ATLANTIS PRESS

Advances in Economics, Business and Management Research, volume 38

Trends of Technologies and Innovations in Economic and Social Studies (TTIESS 2017)

Financial risk management

Pashchenko Svetlana
Department of Finance and Economic Analysis
Ufa State Aviation Technical University (USATU)
Ufa, Russia
svivnc@mail.ru

Pashchenko Nikolay
Department of Finance and Economic Analysis
Ufa State Aviation Technical University (USATU)
Ufa, Russia

Krioni Olga
Department of Finance and Economic Analysis
Ufa State Aviation Technical University (USATU)
Ufa, Russia
okrioni@mail.ru

Abstract— The article is devoted to the most innovative and relevant areas of business management, taking into account risks. The goal of risk management should not be reducing risks, but ensuring that a decision is made taking into account risks. Reducing financial risk involves the implementation of organizational measures that contribute to the prevention of losses. Risk assessment involves the adoption of possible losses and planning their financing in support of the investment decision. According to it, tools of risk management include instruments of risk mitigation and risk assessment. To reduce the risk in financial management, it is advisable to use a number of organizational risk management tools in order to influence certain aspects of the enterprise activities. Also a firm can minimize financial risks by establishing and using internal financial standards in the financial process as a whole. For that purpose, the enterprise risk management process is proposed. It consists of identifying risks, analyzing and prioritizing risks, minimizing risks, monitoring and managing risk culture.

Key words— risk, financial risk, financial risk management, methods of risk analysis

I. INTRODUCTION

In the modern economic theory and practice, the risk is one of fundamental categories. It is connected with the fact that uncertainty of economic events and processes is represented the widespread characteristic, the realization of which can lead to significant losses rather than to winnings. The urgency of this problem and the need to rationalize the behavior of economic agents stipulate that the issue of uncertainty and risk is one of the main directions of modern microeconomic analysis.

Economic entities – households, firms, the enterprises, the state, carrying out enterprise activity, take the risk. Their economic activities are realized in conditions of ambiguity in the course of real social and economic processes, the variety of possible states and situations of the solution implementation, in which the economic entity may appear in the future. Therefore, objectively the risk is an inevitable element of making any economic decisions due to the fact that uncertainty is an inevitable feature of the environment. At the time of making a decision, it is not always possible to obtain complete and accurate knowledge of a time-remote environment for the implementation of a solution, of all the internal or external factors that may or may not manifest themselves [1].

II. RESULTS AND DISCUSSION

There are very different opinions in the literature as to what is a risk, but among the many definitions, the most common risk is combined with such concepts as uncertainty, probability, event, damage.

In the economic theory, "risk" is commonly understood as the probability (threat) of loss by the enterprise of part of the income, arising from the implementation of certain production and financial activities.[3] That is, the risk is the estimated probability of a negative deviation from the goal in any way [1].

Financial risks of an enterprise are the result of the choice by its owners or managers of an alternative financial solution, aimed at achieving the desired target result of financial activity with the probability of incurring economic damage (financial losses) due to the uncertainty of the conditions for its implementation [3].

Financial risks arise in the process of business relationships with financial institutions (finance, investment, insurance companies, banks and exchanges). The causes of financial risk are diverse, such as inflationary factors, bank interest rates, lower value of securities, etc. Financial risks have a mathematically expressed probability of an attack that is based on statistical data and can be calculated with a high probability of [4].

Risk can be managed, i.e., by using various measures to predict to some extent the onset of a risk event and take measures to reduce risk.

A specific variety of the enterprise financial risks.

Main types of the enterprise financial risks [3]:

- Risk of financial stability
- Risk of insolvency
- Investment risk
- Inflation risk
- Interest risk
- Deposit risk
- Currency risk
- Innovative financial risk
- Credit risk
- Tax risk
- Criminogenic risk
- Other types of risks.

Effective management of the enterprise financial risks plays an active role in the general system of financial management, providing reliable achievements of the goals of the enterprise financial activity [9].

The main objective of financial risk management is to ensure the financial security of the enterprise in the process of its development and to prevent a possible reduction in its market value [3].

In the process of realizing its main goal, the management of the enterprise financial risks is aimed at implementing the main tasks (Table 1).

The management of the enterprise financial risks, ensuring the realization of its main goal, is carried out in the main stages [3]:

- Developing an information base for financial risk management.
- Identifying financial risks.
- Assessing the level of financial risk.
- Assessing the potential for reducing the initial level of financial risk.
- Establishing a system of risk-determination criteria
- Making risk decisions.
- Choosing and implementing methods to neutralize the possible negative effects of financial risks.
- Monitoring and control of financial risks.

The effective management of the enterprise financial risks in many respects is largely determined by the information base used for this purpose. The formation of such base, depending on a type of the carried-out operations and the directions of financial activity, provides inclusion in its structure of data on dynamics of factors of external financial environment and an environment of the financial market, financial stability and solvency of potential buyers of production, the financial potential of partners in investment activities, a portfolio of the offered insurance products and the rating of insurance companies, etc [8].

TABLE 1. OBJECTIVES OF ENTERPRISE FINANCIAL RISK MANAGEMENT

The main goal of financial risks management	The main objectives of financial risk management aimed at achieving its primary goal
ENSURING THE FINANCIAL SECURITY OF THE ENTERPRISE IN THE PROCESS OF ITS DEVELOPMENT AND PREVENTING THE POSSIBLE REDUCTION OF ITS MARKET VALUE	1. Identifying areas of high-risk financial operations, generating a threat to its financial security. 2. Comprehensive objective assessment of the probability of the individual risk events and related possible losses. 3. Ensuring minimization of financial risk level in relation to the provided level of financial transaction profitability. 4. Ensuring minimization of possible enterprise financial losses upon the occurrence of a risk event.

In the process of assessing the quality of the generated information database, its completeness is checked to characterize certain types of risks, the ability to construct the necessary series of dynamics (to assess the level of risks manifested in the dynamics - inflation, currency, interest, etc.) and the required groupings (in assessing static types Risks - credit, crime, etc.), the possibility of a comparable assessment of the amount of financial losses in a single price level, the reliability of information sources (own information base, published statistical data, etc.). It must be kept in mind that the insufficient or low-quality information base enhances subjectivity of the subsequent assessment of risk level [2].

Identification of financial risks is carried out by stages. The first stage identifies the risk factors associated with the financial performance of the enterprise as a whole, in the process of which factors are divided into external and internal.

At the second stage in the context of each direction of financial activity, external or systematic types of financial risks are determined. In connection with specificity of the enterprise, financial activity of separate types of risks are excluded from the list.

At the third stage, the list of internal financial risks, inherent in separate kinds of activity or the planned financial transactions of the enterprise (risk of insolvency, credit risk, etc.), is defined.

At the fourth stage, the total portfolio of the financial risks, connected with the forthcoming financial activity of the

enterprise (including systematic and not systematic financial risks), is formed.

At the fifth stage, on the basis of the financial risk portfolio, the spheres of the most risky types of the enterprise financial activity are determined according to the criterion of the breadth of generated risks.

In a risk management system, assessing the level of financial risk appears to be the most challenging phase, requiring the use of modern methodological tools, a high level of technical and software equipment and involvement of appropriate qualified experts.

At the first stage, the probability of a possible approach of a risk event is determined by each type of the identified financial risks. At the same stage, the group of financial risks of the enterprise, which probability of realization cannot be defined, is formed.

At the second stage, the amount of possible financial damage is determined when a risk event occurs. This damage characterizes the maximum possible loss from the implementation of a financial transaction or a certain type of financial activity, without taking into account possible measures to neutralize the negative consequences of financial risk. The methodology for assessing the amount of possible financial damage in the event of a risk should take into account both direct and indirect losses of the enterprise (in the form of lost profits, possible claims from counterparties and third parties).

The amount of possible financial losses is determined by the nature of the implementation of financial transactions, the amount of assets (capital), involved in them, and the maximum level of the amplitude of the volatility of revenues with the corresponding types of financial risks. On the basis of this definition, there is a grouping of the financial transactions to be carried out (intended to be carried out) in accordance with the possible financial losses.

The results of this grouping allow us to assess the level of concentration of financial transactions in different risk areas by the amount of possible financial losses. This determines the relative weight of individual financial transactions in each of the respective risk areas. The allocation of high-concentration operations in the most dangerous risk areas (catastrophic or critical risk areas) allows them to be considered as an object of increased attention during further stages of financial risk management.

Taking into account the probability of the risk event and the related financial damage (expected financial losses), the general initial level of financial risk is determined by separate financial transactions or separate types of financial activity at the third stage.

The assessment of opportunities to reduce the initial level of financial risks is carried out by stages.

At the first stage, the level of controllability of the considered financial risks is defined. This level is characterized by the concrete factors generating separate types of financial risks (their belonging to the group of external and internal factors), existence of the corresponding mechanisms of their possible internal insurance, opportunities of distribution of these risks between partners in financial transactions, etc.

At the second stage, the possibility of transferring the considered risks to insurance companies is studied. For this purpose it is determined whether the insurance market includes the appropriate types of insurance products, the cost and other conditions for providing insurance services.

At the third stage, the enterprise internal financial capacity to reduce the initial level of individual financial risks is assessed, which means the creation of appropriate reserve cash funds, the payment of brokerage services in hedging risks, the payment of insurance services, etc.

The establishment of criteria for making risky decisions takes place. Developing a system of such criteria is based on financial philosophy of the enterprise and it is concretized, taking into account the policy of implementing management of various aspects of its financial activities (policies for the formation of financial resources, asset creation policies, real and financial investment policies, cash management policies [8].

When making risk decisions, based on the assessment of the initial level of financial risk, the possibilities for its reduction and the set values of the maximum admissible level, the procedure for making risk decisions are reduced to two alternatives: accepting financial risk or avoiding it.

Selecting and implementing methods are aimed to neutralize [1] the possible negative effects of financial risks. The process of neutralizing the possible negative effects of financial risks is to develop and implement specific measures to reduce the risk of individual risks and to reduce the expected financial losses associated with them.

Monitoring and control of financial risks are as follows. Monitoring is divided into main blocks: monitoring of factors generating financial risks; monitoring the implementation of measures to counteract possible negative effects of financial risks; monitoring the cost budget associated with financial risk management; monitoring the results of the implementation of risk financial transactions and types of financial activities.

In the process of control, on the basis of their monitoring and results of the analysis, the updating of earlier made administrative decisions directed to achievement of the provided level of financial safety of the enterprise are provided.

Risk assessment is a systematic process of identifying the factors and types of risk and their quantitative assessment, that is, the risk analysis methodology combines complementary quantitative and qualitative approaches. The sources of information intended for risk analysis are: enterprise accounting reports; organizational structure and staffing of the enterprise; maps of technological flows (technical and production risks); treaties and contracts (business and legal risks); cost price of production; financial and production plans of the enterprise [3].

The most widespread methods of the quantitative analysis of risk are statistical, analytical, methods of expert evaluations, a method of analogs.

II. STATISTICAL METHODS.

The essence of statistical methods of risk assessment is to determine the probability of occurrence of losses on the basis of statistical data of the previous period and to establish the risk area (zone), risk factor, etc. Advantages of statistical methods are the ability to analyze and evaluate various variants of the development of events and to take into account different risk factors within the framework of one approach. The main disadvantage of these methods is the need to use probabilistic characteristics in them. It is possible to use the following statistical methods: assessment of the probability of execution, analysis of the likely distribution of the flow of payments, decision trees, imitation risk modeling, and "Risk Metrics" technology.

A method of assessing the probability of execution allows giving a simplified statistical estimation of the probability of execution, any decision by calculating the proportion of successful and failed solutions in the total amount of decisions [5].

The method of analyzing the probability distribution of payment streams allows at the known distribution of probabilities for each element of payment stream to estimate possible deviations of costs of streams of payments from expected ones. The stream with the smallest variation is considered less risky. Trees of decisions are usually used for risk analysis of the events having foreseeable or reasonable number of development options. They are especially useful in situations when the decisions made in timepoint of t = by n strongly depend on the decisions made earlier and in turn define scenarios of further succession of events. Simulation modeling is one of the most powerful methods of analyzing the economic system; in general, it is understood as the process of computer experimentation with mathematical models of complex real-world systems. Simulation modeling is used in those cases when real experiments, for example, with economic systems, are unreasonable, requires considerable expenditures and / or is not feasible in practice. In addition, it is often almost impossible or necessary to collect the necessary information for decision-making, in such cases, the missing actual data is replaced by the values obtained during the simulation (i.e., generated by the computer).

The “Risk Metrics” technology is developed by the J.P. Morgan company to assess the risk of the securities market. The technique involves determining the degree of risk impact on an event through the calculation of a "measure of risk," i.e., the maximum possible potential change in the portfolio price, consisting of a different set of financial instruments, with a given probability and for a given period of time.

III. ANALYTICAL METHODS.

Analytical methods allow to determine the probability of losses on the basis of mathematical models and are used mainly for the analysis of the risk of investment projects. It is possible to use methods such as sensitivity analysis, risk-adjusted discount rate method, equivalent method, scenario method.

The sensitivity analysis) is reduced to the study of the dependence of some resultant index on the variation of the values of the indicators participating in its determination. In other words, this method allows getting answers to questions of the form: what will happen to the resultant value if the value of some initial value changes?

The method of adjusting the discount rate taking into account the risk is the simplest and, therefore, the most applicable in practice. Its main idea is to adjust some basic rate of discount, which is considered as a risk-free or minimally acceptable. [8] The adjustment is made by adding the amount of the required risk premium.

Using the method of reliable equivalents, the expected values of the payment flow are adjusted by introducing special decreasing coefficients (a) in order to bring the expected revenues to the amounts of payments, the receipt of which is practically unquestionable and whose values can be reliably determined.

The scenario method makes it possible to combine the sensitivity study of the resulting indicator with the analysis of probabilistic estimates of its deviations. Using this method, one can get a fairly clear picture for the various variants of events. It represents the development of a sensitivity analysis technique, since it involves the simultaneous modification of several factors.

The method of expert evaluation. It is a complex of logical, mathematical and statistical methods and procedures for processing the results of a survey of an expert group. And the results of the survey are the only source of information. In this case, it becomes possible to use the intuition, life and professional experience of the survey participants. The method is used when the lack or complete absence of information does not allow the use of other possibilities. The method is based on conducting a survey of several independent experts, for example, to assess the level of risk or to determine the impact of various factors on the level of risk. Then the information received is analyzed and used to achieve the goal. The main limitation in its use is the difficulty in selecting the necessary group of experts.

The method of analogs is used in that case when application of other methods for any reasons is unacceptable. The method uses the database of similar objects to identify common dependencies and transfer them to the object under the study.

Having considered the main types of financial risks and methods of managing them, we will create the main sequence of actions for managing financial risks of the enterprise.

Risk management is a systematic approach to identifying, analyzing, minimizing and monitoring risks. The risk management process can consist of the following five steps:

The first step is to identify the factors that can affect the company's objectives. Risks that will not be identified at this stage can not subsequently be minimized, so it is necessary to focus on important and significant risks.

There are certain barriers in identifying risks, so-called "mental traps". Each person looks at risks through a prism of the experience, the professional activity, through that information which he knows at the moment, all this also prevents identification of important risks. Therefore, the process of identification cannot be an individual process. It is possible to avoid "mental traps" by means of three tools [6]:

1) Structuring the purpose of the company. Let us define the purpose of the company, decompose the revenue and expenditure part, and ask the question "What can happen that will increase or reduce the company's expenses?".
2) Using ready-made risk classifiers. Let us consider both external and internal factors that affect the risks. The disadvantage of this tool is that you need to adapt the classifiers under his company.
3) Using the experience of employees. As mentioned earlier, risk management is not an individual process. It is necessary to share information, communicate with employees, partners, managers, can help in identifying risks. To analyze statistics – what it was earlier, it can be repeated – it is important not to start from scratch to use information from other companies but to find various researches.

The second step is "Analysis and prioritization". Prioritization is the analysis and identification of the most critical risks from the point of view of the damage, which will allow us to identify a narrow range of risks on which it is necessary to focus. It is necessary to identify unacceptable risks for the company, involve qualified and experienced employees in the process and, if necessary, allocate resources to eliminate the risk.

When assessing risks, there are also the "mental traps". The correct formulation of the risk depends on the decision made. Often one ignores important risks, considering them less risky.

The national standard of the Russian Federation GOST R ISO / IEC 31010-2011 lists the main methods and techniques for assessing risk. The standard is the main one in the field of risk management and is intended for all types of companies' activities. Let us consider the most common methods of risk assessment.

Methods of risk assessment include expert methods and mathematical-quantitative methods.

Expert methods are imperfect, but sufficient to make the conscious decision. Each company has its own risk criteria: high, medium, low. After the distribution based on the evaluation criteria, you can present an overall picture, prioritize, and identify the responsible.

There is also a “Bow Tie” method that allows one to think about the causes and probability of the risk, and to analyze what the damage is. The method helps to decompose the problem into components, see the interdependence of risks, which is easier to understand, and is useful for exchanging information using more complex methods. It is important to understand that this approach takes time to complete.

Quantitative methods include sensitivity analysis (stepout analysis) and scenario analysis, which allow assessing the impact of risk on the company's financial stability. [4] The analysis concentrates on certain parameters.

The choice of the risk assessment method depends on the availability of information or data for calculation in quantitative evaluation, labor costs. By the degree of complexity, expert methods are the easiest to use; and sometimes easier does not mean wrong.

The third step is "Minimizing risks." Risk can be taken or managed. At this step, one needs to respond to risks, implement or modify activities that will help reduce the level of risk. In order to define the responsible, activity implementation deadlines, additional resources need to be allocated.

The methods for minimizing the risk are diverse and depend on the risk situation. There are four ways to minimize risk:

1) risk avoidance – the choice of alternative option with the smallest risk;

2) risk redistribution – transferring or partial transferring the risk to other party by signing the contract of insurance or hedging;

3) risk reduction – mitigation of the negative effects of the risk or probability of the risk realization

4) risk assumption – assumption of the risk occurrence and identification of sources of loss coverage.

The fourth step is "Risk monitoring". The risk is not static; it is constantly changing, that is why monitoring of risk identification is an important element of risk management. Often managers are busy with other authorities and forget about monitoring risks. So, monitoring of risks must be attached to planning the company's activities or setting goals.

The fifth step is "Culture of Risk Management". The company needs to create such environment that promotes open communication about risks. It is necessary to encourage employees who are interested in identifying risks. No matter how simple or complex the risk management process was, if employees and managers reject it, the company will not be able to manage risks [6].

In conclusion, it is possible to say that in order to develop the culture of risk management and to avoid a trap, it is necessary to ask information on risks from employees, to define responsible ones, to include competence of risks in the individual plans of employees, to connect financial processes

with process of risk management, to disseminate information about risks among employees.

The existing risk management approaches and methods include risk reduction tools and risk accounting tools.

In order to reduce the risk of financial management, it is advisable to use a number of organizational risk management tools to influence the activities of the enterprise. The company can also minimize financial risks by establishing and using internal financial regulations in the process of developing a program for the implementation of certain financial transactions or the financial activities of the company as a whole.

Reducing financial risk involves the implementation of organizational measures that contribute to the prevention of losses. Accordingly, the risk management tool includes risk mitigation tools and risk accounting tools.

To reduce the risk in financial management, it is advisable to use a number of organizational risk management tools to influence certain aspects of the enterprise's activities. The variety of practical methods of reduction can be divided into 4 groups:

- methods of risk evasion;
- risk localization methods;
- methods of risk dissipation;
- methods of risk compensation.

The methods of risk avoidance include the rejection of unreliable partners, insurance of economic activities, the creation of regional or branch mutual insurance structures and reinsurance systems, and the search for "guarantors".

The methods of risk localization include the allocation of "economically dangerous" plots in structurally or financially independent units (internal venture), the formation of venture enterprises, the consistent disaggregation of the enterprise.

The methods of risk dissipation include the integration of responsibilities among production partners (formation of FIGs, joint-stock companies, exchange of shares, etc.), diversification of activities, diversification of sales markets and management zones, expansion of purchases of raw materials, materials, risk distribution by stages of work.

The methods of risk compensation include the introduction of strategic planning, the forecasting of the external economic situation in the country, the economic region, monitoring of the socio-economic and regulatory environment, the creation of a system of reserves in the enterprise, active targeted marketing, the creation of unions, associations, mutual funds, lobbying of bills, neutralizing or compensating foreseeable risk factors.

Other methods of neutralizing financial risks include:

- Avoidance of risk.
- Risk taking over.
- Transfer of risk.
- Diversification.
- Risk pooling.
- Insurance.
- Hedging.
- Use of internal financial regulations.

Risk assessment involves accepting possible losses and planning its financing when justifying an investment decision [7].

IV. CONCLUSION

Risk management is a competence that is included in the top of the important competencies in the activities of the company, business and human life. The competence of risk management at present in Russia is not sufficiently developed.

Risk means an external or internal event that affects the achievement of the goal. Each risk has its causes and consequences and is expressed through damage and probability.

Risk is an event that can adversely affect the company's goals.

Thus, the goal of risk management should not be reducing risks, but ensuring that a decision is made taking into account risks, as some risks can be reduced, while others can be taken, and some can be increased. The proposed risk management process is to identify, analyze, develop and implement risk mitigation measures and to monitor risks.

References

[1] J.R. Menendez, N.G. Gharaibeh, “Incorporating risk and uncertainty into infrastructure asset management plans for pavement networks”, Journal of Infrastructure Systems, vol. 23(4), pp. 247-267, 2017.

[2] A. Ali, D. Warren, L. Mathiassen, “Cloud-based business services innovation: A risk management model”, International Journal of Information Management, vol. 37(6), pp. 639-649, 2017.

[3] P. Cerchiello, P. Giudici, “Big data analysis for financial risk management”, Journal of Big Data, vol. 3(1), pp. 237-255, 2016.

[4] A.D. Sheremet, R.S. Saifullin, Metodika of the financial analysis, M.: Infra-M, 2006.

[5] M. Hanke, S. Penev, W. Schief, A. Weissensteiner, “Random orthogonal matrix simulation with exact means, covariances, and multivariate skewness”, European Journal of Operational Research, vol. 263(2), pp. 510-523, 2017.

[6] P.A. Fomin, “Budgeting – the theory and practice of production financial planning and the analysis”, Finance and the credit, vol. 1, pp. 23-26, 2006.

[7] S.N Pashchenko, O.F. Habibrakhmanova, “Financial risks at implementation of innovative projects”, Research and development, vol. 1, pp. 202-204, October 2017 [XIX International scientific and practical conference, 2017].

[8] V. A Boltyrov., O.V. Krioni, S.N. Pashchenko, “One from approaches to assessment of investment attractiveness of the enterprise”, The Kazan science, vol. 9, pp. 22-26, 2016.

[9] I.A. Form. Management of financial risks, M.: Nika Center, 2005.