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# RISK MANAGEMENT IN ROAD TRANSPORT

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## **Abstract**

*In road transport, as in other fields of national economy, basing management decisions requires deep knowledge of internal and external environments related economic systems, while the effectiveness of transport activity is transmitted directly to the consumer. Knowledge of diversity and specificity of their risk and individualization of possible areas requires developing a system of adequate and well-grounded predictions. Only in this way creates an overview of the size of uncertainties and risks and contribute to making the decision to mitigate them, and if Road transport in mind, it creates security system business, volume and structure of supply, degree of diversification and its level of quality and consumer appeal.*

## **Keywords**

- *Risk*
- *Uncertainty*
- *Specific risks of road*
- *Investment risk*
- *Limiting risk*
- *Risk heritage*
- *The risk of failing to fulfill obligations*
- *Term risk*
- *Risk integration*

## **Introduction**

Stability and security in road transport operators require constant supervision of the relationship between that module, such as transportation and consumer throughout the course of work. Individual or collective consumer of the service supports, sometimes, even often lately, the inevitable consequences of the prolongation effects risk and uncertainty to it, the more serious as it appears that the road transport general topic of risk factors of the manufacturer of such transportation services ahead of those independent will and action. We believe that in order to shape a clearer picture of the size and action of specific risks to road transport is particularly helpful to take into account the following aspects: a) the degree of decentralization of the decision by the transport operators in the sense that action decision risk assessment belonging directly provider of transport services (on a lesser extent risk can be seen more quickly and more timely intervention to stop), b) the risk may be divided by modes, types and flows of transport links, making restrict its possible and achieve an end result more secure, c) road freight transport activity and / or individuals requires some distance movement and points in different areas sometimes exceed the boundaries of the country - in this case, the decision maker will consider opportunities for transmission, respectively, taking the risk of a third party, that some of the effects of risk factors can be transmitted to other economic participants directly or indirectly to the achievement of production of transport (eg, failure of contracted transportation program leads to diminishing the use of transmission capacity and the risk of contracting party may belong guilty) d)

reducing risk should consider the common interests of operators and consumers, e) the risk may occur and manifest itself in the form of road transport operators different, in a certain space and time, and ignored by risk likelihood and consequences of the event generates damage to be covered in order to resume and continue the transport process, and f) the degree of vulnerability of transport activities may generate advantages and disadvantages mode of assessment and any hedging - keep in mind that decreasing returns to manifest themselves fully in the activities of road transport operators, and, consequently, appear different degrees of risk taking and coping with bad influences.

Therefore, knowledge of the effects, incidental or otherwise, direct or indirect unwanted literature and which are defined as risks, leads us to the need to mainstream road transport system, given its complexity and dynamics of social and economic processes taking place within it.

## **Chapter I - Risk and uncertainty in social and economic activities.**

Romanian Explanatory Dictionary defines risk as "this opportunity to get into danger, to face the trouble or incur a loss, and the uncertainty is the" state of uncertainty, doubt, hesitation, change of a phenomenon "<sup>1</sup>.

Of course, the range is quite wide definitions of risk, given the diversity concerns of specialists, meaning that each explores a broad vision, we might even say embracing risk, while others try differentiated definitions, corresponding to their area of specialization(The risk in property insurance, the person or civil liability or risk in banking risk tourism activity). Risk is a difficult concept to understand, there are a lot of controversy in their attempts to define and measure risk<sup>2</sup>. All but starting from a general acceptance acquired. A group of Romanian authors consider that in a competitive economy three situations may occur.<sup>3</sup> As follows:

a) certainty - meaning that there are several decision-making process, but the optimal solution and its implementation are living under conditions of certainty, that evolution can be predicted with precision (the maximum possible performance)

b) uncertainty - there are doubts regarding the solutions and, especially, in terms of optimal solution (although it is possible to achieve the final objective, the volume and structure of information available to decision makers makes it difficult to accurately predict the effects of economic actions)

c) risk - in which part or all of the events that make up the proceedings until the final event network have a low probability of realization, there are events beyond the control and whose evolution is impossible to predict (the risk starts to situations of uncertainty economy and reflects the concrete form that takes a loss in business).

All three major categories of cases are found in the road. Contemporary realities, in turn, highlight the appearance and action and other forms of risk characteristic of the analyzed domain, such as pollution, serious accidents, terrorism, hurricanes, floods. Vulnerability road transport system in the face of such dangers led to the idea that both means of transport, but also the life and physical integrity, property of persons and goods are transported in a constant state of uncertainty and risk. Causes of risks and uncertainties in this area, be they dependent (subjective) or independent (objective) will of man, calls for efforts, methods and techniques for preventing, mitigating, or removing them. It is important to realize that, even in the road,

<sup>1</sup> (Explanatory Dictionary of Romanian language, Romanian Academy Publishing House, Bucharest, 1975, p. 809 and 480)

<sup>2</sup> (Paul Halpern, J. Fred Weston, Eugene F. Brigham, Managerial Finance, Economic Publishing House, Bucharest, 1998, p. 482.)

<sup>3</sup> (V. Cornescu, and I. Gheorghe Bucur Cretoiu, Economics, Actami Publishing House, Bucharest, 2001, p. 76-78.)

risks, whether commercial, financial, social, competitive prices, infrastructure, etc., There is a component of their own intrinsic derivative and economic life social.

If we consider the time evolution of transport in general and road transport system, in particular through the situation mentioned above, we find it first, a few trends in uncertainty and risk assessment, namely:

- a) increase in increased pace of the situations of uncertainty and risk,
- b) specialized fields of science and management, marketing, mathematics and statistics, etc .. expanding their area of study on risk level and size, specific area,
- c) amplification and diversification consequences of these efforts are based on the level of the road to the system, both in their internal and external at, and
- d ) risk consequences of road transport in scale of global interest. One thing worth noting is that the risk of road transport and has no boundaries or specific areas in which it appears.

He begins with the entrepreneur and the firm, continuing the negative consequences on the entire road transport system, which is why we mention the emergence of new risks, such as those associated with the integration of Europe. As such, the methods of research appropriate risks and uncertainties should change the dynamics of real economic, social and political, as put their distinctive mark in this field. The question is whether patterns of risk analysis and mitigation solutions that meet enough destructive purposes, if effective solutions are achieved by these solutions and we have to do with the emergence of new risks and their indirect effects.

In road transport find that certain discordances between efforts and results are often uncertain due to discrepancies between actual behavior, effective road transport system and made predictions about this behavior. This means that they are emerging areas of instability (areas of risk and uncertainty - Riz ), together with stability (ensuring equilibrium subsystem - SZ). When the stability ahead of the instability, the system can be controlled and directed efficiently and vice versa. The problem is not to eliminate risk and uncertainty, but their awareness, to find ways of living with them, in this case, their control, acceptance of some degree of risk and uncertainty because they are not subject to option. Life itself is a risk.

In a dynamic economy, with the market open, deregulated, competitive uncertainties are always present. Is normal business risk, a component of economic life, which is not surprising, and whose disappearance would create confusion and unnatural behavior of economic agents. I agree that risk loss of business would mark the existence of circumstances dictate that other factors than economic ones would lead the market and economy, so an unnatural situation, which dominated the economic is subordinate or non-economic factors. Host factors and situations not Probabilistic naturally there is no normal economy or business risk<sup>4</sup>.

Inclined to say, in these circumstances, the risk is born with the business. In the long term accumulation of states is negative (or negligible amount of risk accepted), which certainly leads to serious disruption of the system and therefore to its instability, with consequences and costs neeconomicoase difficult to repair. It is possible that the road system to the risk of certain forms of expression to be less significant, but some structures or parts of it may be seriously affected, leading ultimately to the general condition of the system imbalance, which requires analysis of the whole party through an integrative approach. Therefore, analyzing the probability of harmful events and unanticipated events and contradictory is the starting point for future action research strategies of risk and uncertainty.

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<sup>4</sup> Cornescu V., and I. Gheorghe Bucur Cretoiu, the works. Cit., P. 77.

Currently, all research efforts phenomena causing damage, there is an acute dysfunction between the achievements in the field of models and risk analysis methods and possibilities to control the states of equilibrium and face the consequences of risk<sup>5</sup>.

Risk analysis and uncertainty require interdisciplinary studies. Literature gives us in this regard, various concerns of scientists to clarify the risks. Size effects of risk<sup>6</sup> can be expressed in quantitative or qualitative indicators based on knowledge of probability and extent of the effects of the period of occurrence and their dynamics. They are different from one operator to another, even if everyone faces the same decision problem. In transport, for example, one operator seeks maximum security, the other minimal cost. According to some authors' size and the measurement of risk is given by the attitude towards risk, how a decision maker thinks and considers a risk <sup>7</sup>. Therefore, transport is difficult to assess risk. In their decision, the notions of uncertainty (medium risk) and certainty (which ignore the entire risk) can not be opposed, but also may be a function gradualizare importance and quality of information that affects the quality of economic decisions. A number of specialists<sup>8</sup> believes that decision problems do not only depend on the profile, scale and timeframe of occurrence of risk situations, but also of existential space. In such situations, control is more risk than necessary. Controlling risk in transportation can be of three kinds, namely: economic, technical and social. How real is the mitigation program based on the probability of occurrence of events and their severity. This implies conservation decisions or action and their inclusion in the average costs of economic activity.

Risk cost structure is as follows: investment expenditure + expenditure on prevention and protection against risks + transfer costs + loss of the effects on third parties (damage that can not be removed). Even if it is considered a "necessary evil", the risk must be taken into consideration.

Road, as an open system, interacting with the environment is generally provided by nature and society. He reported in time and space, directly or indirectly, from other systems or subsystems of the same nature / or not. These disturbances otherwise transmit its own interests.

Therefore, the road transport system or selective binding may have links with one or more groups of computers, with the State and its bodies, consumer, directly or indirectly, in a word, and adversarial, with the stabilizing or destabilizing influence, that it favors or mind. In this competitive relationship, otherwise dictated by the market, road transport set their actions by thinking of policy makers, supporting mandatory, for example, if the interests of public power to consider state-agent relationship . If we consider only the pollution and traffic safety, things are entirely clear. Not taking into account these requirements lead to tense situations, and the system is generating factor of such states. Peculiarities of road risk treatments required totally different to other areas, or transportation systems. Analysis of all the activities that give life a priority selection system and to treat risk, those that can generate a higher probability of generating risk is a strategic move of great importance.

From the point of view of international relations, multinational transport companies may face the following categories of risk: heritage (partial or total loss of assets derived from

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<sup>5</sup> St. George, market economy, the regularities and mechanisms, Inter-Media Publishing House, Bucharest, 1992, p. 218-221.

<sup>6</sup> Ion Purcariu, Mathematics and Insurance, Economic Publishing House, Bucharest, 1994, p. 291-299

<sup>7</sup> F. Aftalion, C. Viallet, Theorie du postefenille, Presses Universitaires de France, 1977

<sup>8</sup> D. Penaut, Mise en place d'un concept de gestion Kauban dans un atelier flexible, Revue Francaise de Gestion, november-december, 1988; V. Giard, Gestion de production economique et prise de decision, Revue Francaise de gestion, janvier-fevrier, 1988; G. D. Pena, mise en place Gestion d'un concept Kauban flexible dance workshop, Revue Francaise de Gestion, November-December, 1988, V. Giardia, Economique et Gestion production of an excess of Decision, Revue Francaise de Gestion, Janvier-Février , 1988; G. Marmuse, Les Aides a la decision, Nathan, 1988.

business) risk failing to fulfill requirement (failure to achieve contracted transport services, and what reduce the market return), loan default risk (credit and not paying tax obligations due to lack of funds or insufficient cash flow) term risk (mismatch to competitive market conditions), the risk of sectoral dispersion (low economic efficiency or volume of transport services at the cross), liquidity risk (no net working capital), political risk (customs regulations, transit), economic risks (failures to receive claims). Optimizing management decisions under uncertainty and risk is a concern of a close-up specialists, economists, mathematicians and statisticians, giving us a logical process of decision making. However you might like but the mathematical model, for example, two things remain difficult to quantify, namely the psychological factor, subjective (the decision maker or consumer) and the cost of the time.

It seems that developing a new theory of consumer would consider, in part, to avoid this obstacle. Mechanism is its own market economy and a certain state of conflict between the main protagonists: employers and workers employed entrepreneurs (particularly around the issue of distribution), and between entrepreneurs, manifested through competition or competition. State conflict has a mobilizing role in increasing the efficiency with which productive factors are used, and the harsh economic competition make a selection. It appears, therefore eliminating the risk of transmission of activity not covered in the rigors of efficiency required at a time.

## **Chapter II - The risk of investment in road transport.**

We consider the following situations:

a) The risk of transport cash. Starting from a situation where an operator has used the road on a certain stretch of road, rail for transporting an oversized industrial equipment, transferring it from the truck on the platform of the car, crossing a tunnel machine has suffered degradation because of its larger size than usual. Road, risking the way to organize the transfer can not be held liable for damage sustained while traveling to other means of transportation;

b) Financial risks of investing in infrastructure. Financial risks are very important investment projects of this kind. Values are very large amounts to invest may be of little phase and the amounts are invested before the first earnings to be seen. Furthermore, traffic (and hence incomes) grow naturally over time, and lower depreciation rates. On the other hand, revenue projections are very difficult. It is difficult to predict the interest that it will pursue new infrastructure. It is almost impossible to predict the optimal level of payment can be accepted by the user. To optimize this payment is required a departure from the economic theory of maximization of surplus, to incorporate criteria psychological perception of global supply and road tax that a user has. For large facilities for traffic, state involvement is essential. Direct financial return is often weak and negative implications for the community are often important. Under the generic name of "roads" French experts, for example, discusses three major categories of infrastructure<sup>9</sup>. The use of public-private partnership and the French experience in the world, Publishing Ministry of Administration and Interior, Bucharest, 2004, p. 136.) Roads and highways of the plains, urban road service, road art works (bridges and tunnels). We infer from this that the road infrastructure respond above all to meet community needs. The road network is essential to the existence of a country, be it to ensure national unity, economic development and mobility of citizens. In fact, no society is better off road type communication paths (trails, roads, streets, highways). To build, maintain and provide a

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<sup>9</sup> (French Ministry of Equipment, Transport, Housing, Tourism and Marine Affairs, Department of Economic Affairs and International Financing infrastructure and municipal services)

road system is an essential and natural prerogative of the State of eliminate investment risk. Another key feature is that the road service operation (transportation) is provided by the user. The role of public power or operator is not only to provide infrastructure and service infrastructure itself is provided by the user, unlike other sectors where the number of participants to provide greater service. For example, rail and urban transport, in addition the operator is found (The term "holder" refers to the entity which manages and maintains the road and collect any fees. This does not refer to the provision of transport services.), even the manufacturer (water, electricity, etc..). Services associated infrastructure such as transport in the car or truck freight are final services. The final product is declined transport as many forms as are many users, each with different characteristics;

c) Risks arising from public-private partnership. The use of public-private partnership is usually done when the power of collective public identified a need for road infrastructure, with important socio-economic returns for society as a whole, but for which public funds are insufficient resources and capacity to direct input of users is sea. Another reason for the appeal to public-private partnership is the desire to rule himself no longer provide maintenance of infrastructure, they want to delegate, and manage construction work, without requiring user involvement in infrastructure financing and maintenance of its own , with revenue split time, traffic-related. We find three types of participation in this financing: financing in full (or near) the construction and maintenance partial financing of the construction and maintenance, financing only for maintenance. Remuneration for these types of partnerships is twofold: direct remuneration by the user, by collecting the tax; remuneration by the state. If the user pays a significant portion of the costs of construction and maintenance, we focused on a real toll concession. If the public believes that power users will not have to pay, for reasons of national policy or because its contribution is low power (low traffic) and infrastructure is a planning role, then we shift to the grant payment system remunerated public power fictional manufacturer (the holder), depending on traffic. The two systems can coexist or succeed each other. Infrastructures road has an interest that exceeds that of the user himself. By their nature, they have important indirect effects on the economy, the development of certain regions, the rest of the road network, environmental, security. They can not be studied only in the angle of financial profitability, linked to what the operator can charge by the payment of benefit to the user. That explains a legitimate contribution to the financing of public power infrastructure. Through public-private partnership, public power is already providing basic infrastructure and private enterprise develop complementary infrastructure, bringing a higher level of service. Collective interest comes first and is generally much higher amount of users, socio-economic return is much higher than the direct financial return. The risk also appears in this situation. Road infrastructure involves an initial investment is very important and less split, revenues appear only after commissioning has been completed. They grow in time and are difficult to predict. Uncertainty and risk are very high in such a situation;

d) The risk of traffic-related income. It is essential, although it is very difficult to reliably know the income flows to be generated by the new infrastructure. Customers infrastructure are users who have their own individual traits, behaviors and interests. Knowledge of these characteristics requires a very detailed data collection and very thorough in terms of movements and behaviors of current users. But this is not enough. Must provide their reactions, when faced with an offer in November, and if the toll motorways in the charging infrastructure.

The following situations may occur: a) when the new tax structure is fictional (the user does not pay directly for use) - in this case user behavior is more predictable, he would

naturally lean toward the new infrastructure must provide a better service, in these situations, the problem of induced traffic and the balance to be achieved between the various existing infrastructure, b) when the infrastructure is in charge but takes place or is in competition with other paid services, cheaper, have a reference to assess public reaction to the bid, it is especially the case that the crossing works are replaced or added to a system where the bridges were already or shipping services through passage paid, in this situation traffic induced by new infrastructure creates uncertainty, c) when the infrastructure to charge is created in a country where infrastructure is already equivalent, there is also enough database to permit assessment of public reaction to the charge, you can use these data provides user reaction to the new network infrastructure and the existing free (for a country like Romania is in the highway), d) when the infrastructure is new toll in a country, it is very difficult to predict in advance the population response, the calculation elasticity of traffic at the level of taxation is very complex. Such flexibility is rarely linear, and economic parameters are not sufficient to evaluate the traffic. Infrastructure operation is started, several years after the project after the first expenditure. Revenue stream may be spread over periods that far exceed twenty years. During this period, macroeconomic and social developments are so large that it is impossible to make reliable forecasts of traffic to your existing network and new infrastructure. What can be done but it is designing and trends that will manifest and will enable global assessment of these revenues, prudence required by such figures. Strategies aimed at transport and environmental protection have a major influence on the profitability of the toll road infrastructure (the introduction of railways in a given area reduces heavy auto traffic revenue impact of these highways). So the building of new competing facilities could have a negative impact on revenue.

### **Chapter III - Limiting the risk of road transport.**

In the case of financial risks is by limiting: consideration of technical rules, those relating to environment and safety measures required, for the purchase of land or issuing building permits, construction and operating cost optimization, construction and technology risk-taking, risk-taking difficult to predict for example, geological reduced costs that will produce the necessary quality.

Sizing infrastructure must respond to two objectives: to limit the initial investment and progressive loading infrastructure as traffic grows, except for bridges and tunnels that do not support rhythms. For highways in developing countries, where traffic is weak, but growing, one can think of infrastructure construction in several phases (two broad bands at first, then 2 x 2 lanes, if traffic permits or requires ). State participation in public-private partnership through: grants, guarantees for loans, contributions in kind.

For example, public power offered either ground or free existing infrastructure will be integrated into new infrastructure or infrastructure adjacent to Toll, which allows the production of income since the beginning of the work (eg France, Portugal). Limit on revenue and risk sharing requires: detailed knowledge of existing flows, identifying the real needs of the original knowledge of the situation, knowledge of response efforts to charge users. The risk of an erroneous assessment is negative (insufficient income, bankruptcy). A prudent solution is to underestimate the willingness to pay users to search and, above all, be used to pay for using a good quality infrastructure. Only when the user can learn to appreciate the true value of new service quality infrastructure. In countries with a good living environment, the introduction of fees for infrastructure maintenance and development whose construction was financed by the state can provide a solution that allows improving the quality of road service, offering users an efficient service and habituation of the latter to pay , while respecting their ability to contribute.



## Conclusions

Current social and economic activities, especially future ones, living with risk and uncertainty. These are not matters of choice - they simply exist, as such, management of economic systems, including road transport, must take into account these elements inevitable in the decision making process. Strategic management of road transport is required to address this issue, especially since the risk and uncertainty increases by the European integration. Risk and uncertainty can not be removed - to believe this is a utopia, preventive measures can be reduced to acceptable levels of adverse effects. Strategic plan is reduction of uncertainty, risk management tool and leverage opportunities.



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