The study of logistics risks in optimizing the company's transportation process

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Abstract. The scientific article is devoted to the study of logistics risks in the optimization of the company's transportation process. The relevance of this topic is not in doubt, since one of the principles of logistics is reliability in fulfilling obligations to partners in the implementation of logistics operations related to the organization of cargo delivery. The purpose of the scientific article is to study risk analysis methods in the logistics system of cargo delivery to determine ways to optimize the company's transportation process. The following scientific methods are use in the article to study logistical risks: system analysis, scientific literature analysis method, document analysis method, statistical method, comparative analysis, synthesis. The current economic situation in Russia requires the use of new methods and technologies in organizing the delivery of cargo from the manufacturer to the final consumer. The rational use of various combinations of modes of transport in the organization of cargo delivery leads to a decrease in total logistics costs. Logistics solutions aimed at reducing uncertainty in the organization of cargo delivery should contribute to solving the current tasks of cargo delivery, as well as to prevent and reduce possible logistics risks in the future. The article examines the process of logistical risks in the logistics of delivery of goods.

1. Introduction
One of the important tasks defined by the Transport Strategy of the Russian Federation for the period up to 2030 (as amended on 05/12/2018) is “working out and introducing highly efficient integrated transport and logistics technologies ensuring the integration of all types of transport, cargo owners, consignees and other participants in the transport process in a single technologically compatible system, intelligent management of transport and logistics processes in the supply chains of goods, as well as reducing the processing time of shipments to those terminal logistics network ”. To solve this problem, the use of new approaches and technologies in transport and logistics activities is of particular importance, making it possible to reduce the cost of freight transportation and make it more flexible [1, 14].
Logistics risk assessment is carried out by the head of the logistics department. Its main goal in this area is to combat the negative consequences of risks, that is, to reduce losses from the company's logistics activities, as well as to increase positive risks, that is, profits. Decisions on specific actions to protect and reduce (increase) risk can be detailed only with careful study and analysis of risk situations that are possible in the future and the present [9, 10].

2. Study methodology
The purpose of the publication is to analyze the scientific literature, regulatory framework and the results of scientific research on the management of logistics risks in transport companies to determine ways to optimize the transportation process. The study used the following methods: a systematic approach, comparative analysis, analysis of official statistics; document analysis method.

Analysis of logistical risks is a new direction in economics. Of the entire volume of scientific literature, first of all, it should be noted the work of an economic nature of foreign authors. (A. Ballis, Danielis, R. J. Gasparik, Hanssen, T.-E. S., Kurenkov P.V., Limbourg, S.). The formation of the theory and methodology of logistics risks are devoted to the work of A.N. Sterligov; including transport: A.V. Grigoriev, P.V. Kurenkov, L.B. Mirotin, A.Yu. Mikheev, K.R. Mkhitaryan, V.A. Persianov, V.P. Fedko, and etc.).

The whole process of the study of logistical risks can be divided into eight stages that help manage risk (reduce its negative effects) (Figure 1).

Risk identification is the formation of a complete list of adverse events.

Methods of risk analysis in the logistics system of delivery of goods:
- empirical method - based on logical reasoning, by extrapolating past situations and predicting them for the future;
- statistical method - based on the study of statistics of losses with the establishment of the frequency of occurrence of certain levels of losses;
- expert method - based on assessments of information received from experts.

3. Assessment and results
The basis for the study of risks in the logistics system of cargo delivery company can take the results of a logistics audit (Figure 1).

Figure 1. The process of researching the logistical risks in the logistics system.
Often, based on the results of a logistic audit, the following problems identified in the logistics system of cargo delivery:

- no process control system has been created;
- there is no complete supply chain control system;
- there are large gaps in the interfunctional interaction of the company's structural divisions.

This circumstance is a serious logistical risk, which reduces the reliability and manageability of the supply chain in the logistics system of cargo delivery and does not allow automating the work of the company's logistics system. As a result, there are risks of making an untimely or incorrect management decision in supply chain management [6, 12].

These are the risks of “uncertainty”, which are consider as the sum of circumstances, they can be foreseen in advance, but it is impossible to determine how much they will affect the resulting indicators of logistics activities.

The risk of “uncertainty” in the logistics system of cargo delivery is also identified as a result of blurring, uncertainty of individual responsibility and motivation of staff. This risk leads to a decrease in the quality of management, performance discipline, and increase in personnel costs [2, 13].

An analysis of a risk situation, or a risk situation, determines three interrelated conditions: the presence of uncertainty, an analysis of possible development alternatives and the choice of the optimal opportunity to assess the likelihood of the implementation of selected options [8]. The definition of the type and magnitude of the risk has the character of random processes, and quantitative estimates can be obtained using the probabilistic theory apparatus. The specialist should remember that in a risk situation, besides identifying the causes of its occurrence and calculating the absolute values of losses or profits, it is necessary to take into account: the probability of success (losses), the probability of deviations from the chosen goal, the possibility of favorable or negative consequences of actions taken.

Technical risks are also included in the group of logistical risks.

An example of technical risk in the company's logistics system of cargo delivery is the insufficient technical equipment of the warehouse with stackers and loaders, which increases the risk of damage to the goods.

These risks reduce the reliability of the logistics system, as they introduce uncertainty in the processes of acceptance, picking, and shipment of goods. Now there is no possibility to plan in the warehouse the time of acceptance of goods and their receipt in the sale [22, 23].

Periodically, the elimination of all (as well as all) logistical risk is impossible. Thus, its reduction also includes the determination of only an acceptable level of residual risk. Logistical risk management, including the determination of acceptable levels of residual risk, lies at the heart of the entire process for their gradual eradication from the system. Baseline, unlimited risk reduced by a combination of regulations, effective and prematurely designed rules and regulations, best practices and insurance. Each element of risk reduction reduces the residual risk; the more elements used, the lower the residual risk [3, 15].

In general, methods of protection against risks can classified depending on the object of impact on two types: physical protection and economic protection.

Physical protection consists of the use of such means as alarm, purchase of safes, product quality control systems, data protection from unauthorized access, hiring of security, etc.

Economic protection consists in predicting the level of additional costs, assessing the severity of possible damage, using the entire financial mechanism to eliminate the threat of risk or its consequences.

Methods of economic protection include, as mentioned earlier:
- avoidance of risk;
- limiting the concentration of risk;
- hedging;
- diversification;
- creation of special reserve funds (self-insurance funds or a risk fund);
• insurance.

Also, risks that are deliberately inherent in the logistics system are possible.

This is an increased risk at customs, since the “gray scheme” used when disinhibition, with the replacement of the codes of the commodity nomenclature of foreign economic activity and documents, in order to reduce customs costs. It is clear that this risk taken from the absence of other delivery options, but it is conscious, since at the stage of concluding a contract with the client one could not take it.

Then you can focus only on the main losses identified because of a logistic audit.

Risk analysis in narrow places indicates possible locations for logistical losses and measures to combat them.

It considered that losses mean any actions that do not add value to the product. This means that all logistics operations, since they do not improve the quality of the goods, can considered potential losses.

But in the context of this study, by losses we shall mean excessive expenses on logistic costs, which arise as a result of their not optimality.

Accordingly, the main method of reducing these costs or reducing to zero will be optimization of the supply chain.

Conducting a study of logistics risks in the logistics system of cargo Delivery Company can identify the following costs that need to be minimize:

Losses from poor planning of delivery, and as a consequence of the logistics operations in a fast mode.

For example, long-term coordination of issues with counterparties, lack of timely funding, lead to a loss of time for the delivery of goods in the optimal mode, the optimal mode of transport, with such delivery all units are forced to work in emergency mode, and therefore with excessive costs. At the same time, the course of implementation of planned operations is disturbed, their quality decreases, which also entails losses that are difficult to estimate and calculate, but can be avoided.

4. Conclusions
Ways of counteraction: It is possible to reduce this type of losses if regulation and rationing of operations carried out throughout the company.

1. Losses on the excessive level of service. Logistics service is set to the maximum level of service for customers, which is not relevant at this stage.

Ways of counteraction: it is necessary to apply such a high level of service only to the VIP clients of group “A” according to ABC client analysis. For customers of groups “B” and “C”, the level of service set at a much lower cost. This will significantly reduce the company's logistic losses.

2. Losses on excessive payment by the insurance company for insurance of cargo in the area of transportation in the Russian Federation. The study of logistics risks showed that insurance is a source of unnecessary losses, and the amount of these losses is about 1-1.5 million rubles. in year.

Ways of counteraction: it is necessary to create a cargo insurance system. The system should determine how and under what conditions, and what cargoes insured.

When considering the issue of insurance, it is necessary to understand that this is a sphere of financial risks. Therefore, the question: to insure or not to insure? - should be considered from the point of view of financial expediency, by optimizing insurance payments.

3. Losses due to shutdown of warehouses for a full inventory every quarter. The company incurs essential expenses for carrying out full inventory and from violation of a rhythm of sales, that reduces the level of service.

Ways of counteraction: it is necessary to modernize the warehouse software or replace it with a more modern one, which will allow carrying out daily scheduled reconciliations of the goods in online mode (real time) without stopping the warehouse. Scheduled reconciliations of goods, adequate systems of placement, selection, picking of goods will reduce the risk of deviations of the residual
goods to zero and avoid the need for full inventories every quarter. It will be enough to conduct an annual inventory in the offseason [7, 10].

Insurance is advisable if the probability of risk realization is low, and the amount of possible damage is large enough.

The most common types of risk insurance in logistics are CARGO (cargo insurance) insurance, professional liability insurance of logistics service providers (carriers and forwarders), and liability insurance for the use of high-risk facilities (motor vehicles).

When deciding on the insurance of logistics risks, it is necessary to evaluate the expected post-event funding of risks, to determine how much of the loss will be compensated by the insurance company.

4. Losses due to a small number of direct shipments. Now the need to work through the central warehouse is associated largely with great risks of poor-quality supply from the manufacturer. However, delivery through the CA is the loss of additional cargo handling, from possible damage to the goods while.

Ways of counteraction: in order to reduce this type of loss it is necessary to change the system of work with forwarding companies.

It is necessary to create a single automated supply chain management system with long-term counterparties.

5. Losses on low labor productivity due to the lack of motivation and rationing of operations. No need to naively believe that the company employs people who will work with maximum productivity. From analytical sources it is known that the introduction of adequate motivation increases labor productivity by 30-50% - this is a long-term statistics on various companies in different countries [4, 5, 19]. Greater effect on increasing labor productivity can only brought by the “conveyor belt” invented by Henry Ford in the 1930s. The “conveyor” system can and used not only in production - it is a universal system. Proof of this is the use of the conveyor system in the warehouse since the beginning of the 2000s, combined with full automation through WMS (warehouse management systems). Therefore, now such warehouses called “distribution centers” - these are cargo-processing shops. RCs show labor productivity several times higher than a traditional warehouse.

Ways of counteraction: it is necessary for the repeated reduction of this type of loss to build the work of the logistics department to handle the “supply chain” according to the “conveyor” principle with accurate rationing of all elementary operations and motivating employees of the executors to perform their specific operations qualitatively and timely [25, 26].

6. Losses on the use of employees on operations that do not meet their qualifications and payment. You can find many examples of this type of loss. For example, when using the storekeeper as a loader, he loses an amount equal to the difference between the salary of the storekeeper and the loader. In the labor market, the stockman costs about two to three times the loader, 60 and 25 thousand rubles. per month, respectively. Losses will be about 250 rubles. per hour on the use of a loader one storekeeper [27-30].

Ways of counteraction: it is necessary to carry out an exact calculation of the need for personnel based on the laboriousness of operations.

7. Losses due to the division of warehouses into two rooms. This type of loss arises as transportation costs increase - cars are forced to first go to one warehouse, and then to another to load / unload consolidated goods, and the use and redistribution of warehouse resources and their management worsens.

Ways of counteraction: it is necessary to consider the possibility of combining warehouses in one room and with a single management. One warehouse manager will better plan the work of the joint warehouse; more efficiently distribute human and technical resources.

To reduce the significance of negative phenomena (risks), a system of “risk management” is usually create, which includes a number of activities (table 1).
Table 1. Basic requirements for transport company risk management regulations.

| Elements of a risk management system | Basic requirements for transport company risk management regulations |
|-------------------------------------|-------------------------------------------------------------------|
| Strategic                           | • availability of an appropriate interrelated multi-level structure of risk management, ensuring an adequate distribution of responsibility among all company employees or departments;  
• maintaining a balance between the costs of risk management and the possible damage from the occurrence of a risk event;  
• availability in the system of the use of the whole variety of risk management procedures and their combinations that take into account the specifics of a specific risk situation. |
| Organizational                     | • regulatory procedures for risk assessment and management;  
• the regulation of the distribution of functions and responsibilities between the participants of the risk management system in accordance with the organizational structure and objectives of the company. |
| Methodical                          | • the unity of terminology used in the risk management system;  
• management of all types of risks at each level of the company's organizational structure according to a uniform methodology. |
| Informational                       | • availability of a single information field and ensuring the interconnection of information at all levels of management in the company;  
• the ability to quickly respond to the emergence of new risk-forming factors. |

8. Risk identification. Risk identification means identifying the sources of risk, their types and possible damage. This issue is sufficiently develop both in theory and in practice; there are various classifications, the use of which greatly facilitates the identification of risk and the planning of measures to manage it [14, 17, 18]. The most common are the logistical risks associated with the performance of relevant functions: production, storage, labeling and packaging, consolidation and disaggregation, transportation by various modes of transport, documentation, calculations, distribution, etc. For example:

• risks directly related to the transportation of cargo on a specific means of transport, including fires, road accidents, theft or loss of a vehicle, explosions, damage during loading, stowage, unloading, receiving goods; loss or damage to packaging, packaging, loss or incorrect paperwork, staff negligence, etc.;  
• risks affecting cargo from outside: accidents, climate, prohibition of authorities, insolvency or bankruptcy of subcontractors, errors in the design of payment procedures, delay in transit, loss or damage to cargo during storage, warehousing and other operations in warehouses and in preparation for transportation, high concentration cargo, low skill level of workers [11, 16];  
• risks affecting external objects due to cargo incidents: victims of accidents, an accident, waiting for operations, damage to the property of the contractor, damage to someone else's property, customs risks, etc.;  
• other risks, costs of rescue and accident, liquidation of consequences, costs of a surveyor or a lawyer and other costs. Experts or specialists can identify imminent risks before they appear. It is important to identify factors that influence risk. These risks include type of product and its packaging; means of transportation (mode of transport, number of vehicles and their characteristics); terms and duration of transportation and transport routes, etc. The following are the types of risks that have a major impact on overall logistics costs [20, 21].  

The results of the assessment, as a rule, make it possible in the future to decide on measures to compensate, reduce or prevent logistical risk, which based on existing and constantly modified methods. Among them:
1. Diversification - the allocation of invested funds between various capital investment objects, which are not directly interconnect, which helps reduce risk and reduce losses.

2. Risk transfer (risk reduction) - the transferor (transfer) transfers the risk to the receiving party (transfer) based on a contract. It is widely used when entering into construction contracts, leasing, leasing, in storage, transportation, sale, maintenance, supply, commission, factoring agreements (with assignment of a monetary claim), exchange transactions. The risks of solvency, property, liability, business interruption can be transfer.

3. Limiting - setting limits on expenses, sales, loans, etc. Used by banks in issuing loans, enterprises in the sale of goods on credit, investors in determining the amount of capital investments. Limiting can be consider as a method of limiting risk [24, 30].

4. Insurance - the transfer or distribution of risks that arise from one person between a numbers of persons. Used in accordance with the current legislation in different countries - double insurance, reinsuranse.

5. Risk Elimination — Eliminating Certain Risk-Related Activities.

Considering all these components, the risk in modern logistics transformed not just into a physical or monetary assessment of losses. Risk identified in a special kind of activity aimed at overcoming the factors contributing to its occurrence.

Grouping risks according to certain criteria allows you to systematize potential threats that may arise during transportation. Irrational choice of the vehicle and its forwarders, selection of its carrying capacity, route, and strategy of maintenance and repair of rolling stock - all this can lead to losses and lead to increased costs [17, 18]. As a result, similar gradations of risks arising at the stages of the transportation process make it possible to understand at what points the operator should pay attention when planning the transportation.

Thus, the risks arising in the process of transportation depend on how carefully and professionally the carrier has designed and organized the transportation. At each stage of planning the transport process, the operator of multimodal transportation has the ability to manage very specific and specific risks of the transportation process.

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