Investment Decision-Making Under Uncertainty

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Abstract – **The investment decision-making problem, which makes it possible to distribute capital among real and portfolio investments, is presented. The investment decision-making method under uncertainty is proposed for solving the problem.**

Keywords - **investment decision-making, investment portfolio, real investment.**

I. INTRODUCTION

The investment activity is directed to the acquisition of income, therefore the investment decision-making effectiveness increase task is very important. There are 2 types of investment: real and portfolio investment. Financial capital making and turnover are conditional on real capital functioning, so it is necessary for investor to distribute capital among real and portfolio investment.

II. THE INVESTMENT DECISION-MAKING PROBLEM

The investment decision-making problem is how to distribute the capital among real investments and investment portfolio in such a way that capital is invested in a project (real investment) if the investment of the capital, which is required for investment project execution, during the necessary investment period of time is more effective with an allowance for risk than the investment of the same capital for the same period of time in portfolio.

Investment efficiency with an allowance for risk is estimated by experts based on efficiency and risk measure of investment process. These real and portfolio investment measures can be compared because of the equal capital and investment period.

The short-term investment decision-making problem rises as a result of the long-term problem solving. The short-term problem is caused by real investment fund utilizing way: the capital is utilized during full investment period, not only in its beginning. Therefore temporary free capital can be used for portfolio investment for short periods of time. The investor should make a decision: is it effective with an allowance for risk to invest temporary free capital in portfolio during the period of its availability.

III. THE INVESTMENT DECISION-MAKING METHOD UNDER UNCERTAINTY

The investment decision-making method under uncertainty is proposed for the given problem solving. It defines management procedures during investment process.

At the first stage it is necessary to choose real investments for the given problem solving from the alternatives set. Every alternative is estimated by experts using the fuzzy analytic hierarchy process. Expert group is formed from all experts in the organization depending on their specialization. Real investment types are defined using the self-organizing maps based on Project Definition Rating Index and planned costs and duration of real investments. Every expert specializes in one type of real investments and expert group is formed in proportion to alternatives type structure. Real investment alternatives are estimated using iterative procedure for its choice.

It is proposed to use the method of real investment risk prognostication [1] and the method of actual real investment results deviation (from planned results) prognostication [2] for real investment risk and efficiency estimation. It is proposed to use the portfolio management method based on D-scores of Russman [3] for estimation of portfolio efficiency and risk. The real investments, with which investor compares portfolio investment, determines the planned portfolio investment period.

Experts estimate efficiency with an allowance for risk of every presented real and portfolio investment ways. After comparing estimations the best ones are invested. Real investments are managed to improve definition rating of its less-defined parameters according to its level in Project Definition Rating Index.

During the investment process risks and performance deviation from plan are monitored. If these deviations are significant the method defines procedure for group decision-making: if it is necessary to reinvest capital, extend investment period or change planned costs.

IV. CONCLUSION

In this paper the investment decision-making problem is considered and its statement is presented. The problem is to distribute capital among real and portfolio investment according to its efficiency and risk level. The long-term and short-term problem statement are proposed. The investment decision-making method under uncertainty is proposed for the problem solving.

REFERENCES

[1] В.І. Дубровін, В.М. Льовкін, "Метод прогнозування ризику неуспішності проектів на стадії передпроектного планування", Праці Одеського політехнічного університету, 2011, №1 (35), С. 106-111.

[2] В.М. Льовкін, В.І. Дубровін, В.Ф. Оніщенко, "Прогнозування фактичних результатів проекту на стадії перед-проектного планування", Радіоелектроніка. Інформатика. Управління, 2011, №1 (24), С. 44-51.

[3] V. Liovkin, V. Dubrovin, "Investment portfolio management process", Computer Science and Information Technologies: Materials of the VIth International Scientific and Technical Conference CSIT'2011, Lviv, Publishing House Vezha&Co, 2011, pp. 218-221.

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