

Using of Neural Networks for Risk-management of State Investment Projects

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Abstract: Choosing a method of risk management by using neural networks in the ideal of self-organizing maps. Insurance justified as optimal method of risk aversion in the implementation of state investment projects. **Methods:** Proposed use of neural networks based on fuzzy logic. Their visualization in forms of self-organizing maps and approximation in the risk field allow optimize the choice of risk-management. **Results:** At realization of road investment projects in the Russian Federation dominates funding from the federal and regional budgets. Therefore performed systematization risks in the system of budgetary purchases. Calculated the financial impact of liability insurance specific road investment project in the Vladimir region.

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1. Introduction

Risk existence is connected with impossibility to predict the future with 100% probability. Proceeding from it, it is necessary to point out its basic property: the risk takes place only in relation to future and inseparably linked with forecasting and planning, as well as with decision-making in general ("risk" in a literal translation means "the decision-making result of which is unknown") [4]. It is necessary to note that categories "risk" and "uncertainty" are closely connected to each other and frequently used as synonyms. However some researchers suggest differentiating these concepts.

First, the risk takes place when it is necessary to make a decision (if it is not so, there is no sense to risk). In other words, necessity to make decisions in the conditions of uncertainty generates risk.

Secondly, the risk is subjective, and uncertainty is objective. For example, objective absence of trustworthy information about potential volume of demand for produced goods leads to origin of a spectrum of risks for participants of the project. For example, the risk generated by uncertainty owing to absence of marketing research for the investment project (IP), turns into a credit risk for the investor (the bank financing these IPs), and in a case of failure of credit return - in risk of loss of liquidity and further in risk of bankruptcy. For the recipient this risk is transformed to risk of unforeseen fluctuations of market conditions, and for each of the IP participants risk occurrence is of individual character both in qualitative, and in quantitative expression.

Owing to the likelihood character of reproduction process at the enterprises of small and average business there is a problem of their steady

functioning and development. In the economic equilibrium theory the basic question is the problem of creation of such conditions at which product offering would satisfy demand for them, and manufacturers and consumers would not be interested in change of a current situation and would not aspire to infringement of the gained balance [2]. Stability of macroeconomic systems is supported by market price regulation. At the level of micro-economics of the production organizations the big role is played by the kind of stability connected with production and realization of goods under the conditions of economic risk.

Distinctive feature of the economic activities connected with building, repair and the maintenance of highways and road covering is that its condition in the Russian Federation till now, even in the conditions of the developed market, almost completely depends on terms of financing both from federal, and from local budgets. The size of park of road technics and quantity of the organizations specializing on building, repair and the maintenance of automobile and foot roads, is determined by the volumes of a roadwork entirely depending on budget financing.

Volumes of roadwork in Russia for the last twenty years had considerable fluctuations. So, during 2000 - 2010 extent of input of highways of general using in the Russian Federation constituted 319 thousand km, and for 1992 - 2000 already only 118 thousand in km, or in calculation for year 35.4 and 14.7 thousand km accordingly: In particular, planned by the program «Road of Russia» scopes of building of federal roads were executed in 1996 on 97 %, repair - on 40 %. Scopes of building and repair of

provincial roads have been executed on 59 and 47 %, accordingly. The reasons of a similar state of affairs were explained by a grave condition as economy of the Russian Federation as a whole, and a financial position of separate regions.

For the last 4 years (2010-2013) at the background of multidirectional economic movement growth of road building was observed. At that general extent of input of highways of general using in the Russian Federation constituted more than 3.4 thousand km for the specified period [1].

Thus, for the persons making decisions (PMD), the task of timely revealing and an estimation of the risks accompanying realization of any road project, choice of an optimum method of risk-management becomes the most significant.

2. Choice of a method of an estimation of risk on the basis of fuzzy logic.

One of stages of management of risk is its estimation, having for an object to specify quantitative characteristics of researched event: possibility of a failure and the size of a damage. The author suggests considering *risk* as *a possibility P of losses L arising at a failure of realization of administrative decisions made under conditions of uncertainty*. Thus it is necessary to allocate especial nonidentity of "risk" and "uncertainty" concepts and use for an estimation of risk not only traditional toolkit of the theory of probability, but also the theory of possibilities.

Uncertainty can be set differently in a kind of:

Likelihood distributions (random variable distribution is precisely known, but it is not known what exact value the random variable will accept);

- Subjective probabilities (random variable distribution is not known, but the probabilities of separate events specified by an expert way are known);

- In the form of interval uncertainty (random variable distribution is not known, but it is known that it can accept any value in a certain interval).

Since uncertainty acts as a risk source, it should be minimized by means of information acquisition. However in practice, as a rule, it is not possible to do, therefore, making of the decision in the conditions of uncertainty, it is necessary to be formalized and estimate the risks the source of which is this uncertainty.

The offered approach of an estimation of risk has some differences from classical variants. The first - consists in refusal of aprioristic assumptions of stochasticity (accident) of researched processes and quantities.

The second difference concerns scopes of application of the risk. Under the intrinsic

maintenance of a word "risk" it is considered reasonable to use it not in all situations with casual outcomes, and only when the given outcome really represents significant danger for PMD. If the outcome is connected with loss of the insignificant sum for the investor, such outcome is not considered risky. At such approach the concept of the "considerable" or "insignificant" sum though contains a powerful objective component, as a whole it has subjective character.

Basic component of the offered concept of risk is its subjective characteristic of a situation in the conditions of the uncertainty, reflecting a cumulative possible damage for the subject, making this or that decision. Thus, the studied context consists of the following elements:

- a situation in which accepting of this or that decision is possible;
- uncertainty of approach of some or other consequences (outcomes) of each of variants of decisions (alternatives);
- the subject accepting and / or analyzing the decisions from the point of view of their consequences in one's aspect of interest;
- estimation of consequences of decision-making from a point of their desirability or undesirability for the subject.

It means that the risk estimation always has subjective character.

The most perspective moment of accepting of administrative decisions is the complex estimation of risk uniting possibilities of a qualitative and quantitative estimation. Various methods and their methods yield result with a various error. And in a concrete case there can be a situation when the error sum will give aggregate results which will appear critical for the enterprise of small and average business. At an estimation of risks, in such dynamical structure as the road enterprise participating in the regional target program «Road economy of Vladimir region» arises necessity of constant estimation of risks influence and making administrative decisions in due time.

We face necessity to regulate the process of risks influence.

At each enterprise which wants to work and develop stably, it is necessary to make active risk-management. For these purposes we will use toolkit of the theory of fuzzy logic and neural networks in a basis of which lies subjective-likelihood estimation of risk factors and creation of fuzzy-plural model of a risk level at the enterprise. The given means in a combination to methods of neuro-network programming are:

- Informational, because databases and the automated handling of the statistical data are used;

- Innovative, because fuzzy-plural models of risk and efficiency are used;
- Intellectual, because under the statistical data knowledge bases are built in the form of rules of system of a fuzzy conclusion that allows to receive new knowledge for management by criteria of risk.

They allow to construct a logic model of risk of failure of the decision of the economic problem, elements of which are the subjects of business solving a problem, and the objects – risk level determination.

Tasks of fuzzy logic have the big computing complexity and without special software are practically not to be solved. Such programs provide the performing of following difficult computing tasks: constructions of fuzzy functions of belonging of risk factors; identification of model of risk under the fuzzy data; risk analysis and stability of functioning of the enterprise for contributions of influencing parameters, forecasting of significant risk factors and a choice of an effective method of their management on the basis of the visual control of neural networks.

Innovations of the fuzzy-plural approach are reached by following decisions:

- Economic systems and processes consider as structurally-difficult with casual events with logic communications and variables;
- Parameters of efficiency and the initial data represent sets of an accessory of values;
- Accounting of groups of inconsistent events at the expense of fuzzy-logic risk level estimations;
- Construction of models of risk of failure of solving difficult economic problems and realization of large-scale projects [11].

By means of fuzzy-plural model it is possible to estimate influence of the whole profile of risk at the enterprise at the concrete moment of time and only then to make corresponding administrative decision on minimization of risks since in practice in the conditions of uncertainty it is difficult enough to perform measures on decrease in one separately taken risk. Changes of risk factors influence other processes in activity of the enterprise and not always these changes will be positive in relation to the economic subject. The feature of fuzzy-plural model is the establishment of interrelation of all economic risks influencing the enterprise that is necessary for revealing optimum methods of management of them.

The main problem of an estimation of enterprise risk is that environment influences often do not possess property of steady repeatability and uniformity. Therefore application in the analysis of such widespread tool as *the analysis of probabilities*, encounters serious obstacles of modeling character.

Probabilities are historically the first method of accounting of uncertainty at decision-making. PMD are interested in an estimation of those frequencies or other variants of influences that at realization of long-term strategy to adhere to the certain fixed administrative decisions promoting at least the minimum prize at steady behavior of a managed system. Thus it was from the very beginning clear that the researched frequency of those or other influences not is the characteristic of *a single event*, but their *complete set*, later named as a *general totality of events*.

In case of application of fuzzy numbers to the forecast of parameters it is required from PMD not to form point likelihood estimations, but set a *rated corridor* of values of predicted parameters. Then the expectational effect is estimated by the expert the same as fuzzy number with the rated disorder (illegibility degree). At this point there are engineering advantages of the method based on fuzzy since the researcher operates not with indirect estimations (where we put probabilities into), but the direct design data about disorder of parameters that is a practice of the interval approach to design estimations.

At an estimation of risk of decision-making in the conditions of uncertainty, subject- probability and fuzzy-plural methods give the researcher approximately identical possibilities. Degree of stability of decisions is verified during the analysis of sensitivity of the decision to fluctuations of the initial data and can be estimated analytically.

The advantage of fuzzy sets is a quantitative interpretation of the qualitative factors expressed in terms of a natural language [14].

Responsibility for the made decision always lies on the one who makes it. And in this sense at making administrative decisions the estimation of enterprise risk is constantly performed. Thus in a basis of the decision lie:

- *The expectations* connected with perspective purposes of PMD;
- *Fuzzy classification* when PMD compares the current information about a condition of the firm with expected indicators and produces one's analysis.

For the description of decision-making process we consider behavioral model in which the person making the decision chooses alternatives or by means of such factors, as final effect or desirable level of behavior, or on the basis of prize function, as in a classical case [3, 10, 13].

Application of fuzzy model is caused by following circumstances:

- Complexity of object of estimation (multidimensionality and discrete observability only during the reporting periods);

- Complexity of environment of object of estimation (instability of an economic situation);
- Ambiguity of interpretation of situations at possible combinations of logic signs (if along with good economic indicators of object there are indicators of deterioration of its steady activity);
- Possibility of an expert estimation of parameters of the model.

We considered individual approach PMD shown at an estimation of risk, described by curves of indifference or utility which is named by some researchers as an individual tolerance to risk γ . Authors suggest to describe risk as function of three variables:

$$\text{Risk} = \{P; L; \gamma\} \quad (1)$$

For the objects functioning under the conditions of unstable environment, including the enterprises implementing road projects, the realistic concept of measurement of risk basically cannot be based on the classical principles of statistical probability assuming possibilities of unlimited repeating of the same events under the same or similar conditions. In this connection for risk measurement in activity of the enterprises the special toolkit of measurement – special scales, indicators, algorithms should be used. At the same time, the range of application of the elementary linear indicators like a population mean is narrowed, because under conditions of spasmodic changes of the environment of dependence, more or

less adequately reflecting reality, rarely meet the elementary ratios underlying linear models. The area of use of subjective expert estimations essentially extends. Not only the form of one or another dependence gets unstable, but also a composition of the factors influencing the given phenomenon or process. In particular it concerns risk factors in an unstable economy.

The information aspect limits possibilities of measurement of risk in connection with limitation of the information which are available for the subject of risk and experts. It is reasonable to consider separately the subject who makes the decision for purposes known just to him alone, and the experts supplying him whenever possible with the objective information; so, experts, and value judgment of amount of losses - only the subject can perform value judgment of probabilities of outcomes. If they have sufficient data to order outcomes according to their danger and undesirability to him, but there is not enough for determination "in how many times" one outcome it is more dangerous than another inevitably it is necessary to be limited to a serial scale, having refused a risk estimation in a scale of relations. It is necessary to note that such situation is possible not because of lack of information or incompetence of the subject, but because of his indifference to some or other aspects of the situation caused by concrete conditions of economic activities of the subject.

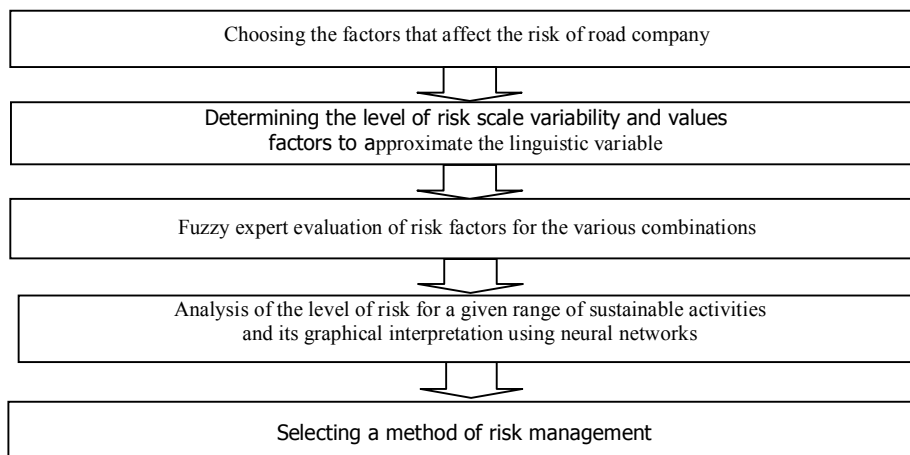


Figure 1. Algorithm of a choice of a method of risk management of the road enterprise on the basis of its fuzzy estimation

The analysis of lacks of expert methods, in addition, proves necessity of taking into consideration of subjective character of administrative decision, made under conditions of risk. At an estimation of risk on the basis of fuzzy logic specific features of experts are considered at subconscious level at splitting of a scale of risk and at exhibiting of resultants of estimations in each determined

combination of estimated factors. The order of forming of an expert estimation of risk of the road enterprise taking into account its steady activity is presented on figure. 1.

During the analysis of classical methods of risk-management of the enterprises of various industries most applied in modern practice, we offered an original variant of a choice and the justification of an

optimum risk management method of the enterprise implementing road projects, with use of model of a fuzzy estimation of a profile of risk.

By analogy to a two-dimensional matrix of administrative decisions of Consulting Boston group, possibility of determination of communication between an applied risk management method at the enterprise, degree and speed of realization of administrative strategy [8, 12] is studied. The subjectivity which is present at an estimation and risk management is reflected on a level of PMD, being shown in capability to supervise accomplishment of the offered program of minimization of risk and persistence in terms of its realization.

We offered and studied *«the risk field»* - graphical interpretation of described dependence between a risk level, degree of realization of administrative strategy and the chosen risk management method at the enterprise (fig. 2). At a low risk level and low activity in the control of its decrease PMD chooses methods of evasion from the risk, assuming refusal of things causing it, or insurance of possible failures.

Risk degree increase at the same passive relation to it from a command of managers leads to transition to use of methods of localization which allow isolate not a risk alone, but the centers of responsibility for it. Allocation of specialized risk divisions or venture capital companies assumes carrying over of the increased risk on other site with its limited sizes and the limited financial losses.

The high risk level for the administrative team actively implementing the developed strategy, leads to use of methods of dissipation, switching off the most cardinal measures on prevention or decrease in risk up to change of a sphere of application of business, possible at an active diversification of production and investments. The given group of methods includes active administrative activity on risk optimization - distribution of possible failures between partners in investment activity or restructuring of risks (their redistribution in time).

The decrease in a risk level received as a result at the enterprise allows top-managers of active type to pass to methods of compensation which are directed on timely revealing and the control of risk at initial stages of its origin. Monitoring of all kinds of financial and economic activity and its careful planning are the basic ways of compensation of uncertainty of the external and internal environment of the enterprise.

Thus, at interaction of subjective features of PMD and a risk degree it is possible to find at level of logic researches the most acceptable and selected method of risk management for the concrete enterprise.

Authors suggest considering the given «risk field» model for the studied enterprises of small and average business participating in realization of road projects on enhancement of an automobile network of Vladimir region, and to use in this process the possibility of handling of the information by means of neural networks.

Neural networks is a section of artificial intelligence in which the phenomena, similar by an event in live beings' neurons [9] are used for handling of signals. The major feature of a network consists in parallel handling of the information by all links that at a large quantity of interneural communications allows accelerate process of handling of the information considerably. Besides, the network on the basis of real-time transformation of signals acquires stability to errors that smoothes possible perturbations.

Other important property of a network is its capability to training and generalization of the saved up knowledge. It possesses features of artificial intelligence. Trained on the limited set of the data the network is capable to generalize the acquired information and to show results on the variables which were not used in the course of training.

Artificial neural networks in practical applications are used as a subsystem of management or the development of decisions, transmitting an executive signal to other subsystems, having other methodological basis. It allows use them in a researched special case of a choice of a risk management method for the concrete enterprise.

Possibility of visual handling of the information received at construction of a neural network was prompted by T.Kohonen's works on making use of self-organizing maps (SOM) [5]. SOM is a neuro-network method assuming training without external intervention. It displays data of higher dimensionality on the map of the smaller dimensionality consisting of a lattice of neurons. The SOM algorithm saves topology of display from a space of higher dimensionality into map elements. Map elements, or neurons usually form a two-dimensional lattice, hence, they are reflection to a plane.

In our case a neural network clusters in the field of the risk, presented on figure. 2. The scale of visual clusterization from 0 to 1 is presented under each picture. The more bright and closer the color to corresponding to yellow number one, the more is a risk possibility, the more actively should the chosen administrative strategy be conducted. Hereinafter there is presented a two-componental dependence of functions of belonging of factors-signs and the resulting risk level indicator (figure. 2), it is transferred to «a risk field» and in the form of visual

clusters of different color reveals maxima and minima of the given interrelations.

Dependence of a risk level of the road enterprise, the contractor of the road projects included in federal or regional target programs, on features of realization of budget financing specifies in necessity of use of methods of evasion from risk (figure 2). Budget financing through federal or regional target programs on enhancement of a road infrastructure is an external risk factor on which the

company itself can have the limited influence, as determined by a method of escaping from risk, connected with attraction of external insurance tools.

Thus, on an example of the enterprise implementing road projects, we showed a possibility of use of neural networks for visual handling of the information of expert system on management of a profile of risk and a choice of an optimum variant of an administrative decision being made.

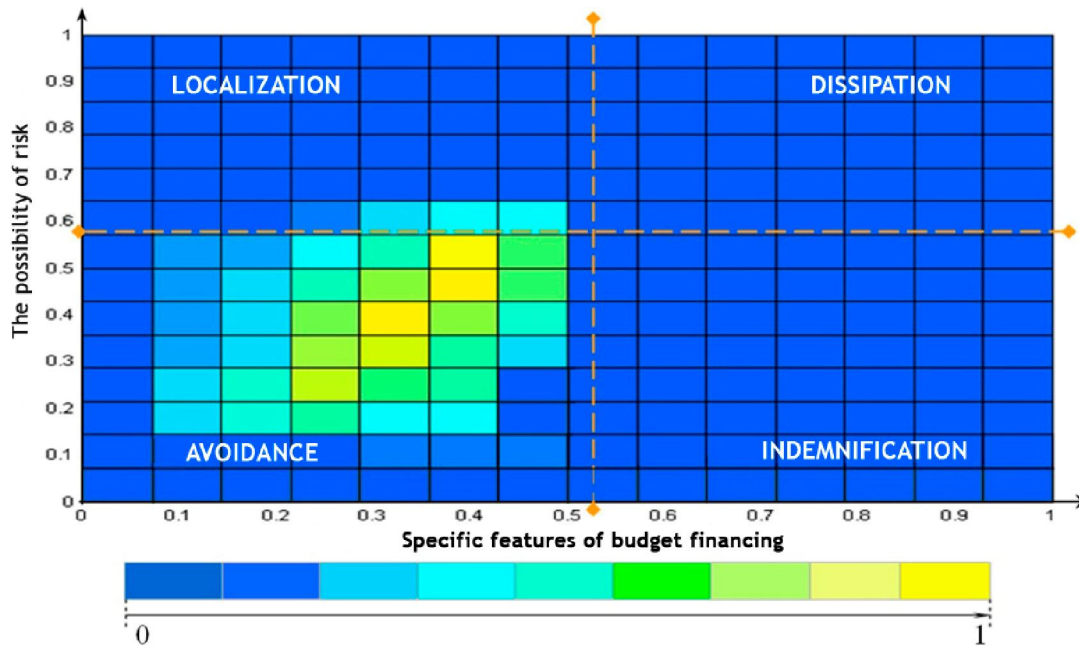


Figure 2. Approximation of dependence of a risk level from features on budget financing in the field of risk management methods

3. Insurance as an optimum tool of risk-management.

Building of the new and repair of existing highways in Russia is included into tasks of priority national projects. Organization of efficient risks management accompanying activity of the enterprises of small and average business at realization of road projects, is a task of special importance. The analysis of features of conducting works in the conditions of budget financing has led to a conclusion that evasion from risk (risk transfer) is the most acceptable method of managing enterprise risks in the considered types of activity.

Vladimir region, thanks to the geographical position and the developed transport infrastructure is the largest transporting -logistic knot of the Russian Federation. Region highways are one of the major elements of transport system, in many respects determine social and economic development of the territory. At the same time, the condition and a level of development of highways are directly connected

with such indicators as a total national product, a price level, budget revenues, a population level of employment.

The developed network of highways of Vladimir region has a point-to-multipoint structure. Total extent of highways of general using constitutes 12650 km, including roads of federal importance – 429.2 km, regional and intermunicipal importance - 5158 km, local importance - 7063 km. 97 % of them have a firm covering. The density of highways of general using with a firm covering in Vladimir region for 2013 has constituted 389.2 km on 1000 sq. km of territory of region. By this indicator the area occupies the 9th place in CFD.

Within the limits of realization of the long-term target program «the Road economy of Vladimir region for 2009-2015», the volume of financing of a roadwork following the results of 2010 has constituted 1 billion 330.9 million roubles, in 2011 - 1 billion 851.6 million roubles. [1]

Since 2009 by request of department of transport and a road economy of administration of Vladimir region the geoinformation system (GIS) of highways of Vladimir region is created, which provides uniform information field of use, orders, ownerships and maintenances of dynamically developing network of highways. Following tasks are solved with its help:

- Determination of general tendencies of development of the system;
- Determination of interrelation and interference, highways and territories adjoining to them;
- Revealing of the social-ecological positive and negative processes appearing as a result of operation of highways.

In this research there was considered a project of carrying out of a complex of works on technical accounting, certification, forming of an electronic databank with creation of GIS on highways of general using of regional or intermunicipal

importance of Vladimir region, implemented by LLC “ R&D production facility Region Vladimir “.

At the analysis of sensitivity of the project influence of initial variables (is compared at their change on the fixed size) on resultants project indicators. This analysis has allowed to specify the initial variables most essential to the project; the control of their change should be produced first of all.

The data received during the analysis of sensitivity (tab. 1), allows to carry the realization price to the most significant factors for determination of economic productivity of the considered project. The following on the importance is the sales volume. A reality of the given investment project is quite a different one. Since budget financing on a competitive basis is provided, the realization price is the fixed indicator. Similarly, the sales volume is of fixed value, as the auction method of a choice of the contractor of the given investment project allows to change only own costs of auction participants, that is, only a cost value remains a volatile indicator.

Table 1. Sensitivity of the project to various risk factors.

The realization price	90%	95%	100%	105%	110%
Net present value of the project, NPV	327,85	433,80	532,14	630,50	727,66
Sales volume	90%	95%	100%	105%	110%
Net present value of the project, NPV	345,39	442,45	532,14	621,80	710,66
The cost value	80%	90%	100%	110%	120%
Net present value of the project, NPV	566,71	549,42	532,14	514,86	497,57

As a peculiarity of the considered investment project there is its financing from means of the regional budget, for the result of the project is directed to development of an infrastructure of Vladimir region, increase of its investment appeal.

The expenditure of budgetary funds has its risk features. Management of the risks accompanying system of purchases of the goods (works, services) at the expense of budgetary funds, raises productivity of budget outlays, minimizes financial losses.

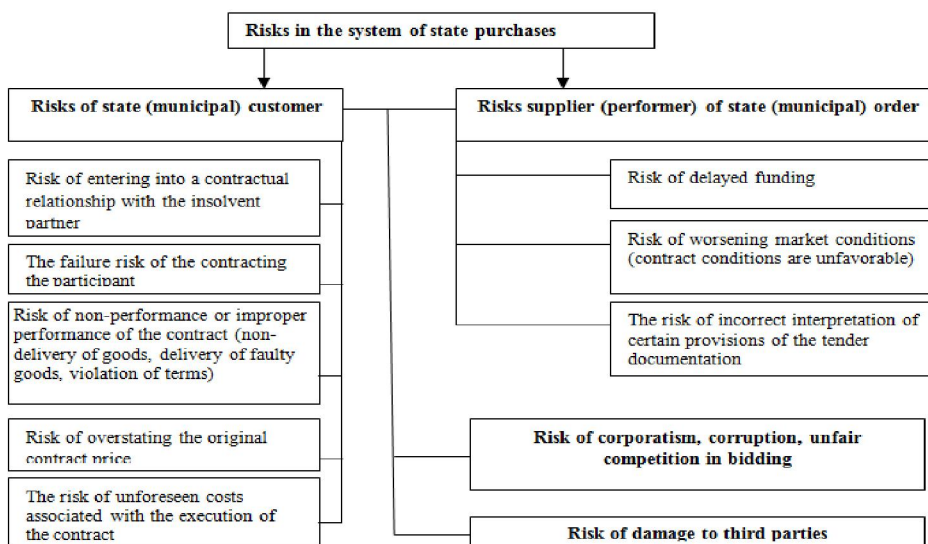


Figure 3 - Kinds of risks in a system of budgetary purchases.

Algorithm of risks management at budgetary purchases, in our opinion, can be shown as follows:

- To reveal a character and to systematize possible risks of system of budgetary purchases;
- To analyze the possible variants of the succession of events corresponding to the given risk (possible outcomes of decision-making, character of casual events);
- To specify possible ways of minimization of financial losses.

We conduct ordering of the risks arising at the conclusion and execution of the state (municipal) contract which is presented as follows (figure. 3) [7]:

1. Risks from the state (municipal) customer;
2. Risks from the supplier (the contractor of the order);
3. The risks inherent in the state (municipal) customers and contractors of orders.

Risks can be minimized, stipulating in the contract the conditions for compensation, and also responsibility insurance. Now there are three kinds of provision of obligations of execution of the state contract: insurance, a bank guarantee and a pledge. For the last year experts point out growth of the market of state contracts insurance, and this tendency will proceed still for a long time. [6]

Objects of insurance are the property interests of the insurer connected with his obligation to pay damages, caused by him to the state or municipal customer owing to a failure to perform or inadequate execution of the obligations provided by the state or municipal contract, and / or to pay the penalty (the penalty, a penalty fee). At that, insurance costs much more cheaply, than a bank guarantee. If a bank guarantee costs from 1,5 to 5 % from the cost of the whole state contract the insurance policy price, as a rule, constitutes nearby 1 % from the cost of the contract and depends on features and conditions of the state or municipal contract and a covering type:

- Covering A – a real damage, a lost profit and all kinds of the penalty;
- Covering B – a real damage, a lost profit and the test penalty;
- Covering C – a real damage and the test penalty;
- Covering D – a real damage or the exclusive penalty;
- Expense refunding on conducting a case in judicial bodies.

Let's list advantages of insurance:

- Fast enough procedure, as a rule, it takes about 48 hours (in comparison with a bank guarantee taking about 2 weeks for acquisition);

- Insurance does not demand a withdrawal of considerable money funds from the contractor's turnover, unlike the bailment;

- The list of the documents necessary for reception of the insurance, is insignificant in comparison with the list of papers which are enquired by bank;

- The contractor does not risk the money funds. In case of infringement of conditions of the state contract (a problem with goods deliveries, failure of terms; non-observance of technical characteristics of goods or services; infringement of technology, rates and rules of job fulfillment etc.) the insurance company pays damages to the state customer while at registration of a bank guarantee or bailment indemnification would lay down on shoulders of the executor of the contract.

Table 2. The approximate size of tariff rates at insurance term of one year

Type of covering	Tariff, %
Covering A	from 1,5
Covering B	from 0,75
Covering C	from 0,55
Covering D	from 0,25
Expenses on conducting a case in judicial bodies	from 0,15

All these reasons do insurance as a kind of provision of execution of the state order as much as possible attractive to suppliers - participants of the state tenders. For today, over 50 % of all state and municipal contracts as a provisional measure give the customer the policy of assurance. However it is necessary to note that many suppliers showing as provision of execution of the state order bank guarantees or pledge, simply have no information on the possibility of insurance giving certain benefits and advantages.

Insurance of the state contracts is not performed anywhere the world, it is exclusively Russian practice. At realization of a similar new product many problems arise which still have not been solved . Accurate conditions of insurance of responsibility on state contracts are not registered in the Law 94-FL. There is no list of insurance risks that can negatively affect interests of the state customers.

For today there is no requirements formulated applicable to the insurance companies and their solvency indicators. The insurance on provision of execution of the state order is sold by all insurance companies with an authorized capital stock more than 30 million roubles, however not having in a reserve of the necessary money funds covering risks. A state customer is the only who is not protected in the present state of affairs.

There are no uniform conditions of insurance of responsibility under the contract, and also standard tariffs. As a result, unreasonable legislatively demands can be made to the insurance companies from the state customer. In particular, municipal and state structures do not want to admit the right of insurers to carry out a procedure of acknowledgement of insured event.

Partially the specified problems have found reflection at entering since 01.01.2012 of the new Federal law «About obligatory insurance of a civil liability of the owner of dangerous object for a trespass as a result of accident on dangerous object» (225-FL Insurance of DMO). The basic complexities at law introduction are connected with substantial growth of the list of dangerous objects. It included dangerous production objects from the corresponding state register, hydraulic engineering objects from GTS register, the gas stations of liquid motor fuel. The new scheme of insurance covers a wide range of the enterprises in metallurgy, petrochemistry, oil refining, electric power industry, gas supply and etc.

According to FL № 225 requirements to insurers have changed. They concern an authorized capital stock, the minimum experience in sphere of DMO insurance (from 2 years), availability of the licence for the given kind of insurance. It is required, that the insurance company was a member of the National union of insurers of responsibility. The union has accepted professional standards, obligatory for all members, and also has developed system of a joint liability and reinsurance of risks. Each company having the right to DMO insurance should reassure risks more than 50 million roubles.

4. Discussion

In our opinion, one of criteria of efficiency of use of budget investments can become an offered individual approach to an estimation of risk of the projects implemented during the state contract. Thus it is necessary to estimate not only a financial condition and reputation of the direct contractor under the state order whose responsibility is insured, but also to study a situation more deeply: studying of suppliers, the information on availability at the contractor of alternative variants of provision, an estimation of use of demand lines of credit as the budget does not advance work.

The result of an expert estimation of risk of the considered project has allowed to receive most contract acceptable conditions on insurance of responsibility for infringements of conditions of the contract, won by LLC “ R&D production facility Region Vladimir “. Now the given kind of insurance in Vladimir is performed by nine insurance

companies. Rates of insurance payments depend on contract conditions, they fluctuate from 0.5 % to 2.5 % of cost of the contract. Calculation of indicators of a realizability of the concrete project testifies that the rate of insurance more than 10 % makes it economically inexpedient. Profitability of the project for LLC “ R&D production facility Region Vladimir “ has constituted 20.23 %. Use of insurance of responsibility and examination of risk of the project have lowered profitability of the investment project to 16.8 %. But the organization had an opportunity to occupy a new niche of the market, to create a database on regional roads, for development of an infrastructure of Vladimir region.

At an investments efficacy estimation in development of a road network of Vladimir region it is necessary to consider a social effect consisting in creation of new workplaces, transfer of tax revenues in budgets of federal and regional levels, to accomplishment of the initial stage of works on improvement of an infrastructure of the region.

If the developed economic situation on crisis overcoming in the country is considered, the state order is the mechanism of support of economy from the state. Thanks to the state contracts now the workplaces, enterprises remain, development of technologies is kept on.

In our opinion, one of criteria of efficiency of use of budget investments can become an offered individual approach to an estimation of risk of the projects implemented during the state contract. Thus it is necessary to estimate not only a financial condition and reputation of the direct contractor under the state order which responsibility is insured, but also to conduct studying of suppliers, information on availability at the contractor of alternative variants of provision, an estimation of use of demand lines of credit as the budget does not advance works. Attraction of credits will increase the depth of risks at setting up of contracts by insurance of responsibility of the executor under the state contract.

Thus, the level of decrease in risk at the expense of evasion factors depends on development of system of insurance of responsibility in a region and a stock of financial durability of the enterprise at realization of the investment project included in the state target program.

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