

On the Issues of Instrumental Adaptation of Investment Risk Assessment Methods

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Abstract. The article analyzes the foreign and national instruments of investment, in particular, project risk assessment, and identifies the advantages and disadvantages of using some traditional methods. In the context of uncertainty in modern conditions, the level of risk increases in the conditions of the fluctuating movement of the economy in the country as a whole, including the investment market. From this point of view, it is noteworthy that the author described the process of clarifying the width, periodicity and other characteristics necessary for the development of measures aimed at effective risk management as risk identification, and also researched the possibilities of benchmarking investment risk assessment instruments.

Key words: investment activity, investment risks, classification of investment risks, project risks, methods of assessing investment risk, traditional methods of assessing investment risk, expert assessment method, illustrated ranking of risks, risk minimization, risk transfer.

Introduction. In modern conditions of globalization, the cyclical development of the economy and uncertainty in the market force business entities to think about the effective management of investment, in particular, project risks .

As is known, investment activity is associated with uncertainty and risks, which is set by default by the identification of the project: investment activity, in particular a project, is an event of a non-permanent nature aimed at creating a new product, process or service.

On the one hand, the methodology for examining the risks of an investment project appears outwardly to be very simple - descriptive, but in theory it should lead the expert to a quantitative result - a cost assessment of the identified risks, their negative consequences and anti-risk measures. Therefore, even at the stage of developing the concept of an investment project, it is necessary to conduct a high-quality examination of the risks as a whole.

The relevance of this provision is confirmed by the words of the President of the Republic of Uzbekistan Sh.M. Mirziyoyeva: "...to develop the economy at a high pace, we need an active investment policy"¹

Based on this, it seems appropriate to us to identify the following main approaches to qualitative examination of investment project risks:

¹Message from the President of the Republic of Uzbekistan Shavkat Mirziyoyeva Oliy Majlis , December 29 , 2020 // <https://president.uz/ru/lists/view/4057>

- *method of expert assessments* - a set of procedures aimed at identifying, ranking and qualitatively assessing probable risks in an investment project based on expert opinions of subjects with significant experience in this specific activity;
- *SWOT analysis* - allows you to clearly contrast the strengths and weaknesses of an investment project, its opportunities and threats based on a qualitative risk assessment;
- *spiral ("rose") of risks* - illustrated ranking of risks based on qualitative assessments of risk factors;
- *method of analogies or conservative forecasts* - a study of the accumulated experience on investment projects of analogues in order to calculate the probabilities of losses.

Literature review. The degree of development of the problem. The basics of assessing investment risks are discussed in the scientific works of theoretical scientists. Among foreign authors who analyze investments under conditions of risk and uncertainty, one can single out Alexander G.², Bakhtin I.³, Van Horna J. K.⁴, Kahneman D.⁵, McCarthy M.P.⁶, Knight F.H.⁷, Holmes E.⁸, Fishburne P.⁹, Flynn T.P.¹⁰, Sharp U.¹¹, Schmidt S.¹², Blanca I.A.¹³, Budnikov M.Yu.¹⁴, Granaturova V.M.¹⁵, Kokina A.S.¹⁶, Tsareva S.V.¹⁷, Shapkina A.S.¹⁸ and etc.

Research in this area includes the scientific works of Abdullaev Sh.R.¹⁹, Alimardonova E.D.²⁰, Akramova, O. K.²¹, Karimova N.G.²², Sultanbaeva M. B.²³, Shodiboeva M.K.²⁴ etc. These works

²Alexander S. Financial Risk Management and Analysis. Wiley, 1996. -186 p.

³Bakhtin, I.V. Guide to choosing the best software for project management / I.V. Bakhtin // Scientific electronic journal Meridian. – 2020. – No. 7 (41). – P. 60–62.

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⁵Kahneman D. Think slowly... decide quickly. M.: AST Publishing House, 2021. 710 p. [Kahneman D. Think slow... decide fast. Moscow: AST Publishers. 2021. - 710 p. (In Russ.)]

⁶McCarthy, M.P. Risk: risk management at the level of top managers and boards of directors Text. / M.P. McCarthy, T.P. Flynn; lane from English A. Lisitsina. M.: Alpina Business Books, 2005. - 234 p.

⁷Knight F.H. Risk, uncertainty and profit / Transl. from English - M.: Delo, 2003 - 176 p.

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¹²Birman G., Schmidt S. Capital investments: economic analysis of investment projects. M.: Unity, 2003. - 632 p.

¹³Blank I. A. "Investment management." Tutorial. - Kyiv: Nika-Center: Elga-N, 2003. - 592 p.

¹⁴Budnikov M.Yu. Development of an enterprise's investment risk insurance system: abstract of dissertation. ... Candidate of Economic Sciences: 08.00.10. - 22 s.

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¹⁶Kokina A.S., Sarkisyan L.M. Quantitative methods for analyzing innovative projects // Economics: yesterday, today, tomorrow. - 2014. – No. 8-9. - P. 58-70.

¹⁷Tsareva, S.V. Methods for assessing risks when implementing investment projects / S.V. Tsareva // International scientific journal "The Path of Science". – 2018. – No. 6 (52). – P.25.

¹⁸Shapkin, A. S. Risk theory and modeling of risk situations: textbook / A. S. Shapkin, V. A. Shapkin. - 6th ed. - Moscow: Dashkov and K, 2017. - 880 p.

¹⁹Abdullaeva Sh. R. Increasing the efficiency of centralized investments in basic sectors of the economy // Vectors of development of modern science. 2016. No. 1. pp. 118-122.

²⁰Alimardonov E.D. "Global moliyaviy-iktisodiy yzgarishlar sharoitida xalqaro moliya bozorining rivozhlanish omillari va tendentalari." i.f.n. illm. darazh. ol. uchun diss. Author's abstract. UMEiD-2012 – 21 p.

²¹Akramova, O. K. (2022). Ensuring investment security as an autonomous factor in increasing investment attractiveness.

mainly studied issues related to the securities market and attracting portfolio investments.

Currently, there are a large number of different definitions of the concepts of “risk” and “uncertainty”. In economic practice, a distinction is not usually made between risk and uncertainty. In this case, the term “risk” refers to some possible loss caused by the occurrence of random unfavorable events²⁵. In some cases, the riskiness of an investment project is understood as the possibility of future cash flows for the project deviating from the expected flow. The greater the deviation, the more The project is considered risky²⁶.

However, even in the first scientific definition of risk in economics, F. Knight proposed to distinguish between the concepts of “risk” and “uncertainty”. Risk occurs when some action can lead to several mutually exclusive outcomes with a known distribution of their probabilities. If such a distribution is unknown, then the corresponding situation is considered as uncertainty²⁷.

Currently, many authors define risk as a derivative of uncertainty factors²⁸. In this case, uncertainty refers to the incompleteness or inaccuracy of information about the conditions of the project, including the associated costs and results. The uncertainty associated with the possibility of adverse situations and consequences arising during the implementation of the project is characterized by the concept of risk.

Achieving the goals set by the investor and obtaining the necessary results during the implementation of the investment project leads to the emergence of a corresponding investment object. This object can be treated as either explicit or implicit. In this context, the choice of object allows you to create conditions for describing the investment project, estimate future income and expenses for its operation. Also, the features of the created object make it possible to determine the possibility of using certain methods for assessing the justification of the corresponding investment projects.

There is also no methodological clarity on the issue of assessing the risk of an investment project. Although most authors dealing with investment issues usually distinguish two main approaches (qualitative and quantitative), there are nevertheless significant differences when considering specific methods of assessment. The main task of the qualitative approach is to identify and identify possible types of risks of the investment project under consideration, as well as to determine and describe the sources and factors influencing this type of risk.

Despite the existence of a significant amount of work, many aspects of investment risk assessment remain not fully developed. In particular, the task of assessing and managing the risks of real investment projects needs further development. The classification of investment risks requires clarification. Existing methods of qualitative and quantitative analysis of investment risks presuppose the

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²²Karimov N.G. “Iktisodiy integratsionlashuv sharoitida investmentslarni moliyalashtirishning bozor mexanizmlarini zhoriy etish muammolaori.” i.f.d. illm. darazh. ol. uchun diss. abstract BMA-2007. -21 s.

²³Sultanbaeva M. B. Using foreign experience in the development of investment funds in the Republic of Uzbekistan: abstract. ...cand. econ. Sci. Tashkent, 2012. -21 p.

²⁴Shodiboeva M.K. Investment attractiveness of Uzbekistan // Young scientist. 2016. No. 10. pp. 939-941.

²⁵Chetyrkin, E. M. Financial analysis of industrial investments / E. M. Chetyrkin. – M.: Delo, 1998. – 256 p.

²⁶Teplova, T. V. Financial decisions: strategy and tactics: textbook. Benefit. / T. V. Teplova. – M.: IChP “Magister Publishing House”, 1998. – 264 p.

²⁷Doladov, K. Yu. Economic assessment of investment risk when making management decisions: On the example of industrial enterprises of the Samara region: dis. ...cand. econ. Sciences: 08.00.05 / K. Yu. Doladov. – Samara, 2002. – 187 p.

²⁸Igoshin, N.V. Investments. Organization of management and financing: a textbook for universities / N. V. Igoshin. – M.: Finance, UNITY, 1999. – 413 p.

availability of a priori information, expert assessments, and taking into account the subjective attitude of a particular investor to risk.

All these factors are associated with uncertainty, which necessitates the need to improve and adapt existing methods for assessing investment risks to practical reality. Economic entities need accessible methods of “express diagnostics” of risks, which are practically absent in the literature.

Thus, there is a need to develop practical methods and algorithms for assessing and minimizing the risks of investment projects.

The methods and methodology of the study within the framework of this article are: the fundamental provisions of economic and financial science in the classical and modern understanding of the conceptual positions of the theory and practice of applying investment risk assessment methods, traditions and innovations, monographic scientific publications that reveal patterns of relations in foreign and national investment systems activities, methodological developments of professional participants in the investment market as a whole.

The methodological apparatus of the study includes the following combined methods: logical, system-structural, factor and comparative analysis, as well as historical, logical, graphic, statistical and economic-mathematical methods of processing information in the future with the construction of analytical and integration models based on comparison, abstraction, analysis and synthesis of systemic scientific methods of cognition of socio-economic phenomena.

Results. Carrying out a quantitative examination of investment, in particular project risks, is a continuation of qualitative research and presupposes the presence of a basic version of cash flow calculations for such a project, the value of which may change as a result of the implementation of each of the risks given in the article. The task of quantitative examination is to numerically measure the degree of influence of risky factors of the project on the behavior of the efficiency criteria of the entire investment project. Quantitative risk assessment is a numerical determination of the impact of individual risks of the investment project as a whole.

all quantitative methods used in risk theory into direct, inverse problems and research methods. Risk assessment associated with determining its level in direct tasks occurs on the basis of a priori known information. In inverse problems, restrictions are determined on one or more variable initial parameters in order to satisfy specified restrictions on the level of acceptable risk.

The main methods for quantitative risk assessment include the sensitivity analysis method, the statistical test method (Monte Carlo method) and the modeling method.

The sensitivity analysis method is one of the main methods of quantitative risk analysis. The main idea of the sensitivity study method is to analyze the degree of variability of performance indicators in relation to variations in the parameters of the investment project. The more responsive the economic efficiency indicators of this type of project are to changes in input quantities, the more susceptible such an object is to the corresponding risk.

Sensitivity analysis is based on a sequential unit change in the variables tested for riskiness. At each step, only one of the variables changes its value by the predicted number of percent (± 5 ; ± 10 ; ± 15), which leads to a recalculation of the final values for the investment project. Sensitivity analysis of investment project indicators is carried out on changes in the most important initial (input) parameters for such a project.

They are divided into two categories of indicators: those affecting project revenues and those affecting project payments. For example, the volume of investments, income dynamics, inflation rates,

growth potential and fluctuations in market demand for the project product, physical sales volume, trading price and trends in its changes; fixed and variable costs and trends in their changes, the cost of attracted capital. To calculate the present value, factors of the timing of the investment project and the calculation of the discount rate are also examined.

The use of sensitivity analysis and the choice of variable components that affect the sustainability of an investment project should be determined for each specific case within the project, taking into account its specifics. To confirm the effectiveness of an investment project, it is necessary that the break-even point be less than the nominal sales volumes. The further the break-even point is from them, the more stable the investment project.

The uncertainty of the conditions for the implementation of an investment project in sensitivity analysis can be taken into account by adjusting the parameters of activities within the project and the economic standards used in the calculations, replacing their values with the expected ones. For this:

- the time frame for completing the work increases by the average amount of possible delays;
- the average increase in the cost of an investment project is taken into account, due to the errors of the specializing entity and the revision of decisions on the project;
- takes into account late payments, irregular supply of materials, equipment shutdowns, technology violations committed by personnel, fines paid and received and other sanctions for violation of contractual obligations;
- expenses from losses from a certain risk are included if it is not insured;
- the discount rate and the required internal rate of return may be increased.

The sensitivity analysis of an investment project is based on an analysis of changes in one factor, which is a significant limitation of this method. Overcoming this problem is carried out within the framework of the statistical test method and the scenario method, which are a development of the sensitivity analysis technique.

The statistical test method (Monte Carlo method) was initially used to calculate the expected duration of each stage, and of the entire project. In the statistical testing method, the values of non-deterministic key input parameters are selected randomly. As an example, one model is given that allows one to analyze the consequences of the accumulation of risk situations. In this model, risks are divided into several (usually three or more) categories that affect the scope of work, timing and cost of their implementation. Based on this, risk categories are also presented in three matrices: a matrix of work volumes, a matrix of total activity duration and a cost matrix.

The scenario method is based on methods of formalized representation of systems and methods aimed at enhancing the use of intuition and experience of specialists. These methods underlie various types of modeling.

Simulation modeling means a targeted series of multivariate studies performed using mathematical models and digital technologies. This direction corresponds to the main idea of system analysis - a combination of the capabilities of the individual as a carrier of values, a generator of ideas for decision-making with formal methods that provide the possibility of using communication technologies.

Situational modeling is based on displaying in computer memory and analyzing problem situations using a specialized language developed using the tools of set theory and mathematical logic.

Structural-linguistic modeling is based on the use of various kinds of structural representations, on the one hand, and the means of mathematical linguistics, on the other, to implement ideas.

The method of gradual formalization of tasks and problem situations with uncertainty is based on

the alternate use of methods of formalized representation of systems and methods aimed at enhancing the use of intuition and experience of specialists.

With regard to types of uncertainty, these methods include the following steps:

- a description of the entire set of possible conditions for the implementation of an investment project in the form of appropriate scenarios or models that take into account a system of restrictions on the values of the main technical, economic, etc. parameters of the project being implemented;
- transformation of initial information about uncertainty factors into information about the probabilities of individual implementation conditions and the corresponding performance indicators or the intervals of their change;
- determination of efficiency indicators of the investment project as a whole, taking into account the uncertainty of the conditions for its implementation.

As a result of scenario analysis, the impact on the economic efficiency indicators of an investment project of simultaneous changes in all the main variables of a particular project characterizing its cash flows is determined. The advantage of the method is that the deviations of the parameters are calculated taking into account their interdependencies (correlation).

When building models, it is necessary to actively collect and formalize expert assessments, especially in relation to production and technological risks. The main advantage of using expert assessments is the ability to use the experience of experts in the process of project analysis and taking into account the influence of various qualitative factors.

As a result, it is advisable to construct at least three scenarios: pessimistic, optimistic and the most probable (realistic or average). The main problem in the practical use of the scenario approach is the need to build a model of an investment project and identify the relationship between variables.

In addition, the disadvantages of the scenario approach, according to the authors, include :

- the need for significant qualitative research of the investment project model, i.e., the creation of several models corresponding to each scenario, including extensive preparatory work on the selection and analytical processing of information;
- sufficient uncertainty, blurred boundaries of scenarios. The correctness of their construction depends on the quality of the model construction and initial information, which significantly reduces their predictive value. When constructing estimates of variable values for each scenario, some voluntarism is allowed;
- The effect of a limited number of possible combinations of variables is that the number of scenarios to be worked out in detail is limited, as well as the number of variables to be varied, otherwise it is possible to obtain an excessively large amount of information, the predictive power and practical value of which is greatly decreases.

At the same time, the scenario method for examining investment project risks, in our opinion, also has the following features that can be considered as its advantages:

- taking into account the relationship between variables and the influence of this relationship on the value of integral indicators;
- construction of various options for implementing an investment project;
- the meaningfulness of the process of developing scenarios and building models that allow the expert to get a clearer understanding of the investment project and the possibilities of its future implementation, to identify both the bottlenecks of a particular project and its positive aspects.

Conclusions and offers. The process of detecting and establishing spatial, temporal and other characteristics necessary for the development of measures aimed at ensuring the management of identified risks is defined as risk identification.

all quantitative methods used in risk theory into direct, inverse problems and research methods. The main methods for quantitative risk assessment include the sensitivity analysis method, the statistical test method and the modeling method.

When applying one or another risk assessment method listed above, it should be borne in mind that the apparent high accuracy of the results can be deceptive and misleading.

To assess the probability of losses caused by the occurrence of a risk situation, it is necessary to quantify each type of possible loss. When researching, you should pay attention to the characteristics of the maximum and minimum of the generated indicators to monitor the highest and lowest values of the investment efficiency ratio.

Despite the existence of a significant amount of work, many aspects of investment risk assessment remain not fully developed. In particular, the task of assessing and managing risks, instrumental adaptation of methods for their assessment, including real investment projects, need to be further developed.

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