

Improvement of the Mechanism Reducing the Risks of Financing of the Investment Projects

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Abstract

The aim of this work is the development of a mechanism for minimizing the risks of project financing. The article offers a methodology to reduce potential risks of financing investment projects. Methodology includes such basic steps as a sensitivity analysis of the project's net present value to changes in key financial and economic parameters of its realization. The method used is based on the scenario approach: expert evaluation of the relevance of project-specific risks, calculation of integrated risk evaluation and development of recommendations on the prevention of the most significant for the particular variant of project financing risk. In General, the proposed method allows, on the basis of the sensitivity analysis and synthesis expert estimation, highlight the most significant risks of project finance and develop activities to minimize them in the future. The proposed methodology has been tested on real production development project financing Ltd. "Lesokombinat"(all names changed in the article). Found that the most significant risks of project funding are possible decrease in operating income and an increase in operating costs. In the minimization of the risk of a possible reduction of the operating income includes the following main activities: active work with major customers; long-term contracts for the supply of woodworking products at fixed prices; a more active market research (now the plant practically not engaged in active market research and forecasting market size); strengthening participation in State and municipal order as potentially effective channel of saling of products of plant.

Keywords: investment project, investment risks, project financing, reduce project risk

1. Introduction

The most important factor affecting the decision of the investor, is the level of risk associated with an investment in an investment project. Therefore, the uncertainty and risk identification, quantitative and qualitative analysis of risk, monitoring and verification remain relevant at each stage of the preparation and realization of investment projects. The first attempts to assess the risk arose at the beginning of the century. In 1921, the Knight invited their qualitative analysis in the context of the theory of finance (Knight, 1921). Practical interest for forecasting and risk assessment began in 1929 year in connection with the global economic crisis, then Dow introduced the theory of the cyclical movement of the exchange rate value of the securities.

Later, its temporary money theory Fisher put it, in fact, investment planning, identifying the impact of inflation on interest rates (Fisher, 1930). A new surge of research on this topic occurred in 1952, when Markowitz suggested a method of risk when choosing investment strategies (portfolio theory) (Markowitz, 1952).

In the early 60's work Johnson (Johnson, 1960) and Stein (Stein, 1961) has enriched the theory of portfolio hedging. Later, at various times the development of risk assessment a number of researchers was engaged (Williams, 1938; Bromwich, 1976; Gordon, 1962; Altman, 2008; Van Horne, 1977; Bruni, 1996; McNeil, 2005; Gregoriou, 2009; Chong, 2013; Balbás, 2009). The solution of such issues has identified the need for theoretical developments based on the model of the financial economy, and at the same time adapted to Russian conditions (Askhatova, 2013; Isaeva, 2013; Ismagilova, 2013; Safiullin, 2013).

The above mentioned authors at a high theoretical level considered investigating the nature of uncertainty and risk, the risk assessment methods, the risk management process. However, insufficient attention is paid to the

analysis of risk factors and receives a comprehensive risk assessment of investment activity review of methods for risk assessment of investment activity on the basis of their simultaneous combinations.

2. Methodology

An important element of the system of management of project funding is effective analysis and minimization of risk.

It should be noted that in the literature the problem of evaluation of the project and risk mitigation project finance is described insufficiently systemically.

There are following methods of an estimation of risk of investment projects:

- 1) Dispersive method. It consists in an estimation of probability of approach of certain outcomes of investment and calculation of a dispersion and factor of a variation of considered variants;
- 2) Interval method. Consists in allocation of zones of admissible, critical and catastrophic risks of realisation of the investment project;
- 3) Balance method. It consists in the analysis of factors of the financial reporting of the project;
- 4) Expert method. Represents quantitative interpretation of qualitative threats to project development;
- 5) The sensitivity analysis. It consists in research of size of deviation NPV of the project at change of the most significant financial and economic factors.

In the present work is proposed approach that synthesizes the sensitivity analysis and the expert method.

The proposed risk assessment methodology of the project financing is offered to evaluate the sensitivity of NPV to changes in such key financial and economic factors: as income from operating activities, the total value of the transaction costs, the amount of investment costs in project finance and discount rate, defines the value of the future cash flows of the project bring to the current time.

The general sequence is proposed methodology to reduce potential risks of financing investment projects in the schematic as presented in Figure 1.

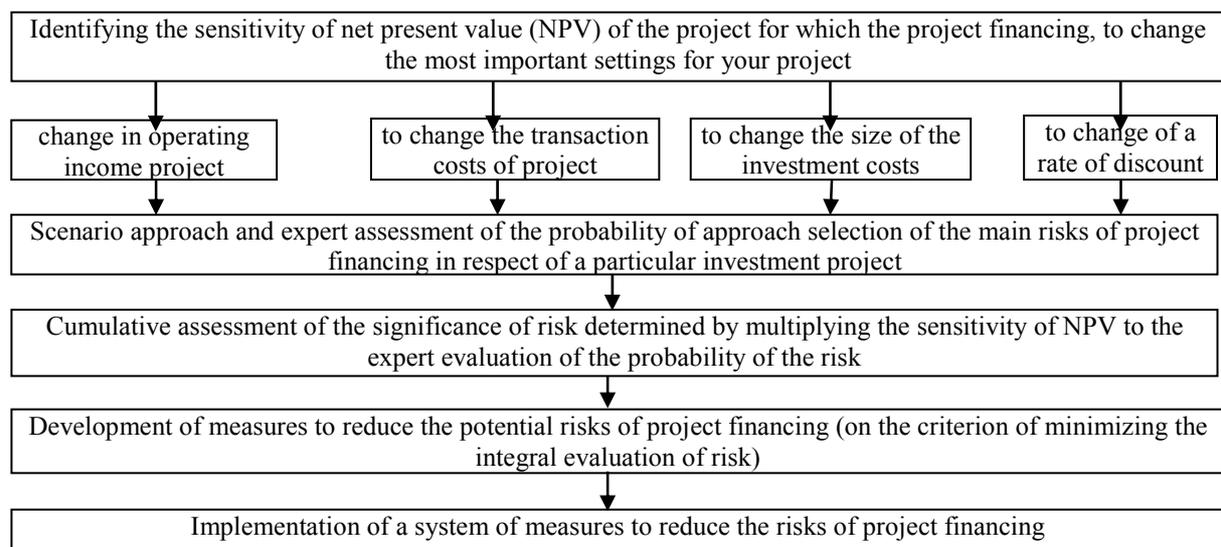


Figure 1. The sequence of proposed methodology to reduce potential risks of financing investment projects

3. Results

Let's consider the basic financial and economic parameters of the investment project of expansion of capacity of Ltd. "Lesokombinat" financed at the expense of a loan of Jsc. "Bank".

As a result of realisation of actions assumed the investment project of expansion of activity of Ltd. "Lesokombinat" plans achievement of following effect:

- 1) Increase in manufacture and realisation of production and reception of the additional income at the expense of application of high technologies and use of the modern equipment (on 27,3% by 2016 after the relation to level of 2014)
- 2) At the expense of reception of additional profit there will be a further expansion of industrial base of the enterprise that will make more competitive on long prospect
- 3) To provide with work and to increase level of a salary for the region population

The monetary stream from operational activity of the project is formed basically at the expense of the planned growth of sales volume plywood and other production for the furniture industry-most potentially competitive production of industrial complex. The stream from investment activity is formed at the expense of investment of all credit received from Jsc. "Bank" at a rate of 545.0 million rbl. In 2014. Payments under the credit, including repayment of percent, begin since 2016 credit Currency - US dollars. The interest rate about the credit of 9.0% annual. Because the rate of exchange is now rather a stable, it is offered to include in structure of the rate of discounting the award for currency risk at a rate of 1.5 percentage points. The basic advantages of strategy of financing of the investment project of expansion of capacity Ltd. "Lesokombinat":

- 1) Credit use under the rate of 9.0% annual in currency at the average regional rate in roubles under long-term design credits of 14-17% annual.
- 2) Equation of operational, financial and investment monetary streams of the project.
- 3) Acceptable time limit of a recoupment of the project (7.3 years) for the given industry.
- 4) Higher internal norm of profitability of the project (IRR = 16.2%) in comparison with average profitability on деревообрабатывающей the industries (15.1%).

The basic lacks of strategy of financing of the investment project of expansion of capacity of Ltd. "Lesokombinat".

- 1) The high risk of impossibility to start to pay off in full under the credit and percent since 2016 in case of lower demand for project production in comparison with the planned.
- 2) Absence in financial section of the business plan of the quantitative analysis and ranging of risks and directions of their minimization.
- 3) Attraction for current crediting of the project of means of several banks of region while crediting only at the expense of means of the basic investor (both long-term, and short-term) would be more rational.
- 4) Non-use of toolkit of state-private partnership for possible financing of a part of the project.
- 5) Irrationally high operational expenditure on insurance of property of the project (365.0 thousand rbl. a month).

Table 1. Parameters of strategic scenarios of the net present value of the investment project of Ltd. "Lesokombinat"

Scripts	Script settings	Basic management activities
1. Optimistic scenario	1.1. An increase in operating income to 10%.	- active marketing policy, the development of target markets wood
	1.2. Decrease in operating income to 10%.	- introduction of budgeting system and lean manufacturing.
	1.3. Reduction of investment costs 10%.	- transparent policy of cost estimates, long-term stable relations with suppliers of equipment.
	1.4. Reduction of discount rates on 10%.	- rationalization of the structure of the sources of financing, including through public-private partnership tools.
2. Pessimistic scenario	1.1. Decrease in operating income to 10%.	- increased competition in the markets for wood products, combined with the lack of an effective marketing policy.
	1.2. An increase in operating income to 10%.	- improper control of operating costs.
	1.3. Increase in investment costs 10%.	- the sharp rise in equipment for woodworking
	1.4. An increase in the discount rate on the 10%.	- the lack of schemes of optimisation of the funding cost of credit resources.

Thus, the considerable part of lacks of financial strategy of the investigated investment project is connected with lacks of analytical work regarding research of risks and optimisation of terms of payments under project promissory notes. The proposed method synthesizes elements of sensitivity analysis and scenario method, which has been tested on the material production development project financing Ltd. "Lesokombinat". Key scenarios for changes in the net present value of the project are presented in Table 1.

3.1 Sensitivity Analysis of Project Net Present Value (NPV) to Changes in Financial and Economic Factors

According to the plan of cash flows of the studied project of development of capacities Ltd. "Lesokombinat" we made an analysis of the sensitivity of the net present value to changes in selected elements (Figure 2-4).

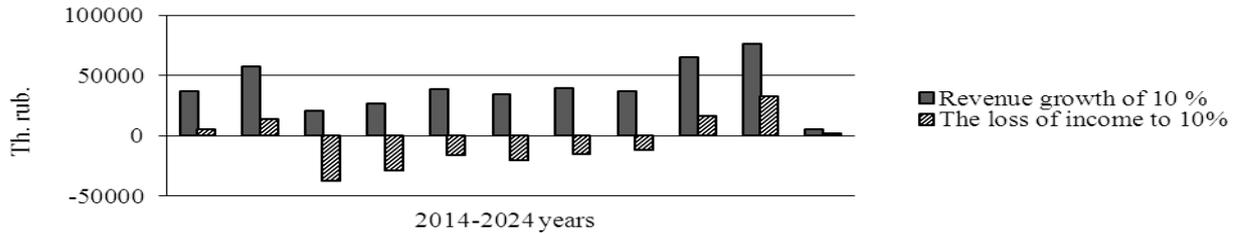


Figure 2. Discounted cash flow project sensitivity to changes in income from the sale of

As demonstrated by comparative analysis of rice. 2 and rice. 3., change in operating income was somewhat more effect on net present value of the investment project and, accordingly, the level of effectiveness of the project financing compared with changes in the operational costs of the project.

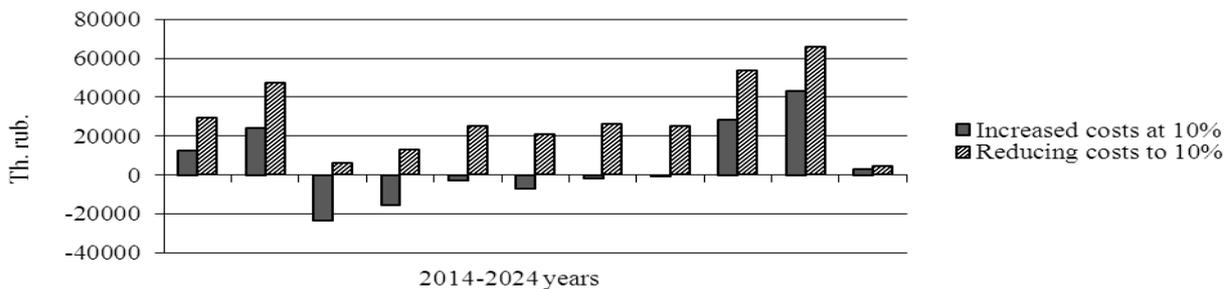


Figure 3. Discounted cash flow project Sensitivity to changes in operating costs

However, quite dangerous moment is from the point of view of financial flows of the investment project is, when at the same time there is peak growth of costs and is peak decrease net cash. For this project, the such peak is on to 2016-2017, in that time payments on long-term investment credit begin.

As shown in Figure 4, to possible changes in the level of investment costs the cash flow of the investment project is less sensitive, than the possible dynamics of income and operating costs.

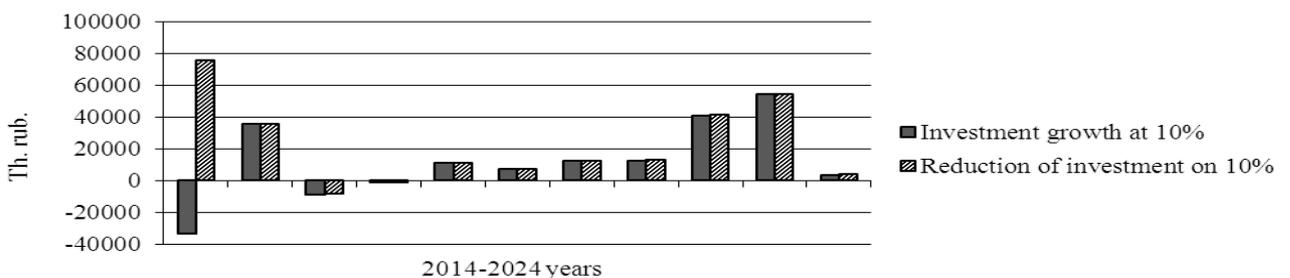


Figure 4. The project cash flow Sensitivity to change of investment costs

However, in absolute terms, the change in the net present value of the project from possible fluctuations in the value of investment spending also is elastic. So, if you increase the cost of 10% of the project investment NPV is reduced by 28.94 percent and vice versa. A major financial risk of many investment projects is and potentially changes the discount rate. However, in the case of the investment project (Figure 5), change the project's net present value to changes in the discount rate was not sufficiently sensitive in absolute value and relatively less significant compared with the operating income and investment costs.

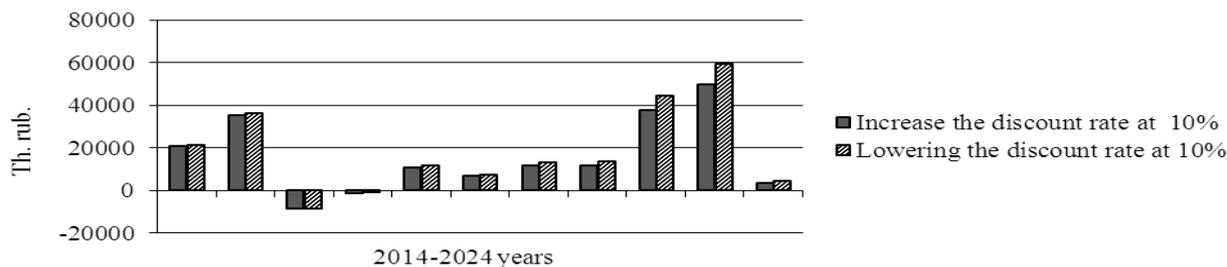


Figure 5. Discounted cash flow project sensitivity to changes in the discount rate

3.2 Expert Assessment of the Significance of Project Financing Risk

Further, in accordance with the proposed methodology, evaluate expert by significance of each of the risks for the project in accordance with the proposed methodology. As experts were specialists in the area of wood processing industry, demand for the products of the sector and project financing in General. The evaluation results are presented in Table 2.

In General, as shown in Table 2, the most significant risks of project financing, in accordance with the proposed methodology, are reducing operating income, as well, albeit with a significant margin, an increase rate discounts cash flows of the project and an increase in operating costs (difficulty raising resources to finance the needs primarily working capital and at all stages of its implementation).

Table 2. Evaluation of the potential risks of project finance for project development Ltd. "Lesokombinat" in accordance with the proposed methodology

Sensitivity indicators of project	NPV, thousand roubles.	The absolute increase in the NPV, thousand roubles.	Relative increase NPV, %	Expert estimation of the probability factor (от 0 до 1)	The integral value of risk of project financing
1. An increase in operating income to 10%.	437948	249616	132.54	0.03	3.98
2. Decrease in operating income to 10%.	-61283	-249615	-132.54	0.64	-84.83
3. Increase transaction costs for the 10%	60276	-128056	-67.99	0.18	-12.24
4. Reduction transaction costs for the 10%	316336	128004	67.97	0.01	0.68
5. Increase in investment costs 10%	133832	-54500	-28.94	0.24	-6.95
6. Reduction of investment costs 10%	242832	54500	28.94	0.09	2.60
7. An increase in the discount rate on the 10%	178241	-10091	-5.36	0.85	-4.55
8. Reduction of discount rates on 10%	199317	10985	5.83	0.07	0.41

4. Discussion

On the basis of the above analysis of the risks of the project will develop the following main activities to minimize the identified the most significant risks of project financing:

1) at part to minimize the risk of possible loss of operating income:

-active work with major customers;

-long-term contracts for the supply of woodworking products at fixed prices;

-more active market research (now the plant practically not engaged in active market research and forecasting market size)

-increased participation in State and municipal order as potentially effective channel marketing of products of the works.

2) at part to reduce the risk of increasing the discount rate appropriate insurance against financial risks associated with the project in specialized insurance companies.

3) although the risks associated with the project, transaction costs are relatively less significant than risks of lower income levels, there are also certain provisions of their decline. The main article of transaction costs increase the plant's capacity of woodworking is presented in Table 3.

Table 3. Approved estimates the cost of the investment project of expanding the production of wood products on the base of Ltd. "Lesokombinat"

The Name	The amount rubles.	Payments
Every month, the whole project	20000.00	Every month, the entire period of production
Communications (telephone, Internet)	50000.00	Every month, the entire period of production
Computer science and software	30000.00	Every month, the entire period of production
Petrol, oil and lubricants	220000.00	Every month, the entire period of production
Insurance cost	365000.00	Every month, the whole project
Cost of certification and licenses	20000.00	Every month, the whole project
Gas, water, sewage	100000.00	Every month, the whole project
Expense worksheet. materials	250000.00	Every month, the whole project
Advertising costs	80000.00	Every month, the whole project

Based on the above costing, the main reserves of lower transaction costs are:

- reduction of insurance premiums that make up 365 thousand roubles. monthly or 4380 thousand roubles in the year, that is a lot for a relatively small plant; in our view, to reduce the level of such costs can be by choosing a more acceptable insurance company (taking into account multiple proposals for property insurance and risk in the insurance market of Russia), as well as through a more thorough analysis and operational risk management on the part of the plant's workers;

- reduced advertising expenditures (80 thousand per month or 960 thousand rub. per year) to make it more targeted, more clearly define the target audience of advertising appeals and rationalize the structure of the advertising media (specialized publications, individual marketing).

In addition, the project is to minimize risk selection in the separate legal entity to produce beams (produced with minimal total charges) based on the use of USNO (under 6% of revenue, resulting in a relatively large mass of profit will remain at the disposal of the project). Proposed organizational scheme of tax optimization and reduction of liquidity risk through the restructuring of Ltd. "Lesokombinat". Ltd. "Lesokombinat" should be divided on two legal bodies Ltd. "Lesokombinat" (General tax treatment) and Ltd. "Beams" (simplified tax regime).

5. Conclusion

In General, the proposed method allows, on the basis of the sensitivity analysis and synthesis expert estimation, highlight the most significant risks of project financing and develop activities to minimize them in the future. The method allows to analyze the risks of financing the investment project, to collect data on the problem, assess the conflicting data and minimize it, a synthesis of issues a decision on financing for the project, allows you to

organize issues contributes to the achievement of consensus, rate the importance of each solution and the importance of each factor affecting the priorities of investment decisions, to assess the sustainability of the decision.

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