process analysis determines the main directions and methods of ensuring the equilibrium of the company's financial flows. It was determined that in the practice of financial logistics it is advisable to use an integrated approach and logistics tools. Thus, the methods of statistical analysis: Regressive and dispersion analysis, exponential smoothing method, multivariate statistical analysis method used in combination, compensate each other's shortcomings. **Findings:** Steps and methods of forming the financial level of integration of logistic systems are described. It is proved that the reduction in the cost of resources and the minimization of time expenses is achieved through the optimization of end-to-end control of material, information and financial flows. It is shown that during the transition from the traditional to logistical approach of financial flows management, some structural transformations of enterprise as logistics system are needed. The process of the organization of through financial flows and also financial flows accompanying them and passing through various structural units with the traditional approach is not enough coordinated. Existing financial services involved in the management of correspondent accounts, mostly control the state of input and output financial flows. Acting as the indicators of well-being and stability of the organization, the parameters of financial flows reflect the effectiveness of the activity required in the planning and organization of relationships with contractors. **Applications/Improvements:** The possibility of using a DuPont multiplier to assess the effectiveness of the financial flow is considered.

Keywords: Innovative Logistics, Management, Optimization of Financial Flows

1. Introduction

Increasing interest on the part of employers to logistics is due to the potential possibilities to increase the efficiency of systems providing material flow. Experience shows that companies using logistics have a competitive advantage and significantly increase profits by reducing costs related to reduction in production costs in the field of resource potential¹⁻¹⁰.

In turn, the operative analysis and comparison of the amount of expenses to financial income influence the

enterprise's financial stability. As a result, management of financial flows in the enterprise becomes an integral part of the enterprises' financial management. The use of logistics can significantly reduce the time interval at all stages of the production cycle. Reduction of time occurs primarily in the manufacturing process between the acquisition of raw materials and the delivering of final product to the consumer. Using the synergetic paradigm of time allows creating a system-holistic understanding of the mechanism of economic gain through innovation^{11,12}. The efficiency of functioning the enterprises using

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logistical approaches is achieved mainly due to a sharp decline in the cost of goods; improving the reliability and quality of supply.

The peculiarity of logistics is in system considering the totality of all the links of the production process from the standpoint of a whole material production chain, which is called "logistical system"¹³. The interaction of separate links of this chain is carried out at the technical, technological, economic, financial, methodological and other levels of integration. Management optimization affects both material and financial and information flows.

Working capital management refers more to the management of material flows, rather than financial ones, although it is within the scope of financial management¹⁴. The position of the enterprises which have achieved success in the competition, accurately reflects the content of the financial logistics, where the goal is not only to reduce risks, but streamlining the entire system of financial relations, including the allocation of financial powers within the group, the organization of calculations, i.e. an increase in financial results. "Cash flow" becomes the key term, which directly reflects the movement of cash and accounts.

The approach to the management of financial flows, in terms of an integrated logistical system allows using the principle of synergism, based on coherency actions in all interrelated processes of production and circulation, achieving a greater effect in the whole structure, rather than improving the functioning of separate elements. Application of logistical approach allows maximizing revenues, minimizing losses and hedging risks.

Currently, an insufficient attention is paid to the analysis of return on equity for the optimization of the company's financial flows.

2. Literature Review

Research of theory and methodology of logistics is presented by B. A. Anikin¹, T. A. Prokofiev⁶, V. I. Sergeyev⁷, S. A. Uvarov⁸, A. V. Zyryanov¹⁵, V. I. Stepanov, L. B. Mirodin¹⁶, D. T. Novikov¹⁷, O. D. Protsenko¹⁸, V. V. Shcherbakov¹⁹ in Russia and abroad by D. J. Bowersox and D. J. Kloss², J. Johnson³, J. B. Heywood⁹, R. B. Handfield¹⁰, M. Christopher²⁰, M. R. Linders²¹, D. Waters²² and many other scientists.

Such researchers as V. V. Lukinsky⁵, D. M. Lambert¹³, N. A. Adamov²³, A. N. Bryntsev²⁴, A. G. Butrin²⁵, T. A. Kozenkova, T. D. Krylova²⁶, J. D. Martin²⁷ and others made

a significant contribution to the analysis and solution of problems of financial logistics.

The works by such Russian and foreign scientists as Ye. S. Stoyanov, I. Blank and Ye. V. Bykova¹⁴, J. Vanhorn and J. Wachowicz Jr.²⁸, V. V. Kovalev²⁹, A. D. Sheremet³⁰ is devoted to the problems of formation, use and estimation of financial resources.

3. Methodology

The ability to use the logistical approach in the process of optimizing the financial flows determined the complexity of using different methods of analysis of the investigated problem on the basis of fundamental works in logistics and financial management. A systematic approach to the synthesis and analysis of the theoretical foundations of the financial management and logistics serves as the methodological basis of research. The methods of financial analysis and forecasting, economic-mathematical modeling and expert judgment were used during the study. To achieve the objectives, the methods of cognition (deduction and induction, synthesis and analysis), systematization, comparative analysis, generalization, formal modeling of investigated processes, economic analysis and dialectical method were used. Within the concept of logistics, the possibility to consider the optimization of the enterprises' financial flows as a principle of transformation of economic systems appears, which allows not only studying their separate parts, but also connecting them together. The hypothesis of the study is that the optimization of financial flows is inseparable from enterprise financial management, thus logistical approach in management involves the use of different business management models, including models of return on equity.

4. Results

Within the framework of economy synergetic paradigm the logistical approach is the backbone for enterprises with complex structure. The logistical approach serves as an indicator of costs and results of innovation activity in the of resource allocation, coordinates the process of optimizing the enterprise's financial flows and ensures adaptation to rapidly changing business environment. The aim of the study is to reveal the logistical approach to the management of the company's financial flows and the

possibility of their optimization; the concept of financial logistics is revealed, the expediency of the transition from the traditional approach to logistical one in management of the company's financial flows is substantiated, the main stages of logistical process of cash flow management are considered. A systematic approach to the formation of the aggregate of all parts of the production process allows considering the company as a logistical system in which all parts interact at the financial level of integration. The logistical approach to the management coordinates the through financial flow organization process passing via the various structural units. The DuPont analysis model for a number of industries in Russia was carried out. It is proposed to use this model to optimize the company's financial flows based on an analysis of equity, considering the relationship of the multiplier and profitability in the DuPont model.

5. Discussion

5.1 Financial Flows Management: Classification and Principles

Currently there is a process of improving cash flow management tools. One of these areas is financial logistics^{24,26,31,32}. Cash flow from the point of view of logistics is the movement of funds circulating in the logistics system and between the logistics system and the external environment.

Logistic activity optimization models are extended to the totality of the works: Both to passive operations related to mobilization - raising funds from the outside from other organizations by an enterprise and to active operations - cash investment in the economy. The need for parity of interaction between business and the state is caused by such modern features of world and national economy, as the openness of markets, limited resources, globalization and introduction of informational technologies. These conditions create qualitatively new demands for business adaptation to rapid changes in the market^{17,33}.

The logistical process of financial flows is composed of several continuously repeated successive phases. The planning phase has a forward-looking behavior because of the uncertainty of a number of assumptions and is carried out in the form of multiple calculations. Balanced enterprise budget solves such tasks as providing current planning, coordination of departments, cost justification, creation of base for evaluation and monitoring plans of

the enterprise^{27,28,34}. One of the main problem that needs to be constantly solved in the activity process is a liquidity problem²⁸. The analysis of financial flows is one of the most important stages of the logistical process, as a result of which the main directions and methods of ensuring the equilibrium of the company's financial flows are identified, reserves of increase in management efficiency considered for financial planning are revealed.

Then the coordination of functions and tasks of services of accounting, financial and operational management of the enterprise is ensured. The object of the control of the company's financial flows is the identifying the uniformity of formation of financial flows and liquidity. In case of deviations from the targets, it is necessary to reveal their causes, to assess them in terms of the objectivity of origin and take into account when elaborating the plan for the next period.

With the aim of selecting economic tools of logistical processes, we proposed to systematize them by the elements: Planning, analysis, accounting, control. In addition, the applied methods of financial logistics depend on the enterprise activity period under consideration.

In strategic time period the following methods are used in planning: Budgeting, hierarchy of strategies, Balanced Scorecard; in the analysis: Expert assessments, statistical analysis; in control: Control of the conformity of the actual planned indicators (analysis of variance), the early warning system, bottleneck analysis²⁹. In operational time period during the planning we based on: Financial planning, enterprise activity result planning, performance indicators for subdivisions of the enterprise; in accounting on: Reports on economic activity of enterprise, management accounting system, reporting analysis methods.

The most important tool for logistics, having a value in all types of enterprise activity, is the control of compliance of the actual indicators to the planned ones (the analysis of variance) and related to it the bottlenecks analysis. In the system of analysis of the planned and actual indicators the data about the financial and economic facts already occurred are processed, which are formed in the financial accounting system. Some researchers recommend to carry out this analysis on the informational basis of the Balanced Scorecard (BSC), developed by D. Norton and R. Kaplan³⁵ in the early 1990-ies and widely used in the world currently. The Balanced Scorecard is a combination of traditional financial indicators characterizing the previous period with other indicators including non-

financial ones characterizing the strategic prospects of enterprise development.

Methods of expert assessments and methods of statistical analysis can be used in an analytic paper. To obtain sufficiently reliable estimates it is necessary to reasonably arrange the scheme of execution of an examination and to use mathematical apparatus of results processing. Estimation of one or another management decision, obtained on the basis of expertise, involves an existence of a variety of indexes, indicators that can be ranked according to the level of their preference resulting in a preliminary analysis with the introduction of quantitative significance evaluation. One of the difficulties of this ranking is that it is not easy to quantify the peculiarities of comparative correlation of qualitative indicators in quantitative values. It is usually carried out on the bases of some average matrices of expert preferences.

Methods of regression and analysis of variance, exponential smoothing method, the methods of multivariate statistical analysis can be noted among the methods of statistical analysis. The main disadvantages of the above-mentioned financial logistics methods are: Difficulty of searching information and cumbersome calculation; presence of a large number of adjustments related to the peculiarities of accounting reporting; complexity of long-term planning; lack of an adequate basis for comparison with counterparts^{25,30}.

The activity of business entities depends largely on continuous movement and effective use of financial flows. Thus, in international practice, the choice of delivery terms of CIF or FAS (Incoterms rules) distributes the costs of freight and insurance of both the buyer and the supplier of the goods. Losses related to cargo damage are distributed when transporting to the carrier or provider according to the contractual terms and the actual characteristics of the goods, data of documents of title. The duration of the financial cycle depends on the form of goods sales (on their own, with the help of sales agents, commission agents or consignees), which requires a variety of costs and ensures different circulation of goods, which is accompanied by financial flows: Finance investment or compensation for the sale of goods. For maneuvering financial flows different types of contracts are concluded. It helps regulate intra-trafficking, redistribution of costs and expenses, budget management units.

Cash flow management is based on certain principles.

The planning and system principle is characterized by balance of material and financial flows. Targeting requires

taking into account the objectives of each party of logistical process in the organization of the financial flows management, including: Amounts of financing should match the amount of necessary expenses; funding sources reliably and guaranteedly become involved in provision of logistical process of financial resources, achievement of profitability when placing funds^{19,23}. The principle of strategic orientation is constituted in identifying the extent to which the production is able to expand; forecasting of innovative development options; choosing the new areas of funding that will provide a stable position in the market. The principle of diversification proposes multitasking in the work, linking different combinations of manufactured goods, payment forms and activity types.

The composition, movement direction, purpose and a number of other features characterize the heterogeneity of financial flows, which stipulates their classification with a view to find the most effective ways to manage them. Cash financial flows are presented by cash financial resource flows for payments in ruble and currency. Non-cash financial resources for payments by payment orders, payment requests, collection orders and documentary letters of credit and settlement checks are referred to information and financial flows. Accounting and financial flows as opposed to those types which are formed during the financial estimates between the organization-seller and the organization-buyer, arise in the production of goods or the provision of services at the stage of increasing advance value, coinciding with the process of formation of material costs in production activity of concrete organization, timing of their completion, etc. In each case, a special structure of classification attributes of financial flows is established. In this regard, the financial resources management can be regarded as a decision-making process, ensuring the effective system functioning.

5.2 Financial Flows Management

In financial flows management the optimization of their volume on the current account and maximizing the effect of their use, the timely regulation of current liabilities, cash turnover acceleration and synchronization of incomes and expenses in the current period are very important. To reduce the risk it is necessary to provide the possibility of contingency use of funds and to choose the best directions in terms of their impact on the financial result.

Inflow of funds in full capacity is provided on the basis of realization of production plans and other measures.

Control of timing of this process must be carried out with the help of short-term forecasts specified in accordance with market conditions, changes in other economic parameters.

Economic activity of the company is associated with the transformation of the value of money. Cash funds received from the sale are directed to purchase raw materials, to create reserves, thus money becomes a prerequisite of the organization activity^{21,36}.

At the present stage, the special role belongs to the principle of the effectiveness of each operation associated with the expenditure of money. In addition to the accuracy of determining the directions of financial resources the practicability of decisions on their implementation, considering achieved economic effect is no less important, which depends on the way of financing of the proposed works, types of raw materials, supply conditions, prices that is provided by the choice of the most rational decisions.

The synchronization of financial flows throughout the economic turnover is important to maintain solvency. Cash management system depends on the continuous development of financial flows, organization of control of their spending and impact assessment and rational management of all resources as well. Increasing the system efficiency is achieved by increasing the financial incentives of all participants in the chain to accelerate funds turnover and increase equity¹⁴.

Managing financial flows in many cases allows reducing the gaps between revenues and expenditures, it smoothes out the negative effects of these phenomena and accelerates the funds turnover. It suggests a thoughtful implementation of financial solutions that can eliminate violations and bypass obstacles with which revenues delay are associated; rational use of funds. As effective maneuvers of some of the costs reallocation for another time, a change in the supply lines, borrowing costs and delaying some obligations are used.

Drawing up the budget of the current year, the amount of future revenues and required investments is projected, indicators of profitability and efficiency in the preparation of financial statements that outline the rationale for investment and loans are calculated, contracts and agreements are concluded.

For a complete and timely provision of the company's activity the following requirements should be realized:

- Financial resources adequacy;
- Compliance with the parameters of flows in the

development of financial plans, considering time and costs volume for the purchase and transportation of equipment and materials, standards of warehousing and production, marketing and distribution technologies;

- Reliability of resources and efficiency of financial involvement complying with which we monitor the financial markets condition;
- Optimization of costs in the rationalization and allocating resources;
- Coordination of resource flows throughout the production movement chain;
- Timeliness.

Structure and composition of financial flows when accomplishing the above mentioned requirements are adaptive to each counterparty in producing on them control and corrective effects, despite the fact that the process actors belong to different spheres of production and circulation.

Financial flows managing is possible when the presence of a unified informational environment at the corporate level, using technologies on flow management process, such as automation traffic system, transport management, organization of documents and a number of other informational logistical technologies and corporative automation systems, which are complemented by the inclusion of management modules of financial flows in them. A formalized description of the financial flows occurs when using the mathematical apparatus of the vector description, matrix methods, factor and functional analysis.

A study of the financial environment is carried out for a specific system, determining the value and importance of finance, the availability and liquidity of financial resources, orderliness and accountability of finance movement, the number and competitiveness of the sources and consumers of financial resources. The degree of financial flows detailization is chosen, the influence factors of external and internal environment on the flowing processes and the ability to manage impacts are determined during their study. Thus, for the distribution center, in which the income and the outcome of financial resources are uneven, the cash flow density is calculated, reflecting the intensity of the activity, which is determined by the resulting flow volume per time unit. When accommodating the procurement it is possible to calculate the time gap between the receipt of information from the supplier (inbound informational flow) and

advance of payment (outgoing cash flow). The resulting cash flow is associated with multiple flows.

The possibility of correlation of flow processes in the system determines the advantages in the planning, organization and control. Properties of the correlation of financial, material and informational flows are used in areas of overlapping and coordinated resource flow management.

Defining the node as a resource flows crossing point we can assume that the impact in the units is the most effective in all business phases. The first phase corresponds to the collection of information (accurate, reliable and timely information about the objects of management, external and internal environment) for the effective management of financial flows. The next phase determines the nodes of resource flows intersection and their binding to the organizational structures that allows detailing the characteristics of separate flows. Updating parameters of financial flows is typically: Volume, value, location of nodes and entry and exit time, reliability of sources of financing and risks associated with it.

The technology that reduces costs and the costs of activity is a redistribution of resources. Redistribution mechanism is to identify reserves of resources and direct them to cover the deficit and as the movement of all types of resources is controlled in nodes, then, the use of redistribution is effective with node effects. The mechanism of the impact on flows in nodes is used for the disclosure of internal financial reserves and to direct available funds for compensation of lack of material and financial resources.

In the phase of planning the resource flows the analysis of alternatives, schemes and techniques for selecting optimal processes for system is carried out. Through organizational, legal, marketing and other instruments there is an effect on resource flows, which is characterized by a large funds flow of the organizational processes of the phase. The phase of stimulation includes remuneration of labor, experts and the creation of incentives for suppliers. Coordinating phase includes organizational systems adapting, execution of contracts and agreements. Control is the final stage, which monitors violations in the flowing processes, inconsistencies in the parameters of the financial flows. Flow management during control phase includes monitoring financial market conditions (interest rates on loans and deposits, the market of corporate and government securities), assessment of changes in the cost and risk, identifying possible problems involving

resources, adjusting the sequence of including funding sources.

5.3 Using the Multiplier and Profitability Relationship in the DuPont Model for Assessing the Effectiveness of Financial Flows Optimization

Despite the high degree of knowledge of the problems of cost management, there is a need to study and develop quantitative methods for assessing the effectiveness of the optimization of financial flows considering the specifics of enterprises. Self-financing and involvement of internal reserves of funding is necessary when reducing liquidity.

The effectiveness of the processes is evaluated using cost criteria, taking into account the costs incurred and the income earned, profitability and margins indexes are calculated.

Production costs become the monetary form of manifestation of the cost of aggregate (macroeconomic) time and the market price - the monetary expression of the amount of macro-economic time, which the buyer is ready to channel to purchase the product on the basis of disposable income. It is proved that innovations are the main source of income in excess of standard level¹¹.

Return on equity is the most important factor for assessing the company's investment attractiveness in the long term. However, currently not enough attention is paid to analysis based on the DuPont model of return on equity, which combines possibilities of modeling capabilities of profit on the basis of indexes significant for the enterprise and opens up wide opportunities for the strategic management of the company's finances and cash flow optimization. This model promotes the formation of an integrated view of the company's financial condition and reveals the nature of the interaction between different sources of funding for their optimization^{15,37,38}.

The analysis of branches of Russian economy was conducted: Oil and gas production and oil refining; telecommunications; metallurgy; chemicals and petrochemicals; transport based on three-factor formula of return on equity of DuPont model, which considers asset turnover, return on sales, multiplier of equity, net income, average annual value of equity, sales proceeds, assets.

On the one hand, asset turnover reflects the number of times during the period when the capital invested in the assets of the company (logistics infrastructure -

warehouses, transport) operates, i.e. assesses the intensity of the use of all assets, regardless of source of their formation. On the other hand, it shows how many rubles of revenue the company has with a ruble invested in assets. Profitability of sales shows how much of net income the company gains from each ruble of products sold. Equity multiplier (financial leverage) gives a description of the financial stability of the business and risk and the assessment of the effectiveness of the enterprise use of borrowed funds.

In each branch ten companies were selected. Calculations were carried out according to the 2015 DuPont formula - return on equity (Figure 1). Thus, the transport industry structure includes rail, air, road, water transportation. The share of this sector accounts for 6.05% of GDP.

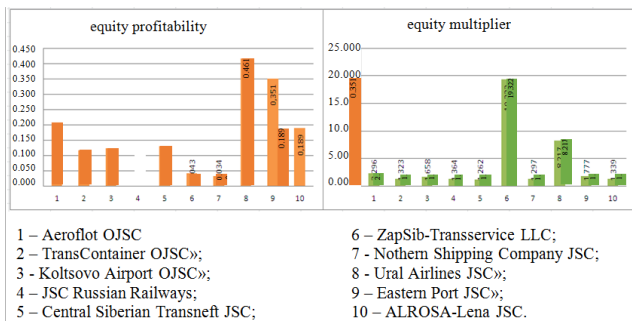


Figure 1. Profitability and multiplier of equity in the transport sector.

Analyzing this sector of the Russian economy it can be concluded that in most companies the leverage ratio is small and own funds are basic.

The ZapSib-Trans service company largely uses borrowed funds, but the profit value indicates that a major part of the revenue goes to pay interest on loans. The combination of these factors reduces the return on equity.

Average values of return on equity were determined for all the companies. For ease of analysis the companies were divided in accordance with the value of the return on equity into four quartiles 1-4³⁹. The upper quartile, further marked as 1 quartile, includes 25% of all companies that have reached a value of return on equity greater than 0.2676. The lower quartile or quartile 4 as opposed to 1, is made up of companies with the lowest value of profitability, that is lower than 0.0897. Quartiles above or below the median (quartiles 2 and 3) were divided according to the median (Figure 2).

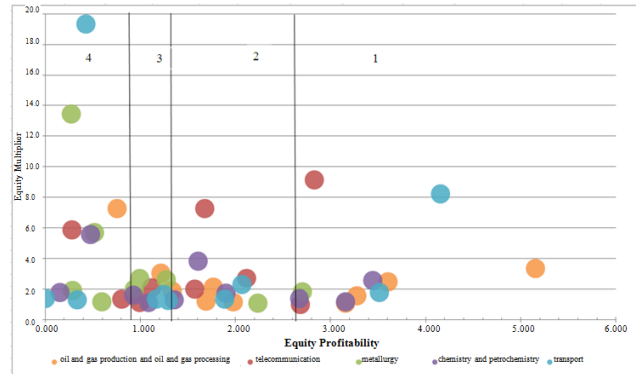


Figure 2. Values of return on equity of all the companies in accordance with certain branches.

When comparing values of specific companies with the industry average indexes, as the result, the standard deviation and coefficient of variation is shown by the companies which have high and low volatility of the resulting index. The conducted analysis of profitability and multiplier for different sectors of the economy shows the relationship between the degree of financial risk and profitability of equity. Obviously, that due to the reduction of the return on total capital, the company must increase the degree of financial risk in order to provide the desired level of return on equity. In all these areas there is a high degree of variability in performance.

6. Conclusion

Management of the company’s financial flows as a rule is aimed at reducing the cost of goods. However, the use of logistics significantly affects the efficiency of the business, by increasing the reliability and quality of the organization of flows, including financial ones.

A systematic approach to the formation of the aggregate of all parts of the production process or the logistics system allows separate links of this chain to interact at the financial level of integration. Logistical approach in the management coordinates the process of organization of through financial flows passing via the various structural units.

In the process of planning and management of financial flows it is important to skillfully apply organizational, legal and administrative tools to quickly define the right direction. The uncertainty of the market economy dictates that participants should use effective funds management model, capable of ensuring the continuity of financial flows and accelerating their adjustment.

The idea of supply chain management is focused on the issues of integration of goods movement participants and reflects a new understanding of their interaction in the chain of logistic activity, directly or indirectly connected in a single integrated process of trade flows management for the most complete and high-quality satisfaction of customers in accordance with their specific needs and business objectives^{16,18,20,22,40}.

Properties of the correlation of financial, material and information flows are used in areas of overlapping and coordinated resource flow management and are defined as the node, the influence upon which is most effective at all stages of the business. Thus, the use of DuPont model allows identifying the factors that characterize the enterprise's functioning effectiveness, quantifying the degree of their impact on the financial result and determining the reserves to optimize cash flow.

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