INVESTMENT PROJECT RISK ANALYSIS IN THE ENVIRONMENT OF RUSSIAN ECONOMY

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The subject of investment appraisal and risk analysis has become very topical in Russia recently because of the growth of investment potential and activity in the country. This paper presents the process of project risk analysis that consists of two main stages: qualitative and quantitative risk analysis. The first part of the paper examines the main groups of investment project risks and the specific character of their identification in Russia. The second part presents the review of the most popular methods of quantitative risk analysis (sensitivity analysis, scenario analysis, simulation) and the peculiarities of their application in the environment of Russian economy.

The application of generally recognized investment decision criteria has become very topical in the conditions of market economy in Russia. However it is important to keep in mind the peculiarities of Russian economy and take them into account during project development and execution. The main features of Russian economy that should be remembered are as follows:

– Russian financial market is relatively undeveloped;

– Crediting rates are set too high;

– The peculiarities of inflation in Russia. The inflation is rather high, irregular, heterogeneous and poorly forecast;

– Several currencies are actually used in Russian economy simultaneously;

– Complexity of tax structure in Russia;

– The difference between Russian accounting standards and International Financial Reporting Standards (IFRS);

– Lack of government financing of the investment projects;

– Fluctuations in paying capacity of population and contracting parties;

– Legislation instability.

All the above-listed features of Russian economy have a significant influence on methodology of investment analysis as a whole and on project risk analysis in particular.

The purpose of this article is to provide a description of basic approaches to project risk analysis in the environment of Russian economy.

Risk can be defined as a source of uncertainty having impact on the outcome of the investment project. That's why risk analysis is an essential part of investment appraisal. The purpose of project risk analysis is to provide the investors with all the necessary information for decision making concerning advisability of their participation in one or another investment project.

Risk analysis usually begins with qualitative risk analysis which consists of project risk identification, risk description, risk classification and analysis of initial assumptions. The outcome of the qualitative risk analysis is the description of project uncertainties, their sources and consequently the description of project risks.

Project risks can be classified according to their appearance during one or another stage of the investment project:

Investment stage risks

1. Risk of insufficient financial support of the investment project. This risk is connected with possible sponsors default and impossibility of project financing. This type of risk can be an effect of various causes like project participants' lack of conscientiousness, participants' financial position, change of managers, different external reasons. The result of insufficient financing can be represented by failure to complete the investment project partially (unachieved planned produc-

tion capacity, impossibility to organize full production cycle, etc.) or entirely (impossibility to proceed to processing stage of the investment project).

2. Risk of project cost increase. This risk is determined by the possibility of investment outlay increase after project financing has already started. It can be connected with suppliers defaults, errors in forecasts, increase of prices, taxes, duties, etc. To reduce this risk in the environment of Russian economy it is recommended to make contracts in fixed prices, to overestimate costs in case of middlemen participation, to include unforeseen costs into expense items.

3. Schedule risk. This type of risk is connected with suppliers defaults, errors in projection, changes in environment, administrative risks, accidents, force-majeure and is associated with failure to complete the project within the estimated time limits because of delays in project construction, delivery date, etc. The specific character of Russian economy requires taking appropriate measures to minimize this risk, for example, contract sanctions for delays.

4. Risk of failure to complete the project to the required level of technical or quality performance. The matter concerns revealed defects in delivered equipment and building and assembly jobs, errors that prevent organizing manufacturing method, achieving planned production capacity, ensuring required quality of products, etc. This risk is usually a sequent of suppliers defaults and errors in projection. To reduce this type of risk in the conditions of Russian economy it is recommended to make the examination of project execution in various stages.

5. Risk of technical unfeasibility of the project. This type of risk is a borderline case of the previous risk. Technical unfeasibility of the project can be a sequent of blunders in project development, choice of project output and basic process. This risk is typical for the projects connected with product innovation or technological innovation.

Processing stage risks

6. Production risks. Risks of this group are associated with interruptions in production process, increase of outlay, technical problems (technical risk), supply irregularity (transport risk), ecological problems (environmental risk), management incompetence (management risk), etc. Risk of outlay increase can be connected with errors in costs estimation during the feasibility study, technological errors, possible changes in price of raw materials and utilities. This risk can become apparent in current cost increase, unachieved production capacity, suspension of production, loss of product quality. This risk can lead to extraordinary expenses, for example, consequences removal in case of environmental damaging. To minimize this type of risk in the conditions of Russian economy it is recommended to avoid application of unapproved technologies, to choose safe suppliers, to study crucial risks of the processing stage, to take out insurance, to make provision for reduction of pollutant emissions, to use prudent forecasts of current costs.

7. Marketing risks. Risks of this group are represented by unachieved planned volume of sales, planned product prices, delay in market entry, etc. Marketing risk is usually the most essential risk in the processing stage of the investment project and is a consequence of price and demand fluctuations, market competition, errors in product choice, errors in market appraisal, errors in market choice, erroneous strategy of marketing and price-formation policy, failure of advertising campaign. Marketing risk is also connected with. Marketing risk is extremely high when the investment project deals with product innovation and competitive market penetration. To reduce this risk in the environment of Russian economy it is necessary to make sales contracts in advance and start project financing only after the market research has been made.

Risks appearing both in investment and processing stages

8. Risk of suppliers defaults. This type of risk is connected with non-delivery or

misdelivery of equipment, delays or errors in building and assembly jobs, warranty service nonfeasance. This risk is associated with cost increase, delays in procurement, failure to achieve the required level of quality performance and therefore the goals of the project as a whole. The specific character of Russian economy generates a need to take measures directed to risk minimization, for example, careful choice of suppliers and contractors, entering into contracts providing for sanctions in case of nonfeasance, taking out various forms of insurance against risks, entering into contracts providing for guarantee of advance repayment and execution of contracts, avoidance of mediation, entering into contracts providing for payment by results of suppliers' or contractors' fulfillment of engagements.

9. Management risks. These risks can appear in the processing stage of the project as variants of production risks or arise in the investment stage. This type of risk is usually connected with errors in managerial control that result in failure to complete project construction, accomplish equipment acquisition or installation, organize production and sale. The main risk factors are lack of experience and inadequate qualification of the managers, senior staff changes.

10. Administrative risks. These risks are connected with difficulties in permission or license obtainment or changes in regulations during project execution. It is very important to take these risks into account in the environment of Russian economy that can be characterized by bureaucratism or red tape: permission or license obtainment can take much time and result in project scheduling variance.

11. Financial risks. These risks are associated with possibility of negative profit in the situation of uncertainty. The main financial risks are the risk of fluctuations in money spending power (inflationary risk, deflationary risk, currency risk), interest risk. Inflationary risk is very important in the environment of Russian economy. Some project managers do not take inflation into account while calculating investment decision criteria but the specific character of Russian economy generates a need to revise models with a glance of inflation. Moreover it is important to keep in mind unpredictability of inflation but at the same it is necessary to remember that inaccurate rate of inflation can substantially distort the values of investment decision criteria and result in wrong summary. Currency risk is connected with unconformity of the actual exchange rate with the expected rate of exchange. Currency risk should be taken into account by those project managers who make calculations in foreign currency to avoid inflationary risk but forget to take into consideration the internal inflation of the currency. Interest risk is connected with changes in crediting rates because of the market fluctuations.

12. Regional (country) risks. These risk are associated with project execution in certain regions or countries that can be characterized by unpredictable governmental performance and other uncontrollable events that can exert negative influence on project outcome. These types of risks usually prevent foreign investors from investments in Russian economy.

13. Legal risks. The factors of these risks are as follows: legislation defects, lack of judicial practice in some spheres, legislation instability, etc. Foreign investors usually mention lack of property and investments defense. But it is necessary to point out the development of Russian legislation and its approach to world standards.

14. Risks of force-majeure. These risks are connected with acts of God: natural disasters, fires, wars, etc.

Qualitative risk analysis is undoubtedly necessary but is not sufficient especially in the conditions of Russian economy where it is important not only to know the list of potential risks but also to estimate them quantitatively thus quantitative risk analysis is more important. There are lots of methods used by project managers to estimate risk. The most popular are sensitivity analysis, scenario analysis and simulation.

Sensitivity analysis helps to measure changes in project result with changes in values of project variables. Sensitivity analysis involves changing the value of a variable in order to test its impact on the project result and therefore is used to identify the most important, highly sensitive variables of the project. The main disadvantage of sensitivity analysis is the assumption that the values of a single variable change while the values of the others are certain. Sensitivity analysis is the simplest and widely used form of risk analysis but determines the project risk only in certain points. This leads to the use of the sensitivity analysis as an information source for other methods of risk analysis.

To analyze project risk with more realistic assumptions regarding correlated variables it is required to use more exact technique like scenario analysis. Scenario analysis remedies the main shortcoming of the sensitivity analysis and takes into account the simultaneous change in values of several key project variables thereby constructing an alternative project scenario.

Scenario analysis is more effective when the number or possible values of the decision criterion is finite but project managers usually face contrary situations when the number of alternative project scenarios is unrestrictedly large. Simulation and its variant Monte Carlo method are the best forma of risk analysis in such cases.

The Monte Carlo method provides a powerful and at the same time rather simple technique of project risk analysis. The main idea of the simulation is based on the assumption that if we know the probability distributions of project inputs we can get the probability distribution of the decision criterion. The flowsheet of the Monte Carlo method includes several stages. The first stage contains preparation of a mathematic model as a function of random variables and certain characteristics. The second stage consists of simulation runs that correspond to recalculations of the model until enough results are gathered to make up a representative sample. This sample is analyzed statistically to estimate various measures of project risks.

The specific character of Russian economy results in some problems and peculiarities of project risk analysis by means of simulation. The main problem is associated with lack of solid statistical information on the project components that is connected with follows:

– Insufficient amount of sampling related to the recent transition to the market economy in Russia;

– Heterogeneity of time series related to the change of the economic system;

– High cost of information.

Project managers usually face these problems while selecting random project variables, determining their probability distributions and correlations and can solve them with the help of expert judgements and various statistical techniques such as analysis of small samples and heterogeneous samples.

In spite of the above-mentioned shortcomings simulation has essential advantages over other examined methods:

– Monte Carlo method allows taking into account unlimited number of variables and analyzing random project scenarios;

– Monte Carlo method discloses weak points of the project and admits of project improvement;

– Monte Carlo method gives a quantitative assessment of the investment project risk.

The advantages of Monte Carlo method make it one of the best methods of the investment projects risk analysis.