

MATHEMATICAL MODEL INCREASING SAFETY OF VENTURE FUND

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With the development of information technology, companies that generate technological ideas are developing. To implement ideas and make them an independent product ready for sale, financing is needed. One of the sources of this kind of financing is venture funds. The peculiarity of the functioning of venture funds is evident from the name ("propensity to risk") and their profit consists of buying a share of the campaign (startup) by investing in them funds. The main features of venture financing are: a relatively small amount of ownership; the possibility of risky investments in the early stages of the startup; direct participation of the fund in the management of the company invested; obtaining income by selling a share of the company's property; opportunities for diversification of risks.

The fundamentals of risk management of venture funds are diversification of the investment of small funds into various projects. The activity is considered to be optimal, with the simultaneous financing of several projects or co-financing of projects by several venture funds. The activity of venture business can be successful if it works synchronously: a venture fund, a startup company and a "venture manager". "Venture Manager" - a person or company that helps in finding investors for a startup, and investors to assess the risks of project start-ups and build a ranking range of their success [1].

Thus, in order to ensure the economic safety of the functioning of venture funds and the soundness of decision-making on the financing of an innovation project, the urgent task of creating a technology for assessing the risk of financing an innovation project.

To solve such a problem, it is necessary to develop an information technology for evaluating projects (innovative) in the conditions of uncertainty of input data and estimation of the economic sector in which the project is being implemented. On the basis of aggregated estimation data, to make an adequate decision on the financing of projects, thereby enhancing the security of the venture manager. The creation of this technology involves the development of a mathematical apparatus and the design of software in the form of a web-platform. The use of such a web-platform by a venture manager will allow adequately evaluating projects, finding investors under them and reducing the risk of financing to venture funds.

One of the main reasons for the discrepancy between the entrepreneur and the venture fund is the lack of proper communication between the two parties, that is, investors often fail to very successfully explain to entrepreneurs their need and method of repayment, and sometimes the venture fund decides to eliminate the founder and hire an experienced executive director as well as discrepancy ambitions.

"Venture Manager" can be endowed with the following functions: portfolio management of innovation projects (selection, evaluation, portfolio balancing, optimization, monitoring); direct management of an innovative project (planning,

implementation, market entry, financing, personnel management); management of financial, commercial and technical risks; financial management of an innovative enterprise; monitoring and control. Therefore, a venture manager can act as an intermediary between the venture capital fund and the entities involved. In this regard, the venture manager needs new paradigms for successful and high-quality functioning.

Mathematical models of problem solving. Let's have projects at the entrance P_1, P_2, \dots, P_n different perspectives, nature and safety of implementation. At the output - evaluated projects regarding the level of safety of their implementation.

To evaluate the startup of projects, a model for evaluating startups in terms of information uncertainty [2] has been developed. The developed model gives an opportunity for the recruited expert points of a weakly structured or unstructured task to get interpretations, revealing the subjectivity of experts and have a quantitative assessment of the startup of the project.

A mathematical model is proposed for evaluating investment projects, which will allow to project investment projects according to the investor's purpose [3]. This model takes into account factors of uncertainty in decision-making, is based on a hierarchical structure and takes into account the wishes of investors at the final stage of selection.

To evaluate the economic sector in which the project is being implemented, we use the developed method for ranking alternative variants of inhomogeneous nature [4]. The proposed algorithm allows to adequately solve such a complex problem as estimating the prospects of functioning of the economy for the possibility of capital investments. The aggregated estimation of the functioning of the economy will be normalized from the interval $[0;1]$ and we will denote it O_S .

Thus, the "Venture Manager" will receive an adequate and objective evaluation of the project, which is assessed exclusively by experts O_P and an assessment of the economy in which the project is being implemented O_S . Aggregation of ratings by "Venture Manager" can be done according to the following formula [5]:

$$m = w_1 \cdot O_P + w_2 \cdot O_S, \quad (1)$$

where w_1 – normalized weighting factor of project startup evaluation, as well w_2 – normalized weighting factor for the estimation of the economy.

Let's introduce a linguistic variable $M(m)$ = "The level of security of project financing". A universal plural for a variable $M(m)$ there is a segment $[0; 1]$, but a set of values of a variable m – term set $M = \{m_1, m_2, m_3, m_4, m_5\}$, where: m_1 = "Very low level of project financing security" ($m \in [0; 0,21]$); m_2 = "Low level of project financing security" ($m \in (0,21; 0,36]$); m_3 = "Average level of project financing security" ($m \in (0,36; 0,47]$); m_4 = "Security level of project financing above average" ($m \in (0,47; 0,67]$); m_5 = "High level of project financing security" ($m \in (0,67; 1]$).

Thus, the project's initial assessment will aggregate the project's assessment and the level of security of its financing. Based on this, a further decision by the venture manager regarding the financing of the project is made.

Conclusions:

The economic security of the functioning of venture funds is directly dependent on decisions on the financing of certain innovative projects. Therefore, the establishment of a technology for assessing and establishing the levels of security of project financing will increase the security of venture capital funds. This technology works in the conditions of uncertainty of input data, reveals the subjectivity of evaluation and is based on the perspective of the economy in which the project is being implemented. Implementation of the created technology into the software (web-platform) will allow an adequate evaluation of innovative projects by the venture manager, find an investor under them and reduce the risk of funding to venture funds, which will increase their security.

Sources

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ИССЛЕДОВАНИЯ Р-Тl-РУД СТУДЕНТАМИ СПЕЦИАЛЬНОСТИ «НАУКИ О ЗЕМЛЕ (ГЕОЛОГИЯ)» С ИСПОЛЬЗОВАНИЕМ НЕСПЕЦИАЛИЗИРОВАННЫХ КОМПЬЮТЕРНЫХ ПРОГРАММ

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