

Analysis and Risk Assessment of the Investment Project of the Organization

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Abstract: The article substantiates the need for a full-fledged assessment of the effectiveness of the investment project, consisting not only of the analysis of standard indicators of project efficiency (NPV, DPP, IRR), but also the analysis of the risks of projects. In addition, the analysis and risk assessment of the investment project of the organization, the ways to improve the effectiveness of risk assessment methods of the investment project are proposed. The purpose of this work is to analyze and assess the risks of the investment project of the organization. To conduct the study the following methods were used: classification, analysis, comparison, modeling and forecasting. The work performed showed that the use of only one method for risk assessment is considered ineffective, since only different combinations of methods for analyzing the risks of an investment project can give a complete picture of the weaknesses and strengths of the project, as well as assess its effectiveness in case of changes in any external conditions.

1 INTRODUCTION

As we know, making investment decisions is inseparably connected with uncertainty and risks. This means that in evaluation of any investment project we must evaluate not only its efficiency with standard indicators NPV (net present value), IRR (internal rate of return) and DPP (discounted payback period), but also pay attention to risk evaluation tools of this project.

The importance and relevance of this topic is that full-fledged assessment of investment project efficiency is possible only in case of analysis of not only standard indicators (NPV, DPP, IRR), but also the analysis of project risks. This applies to all companies, regardless of the area in which they operate.

This work is devoted to the analysis and risk assessment of the investment project of the organization, the study of indicators that characterize the effectiveness of the investment project. Conclusions made in the work, which reflect the recommendations on the choice of methods for assessing the risks of investment project in the company, can find practical application in the analysis of investment projects in various organizations.

The object of the study is an investment project of Novolipetsk Steel Company (NLMK).

The subject of the research is methods of investment risk assessment.

The purpose of this work is to analyse and assess the risks of an organization's investment project.

Achievement of the specified goal determined the statement and solution of the following tasks:

1. definition of the concept of investment project;
2. description of classification of risks of an investment project and methods of their estimation;
3. analysis of investment project by the example of Novolipetsk Steel Company (NLMK);
4. characteristics of risk assessment methods for NLMK's investment project;
5. evaluation of the effectiveness of risk assessment methods of the investment project at NLMK.

The following methods were used for the study: classification, analysis, comparison, modeling and forecasting.

The analysis of works on the problem under study showed that at present the main methods of risk assessment of organizations are formed. But, at the same time, only a small part of enterprises is engaged in the analysis and risk management of the investment project. As a rule, companies assess the effectiveness

of the project in traditional ways, using a discounted approach, and do not consider the risks that may be inherent in it.

Theoretical and methodological basis and information base of the study are the works of domestic and foreign researchers. As an information base the materials of the Novolipetsk Steel Company, available in the public domain, are used.

The issues of studying the risks of an investment project and the choice of methods for risk analysis are presented in the works of foreign and domestic scientists. The basics of the concept of probability and risk were developed in their works by such scientists as F. Knight, K. Gauss and D. Neumann. In the future, the study of various types of risks and methods of their assessment was carried out by many specialists, including L. Haight, F. Hayek, J. Conan, M. Golder, L.V. Dontsova, N.A. Nikiforova and O.P. Zaitseva.

2 MATERIALS AND METHODS

2.1 The Concept of an Investment Project

According to the Federal Law dated February 25, 1999 N 39-FL "On investment activities in the Russian Federation, carried out in the form of capital investments" an investment project is a substantiation of economic feasibility, volume and terms of capital investments, including necessary project documentation, elaborated in accordance with the RF legislation, as well as description of practical steps to make investments.

Each investment project has its own life cycle, which consists of 5 stages: initiation, planning, implementation, monitoring (control), closing of the project.

At the same time, at each stage of the investment project it has different risks, which should be identified in advance and find effective methods of managing them, because the consideration of any investment project and its implementation is impossible without taking into account the changes occurring in the economy (Naidenova, 2020).

At the moment, many investment projects, especially in the sphere of small and medium business, as indicators of their future effectiveness assess only the classic indicators of profitability, the amount of future cash flows and payback period of the project, without paying attention to its risks. But it is the realization of any of the risks may lead to a project becoming unprofitable. That is why when

assessing an investment project, it is necessary to pay special attention to its possible risks (Stefan, 2018).

2.2 Classification of Investment Risks

A unified classification of investment project risks has not been worked out yet. Risks of an investment project can be classified according to various parameters, for example, according to the stages of the life cycle of the project, according to the criterion of acceptable risk limit and the possibility of insurance, based on the sphere and form of manifestation, as well as the source of occurrence (Shevchenko, Razvadovskaya, Kaplyuk, Rudneva, 2020).

2.3 Methods of Risk Assessment of an Investment Project

In order to manage the risks of an investment project, it is necessary to assess them. The updated international standard on risk assessment methods IEC 31010:2019, which is a supplement to the ISO 31000:2018 standard, presents and describes 41 risk assessment methods, which are grouped into 10 groups related to elements of the risk management process (Suyasa, 2019). Qualitative and quantitative methods are used to assess the risks of an investment project.

Qualitative analysis is a method of prioritizing the risks of the project for further analysis or action by assessing their probability and impact on the project, in case of implementation.

The purpose of qualitative analysis is to determine the severity of risk by predicting the probability and impact of risk. Typically, this procedure is performed for all identified risks within a project, and for all types of projects. Risks are usually presented in a risk assessment matrix, which is then used to report the existing most significant risks to the relevant stakeholders.

While qualitative risk analysis should generally be performed for all risks, quantitative risk analysis has a more limited application depending on the type of project, the risks of the project, and the availability of data to use for quantitative analysis. This is why quantitative analysis is usually done only for the most significant risks identified by the qualitative method. The most popular quantitative methods are sensitivity analysis, scenario method and modeling (Gileva, 2017).

It is worth noting that, as a rule, when making a decision to implement an investment project, investors use a combination of different methods to

more thoroughly assess the various indicators and risks of the project. For example, to determine the effectiveness of an investment project, as a rule, a number of indicators is used, which can be divided into statistical and dynamic. Statistical indicators include the following: return on investment (ROI), payback period (PP), investment efficiency ratio (ARR). In turn, dynamic methods of assessment include such indicators as: net present value (NPV), internal rate of return (IRR), discounted investment payback period (DPP) and modified internal rate of return (MIRR) (Suslov, 2021).

Next, let's consider the analysis and risk assessment of the investment project on the example of Novolipetsk Steel Company (NLMK).

3 RESULTS AND DISCUSSION

3.1 Analysis of an Investment Project at Novolipetsk Steel Company (NLMK)

Novolipetsk Steel Company is the leading production site of the international NLMK Group. NLMK uses qualitative and quantitative methods to assess risks. In particular, the company uses in its practice the method of expert evaluations, as well as the method of scenarios, the application of which is possible in the absence of statistical data for risk assessment.

Next, let us consider an example of an investment project for NLMK and assess its risks.

The purpose of the project is to build a plant for the production of steel structures and hot-dip galvanized metal with polymer coating (Sukharev, 2018).

The construction of the plant is planned to be carried out in the vicinity of the Lipetsk site of NLMK Group. To implement the project requires borrowed funds in the amount of 5 500 thousand dollars U.S. (bank loan for 7 years at 11%), working capital of 2,000 thousand dollars U.S., equipment costs of 3,300 thousand dollars U.S., labor costs of 870 thousand dollars U.S. and other costs of 2,300 thousand dollars U.S. It is assumed that the price of 1 ton of produced goods will be 850 dollars U.S. and the cost of 1 ton will be equal to 380 dollars U.S. (Eriksson, 2021). The production line is designed for a volume of up to 4000 tons per year. The final cumulative cash flow is positive (6,378 thousand dollars U.S.), which indicates that this investment project is financially sound. That is, all project costs, including repayment of the loan and payment of interest on it, are fully

financed by the cash flows from the project implementation.

According to the calculations, the discounted payback period of DPP project is just over 4 years, the internal rate of return IRR is 23.67%, and the NPV of the project is 2,463 thousand dollars U.S. This indicates the effectiveness of the project.

When implementing the project, the following risks may arise:

- the risk of delay in the preparation of project documentation and displacement of the start date of the project;
- the risk of an accident in production;
- the risk of reduction of prices for the products manufactured;
- the risk of increase of the cost of the products;
- the risk of increase of the interest rate on the credit and change of credit conditions;
- the risk of breakage of equipment and temporary suspension of production;
- the risk of underproduction of the planned volume of production;
- the risk of change in tax legislation;
- the risk of underfunding of the project due to losses caused by fraud and corruption;
- the risk of leakage of commercially sensitive information (production technology).

3.2 Characteristics of NLMK Investment Project Risk Assessment Methods

Let us analyse the risks of lower prices for the output products, increased production costs and underproduction of the planned volume of products with the help of the scenario method used in the company.

Consider 3 scenarios: pessimistic, optimistic and realistic (most likely).

Each of these scenarios is characterized by a small deviation of the considered indicators of volume, price and cost. In the case of the pessimistic scenario, the price and sales volume decrease by 5%, and the cost increases by 5%. In the case of the optimistic scenario, the indicators are reversed - price and sales volume increase by 5%, while cost of sales decreases by 5%. In the case of the realistic scenario, all indicators remain basic.

The method of scenarios has shown that the occurrence of the pessimistic scenario is not critical for the investment project, because in this case, the NPV of the project remains positive and the project is financially solvent. This means that in the case of this

scenario, to carry out this investment project is still appropriate. In this case, the internal rate of return (IRR) is 18.54%, and the payback period of the project is almost 4 years.

The realistic scenario also allows the project to pay off, moreover, its internal rate of return becomes 23.67%, which is more than 2 times higher than the discount rate and indicates a large safety margin and, consequently, a low risk of the project. The payback period of the project is just over 4 years.

In case of the optimistic scenario when implementing the investment project, NPV will also be positive, the internal rate of return will be 28.73%, and the discounted payback period will be 3.5 years.

Given the probabilities of occurrence of different scenarios, the expected NPV will be 2,531 thousand dollars U.S. This is a good indicator for the project.

Despite the fact that Novolipetsk Steel also uses the method of expert evaluations for risk analysis, the company does not have a wide range of risk assessment methods, which is quite a serious disadvantage for it.

Thus, the scenario method used at NLMK for risk assessment allows us to assess the feasibility of the investment project in case any of the scenarios occurs. However, it does not make it possible to determine which of the factors has the greatest impact on the change in NPV, so it is not very effective.

3.3 Evaluating the Effectiveness of Risk Assessment Methods for an Investment Project at NLMK

For quality increase of investment project risk analysis, you can use sensitivity analysis. For example, conducting a sensitivity analysis on the project under consideration showed that the considered risks are not critical for the project, because even in the case of reducing the volume or cost indicators by 30% NPV of the project remains positive, which indicates its financial solvency even in difficult times. However, a 30% reduction in price leads to a negative NPV and negatively affects the implementation of the investment project (see Figure 1).

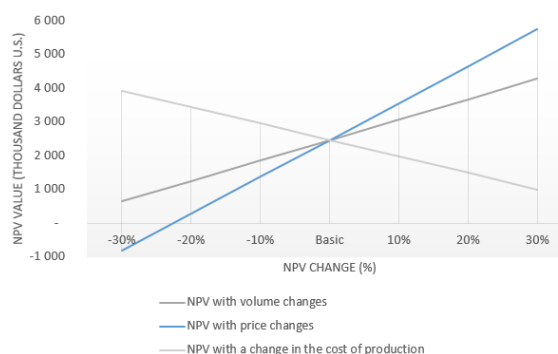


Figure 1: Sensitivity analysis of NLMK's investment project.

This pattern was revealed by conducting a sensitivity analysis. Having only the method of scenarios for risk assessment did not make it possible to understand to what extent certain indicators can deviate, while leaving the project financially sound.

4 CONCLUSIONS

Thus, we can conclude that indeed only different combinations of risk analysis methods of an investment project can give a complete picture of the weaknesses and strengths of the project, as well as assess its effectiveness in case of changes in any external conditions (Golov, 2020).

On this basis, it is worth noting that Novolipetsk Steel, being one of the largest metallurgical companies, should pay special attention not only to the management system of the organization as a whole, but also to risk assessment in individual investment projects. Since it is successful implementation of investment projects that will contribute to improving the company's efficiency and increasing its competitive advantages. In case of an inaccurate assessment of an investment project, NLMK faces the risk of incurring losses under the project and its non-payback, as well as losing part of its competitive advantages due to the slowdown of its own development as compared to competitors.

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