

**METHODS AND APPROACHES TO REDUCING RISKS ASSOCIATED WITH
INVESTMENT PROJECTS**

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Abstract

Financing investment projects is associated with high risks due to a wide range of factors. This article describes and classifies risks at different stages of project implementation, as well as measures and approaches aimed at mitigating them. Particular attention is paid to the risk of misuse. It is noted that this risk cannot be completely eliminated. To reduce uncertainty during project implementation at the financing stage, a procedure for sharing this risk between the project initiator, its participants, and the investor is proposed.

Key words:

risk, risk management, financing, investment projects, investment portfolio management.

Investment project financing is associated with a wide range of risks that may arise at any stage of project implementation: from the project planning stage to the completion of operational facilities. Risk factors can be both exogenous and endogenous. The occurrence of a risk event can not only worsen the performance of an investment project but also lead to its disruption and significant financial losses. While it is hardly possible to completely eliminate risks in investment project implementation, the negative impact of risks on the project can be reduced through the use of various financial instruments and legally binding agreements. Risk mitigation measures may increase the costs associated with the implementation of an investment project, but they can also reduce the potential volatility of the project's financial indicators and make the project's financial model more predictable.

Risk management must be carried out throughout all stages of project implementation. This work includes identifying risks, assessing the potential negative impact of a risk event on the project's financial performance, and exploring measures that could mitigate the impact of these risks on the project. The project development stage is of particular importance, as it allows for the project to be abandoned with relatively minor losses. For example, risks associated with extremely high future losses and characterized by such high costs for mitigation measures that the project will inevitably be unprofitable are identified. The importance of the risk identification stage in an investment project was discussed in the work of A.P. Demina [1].

Literature devoted to risk management in project financing typically examines the risks of financing a single investment project from the perspective of its initiator [2–5]. These articles discuss the importance of organizing processes in the company implementing the project, attracting debt financing, and the use of various methods for modeling the project's outcomes. In the work of E.N. Abramova [6] examines the use of a special bank account, the procedure for using which allows for control over the intended use of funds deposited therein. Articles by A.Yu. Demidov [7] and A. E. Rudenko [8] examine the introduction of treasury support for budget expenditures. This instrument is aimed at reducing the risk of misuse of public funds in financing, including investment projects.

The risks of financing investment projects are considered from the perspective of an investor financing a number of projects, not directly involved in their implementation, and essentially managing a portfolio of such projects. Such an investor may have less information about the project's progress than the initiator of the investment project – the company directly implementing the investment project. A portfolio investor may be a holding company, a credit institution, an investment fund, or a public entity. Development institutions and the government often use a portfolio approach to financing investment projects.

Financing a portfolio of investment projects is associated with a variety of risks of varying nature. Each risk group requires its own unique mitigation methods. The first group of risks includes those directly related to the construction of the project's facilities: risks of misuse or theft of funds, risks of increased construction costs for the project's facilities, risks of possible regulatory restrictions on the project's construction and operation, and risks of increased construction timelines.

Risks of misuse include the expenditure of funds provided to the project initiator for purposes other than those specified in the project. Such misuse may be intentional, resulting in theft. The negative impact of this risk is the need for additional investment to complete the project, as well as delays in the construction of the facilities.

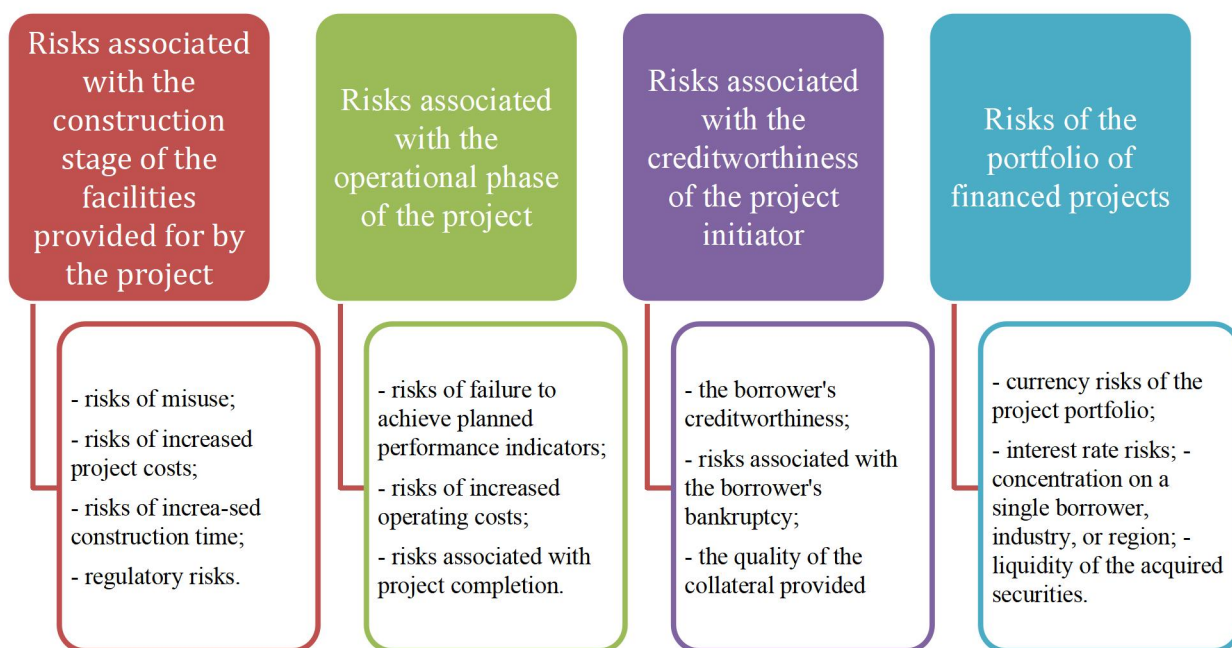


Figure. Classification of risks associated with financing investment projects

The negative impact of this risk is the need for additional investment to complete the project, as well as the construction timeframe. A two-stage approach can be used to mitigate this risk. The first stage involves the use of special accounts from which funds are debited after the project initiator provides documents confirming the intended purpose of the payment. Such an account may be opened for the project initiator with a credit institution, which will monitor the availability of supporting documents, or with a government agency (if the project is financed from the state budget). The second stage involves various control measures to confirm the accuracy of the reporting related to the project. This control can be carried out by reputable and

competent audit firms. If state budget funds are being invested in the project, such control may be carried out by the relevant government agencies.

Increased construction costs for a project may be due to both deliberate misconduct on the part of the project initiator and circumstances beyond the project initiator's control, such as rising prices for raw materials and supplies required for construction. For the investor, this risk entails additional investments or the risk of the project being unable to be completed, resulting in the loss of all or part of the previously invested funds. To mitigate this risk, a thorough project analysis and consideration of various implementation scenarios is essential during the project selection stage. This will eliminate projects whose financial and business models are inherently unfeasible, as well as projects whose financial indicators are subject to increased volatility depending on market conditions. A second measure that can reduce price volatility for materials and various equipment is the conclusion of contracts for the supply of materials and equipment at a predetermined future date, including through forward and futures contracts. The third measure is the need to agree in advance, even during the project selection stage, on the proportions of risk sharing between the investor and the project initiator. Specifically, an agreement may be reached for the investor to finance additional costs in the same proportion as envisaged in the original project implementation plan.

The risk associated with delays in project construction time may negatively impact the present value of cash flows due to the postponement of project commissioning to the operational phase. Funding terms often include a grace period, which defers interest payments by the project initiator. If this risk materializes, the project initiator may not have the funds to pay the investor after the grace period expires due to delayed project commissioning. For the investor, a negative consequence of delays may be the need to extend the grace period. The reasons for delays can vary widely, including a lack (or limited availability) of materials, equipment, or labor for construction, the introduction of regulatory prohibitions and restrictions on construction, poor project management, and various emergencies beyond the control of the initiator or project participants. The variety of factors that give rise to this risk dictates a wide range of measures aimed at reducing the likelihood of its occurrence and its negative consequences.

The majority of measures are carried out at the project selection stage and include a detailed analysis of the project implementation plan and the project initiator's experience in implementing similar projects, consideration of various project implementation scenarios, and identification of the most sensitive factors, as well as conducting the necessary technical assessments to ensure compliance with regulatory requirements. However, no matter how thorough and thorough the project selection procedures, this risk cannot be completely eliminated. To reduce uncertainty during project implementation, at the financing stage, a possible procedure for sharing this risk between the project initiator, its participants, and the investor can be determined. For example, by defining cases in which the grace period can be extended and the procedure for calculating interest on the amount whose payment is deferred to a later date.

The second group includes risks associated with the operational phase of the project. Along with risks associated with various emergency situations, which are extremely difficult to predict, we can highlight the risks of changes in demand and product prices, the risks of changes in the costs of maintaining the operation of project facilities and processes, and the risks of project exit. A decrease in demand and/or prices for products (services) may be caused by increased competition in the market or a shift in demand in favor of other goods, for example, due to scientific and technological advances or new environmental regulations. Scientific and technological advances or the introduction of new requirements for facility performance can also

significantly impact changes in project maintenance costs and/or the emergence of additional capital expenditures for facility retrofitting. Given that the implementation horizon of large investment projects can be long (approximately 10-30 years), it is hardly possible to predict changes in these factors throughout the entire project lifecycle in a financial model. However, better project design can mitigate these risks during the first few years, which have the greatest impact on the present value of cash flows associated with project implementation. Another measure that can reduce the risks of fluctuations in demand and product prices, as well as costs, is the conclusion of long-term contracts with consumers and suppliers. A project co-investor can stipulate that the initiator enters into long-term contracts as a condition for receiving funds.

Although project financing terms often stipulate gradual repayment of the principal by the project initiator to the investor over several years, the final payment is usually the largest. If the planned source for this payment is funds from the sale of facilities constructed within the project, the return on the investor's investment will be significantly exposed to the risk associated with the project's exit. Minimizing this risk will be facilitated by the project initiator accumulating the amount (or part of the amount) to be repaid in their accounts in advance. The initiator can place these funds in deposits with credit institutions, which will allow them to earn additional interest income. The terms and conditions for the accumulation of funds by the project initiator can be established during the selection stage. Given the long project implementation period, other measures are unlikely to be planned at such an early stage.

The third group includes risks associated with the project initiator's creditworthiness. If the project is implemented by a large private company with a wide range of businesses and a high credit rating, this risk will be limited. Even if the project fails, such a company will likely be able to recover the investor's investment through other sources of income. If the company is unable to repay the debt, the investor may be able to obtain a portion of its assets through bankruptcy proceedings and, through the sale of these assets, recover at least a portion of the investment, if not the entire amount.

However, large investment projects are often implemented through the creation of separate legal entities specifically designated for project implementation [9]. The capital of such companies is small, and it is highly likely that in the event of bankruptcy, the investor will only be able to recover a very small portion of their investment. In practice, there are two main ways to mitigate this risk. The first is to provide a guarantee from the person controlling the SPV or another organization with significant capital and a high credit rating. The best option for a lender to such a company is to provide a surety (guarantee) covering the SPV company's obligations for both principal and interest payments throughout the project's life. However, there are cases where such a surety only extends until the project enters the operational phase. The surety (guarantee) can be included in the issue documents, and the guarantor's obligations extend to any holder of these securities. Another form of surety is a separate agreement between the guarantor and the lender, but this may not extend the surety to a third party. This latter circumstance limits the investor's ability to sell the securities to another party.

The final group includes risks associated with the project portfolio. These risks include currency risks, interest rate risks, concentration on a single borrower or industry, geographic diversification of projects, liquidity of the securities purchased by the investor, and others. All other things being equal, high concentration on a single currency, region, industry, or single borrower increases the risks of the project portfolio financed by the investor. To manage these risks, it is necessary to establish concentration limits for the most key characteristics. This approach will allow for the formation of a diversified project portfolio already at the selection stage.

Changes in interest rates can affect the cost of investments in projects. Over the long term of project implementation, it is difficult to predict the dynamics of interest rates and inflation. One of the main ways to reduce the impact of interest rate volatility on the value of bonds purchased by an investor to finance investment projects is to establish floating interest rates. Funds for the acquisition of securities related to project implementation come from various funds, particularly pension funds or sovereign wealth funds. Should funds need to be spent in accordance with established goals, the need to sell the acquired securities may arise. Purchasing securities of companies traded on the stock market helps reduce liquidity risks. Another important factor that can positively impact the liquidity of securities is the absence of any restrictions on their circulation in their issue documents.

An analysis of the risks associated with financing long-term, large-scale projects emphasizes the importance of the project selection stage. Only at this stage can the terms of the funding be amended to include provisions that will protect the investor's investment. Subsequently, such provisions can only be included with the project initiator's consent, and it is unlikely that they would be economically feasible to include them. There are methods for mitigating risks during project implementation, but their implementation can be costly. Therefore, formalizing the rules, criteria, and conditions for funding and properly selecting projects are key factors in building a well-diversified project portfolio and minimizing potential risks.

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