

Formation of an Effective System of Project Financing of Investment Activities in the Region

Khakhanaev U. S.-E.¹, Bashirzade R.R.^{2,*} Pakhomova A.V.²

¹Chechen State University, Grozny 364907, Russia

²Yuri Gagarin State Technical University of Saratov, Saratov 410054, Russia

*Corresponding author. Email: ramila_b@mail.ru

ABSTRACT

The alternatives of project financing of investment activity of the region are analyzed as an object of formation of an effective system of innovation and project activity in entrepreneurship. Proceeding from this, new tasks were formulated based on promising approaches to investment planning, namely, fuji analysis, financing of projects in special economic zones, clusters, allowing more targeted implementation of the binding of capital to certain assets (use of capital) at the regional level. When investing, free capital turns into tied capital and is tied into investments against disinvestment. Requirements for the development of an effective system of project financing are formulated. A model of the project financing process has been compiled. At the same time, investment and construction projects are designed to meet the tasks of developing the economic and geographical potential of the region's development, the priorities of spatial and territorial development, increasing the share of high-tech and efficient enterprises, and implementing a progressive diversification of the regional economy.

Methodological recommendations are proposed for studying the process of forming the efficiency of investment activities of project activities with the identification of factors affecting the overall efficiency of an entrepreneur and the effectiveness of innovative and project activities, which in the context of this article is considered in the form of research and development projects as the most relevant for modern conditions for the implementation of national projects.

The socio-economic initiatives caused by state target programs are considered as an essential factor in the development of entrepreneurship as a driver of our economy. Initiative budgeting is considered as a manifestation of a new direction of social orientation of financing projects initiated by the population of the region and initiatives caused by state target programs, as an essential factor in the development of entrepreneurship as a driver of our economy.

Keywords: *investment activity of the region, project financing system, efficiency, fuji analysis, proactive budgeting*

1. INTRODUCTION

The creation of an effective system of project financing of investment activities in the region largely depends on the availability of its sources of financing. Therefore, simultaneously with the study of the implementation of the plan for capital investments, it is necessary to analyze the implementation of the plan for their financing.

Currently, investment projects are financed mainly from the following sources: enterprise profits, depreciation deductions, proceeds from the sale of fixed assets, bank loans, budgetary allocations, enterprise reserve fund, leasing, etc. In a market economy, the share of the bank's own sources and loans is increasing, while budget financing is decreasing. Of great importance for expanding the economic independence of state enterprises is the right given to them to use all available financial resources to

finance project activities, regardless of the sources of their formation and purpose.

In the process of analyzing project financing, it is necessary to study how the tasks of the project are carried out to generate funds for investment activities in general and by main sources, and to establish the reasons for deviations from the tasks, if any. It is also necessary to analyze the changes in the structure of sources of funds for these purposes, to establish how optimal the combination of own and borrowed funds is. If the share of the latter increases, then this can lead to instability of the region's economy, increasing its dependence on banks and other organizations.

Attraction of one or another source of financing for investment projects is associated with certain costs for the region: the issue of new shares requires the payment of dividends to shareholders; bond issue - interest payments; obtaining a loan - paying interest on them, using leasing - paying remuneration to the lessor, etc.

Therefore, in the analysis process, it is necessary to determine the price of various sources of financing and choose the most profitable ones.

The article [1] quite rightly focuses on one of the reasons holding back investments in fixed assets: a fairly long period of time during which investors do not receive income when creating modern production. Accordingly, a long-term withdrawal of funds from circulation or the possibility of long-term borrowing is necessary. The institutions that accumulate the so-called long-term money are large investment and pension funds, insurance companies. None of the groups of these organizations has received sufficient development in the Russian Federation. In practice, there are two sources for long-term lending to direct investment projects in the country: loans received by the largest Russian banks abroad on a long-term basis, and state budget funds, directly or through state-owned banks, directed to finance investments in fixed assets. The first of these sources has now significantly lost its relevance due to the sanctions. The availability of the second source is largely determined by the importance of certain projects to be implemented for the primary interests of the state and the attitude of the highest levels of the domestic bureaucracy both to the projects themselves and to their initiators [1].

It should be noted an important feature of regional projects, which is as follows. The strategic interest of the regions, increasing employment of the population, as well as the general parameters of the standard of living of the population and, therefore, the authorities representing the region, is to ensure the effective placement of competitive investment and construction projects, including the so-called "megaprojects", which are systemic points of growth, as in the context development of the entire regional economy, as well as industrial and infrastructural projects that generate economic development within one or more adjacent municipalities [2]. At the same time, investment and construction projects are designed to meet the tasks of developing the economic and geographical potential of the region's development, the priorities of spatial and territorial development, increasing the share of high-tech and efficient enterprises, and implementing the progressive diversification of the regional economy [2].

2. BACKGROUND

The scientific research in this article is based on the following methodological principles. The investment is considered by the authors as the use and, therefore, the binding of capital to certain assets (use of capital). When investing, free capital is converted into tied capital and tied into tangible or intangible assets. If assets are released as a result of sale or use, they speak of divestment.

In practice, the term investment primarily refers to the use of funds for fixed assets: capital investments (real investments): for example, buildings, machinery, land; intangible investments: for example, licenses, patents, research and development; financial investments: for example, stocks, bonds. Depending on the situation,

among other things, it is proposed to highlight the following types of investments: start-up investments, investment replacement, reinvestments, rationalization of investments, investments in expansion. One of the insufficiently studied issues of investment planning is the interaction of financing and investment. To be able to make an investment, you must first provide capital. In other words, the investment must be financed. In the context of investments, the project activities are linked to the financial resources that were previously provided to the region and its enterprises through financing. When it comes to investment decisions, the goal is to use the invested capital as purposefully as possible. The practical use of a particular method of investing in projects in many cases requires taking into account the peculiarities of assessing the effectiveness of funding sources that take place in a particular region.

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A regional investment project is an investment project whose purpose is to produce goods on the territory of one of the specific constituent entities of the Russian Federation: for example, - the Republic of Khakassia, - the Trans-Baikal region, - the Kamchatka region, - the Krasnoyarsk Territory, - the Primorsky Territory, - the Khabarovsk Territory.

The article discusses the following research questions. In recent years, several positive changes have occurred in Russian legislation, which have made it possible to create a multi-level system of state support for investments. Advertising events open up new opportunities for foreign investors to conduct their business in Russia under the conditions of mutual sanctions. The main focus is on the localization of innovative companies and research centers of leading international corporations in Russia. A special investment contract as a basis for the localization of production is an innovation in Russian legislation in terms of cooperation between the state and private investors. The grounds and procedure for concluding a contract are governed by the Law "On Industrial Policy of the Russian Federation", which entered into force on June 30, 2015. This law is applied in almost all industries in Russia.

The purpose of the study is to develop a scientific justification and implement the process of forming an effective system of project financing for investment activities in the region as a condition for social and economic development and to propose ways to solve the problem of substantiating the model of the effectiveness of project activities in the region, taking into account the economic and geographical characteristics for the effective implementation of investment projects.

Research methods. The analysis of methods and types of formation of an effective system of project financing of investment activities in the region is based on the use of such methods as system analysis, comparative analysis, modeling, observation. Based on the results of the analysis, recommendations were formed on the implementation of the study of investment planning and their financing based on Fuji analysis, according to the model of project activities developed by the authors. The

practical output of the study is that the use of the proposed model as one of the forms of financing and implementation of project activities serves as the basis for making decisions on increasing the efficiency of investment of financial resources. Taking empirical research as a basis, in the context of analyzing the financial and investment situation and its interaction with project activities in the regions, as well as the authors' recommendations on the use of Fuji analysis, it is possible to increase the validity and feasibility of project activities depending on structured factors in the field of entrepreneurship. In addition, recommendations for analyzing the nature of investments and their financing will serve as a basis for focusing attention on projects, the innovative nature of which will improve their social component as one of the defining results of project activities of regional entrepreneurs.

3. RESULTS OF THE STUDY

In the course of the research, the structuring of the elements of the financing system was carried out, which is considered by the authors as a set of sources, forms and methods of financial resources used in the implementation of a specific investment project. The investment financing process has been formed, which includes the following stages:

First stage. Determination of the purposes of using financial resources.

Second stage. Development of a financing plan: distribution of monetary resources by directions and stages, risk assessment and selection of compensation and insurance mechanisms, selection of suitable sources of financial resources.

Third stage. Organization of financing: selection of rational forms of financing, determination of organizations vested with financial powers, determination of the procedure and conditions for involving resources from various sources in financing, formation of a system for monitoring the implementation of the financial plan and reporting on the results of using financial resources.

The main sources of financial resources are:

- net profit
- depreciation deductions
- on-farm reserves and other funds of the enterprise
- funds accumulated in financial institutions and banks
- funds received in the form of loans and borrowings from international organizations and foreign investors
- funds received from the emission of the central bank
- targeted funding from higher organizations or from non-state funds
- funds of budgets of various levels.

– Investment projects can be financed from one source or from several sources at once. Funding sources are classified according to the following criteria:

1. By type of property
 - 1.1. public investment resources
 - 1.2. foreign investment resources
 - 1.3. investment resources of other organizations, institutions
 2. By property relations:
 - 2.1. Own
 - 2.2. Borrowed (bank loans, funds from the issue of bonds, targeted government loans, tax investment loans, loans and borrowings of international organizations and foreign investors)
 - 2.3. Attracted funds - funds received from attracting ordinary shares, contributions to the authorized capital, sponsorship funds, state budget allocations
 3. Degree of risk when carrying out financing of operations
 - 3.1. Risk-free - sources of own funds at the disposal of the investor himself
 - 3.2. Increasing risks - funds from other sources that do not have 100% reliability in meeting the financing conditions.
- By an investment project we mean a planned and ongoing set of measures for investing capital in various sectors and spheres of the economy in order to increase it. The implementation of an investment project related to the creation of a new or reconstruction, technical re-equipment (re-equipment) of an existing enterprise or production requires a number of measures to acquire, lease, allocate and prepare a land plot for construction, conduct engineering surveys, develop design documentation for the construction or reconstruction of an enterprise, production, construction and installation work, purchase of technological equipment, start-up and adjustment works, provision of the created (re-equipped or re-profiled) enterprise (production) with the necessary personnel, raw materials, components, organization of sales of products planned for production. The implementation of these measures in relation to time and organizational and technological considerations is considered as an investment process.

Investment method - a mechanism for obtaining monetary resources in order to finance the stages and operations of an investment project.

The following main methods are distinguished:

1. Self-financing - used in the implementation of small projects, for the implementation of which there are enough funds at the disposal of the enterprise. In a normal economic mechanism, up to 70% of self-financing is provided by the amortization method, the rest comes from other sources.
2. Credit financing - carried out in the form of a loan or issue of bonded loans. In economic practice, the most widespread use of the trail of loans: banking, commercial, government, foreign. According to the form of granting, the loan can be cash and commodity. The purpose of the loan: investment, mortgage, tax. By the term of validity:

long-term (from 3 years), medium-term, short-term (up to 12 months.).

3. The provision of an investment tax credit consists of deferring the payment of taxes on investment-related activities for a period of 1 to 5 years; the amount of benefits received by the company is set at a 50-75% interest rate. The application regulations are governed by Article 68 of the Tax Code. The application of this method is expected in the implementation of socially-oriented investments, investments associated with innovations, and with research and development and development.

4. Equity financing
5. Government funding
6. Project financing
7. Leasing

The forms of financing include:

1. Equity financing is a form of obtaining additional investment resources by issuing securities. This form is used to reduce long-term loans in the capital structure of the invested project. There are two equity financing mechanisms in place:

- 1) Additional issue of securities for a specific investment project initiated by the company.
- 2) Formation of specialized investment funds of the company in the form of joint-stock companies, where the entire capital of the investment project is formed through the issue of shares.

2. Government funding:

- 1) The provision of state loans on a repayable preferential or irrevocable basis.
- 2) Financing within the framework of federal investment programs.

3. Debt financing.

Based on the structuring of the elements of the financing system and on the experience of other countries, the following model of financing investment projects is proposed, which can be used to implement project financing in the region as a tool for choosing alternative sources of financing (Fig. 1) in order to get out of the crisis and start a new stage of development.

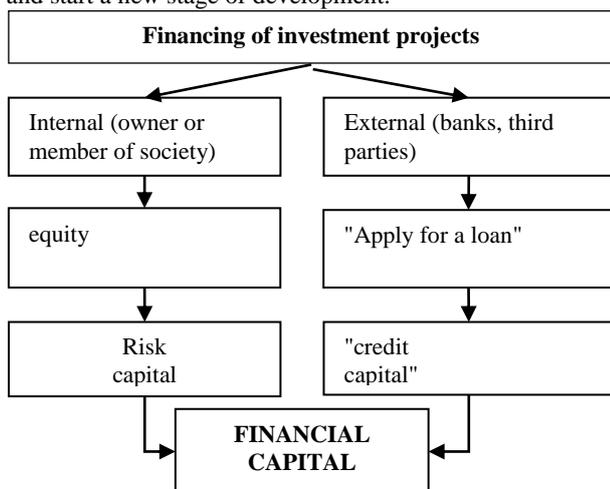


Figure 1 Model of financing investment projects (by sources)

This article provides a brief description of these forms of financing, based on the following reasons for the attractiveness of these alternatives for the regions:

- the need to support the development of industries focused on the domestic consumer market;
 - priority financing of regional enterprises focused on the production of products of strategic importance;
 - national interests and economic security;
 - to develop and implement a development strategy for state support of existing and newly created enterprises and associations;
 - to highlight among the priority areas of financing investment projects production sectors.
- Special economic zones.

A special economic zone is a part of the territory of the Russian Federation that is determined by the Government of the Russian Federation and where special rules for doing business are applied and the customs clearance procedure in the duty-free zone can be applied. The cluster approach leads to an increase in the competitiveness of regions as a result of the interaction of participants in the territorial-production cluster, access to investments, innovations, modern infrastructure [3].

Currently, one of the most important sources of budget revenues is the contributions of taxpayers and citizens. The question of how to build a connection between citizens and the budget of the country, regions, municipalities is urgent. Proactive budgeting practices can answer this question, eliminate such problems, and increase budget transparency. Increasing the number of regions implementing the practice of proactive budgeting is the main goal of the Memorandum of Cooperation in this area, signed by the Russian Ministry of Finance and the World Bank.

4. DISCUSSION OF RESULTS

In recent years, Fuji analysis has become widespread in the practice of investment and financial forecasting, as the basis of a new model, through which it is possible, using a heuristic approach, to consider and evaluate alternative financing by an expert. However, its application requires scientific substantiation of the principles and requirements for the method, which are proposed in this article.

The most difficult and problematic for the financing of investment projects, from our point of view, is the substantiation of the formation of a model of an effective financing system. To a certain extent, the solution of the problem of choosing alternative financing will be facilitated by the approach proposed by the authors, based on Fuji theory as a new model in accordance with the formulated principles:

1. Forecast of the benefits of alternatives.
2. Inability to fully foresee the risks of projects.
3. Application of probabilistic calculations for risk assessment.

4. Determination of risks by management deficit.
5. Development of an optimal planning model for alternatives.
6. Formation of strategies to reduce the unreliability of forecasts.
7. Integration of expert knowledge into planning models.
8. Processing and preparation of up-to-date planning information for financing investment projects.

Next, consider the general formulation of the mathematical model of Fuzzy-regression analysis

With classic regression analysis, you can only process data represented by regular real numbers. However, in the case we are considering, individual input indicators and parameters can be described either in the form of linguistic variables, or Boolean variables, or interval values. Fuzzy-regression analysis methods can use both fuzzy information and information represented by real numbers, as well as the value of data on the belonging of parameters to certain intervals (representing individual linguistic terms) as initial information, which significantly expands the scope of their application.

The following statement of the Fuzzy-regression analysis problem is of certain interest. Let the observation matrix

$$(XY) = \begin{pmatrix} X_{11} & \dots & X_{n1} & Y_1 \\ X_{12} & \dots & X_{n2} & Y_2 \\ \dots & \dots & \dots & \dots \\ X_{1N} & \dots & X_{nN} & Y_N \end{pmatrix}$$

represented by Fuzzy numbers. It is necessary to find a fuzzy linear regression model of the form

$$\bar{Y} = a_1 \otimes \bar{X}_1 + a_2 \otimes \bar{X}_2 + \dots + a_j \otimes \bar{X}_j + \dots + a_n \otimes \bar{X}_n + a_0,$$

where X, X_2, \dots, X_n are some fuzzy sets with given membership functions, and the coefficients of the model are $a_1, a_2, \dots, a_j, \dots, a_n$ and a_0 are some real figures. Note that in a particular case, some input variables X and the output variable in sets of information can be represented by real numbers.

Operations " \otimes " and " $+$ " - respectively operations of multiplication and addition of fuzzy sets. The result of calculation by this formula is also some fuzzy set.

$$(m_j, v_j = m_j - \lambda_j, w_j = m_j + \mu_j)$$

In what follows, we restrict ourselves to considering the triangular and trapezoidal membership functions of the LR representation of the form (see Fig. 1.1),

where and

$$(m_j^1, m_j^2, v_j = m_j^1 - \lambda_j, w_j = m_j^2 + \mu_j)$$

- respectively parameters

this membership function. The form of these membership functions is shown in Fig. 1.1.

Let us consider mathematical models of this problem in the case when Fuzzy-sets of input and output variables are represented by triangular membership functions. The central points of the membership functions $f(X_i)$ and $f(Y_i)$, respectively, of the input and output variables Y_i of these Fuzzy-sets will be denoted by m_j , respectively, the left extreme points are $(m_j - \lambda_j)$ and $(m_j - A_i)$, and the right extreme points are $(m_j + \mu_j)$ and $(m_j + A_i)$, $j = i =$

As a criterion for the quality of approximation, we choose the minimum of the weighted average sum of squares of deviations of the calculated parameters of the output variable according to the Fuzzy-sets regression model from their actual values

$$F_1 = \left[\sum_{i=1}^N \left\{ \bar{m}_i - \left(\sum_{j=1}^n a_j \cdot m_{ij} + a_0 \right) \right\}^2 \right] \rightarrow \min,$$

$$F_2 = \left[\sum_{i=1}^N \left\{ (\bar{m}_i - \bar{\lambda}_i) - \left(\sum_{j=1}^n a_j \cdot (m_{ij} - \lambda_{ij}) + a_0 \right) \right\}^2 \right] \rightarrow \min,$$

$$F_3 = \left[\sum_{i=1}^N \left\{ (\bar{m}_i + \bar{\gamma}_i) - \left(\sum_{j=1}^n a_j \cdot (m_{ij} + \gamma_{ij}) + a_0 \right) \right\}^2 \right] \rightarrow \min$$

Let us also consider a special case when the output variables in the set of experimental data are real numbers with the value $Y_j = t_j$, and the input parameters are fuzzy sets, the membership functions of which $f(X_i)$ are represented by trapezoids with parameters $(t, t - L_i, t^* + L_i)$. Building a Fuzzy-regression analysis model in this case is reduced to solving the following multicriteria problem

$$F_1 = \left[\sum_{i=1}^N \left\{ y_i - \left(\sum_{j=1}^n a_j \cdot m_{ij}^1 + a_0 \right) \right\}^2 \right] \rightarrow \min,$$

$$F_2 = \left[\sum_{i=1}^N \left\{ y_i - \left(\sum_{j=1}^n a_j \cdot m_{ij}^2 + a_0 \right) \right\}^2 \right] \rightarrow \min,$$

$$F_3 = \left[\sum_{i=1}^N \left\{ y_i - \left(\sum_{j=1}^n a_j \cdot (m_{ij}^1 - \lambda_{ij}) + a_0 \right) \right\}^2 \right] \rightarrow \min,$$

$$F_4 = \left[\sum_{i=1}^N \left\{ y_i - \left(\sum_{j=1}^n a_j \cdot (m_{ij}^2 + \gamma_{ij}) + a_0 \right) \right\}^2 \right] \rightarrow \min.$$

In expression (1.21) $j = \overline{1, n}$, $i = \overline{1, N}$. The optimized parameters of multicriteria problems (1.20) and (1.21) are the values of the coefficients $a_0, a_1, a_2, \dots, a_j, \dots, a_n$.

The solution to this problem is implemented according to the models described in sufficient detail in the literature on Fuzzy analysis.

To solve the tasks set for the country's economy on modernization, import substitution, integration into the world economy, large investments are required. Let us formulate general features for technical regulatory processes and regulatory economic processes of decisions regarding the formation of an effective system for financing investment projects:

1. Economic decision processes are modeled more often as regulatory processes.
2. Creation of comprehensive and accurate input information in reality is often impossible or at least associated with high costs.
3. Relevant information should be processed and prepared in a timely manner, adequate to the requirements of managers, and without loss of information.
4. Highly complex knowledge of experts should be integrated into the model of predictive financing of investment projects.

5. Decisions and ordering, regulation of regulations and orders, regulation rules are associated with concepts such as, for example, "high costs" or "high speed", in other words, with linguistic variables.
6. To reduce the high level of unreliability for both the decision-making process and the regulatory process, an error-free or error-tolerant financing information system is required.

5. CONCLUSION

Thus, the main sources of capital are equity and borrowed funds, in particular, bank loans, issued shares, and bonds. Let us consider the general methodological approaches to determining the cost of various forms of financing for organizations investing in projects as a basis for assessing alternatives.

The price of bank loans is equal to its annual interest rate. Considering that interest for using bank loans is included in the cost of production and reduces taxable profit, the price of this resource is less than the interest paid to the bank (SP) by the level of taxation (Kn).

$$Ckr = SPx (1 - Kn)$$

The price of such a source of financing as the company's bonds is equal to the amount of interest paid on them (P). If the cost of paying this interest is allowed to be attributed to profit before tax, then the price of this source of financing will also be less by the taxation level:

$$Cobl = P \times (1 - Kn)$$

The price of share capital, as a source of financing for investment activities, is equal to the level of dividends paid on preferred and ordinary shares, calculated using the arithmetic weighted average.

Reinvested profits can also play a large role in investments. The price of this source of financing in joint-stock enterprises is approximately equal to the level of dividends on ordinary shares, since the operation of reinvesting profits is tantamount to the acquisition of new shares by shareholders.

Having carried out a comparative analysis of the price of funding sources at the analyzed enterprise implementing the investment project, we obtain:

Bank interest rate - 40%; taxation level - 30%:

$$Ccr = 40 (1 - 0.3) = 28\%$$

Dividend rate on ordinary shares - 25.3%.

Consequently, reinvested profit is a relatively cheaper source of financing compared to bank loans, but it is limited in size. Bank loans are theoretically unlimited, but their price can significantly increase with an increase in the share of borrowed capital, as payment for increasing risk.

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