

## FINANCIAL RISK MANAGEMENT AT THE ENTERPRISE: METHODS AND MODELS

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### Abstract

*In this article you will learn what methods of financial risk management exist in the practice of management, how to build a system of risk management and carry out a phased analysis of effectiveness of introduction of the control system. The article includes the following main parts: financial risk management system, objectives of risk management at the enterprise, classification of risk in risk management system, methods of financial risk management, models of assessment of financial risk of company, stages of creation of the own risk management system, example of mechanisms of accounting and control in the risk management system, influence of risk management system to investment attractiveness.*

**Keywords:** financial risk, management, methods, models, economic value added

Financial risk is a possible financial loss, expressed in losses or not obtaining a possible profit. The purpose of the operation of any enterprise is to generate revenues and minimize costs. The emergence of financial risk increases the share of unforeseen costs.

The economic meaning of risk lies in the probability of occurrence of adverse events. In today's management economic category of risk is no longer only have a negative connotation. Investment projects of the enterprise with a high level of risk also have a high level of potential profit. Such concepts as risk and return are interdependent, and the complete elimination of the risk from activity of the company will result in the complete absence of profit. The economist William Sharpe (William F. Sharpe, 2011) in its formula clearly shows the relationship of the financial risk in the stock market and future profitability.

Financial risk management involves a combination of different methods, models and approaches to reduce the likelihood of a threat and the extent of losses. A key step in financial risk management is to assess the likelihood of the threat, and the absolute size of the loss.

### Financial risk management system

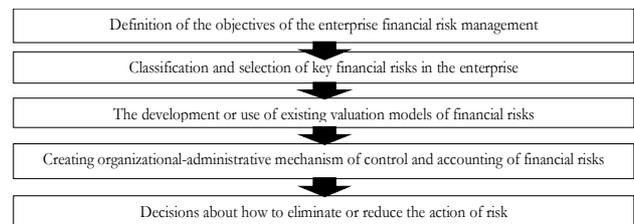
Financial risk management system allows the company to increase its value for shareholders and investors. The analysis of 1500 companies made by the American scientists A. Metrick and P. Gompers (Gompers, Paul A., and Andrew Metrick, 2010) showed a significant difference in the rate of growth of their value. So companies that have high standards of financial risk management experienced an annual growth rate of the value of 10% higher. The risk management system consists of the following circuit, which can be extended and supplemented in accordance with the conditions of operation of the enterprise (Figure 1.).

The control system covers all organizational levels of the enterprise, from senior management to line managers and production personnel. Let us consider in more detail

each block of risk management (Peter F. Christoffersen, 2011).

### Objectives of risk management at the enterprise

We can select the following objectives of risk management and in particular, the financial risk of the enterprise:



**Fig. 1 - Financial risk management system**

Source: Created by the author

The increase of investment attractiveness, competitiveness, enterprise value and solvency; Creation of financial, industrial and economic sustainability of the company; Implementation of the new high-risk, innovative, venture projects; Reduction of financial losses and not making a profit.

Users of the system of risk management are the various departments and officials of the company:

Finance Department (the financial manager and the analyst); The owners of the company (shareholders); Internal Audit Service (auditors, financiers, economists).

### Classification of risk in risk management system

For analysis of any economic object, it is necessary to select its components and produce the classification. This will reveal the problem under study for further analysis. Let us consider the various official classifications of financial risks presented in the table 1.

As we can see from this table, the classification is quite different in the selected types of risk, so every enterprise / company should develop and identify its most significant risks affecting the financial result.

**Methods of financial risk management**

All methods of risk assessment can be divided into two groups: quantitative and qualitative (Figure 2.). Quantitative methods include an objective, numerical assessment of the likelihood of loss of capital / money and for this purpose they use statistical methods of analysis (Steven L. Allen, 2012). Qualitative methods give the same subjective evaluation of the possibility of risk on the basis of expert opinion. The benefit of using quantitative methods is the ability to calculate fast and diagnosis of the current level of financial risk. The benefit of qualitative methods includes the possibility of assessing the qualitative factors influencing the occurrence of risk.

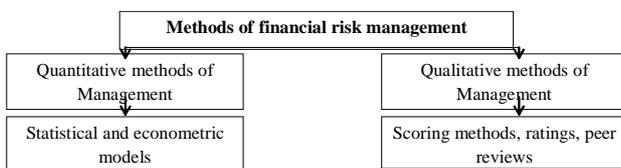
**Table 1 - Classification of financial risks**

Source of classification	Types of financial risks
Law of the Republic of Uzbekistan "On the Central Bank of the Republic of Uzbekistan"	Currency, interest rate and other financial risks
Degree of the Central Bank of the Republic of Uzbekistan "On the order of preparation and presentation of the consolidated financial statements of commercial banks", December 31, 2004 № 595	Credit, market, geographical, currency, liquidity risks and interest rate risk
Degree of the Central Bank of the Republic of Uzbekistan "On the procedure for the classification of asset quality, the formation and use of reserves generated by commercial banks to cover possible losses on them", February 11, 1999. № 632	Interest rate risk, the risk of changes in exchange rates, the risk of the issuer's activities, risk of hedging

Source: Created by the author

**Modelsof assessment of financial risk of company**

Depending on the particular type of financial risk there are defined various quantitative and qualitative assessment models presented in the table 2. These models were built on the analysis of balance sheets, cash flows, macroeconomic statistics, etc.



**Fig. 2–Methods of financial risk management.**

Source: Createdbytheauthor

**Stages of creation of the own risk management system**

If it is necessary to evaluate a large number of specific risks at the enterprise, the use of existing methods of assessment will be insufficient. For each certain enterprise or investment project there should be created its own system. Let us consider the practical steps involved in creating risk management systems.

**Table 2 - Modelsof assessment of financial risk**

Source: Created by the author

Types of risk	Existing assessment models
Credit risk	The models assessment of the probability of bankruptcy: Altman's, R. Toffler's, R. Lease's, W. Biver's models. Scoring methods for assessing the poorly formalized risks of A. D. Sheremet. Assessment methods of rating agencies HPA, Expert - RA, Moody's, Standard & Poor's, Fitch.
Currency risk	Method of VaR, fundamental, technical analysis.
Market risk	Model of Value at Risk, Shortfall, Model of W. Sharpe, E. Fameand K. French, S. Ross, F. Blake, M. Shoulz.
Liquidity risk	Analysis of the ratios of liquidity and solvency
Interest rate risk	Valuation models of macroeconomic factors

First stage. The general formula of the risk assessment.

All financial risks of the enterprise represent the sum of systematic and non-systematic risk, which will be calculated by the integral formula:

$$Risk = R_1 \cdot K_1 + R_2 \cdot K_2;$$

Where, R<sub>1</sub>, R<sub>2</sub>- systematic and non-systematic risks of the enterprise / project; K<sub>1</sub>, K<sub>2</sub>- risk weights for the enterprise / project.

An important task of the experts and financial analysts is the selection of all systematic and non - systematic risks of the enterprise in order to identify the manageable factors (Paul Sweeting, 2011). Systematic risks are formed by the external environment, which is impossible to control and impact on it. Systematic risks include changes in interest rates of the Central Bank of the Republic of Uzbekistan, inflation, unemployment, the size of contributions to the local authorities, etc. Selection of non-systematic risks allows the introduction of new instruments to reduce them.

Second stage. The criteria of comparing the effectiveness of the use of risk management system.

One of the possible criteria for assessing the effectiveness of the financial risk management can be a criteria of value that can be evaluated in terms of the current (discounted) value of the enterprise / investment project (NPV, Net Present Value). The formula for calculating the present value is as follows:

$$NPV = \sum_{t=1}^n \frac{CF_t}{(1 + d)^t} - CF_0 ;$$

Where, NPV – net present value; CF<sub>t</sub> - the cash flow generated by the enterprise / investment project in the time period t; CF<sub>0</sub> - the amount of the initial investment (cost) in the project / enterprise;d - discount rate.

In this model, the unknown parameter is the discount rate, which is calculated on the next stage of the analysis.

Third stage. Calculation of different discount rates.



The discount rate shows a possible yield of invested capital reduced to the current time. At this stage, it is necessary to calculate two discount rates: for the enterprise / project with the financial risk management system and without the system. There are many different ways to measure the discount rate as: the weighted average cost of capital, return on equity, the expected return to the capital asset pricing model, etc.

To calculate the discount rate we use the formula of the cumulative assessment of financial risk:

$$d = d_f + d_p + I;$$

Where, d - discount rate;  $d_f$  - risk-free interest rate; I - inflation rate;  $d_p$  - the risk premium.

As a result, we get two discount rates d and d\*, reflecting the different return from the enterprise's capital.

Fourth stage. Comparison of the enterprise value.

Final calculation of the net present value of the enterprise / project with the use of financial risk management system and without is represented by formula below:

$$NPV_1 = \sum_{t=1}^n \frac{CF_t}{(1+d)^t} - CF_0 ;$$

$$NPV_2 = \sum_{t=1}^n \frac{CF_t}{(1+d^*)^t} - CF_0 ;$$

A comparison of the difference between  $NPV_1$  and  $NPV_2$  shows the effectiveness of the future implementation of the system of financial risk management.

**Example of mechanisms of accounting and control in the risk management system**

Let us consider some of the organizational and managerial decisions in risk management system in the enterprise:

The introduction of regulatory decisions on continuous monitoring and identification of risks that have a negative impact on the achievement of goals of the enterprise; The appointment of the responsible person (risk manager) for managing the system; Developing a mechanism for registering and accounting risks in enterprise databases; Creating a documentary report on the current financial risk for the management and the responsible employees of the enterprise. Design of forming the system of motivation of personnel; Development of complex hedging instruments and insurance of financial and economic activity of the enterprise.

**Influence of risk management system to investment attractiveness**

Implementation of financial risk management at all levels can improve the investment attractiveness of the enterprise. The

increase of attractiveness for strategic investors, creditors, shareholders, allows attracting additional loan capital to create additional production capacity and develop innovative potential. One of the indicators that reflect the investment attractiveness is economic value added (EVA). This indicator is used by many financiers to assess the effectiveness of the creation of enterprise value. The figure below shows the relationship of the level of risk and indicator EVA.

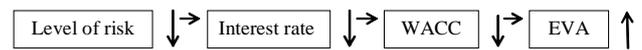


Fig. 3 – The relationship of the level of risk and indicator EVA

Source: Created by the author

Risk management can reduce the cost of borrowing capital (interest rates), which will reduce the weighted average cost of capital and increase economic value added.

**Conclusion**

Financial risk management at the enterprise is the most important task of strategic management to create long-term sustainable development. Development of the system begins with the classification of the existing risks by the risk manager, drafting their hierarchy and structural interconnection. The next step is the choice of the existing quantitative or qualitative risk assessment models, and there is developed a set of measures to reduce the possible threats. Usually, in practice, the existing models reflect only part of the financial risks, so one of the challenges before the enterprise's management is the development of its own risk management system. To assess the effectiveness of the implementation of the risk management system there is used the net present value of the enterprise, which is compared with a net present value without the use of a control system. The risk management system requires constant monitoring, adjustment and adaptation to external economic changes, especially it is important for the modern economy.

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