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НАМАЛЯВАНЕ НА РИСКА ПРИ УПРАВЛЕНИЕ НА ТРАНСПОРТНИ ПРОЕКТИ

Светла Цветкова

RISK REDUCTION IN TRANSPORT PROJECT MANAGEMENT

Svetla Tzvetkova[1]

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Abstract:

The management of each transport project involves probabilities for the emergence of different types of risks conditioned by the uncertainty which results from the dynamic development of modern society and the specificity of transport activities, as well as the impossibility to foresee future events. This in turn could lead to serious negative consequences such as reduced enterprise productivity, low competitive power or lack of highly qualified workforce. The present article determines the necessity to do mandatory preliminary analyses and assessments of the probabilities for the emergence of future risks when it comes to managing the development of transport projects; it also indicates specific approaches and methods for the reduction of said risks.

Ke words*: risk reduction, management of transport projects, sources, factors, assessment and analysis of possible risks, approaches and methods for reducing risks*

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Introduction

Risks result from completely random interconnected occurrences which inflict certain damage under specific circumstances. Risks are usually used to characterize an economic situation where all probabilities for the emergence of certain events are known, and the inability to assess this probability is defined by the term uncertainty, which involves unauthentic and incomplete information regarding the conditions, prerequisites, project realization and losses related to them. Uncertainty usually involves incompetence, accidencts or the emergence of counteraction. That way, no amount of ingenuity and skill can eliminate the risk. There are only ways to reduce it. It is enough to identify and assess the risks and to take them into account when making management decisions. Therefore, the primary goal in the modern management of transport projects is to find approaches for minimizing business risks for the purpose of more effective transport proeject realization as well as reacting adequately and flexibly to potentially occurring changes. In recent years, the variety of risks in the conditions of globalization and extremely dynamic market development has shown a steady growth trend because risks are an integral element of society's economic, political and social life, accompanying all directions and fields of activity of transport enterprises. The potential risks related to the development of transport projects usually involve the speed, rhythm, safety and environmental friendliness in the functioning of transport systems – each freight holds risks of cargo damage or potential threats to people's lives and health. The factors that have the most influence on the emergence of risks include the cargo's nature, the technical characteristics and technical condition of

[1] University of National and World Economy, Economics of Transport Department, Associate Professor PhD, e-mail: svetlatzvetkova@abv.bg

transport vehicles, seasons, climate and weather conditions, the length and direction of freight routes (Parvanov, H., Bakalova, V., Tzvetkova, S. 2010).

Theoretical Justification of the Terms "Risk" and "Uncertainty"

Risks emerge when there are oversights in the identification of uncertainty. The ability to identify possible threats of occurring accidents and failures in the activity of transport enterprises on time would reduce risks and contribute to the more effective realization of projects; for example, when managing operating activities, it has to be reduced to an acceptable level, which is the most important task for the successful development of the enterprise's activity in the conditions of uncertainty. Absolute uncertainty practically does not exist in the management of operating activities and it is usually accepted that it is equal to 0,90…0,99. Uncertainty is not susceptible to assessment, whereas risk is an estimated probabilty. Uncertainty involves the presence of factors under which the results of their actions are not determined and the degree of their possible influence on the results is unknown. Generally speaking, it is caused by the insufficient amount of information for analyzing the situation or by mistakes in setting the management target, as well as making unjustified economic decisions, including the expenses and financial results related to them. The source of uncertainty in economy is objectively determined after the causal links between the studied processes have been analyzed. The desired state of the system is one where the system's reliability reaches a level that corresponds to the acceptable risk, as a synonym of uncertainty. Therefore, objective understanding of risks is necessary in transport activity. Objective understanding of risks means the presences of undetermined probability with an unfavorable outcome which depends on the will and consciousness of the individual at risk. Economic uncertainties could include: indeterminancy of market demand, weak predictability of market prices, indeterminancy of market supply, insufficient information about competitors' actions, etc., under which uncertainty could be divided into three types: complete uncertainty - $\lim t \rightarrow t_{k,} H_{t =} 0$, where t is the time, $t_{k -}$ the end time for the predicted event; partial uncertainty $\lim_{t \rightarrow tk} H_{t =} 1$, with a corresponding predictability of events of almost one; uncertainty which is determined by the inequality: $0 < \lim_{t} \rightarrow_{tk} H < 1$, and uncertainty of obtaining the final result of investment holdings, which is a universal law of economy.

Main Stages and Methods for Analyzing and Assessing Risks

The main reasons for the emergence of risks in processes related to project management include random factors and lack of sufficient information, as well as the impossibility to use appropriate tools and methods of analysis, based on which corresponding management decisions are made. Additionally, heterogenous opinions and differences in party interests, discrepancies between party interests or random factors could be indicated as well. Business risks could also result from competition between transport enterprises which offer similar services – the higher their number, the higher the risk of doing business in one market segment or another. Under these circumstances, companies with large average-weighted risks have competitive advantages. In that regard, risk analysis and assessment need to go through the following stages:

- analysis of every possible potentially dangerous source leading to the occurrence of accidents and failures with various consequences;
- classification of possible accidents and failures;
- determination of the consequences of every possible accident and failure;
- qualitative risk assessment.

The actual process of analyzing the situation and making decisions involves: identifying the problem, setting the respective goal, forming scenarios, selecting criteria for assessment, carrying out

the decision; selecting criteria for monitoring; final evaluation of the result. Risk identification and analysis presupposes quantitative and qualitative studies of the risks that enterprises will encounter.

Quantitative analysis involves the processing of statistical information with the methods of correlation and variance analysis, analysis of the time series, factor analysis or other methods for multidimensional classification. Methods of simulation modelling can also be used to determine the probability of risk emergence and the amount of damage; the numerical meanings of risk factors are determined on the basis of statistical, analytical and expert evaluation. The statistical method for quantitative assessment of risk factors is based on: (1) an analysis of all statistical data on the effectiveness of the realization of the studied operations; and (2) further calculations of the probability for occurrence of losses. The analytical method for quantitative assessment of risk factors is based on: (1) the use of data for the consequences of the impact of unfavorable risk factors in similar works; and (2) their use when calculating the probability for occurrence of losses. Depending on the factors' nature of influence, the expert method for analysis of risk factors divides them into: simple, but independent from each other, simple and integrated factors. The primary objective of this type of method is compiling a comprehensive list of risks, followed by determining the relative weight of each individual one and the whole sum. The first stage of the expert assessment of risk factors determines all factor groups with the smallest priority with regard to possible losses, the second one determines the weight of each group by priorities, and the third one determines the weight of factors for each risk that enters the respective priority group. Under these circumstances, the following system for evaluating risk factors is adopted: 10 – a factor with no real significance; 20 – a future risk factor which will probably not be realized; 40 –nothing specific can be said about the occurrence of the event; 60 – a factor which will most likely lead to risks in the future; 80 – a high probability for the emergence of risks in the future; 100 – the risk will most certainly be realized.

Qualitative analysis reveals the factors, studies their specific characteristics and peculiarities and determines the consequences of the realization of each risk in the form of economic losses and uncovers the sources of information for each risk. This type of analysis is aimed at determining the risk factors and their potential areas, i.e. determining all possible risks.

Usually, risks in transport service, for example, is evaluated through the cargo's price and the transport-distribution system's ability to provide the necessary freight quality such as guaranteed delivery to consumers within the determined schedule and at the indicated location, as well as retention of utility value – the probability for that should be approximately 0,95. In this case, diversification reduces risks and allows for more flexible reactions to changes in economy and the achievement of a systematic effect from the combination of various activities. More often than not, however, the measures are universal and based on an institutional foundation for protecting transport enterprises from certain types of risks. However, "narrow" (critical) places are found quite often in the functioning of the transport socio-economic system, which means increased danger or risk of damage in the constant nature of the process or increasing the value of the transported cargo. In transport the risk of losses with regard to worth and reduction of the cargo's utility value due to detention of delivery, for example, is a common occurrence.

Guidelines for Reducing Risks in the Management of Transport Projects

Transport enterprises always encounter a wide variety of risks regarding the management of project realization processes. There are risks involving the occurrence of fires, natural disasters, international conflicts, changes in legislation regulating transport activities, inflation fluctuations, etc. The high degree of risk emergence in the management of transport projects leads to the necessity for seeking ways to reduce them artificially. In the practice of project management, the most frequently used methods for risk reduction include: risk diversification, distribution of risks between participants in transport activity and risk insurance (Berman, Schmidt, 1997).

Risk diversification in transport enterprises stipulates reduction of demand for offered transport services, seeks new niche markets for work or aims its activity at carrying out other types of services or providing other services that accompany the main one. Diversification offers two primary ways for managing risks – active and passive. The active tactic of transport enterprises for realizing transport production on the market stipulates, on one hand, careful research, study and realization of the most effective investment projects, conquest of the transport market through specializing in one type of services, and as fast a reorientation as possible from one type of transport services to another, including possible conquests of other markets. Passive risk management is characterized by low turnover or minimal level of concentration of the volume of work.

Risk allocation among participants in the transport activity is a standard practice. It places the responsibility for the risk on the one participant in the transport activity who is more capable of identifying and controlling risks than everyone else. Risk is allocated through the development of financial plans for the project and contractual documentation. It should be taken into account that the growth of risk levels for one of the participants should be accompanied by an adequate alteration in the allocation of profit on the project. Therefore, when negotiating, the first thing that should be taken into account is the capacities of all project participants regarding the prevention of unfavorable consequences in the eventual emergence of risks. An acceptable reward for the risk should be negotiated and parity in the risk/profit ratio between all participants in the transport project should be observed. The higher the degree of the risk that participants intend to assign to their partners is, the harder it becomes to attract funding for the transport activity of experienced investors. Therefore, it is recommended that participants in transport projects demonstrate maximum flexibility with regard to how much of the risk they are willing to take. The willingness to discuss the issue of participants taking a large part of the risk could convince experienced investors to lower their requirements (Parvanov, Bakalova, Tzvetkova, 2010).

Risk insurance essentially means passing certain risks to an insurance company. Insurance covers all risks, including exceptional circumstances, and encompasses the transference of cargo from warehouse to warehouse, i.e. it includes the entire process of transportation, including ground transportation in the port of loading and from the port of unloading. This form of insurance is usually also applied to rented equipment. Additionally, it is often used as protection against the consequences from the material damage of transport vehicles. As a means of minimizing risks, insurance is a form of prior appropriation of resources deisgned for compensating damage from the expected manifestation of various risks. At the start of the fiscal period, the enterprise pays an insurance premium and ensures compensation for future damage. The enterprise's worth at the end of the fiscal period when carrying out the insurance is expressed through the formula:

$$S_1 = S - P + r\,(S - P),$$

where:

S_1 is the enterprise's worth at the end of the fiscal period when insuring;

S – the enterprise's worth at the start of the fiscal period;

P – the amount of the insurance premium;

r – the average yield of working assets.

The size of the losses does not affect the enterprise's worth because, as is suggested, they are fully compensated at the expense of the paid insurance benefits. When self-insuring, the enterprise fully retains its own risk and forms a specialized reserve fund – a risk fund. The enterprise directs no less than 5% of the profit obtained during the accounting period toward the formation of this reserve fund.

The influence on the size of the free assets of fully retained risk could be assessed through the following formula:

$$S_r = S - L + r\,(S - L - F) + iF,$$

where:

S_r is the enterprise's worth at the end of the fiscal period with fully retained risk;

L - the expected losses from the studied risks;

F - the size of the reserve risk fund;

i – the average yield of assets from the risk fund.

When self-insuring, the enterprise suffers two types of losses: direct ones and indirect ones. Direct ones are in the forms of expected annual losses. Aside from expected losses, certain resources should be directed toward the reserve fund in order to compensate these expected losses, and with a certain supply. It is assumed that assets in the reserve fund are stored in a quicker liquidity form than the assets invested in manufacture because they are less profitable. When self-insuring, the redcuction of investment profitability due to the necessity to form a reserve risk fund will be an indirect loss.

The comparison of the meanings of S_1 and S_r makes it possible to determine the comparative economic effectiveness of insurance and self-insurance. It should be noted that, in order to make the calculations more accurate, it is necessary to account for the discounting of cash flows as a result of the distribution of losses in time, such as delays in the payment of insurance compensations related to forming and making demands and the presence of inflation.

The most frequently used means of *insurance against transport risks* include: optimization of routes, traffic control, property insurance and insurance of responsibility. The list of insurance risks during freight includes insurance of responsibility for all types of risks, responsibility for partial damage, without responsibility for damage, excluding traffic accidents. For inland transport, auto carriers take out an insurance against the following groups of risks: risk of compensation of losses for cargo owners in the event of misplacement, inadequacy, damage or spoiling of cargo; risk of compensating losses and financial damage related to the consequences of mistakes or oversights of carrier workers; risk of compensating third party losses if damage is inflicted on the carried cargo; customs risk; risks involving the cost of investigating circumstances, accidents or reductions of the size of compensations. When insuring cargo, it is liable to compensation as a result of the following types of losses: fire, lightning strike, explosion, storm and other natural disasters; as a result of traffic accidents; transport vehicle theft; during the process of cargo loading and unloading, etc.

The defining characteristics of cargo insurance are as follows:

- owners are unable to control cargo preservation;
- several carriers can participate in the delivery, using different types of transport;
- during the delivery process, the cargo can pass through the territory of several foreign countries.

When insuring cargo, the subject of insurance can be all types of cargo carried by different types of transport, freight and other expenses involving delivering the cargo to its designated location, but no more than 10% of the cargo's insurance value; responsibility for the cargo during freight, at the point of loading, transfer, unloading and intermediate storage, including the professional responsibility of carriers and shipping agents, warehouse terminal operators and security companies.

Insurance protection for cargo with responsibility for all types of risks helps compensate damage, complete destruction or misplacement of the whole cargo or parts of it due to all manner of reasons, except for the ones specifically excluded from the insurance contract; expenses for general average; all necessary and expedient expenses for cargo salvation or reduction of losses and determining their size.

Coverage of unforeseen expenses is a means of risk reduction which stipulates the establishment of correlation between potential risks that affect the project's value and the amount of costs necessary for overcoming losses.

The magnitude of this amount has to equal or exceed the magnitude of the fluctuations of system parameters in time. The overall value of the project should not grow beyond 7-12% when it comes to allocating funds intended for the occurrence of exceptional circumstances (Parvanov, H., Bakalova, V., Tzvetkova, S. 2010). It is also necessary to allocate additional sources of funding for projects and create reserve funds for collecting deductions within a certain percentage of the realization of transport services. In order to reduce risks in the development of the project's financial

plane, a sufficient reserve should be created in order to guarantee stability in the realization of project stages; additional expenses and temporary reduction of provided transport services should also be taken into account.

Written agreements or obtaining of warranties for risk reduction in transport enterprises, etc.

After the actions for reducing risks in the realization of transport projects have been carried out, their effectiveness should also be evaluated. For this purpose, risks are given a quanitative analysis, and a comparison is made between the expenses for their minimization and the size of the losses if risk events occur. On this basis, project managers should make the respective management decisions regarding the emergence and reduction of possible risks in the process of carrying out transport activities.

The realization of each transport project involves searching for the appropriate approaches and mixing them optimally in order to reduce risks, which are quite expansive and varied.

Inferences and Recommendations

In order to manage transport projects more effectively and reduce risks, managers should focus their attention primarily on rationalizing relations between partners and participants, especially between consignors, consignees and insurers. The arsenal of tools for risk management should involve taking actions aimed at risk prevention and influencing risk sources such as:

- reducing the duration of existing uncertainties;
- reducing the probability for the emergence of unwanted events;
- technical monitoring of situations and ceasing dangerous behavior;
- duplicating operations, objects or resources, if possible;
- allocating risks by various areas or subdividing them;
- integrating innovations or preemptive actions;
- allocating risks in time;
- isolating dangerous, mutually strengthening factors from each other;
- insurance transfer of risks;
- financial hedging of risks;
- price adjustment, eliminating actual losses;
- compensating potential losses with additional earnings;

The program for risk management should be a full description of the formal actions that need to be taken, their information and resource insurance, the criteria for the effectiveness of their realization and the system for allocating the responsibility for the decisions made. The formal methods for risk management could be subdivided into the following groups: **risk evasion, risk differentiation and risk compensation.**

Risk evasion involves rejecting unreliable partners and risky projects, insurance against risks, seeking guarantors or firing incompetent employees.

Risk differentiation aims to distribute invested resources among various subjects which are not directly linked.

Risk compensation involves strategic prognostication of all fields of the company's activity such as prognosis of external conditions, monitoring the socio-economic and normative-legal environment of the respective processes, as well as creating backup systems within the enterprise, including raw materials and component materials, and reserve funds of financial resources. Risks could also be localized in the conditions of their precise identification and the sources of their emergence (Zarenkov, V., 2011).

In order to reduce risks and manage transport proejcts effectively, risk management should be able to answer the following questions: What actions need to be taken? Within what time limits? What

monetary and other resources should be spent on the realization of the given measures and in what volume? Who holds responsibility for carrying out the decisions made and the control over their realization? For example, some of the primary formal methods of the process of risk management which hold the most significance in the modern conditions of investment activity include: risk assessment, perspective development, preemptive actions, self-insurance, insurance, controlling and monitoring integral and residual risks where the limit of financial responsibility is equal to the volume of acceptable losses, divided by the probability for risk realization. The majority of risks could be reduced or eliminated through insurance. Of course, insurance does not provide firms with complete protection from eventual risks, but it helps them protect themselves from some or all financial consequences. Managers often have to ask the question "Is my company insured against certain risks and are risk policies enough to protect it from events which cannot be overcome any other way?".

The informal methods for risk minimization could include: improving the effectiveness of using personnel potential (quality team and hiring personnel, intensive training and professional development for co-workers, a worked out motivation mechanism); optimizing the organizational structure and the enterprise's level of innovation; developing and maintaining relations with infrastructural organizations and other participants on the market. Some risks could arise from insignificant and small acts, but if managers do not identify the probability for their emergence on time, this could turn out to be quite a costly situation with dangerous consequences for the transport project.

Conclusion

The main purpose of risk management is to ensure the successful functioning of transport enterprises in the conditions of uncertainty, i.e. in the conditions of risky situations. Risks could have a certain negative influence on effective project management such as acceptable level of uncertainty regarding possible damage; legality of actions, i.e. consistency with regard to the main objectives of the system, stable operations, realization of profits, etc. Risk reduction in transport primarily involves the search and incorporation of new products, services and technology whose production does not lead to risk growth; and secondly, risk reduction in project management stipulates its precise identification and correct assessment, as well as methods which could minimize possible risks. The unpredictable nature of the search, saturation and differentiation of necessities, as well as the constant changes in customers' preferences and demands and the growing competition increase the possibilities for emergence of risks in transport.

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