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# ASSESSMENT OF INDICATORS OF ECONOMIC EFFICIENCY OF TRANSPORT LOGISTICS

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**ABSTRACT**

In the modern economy, the problems associated with transport logistics (TL) have become important. The strategic goal of the TS is to increase the level of competitiveness of firms in the market, as a result of which, TL is that special direction of the economy, which will contribute to the growth of its level of efficiency and lead to high commercial results. A consistent assessment of the effectiveness of the functioning of the enterprise's TL is a guide to its activities, since the results of the assessment help managers to identify complex components of the system and make optimal management decisions. All this leads to the need to develop assessment mechanisms that will help to calculate the level and degree of efficiency of the TL functioning, because modern assessment methods do not make it possible to identify the integral level of TL efficiency based on the TL efficiency levels. Consequently, the development of a systematic assessment of the effectiveness of TL, based on identifying the levels of efficiency of subsystems, plays a major role in finding its place in the market. A systematic approach to assessing the effectiveness of TL functioning is confirmed by a logistic approach to their management, as well as the properties they own. The significance of the research is confirmed by the fact that the development and improvement of methods for assessing the effectiveness of THB processes in a firm contributes to the implementation of specific use of theoretical provisions in the activities of commercial entities of the Republic of Azerbaijan.

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**Introduction.** It is well known that any economic research ends with the determination of the economic efficiency of certain subsystems. This approach is entirely related to research in the field of transport logistics in the overall logistics system.

To achieve this goal, one should clearly understand the main indicators of the effectiveness of THB.

The main indicators of the economic efficiency of logistics, in particular, TL are usually considered the following [1]:

- the degree of stocks and a decrease in the need for warehouse storage;
- the term of movement of the MP in the LAN;
- time of the order service cycle, quality and level of services;
- the quality of technical specifications in the system of commodity movement;
- the volume of consignments of goods;
- the degree of implementation of production facilities;
- performance, flexibility, stability and efficiency.

Foreign practice shows that significant expenditures in drugs (according to foreign experience, from 20 to 30%) are transportation by long-distance modes of transport (30-50%); warehouse, reloading operations and storage of goods (30-50%); packaging (10-20%); management (5-15%); others, including order processing (10-20%) [2].

Next, we will define the main elements of the components of economic efficiency for drug trafficking and drugs. It is known that the effect is calculated as the savings in money, obtained as a result of the achievement of TL and drugs, the specified parameters of the following indicators [3-5].

I. Cost savings on the creation of new supply, sales, etc. warehouses as a result of a decrease in the level of stocks:

$$\acute{Y}_1 = \sum_{i=1}^{n} \Delta E_i f_i K_i \eta_t$$

where n is the number of warehouses in drugs; $\Delta E_i$ - decrease in the level of stocks in the i-th warehouse; fi is the share of the area required to store goods in the i-th warehouse; $K_i$ - construction price of 1 sq.m. area of the i-th warehouse; $\eta_t$- investment efficiency coefficient [4].

II. Savings by reducing the cost of storing goods:

$$\acute{Y}_2 = \sum_{i=1}^{n} \sum_{j=1}^{m} C_{xi}\, q_i \Delta t_{ij}$$

where m is the number of failures in the delivery of goods, in accordance with the schedule; $C_{xi}$ is the share of the cost of storing goods in the i-th warehouse; $q_i$ is the rate of replenishment of stocks in the i-th warehouse; $\Delta t_{ij}$ is the value of the j-th failures in the supply of goods for loading at the i-th warehouse.

$$\acute{Y}_3 = \sum_{i=1}^{n} C_{ri} q_i n_{ri}$$

where $C_{ri}$ is the cost of performing 1 cargo operation at the i-th warehouse; $n_{ri}$ - reduction in the number of cargo operations at the i-th warehouse as a result of timely delivery of goods for loading.

IV. The effect of reducing the loss of goods as a result of reducing the period for their transportation and storage [5-8].

III. Effect due to a decrease in the number of loading and unloading operations during the delivery of raw materials for processing during the planned period:

$$\acute{Y}_4 = \sum_{i=1}^{n} C_{ni} q_i$$

where $C_{ni}$ - losses as a result of an increase in the transportation time of goods stored in the i-th warehouse.

V. The economic effect as a result of the PS turnover contributes to the reduction of the period of its service at all stages of transportation.

$$\acute{Y}_5 = \sum_{i=1}^{n} q_i \left(\frac{1}{t_{1i}} - \frac{1}{t_{2i}}\right)(c_{ai} - c_{pi})$$

where $t_{1i}$ is the average turnover of a PS unit upon delivery of goods to the i-th warehouse; $t_{2i}$ is the average turnover time of a PS unit of the composition when the goods are delivered to the i-th warehouse using traditional technology; $c_{ai}$ - profitable rates upon delivery of goods for the i-th warehouse; $c_{pj}$ - cost of rates for the delivery of goods [8-11].

VI. Systematic information research of MP contributes to the efficiency of planning at all stages of the transportation process and to obtain a greater effect:

$$\acute{Y}_6 = C_в \sum_{i=1}^{n} \sum_{j=1}^{m} m_{il}\, \Delta t_{nc,il}$$

where l is the number of information retrieval failures; $C_в$ - the cost of a car-hour of downtime; $m_{il}$ - number of PS units , $\Delta t_{nc,il}$ - failures in the maintenance of rolling stock at the i-th warehouse.

VII. An important component of the off-transport effect is the results of an increase in the level of services:

$$\acute{Y}_7 = C_д - \sum_{r=1}^{R} n_r c_r$$

where R is the number of types of services; $C_{\partial}$ - drug costs for the formation of a distribution channel; $n_r$ is the number of r-type services; $c_r$ - cost of r-type services [12].

It should be emphasized that evaluating efficiency only on the basis of calculating costs is not enough, it is necessary to apply methods based on calculating net profit and assessing the level of return on investment:

$$P = Q (C-C)$$

where P is the net profit of the drug; Q is the amount of goods sold; C - the price of a unit of goods; C - the share of costs for the production of a unit of goods.

$$RK = P / K$$

where RK is the return on invested capital; K - capital used to generate income.

This approach makes it possible to evaluate TL in the field of warehousing and transportation of goods.

The effectiveness of the TL system depends to a large extent on the ability to identify potential results in the early phases of the service process.

Practice shows a significant number of examples of the negative consequences of using the system of indicators given in the above methods. They are associated with the possibility of local suboptimization of the functioning of a number of components of drugs and TL at the expense of the efficiency of the system as a whole. This led to attempts to find new approaches, such as direct costing, a system for accounting for transaction costs [9-10].

In the current methods, the systems of transportation of goods are well diagnosed, but they do not pay attention to the process of customs clearance of goods. To obtain these indicators, it is necessary to evaluate all the components of the drug.

Therefore, it is necessary to create an optimal system of criteria that allow to characterize the largest number of indicators of drugs and TL. For rationality, we will designate them as $K_1$, $K_2$, $K_3$, $K_4$, and so on.

Income generation rate:

$$K_1 = S - M - ES,$$

where S is the volume of transportation (customs clearance) services in value terms for a certain time; M - the cost of fixed costs in services; ES - other price components.

Operating costs are calculated as the sum of all types of costs associated with converting investments into income:

$$K_2 = \sum_{i}^{N} OE_i$$

where N is the number of all costs of drugs and TL in the considered BS cycle.

This includes all the costs incurred by drugs and TL for a certain time in connection with the process of processing and promotion of MIP.

Average level of capital tied in the system during the BS business cycle:

$$K_3 = \int_{BS} \big(I_V(t) + I_F(t)\big)dt$$

where $\big(I_V(t) + I_F(t)\big)dt$ - time-dependent components of the inventory that characterize fixed and circulating assets. Tied capital, inventory I, is calculated as the amount of money tied up as a result of the purchase of materials, etc. The concept of "inventory" largely coincides with the concept of "asset" widely used in financial analysis [11].

These operational criteria $K_1$, $K_2$, $K_3$ are related to the integral criteria of EE - net income ($P=K_4$) and return on invested capital ($RK=K_5$):

$$K_4 = K_1 - K_2$$

$$K_5 = \frac{(K_1 - K_2)}{K_3}$$

Currently, timing criteria play a significant role. The bandwidth of the LAN and TL, i.e. the number of completed technological processes per unit of time t.

$$\hat{E}_8 = \frac{\sum_1^n K_{fn}}{t}$$

where $K_{fn}$ is the time spent on the n-th certain stage of the technological process.

However, in the economic literature there are other approaches to determining the economic efficiency of THB and drugs. In particular, VV Lukinsky and TG Shulzhenkov [4-8] believe that a detailed presentation of the structure of the model of total drug costs allows us to identify the relationship with the efficiency indicators of drugs and drug trafficking. So, their components of the indicator "General and operating logistics costs" in table 1 shows seven indicators that express costs in the performance of the main functions: procurement management, transportation, UZ, order procedure management, production procedure management, as well as warehousing, cargo handling, protective packaging, ensuring the return of goods, etc. [12]

Table 1. Relationship between the elements of the drug and TL expenditure model by the structure of the indicator "General logistics costs"

| **Characteristics of private indicators as part of KPI-1** | **Elements of the TLC model** |
|---|---|
| 1. General logistics costs | $C_{\Sigma}$ |
| 2. Expenses for logistics drugs and TL | $C_{пр}$ |
| 3. Costs for internal and external transportation | $C_{m}$ |
| 4. Costs for warehousing and cargo handling | $C_{cr}$ |
| 5. Costs associated with ordering procedures | $C_{0}$ |
| 6. Expenses for KM | $C_{xp}$ |
| 7. Damages from insufficient level of quality of logistics services | $C_{y}$ |

From the comparison of the elements of Table 1. it follows:

- 1st indicator is a general indicator;
- indicators 3 - 6 are included in the equation of total costs;
- indicator 2 can be included in the formula in the case of considering the complete supply chain, while for procurement and distribution logistics, DTP can be omitted;
- indicator 7 should be attributed to KPI-2 "quality of logistics service" and should be added to $C_{\Sigma}$

Thus, in general, the assessment of the economic efficiency of transport logistics in the general logistics system gave satisfactory results. However, the results obtained on certain aspects of transport logistics in the logistics system have a number of serious shortcomings that should be eliminated as soon as possible. In a word, there are the necessary reserves to improve the efficiency of THB in drugs.

**Conclusions.** Given the relevance of intermodal transportation, it is important to clearly apply the capabilities of their drug elements, in particular, to identify possible options for the rational use of individual components of the international logistics infrastructure on the main complex routes of international trade, including a number of factors affecting the formation of drugs and TL as a whole. These supply channel routes are called “transport corridors”, which are part of the MTL, which provides the bulk of international freight traffic between individual countries.

From this it can be seen that the emphasis is placed directly on transport as the main component of the logistics infrastructure, which can replace each other when an additional need for transportation arises.

The analysis of transport corridors reflects the possibilities and growth of the efficiency of operations, the full use of the advantages of the country's infrastructure. In particular, it is necessary to highlight the types of transport that are competitors on the route of this corridor; they have an independent meaning and satisfy the demand for transportation based on technical capabilities.

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