

8.5 Peculiarities of using risk assessment models and methods at enterprises

Risk is an objectively inevitable part of any decision-making system, given that uncertainty is an inevitable feature of business conditions. After analyzing the economic literature, we can come to the conclusion that quite often scientists do not distinguish difference between the concepts of "risk" and "uncertainty". In our opinion, they should be separated. Thus, risk defines a situation when the occurrence of unfamiliar events can be quantitatively assessed, and uncertainty - when the possibility of the occurrence of similar events cannot be estimated in advance. In a real situation, a decision taken by a business entity is almost constantly exposed to risk, which is caused by a number of uncertainty factors that are not foreseen in advance.

In our opinion, the correct opinion among scientists is that the presence of risk is a sign of economic maturity and development. In countries with a small level of production per capita, development is associated with a survival strategy and a strict need to ensure minimum social needs. In the absence of alternative management solutions, there is no risk. Thus, the emergence of risk is related to the possibility of management and decision-making.

In addition, the risk may be absent if there is no interest in making an effective decision. Thus, if there is no interest in results, incentives or even disincentives, there is no risk.

The object of risk is a managed system in relation to which management decisions are made, the level of efficiency and conditions of which are not known with absolute certainty in advance.

In turn, the subject of risk is a person who has an interest in the results of the management of the risk object and has the competence to make decisions regarding the risk object.

The sources of risk are factors (events, objects, etc.) that cause uncertainty in the results of made decisions. In particular, in the process of developing modern technology, the subject of risk is the general designer, the object are samples of modern technology, and the source is the technology market itself. Applying the portfolio

approach, the subject of risk is the owner of the asset, the object is the asset itself, and the source is the financial services market.

Commercial risk has an objective basis due to the uncertainty of the external environment in relation to the entrepreneurial firm. The external environment includes the objective economic, social and political conditions within which the firm operates and to the dynamics of which it has to adapt. The uncertainty of the situation is determined by the fact that it depends on many variables, counterparties and persons whose behavior cannot always be predicted with acceptable accuracy. The lack of clarity in defining goals, criteria, and indicators for their assessment (shifts in social needs and consumer demand, the appearance of technical and technological innovations, changes in market conditions, unforeseen natural phenomena) also has an important impact [405].

Domestic economic science does not provide generally recognized theoretical provisions regarding entrepreneurial risk, it practically lacks risk assessment methods in terms of certain production situations and types of entrepreneurial activity, as well as insufficiently disclosed areas and methods of risk reduction and prevention. Although it is worth noting that in recent years, a lot of scientific works have appeared, where in the process of considering the problems of planning, the economic functioning of commercial institutions, considerable attention is paid to the issue of risk.

By studying numerous definitions of risk, it is possible to understand the main points characteristic of a certain risk situation, in particular: the unpredictable nature of the phenomenon, which determines which of the acceptable results will be realized in practice; the existence of alternative solutions; the possibilities of exiting the risky situation and the expected results; the possibility of losses; the possibility of obtaining an additional amount of profit.

Therefore, the concept of risk should be understood as the danger of probable loss of resources, failure to obtain profits compared to the option calculated for the appropriate use of resources in a certain type of business activity. That is, the risk acts as a kind of threat that the business entity will suffer losses or additional costs or will

receive revenues lower than expected. Despite the fact that the results of risk are quite often expressed through financial costs or the impossibility of obtaining the expected income, risk is not only the undesirable result of the made decisions. In certain situations, there is not only the threat of not achieving the expected result, but also the possibility of exceeding the expected income. In this, the entrepreneurial risk is determined, which combines the prospects of achieving unfavorable and the most suitable deviations from the expected results.

There are various interpretations of uncertainty: the random nature of scientific and technological progress; random errors in forecasting; dynamic changes in the internal and external conditions of economic development; inevitable errors in the analysis of the complex system "nature - society - man"; probabilistic nature of important economic parameters; development and expansion of creative activity of the working population, the need to design powerful information flows, etc. [406].

In the process of operation, the enterprise face a large number of various risks, which differ by the place and time of appearance, external and internal factors that affect their level, and thus differ in the method of analysis and methods of description. Usually, all existing types of risks are interdependent and affect the company's activities. This complicates the process of making management decisions related to reducing the level of risk and requires a thorough study of the composition of the identified risks, as well as the causes and factors of their appearance.

Studying the economic literature, which highlights the problems of entrepreneurial activity, we can come to the conclusion that there is currently no certain systematization of entrepreneurial risks.

The most important characteristics that underlie the classification of risks are: time of appearance; the main factors of appearance; accounting nature; the nature of the consequences; field of appearance, etc.

According to the time of appearance, the risks are divided into retrospective; current; perspective.

The study of retrospective risks, their nature and methods of optimization allows more accurate prediction of current and prospective risks.

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According to the factors of emergence, the risks are divided into political; economic (commercial).

Political risks are risks caused by changes in the political situation that affect business activities (closure of borders, prohibition of export of products to other countries, etc.).

In turn, economic (commercial) risks are risks caused by unfavorable dynamic phenomena in the economic development of both the enterprise and the state [407].

The most common type of economic risk is changes in the market situation, an unbalanced level of liquidity (inability to timely fulfill payment obligations), a change in management, etc.

We are going to analyze models of risk identification and decision-making. The modeling method is quite popular in the decision-making process. A model should be understood as highlighting a certain object in a form that differs from the original, while preserving all its main characteristic features. The main reasons for the use of this method in economics are: the natural complexity of most organizational circumstances, the impossibility of conducting experiments in a real situation, and the orientation of managers to the future.

The following models are widely used in the management system: game theory; queuing theory model; inventory management model; linear programming model; transport task; simulation modeling; network and economic analysis. Let's consider them in more detail.

The method of game theory is designed to simulate the assessment of the impact of the adopted decision on competitors. This method was developed by military personnel in order to strategically take into account the possible actions of the enemy. In the process of entrepreneurial activity, the method of game theory is used to predict competitors' actions on price changes, modifications and production of new types of products, additional services, etc. Game theory is less often used than other models, because real situations are quite complex and change repeatedly. Despite this, game theory is useful for determining the most important factors in decision-making in a highly competitive environment. With the help of this method, the company is able to

predict the reaction of competitors, and therefore has a significant advantage and the opportunity to increase competitiveness.

The queuing theory model allows determining the optimal number of service channels, taking into account the need for them. This method is used in various situations when there are customers and service points (for example, ticket reservation by phone, customer service in banking institutions, etc.). In addition, it is used to balance costs directed to additional service channels and losses from them at a lower than optimal level. For example, if a customer/client waits in line for a long time for banking service, he may have a desire to change banking institutions. In such a situation, it is appropriate to increase the number of employees serving customers/clients. The use of the queuing theory model will help in this case.

Inventory management models aim to determine the time period for placing requests for resources and their quantity, as well as the volume of warehouse products. Therefore, the purpose of this model is to optimize the volume of stocks at the enterprise. Despite the fact that the excessive accumulation of stocks helps to avoid losses caused by their shortage, in most situations it causes the minimum costs for placing orders, since they are placed in considerable quantities, but it also causes additional costs for storage, overloading, spoilage, reducing the volume of turnover funds, which causes a decrease in the mobility of the enterprise in the decision-making process when new risky circumstances appear.

Linear programming is used to determine the best allocation of scarce resources according to competing needs. This model is the most popular at industrial enterprises. It makes it possible to maximize the amount of profit in the presence of one or more resources, each of which is used to manufacture several types of products. Usually, in the process of making a decision regarding the optimization of this model, the Simplex method is mostly used.

The transport task should be understood as a problem that optimizes the supply of resources in the presence of several points of departure and points of receipt of these resources at different delivery prices. This method is a kind of linear programming problem.

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Simulation modeling is a process of model formation and its experimental use to determine real changes. Imitation is used in certain situations when it is too difficult to use mathematical methods such as linear programming. By conducting an experiment on a system model, it is possible to determine its reaction to certain events and their changes, in the absence of an opportunity to observe this system in a real situation.

Network analysis. This analysis involves the use of graph theory, which makes it possible to form optimal schedules for the implementation of various projects. This, in turn, helps to minimize both the project implementation time and the amount of costs for its implementation.

Economic analysis is the most common modeling method, despite the fact that it is not considered modeling. In the process of conducting an economic analysis, almost all methods of estimating costs and economic benefits, as well as the profitability of the enterprise's operation, are used. Economic analysis consists of break-even analysis, calculation of return on invested capital, net profit on a specific date, etc. This model is often used in the process of accounting and financial accounting.

Thus, in certain situations it is necessary to use the most effective model.

In the process of making effective decisions, the following methods should be used: payment matrix, decision tree and forecasting methods.

The payment matrix is a method of statistical decision theory that allows the manager to choose one of several options. It is especially useful when a manager must determine which strategy will best contribute to the achievement of a goal. In general, the matrix assumes that the payment depends on certain events that actually occur. If the event does not occur in reality, then the payments change.

In general, the use of a payment matrix is useful, provided that:

1. There are a limited number of alternatives or strategies and a choice must be made.
2. It is possible to determine with full confidence all the events that can happen.
3. The results of the adopted decision depend on the chosen alternative and on the events that take place.

Also, the manager must impartially assess the possibility of occurrence of relevant

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events and calculate the expected value of such a possibility. The estimated value of an alternative option is the sum of potential values multiplied by certain probabilities. After calculating the expected value of each of the alternatives and placing the results using a matrix, the manager should easily choose the most optimal option.

The decision tree as a management method is a schematic representation of the problem of decision-making. Its application is determined by the choice of the optimal course of action from among the existing options. The decision tree method in certain situations can be used together with the payment matrix, as well as when the results of one decision can affect subsequent decisions. Therefore, the decision tree method is the most practical method in the process of making systematic decisions.

Forecasting is a method by which you can use not only the experience gained during the past years, but also current assumptions about the future. The result of forecasting can serve as a basis for planning. Forecasts can be: economic, technology development forecasts, competition development forecasts, forecasts based on surveys and research, social forecasting.

All of the above types of forecasts involve the use of different forecasting methods. Forecasting methods include: informal, quantitative and qualitative methods.

The information base of informal methods consists of:

- verbal information - most often used in the process of researching the external environment. These are informational data from radio and television broadcasts, from counterparties, buyers or competitors, various meetings and conferences, etc. This type of information is easily accessible and concerns all the main factors of the external environment that are of interest to any enterprise. However, at the same time, such information is quite variable and often erroneous;
- written information, i.e. information provided in newspapers, magazines, newsletters, annual reports. This type of information has the same advantages and disadvantages as verbal information;
- industrial espionage.

Quantitative forecasting methods are usually used when it is believed that the activity during the past years has had a clear dynamics that can continue in the future,

and when there is enough information to express such dynamics. Therefore, quantitative methods are:

- conducting time series analysis. This method is based on the assumption that what has happened in the past is the best approximation of future performance. The application of this method requires the construction of tables or graphs
- conducting causal modeling, which is considered the most difficult quantitative method of forecasting from a mathematical point of view. Used in cases where there is more than one variable. Causal modeling is forecasting by analyzing the interdependence between a determined factor and other variables. Of the large number of cause and effect models, econometric models, which are designed to forecast trends in the development of the economy in general, are considered the most complex.

In turn, qualitative forecasting methods involve forecasting by experts. The following methods are distinguished:

1. The judgment of the jury involves combining and averaging the judgments of experts in various fields. An informal variant of this method is the so-called "brainstorming".
2. General sales opinion. Thus, the judgment of dealers or sales companies is quite valuable, since they interact directly with buyers.
3. The buyer's expectation model involves forecasting, which is based on the results of a survey of consumers of the products produced by the enterprise.
4. Method of expert evaluations [406]. It is a procedure that allows a group of experts to reach an agreement. This method assumes that experts from different fields fill out questionnaires, offering options for solving a certain problem. Then there is an exchange of questionnaires and the experts are offered to review their option for solving the problem according to the proposed warrants in favor of other variants or to argue the feasibility of their own option for solving the problem. The procedure is repeated 3-4 times until a general decision is made as a result. Moreover, all the questionnaires are anonymous, as are the experts themselves, that is, the experts do not know who else is in the group except themselves.