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METHODS TO EVALUATE UNCERTAINTY OF INVESTMENT PROCESS IN INNOVATIVE ORGANIZATIONS*

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МЕТОДЫ ОЦЕНКИ НЕОПРЕДЕЛЕННОСТИ ИНВЕСТИЦИОННОГО ПРОЦЕССА В ИННОВАЦИОННЫХ ОРГАНИЗАЦИЯХ**

The article is dedicated to the potential of expert methods when being used to evaluate environment uncertainty of investment processes in organizations involved in innovative activities.
UNCERTAINTY ASSESSMENT. INVESTMENTS. PROCESS. INNOVATIVE ORGANIZATIONS.

Посвящена возможностям использования экспертных методов оценки неопределенности внешней среды при осуществлении инвестиционных процессов в организациях, деятельность которых носит инновационный характер.
ОЦЕНКА НЕОПРЕДЕЛЕННОСТИ. ИНВЕСТИЦИИ. ПРОЦЕСС. ИННОВАЦИОННЫЕ ОРГАНИЗАЦИИ.

Today, the Russian economic system sees some negative trends, primarily related with constant modifications of legal, administrative and financial environment, caused both by the necessity to redirect the economic development (to modernize) the country and by the world's financial crises effects. This results in the growth of entropy in the business environment of economic agents which primarily affects investment processes in a negative way. Uncertainty of the investment environment leads to lower activity of its participants with the trend being more visible in case the investment recuperation period gets longer. This circumstance imposes certain requirements on strategic plans. Certain methods to raise investment and options to finance venture companies are needed, as well as different approaches to apply the mother corporation's potential and different strategies to stand down business. For innovative organizations the uncertainty of investment processes, related with the environmental uncertainty, produces increased risks with consequent decrease in activity in this business. That's why examination of ways to expand tooling backup to take decisions in the sphere of investments into innovative activities seems important both from theoretical and practical standpoint [1].

Russian government has declared the policy of modernization and innovative character for the economy development. However, practical implementation of the policy is rather contradictory, since measures proposed often do not meet the consistency requirements. Objectives to modernize Russian economic system are to be reached under the effects of the world financial crisis, which has resulted in budget deficit [2]. According to the statistics of the National Association of Innovations and Information Technology Development (NAIITD) the investments into innovations decreased by 70–80 % in 2009. Big corporations reduced their investment up to 90 %, business angels up to 60 % and venture funds up to 45 %. So, in effect, private investments have been decreased considerably.

At the same time the state financial support cannot be considered sufficient. Statistics say that funding of the innovative activities, even though the policy of modernization and innovations in the economy of Russia has been proclaimed, grew only by 0.1 % in 2011.

Today we can mention two public investment funds meant to form financial resources for Russian innovative organizations. They are Russian Venture Company (RVC) and Rosinfocominvest fund. The

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latter, despite being set up as early as 2006, started its activities in 2009 due to different red tape barriers. As for RVC, we can speak with confidence about it being low-effective.

Investment processes in innovative enterprises can be ensured by means of different financial sources (vehicles), which should include: funds, allocated for the development of the innovative sphere in terms of special purpose federal programs, including the ones which are to activate modernization processes; grants, provided by the federal and the regional governmental executive bodies; funding by venture funds; funding by governmental investment funds and non-governmental organizations; funding by private investors, including foreign ones; innovative enterprise's own funds: retained profits and depreciation fund[3].

An effective investment mechanism can be built in case interests of the agent with ownership function dominate, i. e., in this case, those of the investing company, and the criterion of the accommodated decision can be defined as follows: 'To provide capacities for production use of the invested capital in terms of the national legislation within unlimited time interval'. This criterion, being fixed on the federal level, can result in dramatic decrease in the investors' anxious expectations and reduce instability forecast by them. This refers to the legal component of the foreign investments attraction mechanism, which is being developed in terms of certain policy. The directions of such policy can have different vectors, for example:

– policy of foreign investments and trade restriction up to their absolute embargo in most industries;

– policy of foreign capital restriction in a national company, implying strict tax regime for foreign investors, limitation of profit export, complicated procedure for investment capital return;

– policy of foreign investments stimulation (tax and duty exemption, insurance of foreign investors' risks, etc.).

One can draw a conclusion from the analysis performed that the investment process in Russia can become sustainable only provided that the legal treatment of this process is based on the dominance of the ownership function and, correspondingly, on the dominance of the specific interest of the ownership agent (investor) over the specific interests of the regulatory agents, which are understood here as representatives of federal and territorial administrative bodies. This conclusion put a condition on forming the foreign investments attraction mechanism on the federal microeconomic level, since legislative regulation of the ownership issues is in the competence of the federal regulatory bodies. All the afore-mentioned implies that the law should apply to domestic and foreign investors without discrimination, since domestic investors, alike foreign ones, are owners of their production resources, including capitals [4].

One of the procedures which allows revealing possible inconsistencies in the definition of the criterion for setting up the accomodated regime of foreign investments and mechanism of their attraction is multidimensional expertise. With its help it is possible to compare some items under several characteristics. It is suggested that the results of this expertise should be used to increase effectiveness of the investment process on the level of the constituent agent of the federation and also in order to improve the strategic planning processes for the participants (partners) [5]. According to the general scheme of this procedure, first, each expert should identify significant, in his opinion, characteristic of the effectively operating mechanism of investment resources attraction, excluding those aspects that are within the competence of the federal centre. Thus, the expert should give his own variants of answer to the question: «What are the principles or lines of business of an innovative organisation that can be accepted as the basis for an effectively operating mechanism of investments attraction?».

Below there are factors that can be accepted as a basis for a list of necessary qualities to be made by each expert individually:

– anty-cycling development;
– increased fast growth;
– prolonged demand;
– benefits of mass production;
– differences in the operational activities (low production costs);
– resource access;
– competitive advantages.

The list of these factors was proposed by the authors on the basis of the qualitative analysis of the characteristics of the modern investment processes in Russia, which have been detected on the basis of statistical and analytical surveys.

The choice of an accommodated strategic interest of the investing company and innovative organization is the first stage of the expertise. The second stage is to choose forms and methods to attract investments, which should include:

– formation and implementation of strategic investment programs of an innovative organisation;

– granting guarantees and incentives to the investors in accordance with the federal and regional programs of innovative activities support.

The procedure has been put into practice by the authors of the article. Managers of lending divisions from five banks with foreign participation, which are investing or plan to invest in innovative organizations in Russia, acted as experts.

Each expert has identified the following strategic criteria for the first stage of the expertise (See Tab. 1).

The consultant who carries out the expertise analyzes the revealed characteristics and removes those which coincide in contents from the list. Each characteristic is awarded with a letter code.

The cards with answer tables are handed out to the experts and each of them in the box «Choice» marks with a special symbol those characteristics which are most important from his standpoint.

On the basis of all the tables obtained from and filled in by the experts, Tab. 2 is made. This table includes all the characteristics according to their priority – the first ones are the characteristics mentioned by all the experts, followed by the ones mentioned by the majority of the experts. Further on there are characteristics identified as working ones. In the expertise that has been carried out there are five of such characteristics – A, B, C, E, F.

The results of the first stage of the expertise include the list, made on the basis of the data obtained from the experts, of significant characteristics to evaluate the effectiveness of the decision to be made.

The first step of the second stage demands that each expert should make all possible pair comparisons of the characteristics. They are made with the use of special deck of cards, every of which bears a pair of characteristics. The number of cards in the deck depends on the quantity of the identified characteristics. In the expertise that has been carried out, the number of cards is equal to the quantity of possible pairs – 10. ten.

The cards are shuffled and given out to the experts. Each expert has to distribute 100 points in between the two characteristics stipulated on the card.

Table 1

Experts' choice of strategic criteria

I Expert	II Expert	III Expert	IV Expert	V Expert
Access to resources Life extension technologies Counter-cyclical Faster growth The benefits of mass production	Competitive advantages Access to resources Extended Demand The benefits of mass production	Extended Demand Access to resources	Access to resources Faster growth Persistent-Susceptibility Honesty	Faster growth Access to resources Differences in activity The benefits of mass production Counter-cyclical

Table 2

Signs	Experts Index	1	2	3	4	5	Selection
1. Counter-cyclical	A	+	+	+	+	+	×
2. Faster growth	B	+	+	+	+	+	×
3. Extended Demand	C		+	+	+	+	×
4. The benefits of mass production	F	+	+	+	+	+	×
5. Differences in activity	E	+	+	+			×
6. Access to resources	H	+	+	+	+		–
7. Life extension technologies	D		+	+			–
8. Competitive advantages	G	+					–

The second step of this stage includes definition of the priority (significance) of the characteristics for every expert.

Evaluations of characteristics have been transferred from each card into the corresponding columns of the table and the total score has been calculated for every characteristic. Significance of the characteristic that got maximum score has been taken as one; evaluations of other characteristics' significance have been defined as the ratio between their scores and the maximum one. Thus, for example, for the first expert, characteristic A gets the maximum score – 280 points. The significance of this characteristic has been taken as one. Correspondingly, the significance of characteristics are as follows:

$$B = 250 : 280 = 0.89$$

$$C = 210 : 280 = 0.75$$

$$E = 150 : 280 = 0.53$$

$$F = 110 : 280 = 0.39$$

As a result the characteristics have been classified according to their significance for each expert. Thus, for the first expert, the most significant characteristic is characteristic A (significance 1), then – characteristic B (0.89), characteristic C (0.75), characteristic E (0.53), characteristic F (0.39). For the second expert, the most significant characteristic is characteristic B (significance 1), then – characteristic A (0.92), characteristic C (0.77), characteristic F (0.73), characteristic E (0.42). For the third expert, characteristic B is the most significant, too (significance 1), then characteristics C and E (significance 0.88), characteristic A (0.75), characteristic F (0.67). For the forth expert, classification of characteristics from the point of their significance looks as follows: characteristic E (1), characteristic A (0.88), characteristic C (0.73), characteristic B (0.65), characteristic F (0.58). For the fifth expert: characteristic B (1), characteristic C (0.88), characteristic F (0.77), characteristic A (0.65), characteristic E (0.54).

To identify the general priority of the strategic criteria for all the experts, the summary table of characteristics significance for all the experts has been made up (See Tab. 3).

Table 3

Significance signs by experts Signs	1	2	3	4	5
A	1	0.92	0.75	0.88	0.65
B	0.89	1	1	0.65	1
C	0.75	0.77	0.88	0.73	0.88
E	0.53	0.42	0.88	1	0.54
F	0.39	0.73	0.67	0.58	0.77

To identify the general priority of characteristics it is necessary to detect the characteristic whose significance in Tab. 3 gets maximum unities. Such a characteristic is called the leading characteristic. In the expertise that has been carried out, the leading one is characteristic B, which has a maximum significance for the second, third and fifth expert.

Then, significance ratios between the leading characteristic B and all other characteristics have been calculated.

For instance, for the first expert the following ratios have been defined:

$$B : A = 0.89 : 1 = 0.89;$$

$$B : B = 0.89 : 0.89 = 1.0;$$

$$B : C = 0.89 : 0.75 = 1.19;$$

$$B : E = 0.89 : 0.39 = 2.28;$$

$$B : F = 0.89 : 0.53 = 1.68.$$

Then, on the basis of the data obtained, the average value has been calculated for the priority of the characteristics which are compared. Thus, for characteristic A, the average value of the characteristic ratio for all the experts is the following:

$$(0.89 + 1.09 + 1.33 + 0.74 + 1.54) : 5 = 1.12$$

As a result the final scale has been formed, which identifies the significance of the characteristics chosen by the experts (See Tab. 4):

Table 4

Evaluation of strategic criteria significance

Signs	Coefficient value
A	0.90
B	1.00
C	0.89
E	0.60
F	0.72

Thus, characteristic B has proved to be the most significant (most rapid growth), characteristic A has become the next (anti-cycling development), followed by characteristic C (prolonged demand) and characteristic F (benefits of mass production) with characteristic E as the last one (differences in the conditions of business – low production costs). Thus, the foreign investors' value chain can be formed. Consequently, economic growth, active anti-crisis measures with still relatively low, comparing to the developed countries, labor costs, and availability of raw material resources are the factors which justify the foreseen growth of foreign investments.

The results of the expertise show that potential investors see Russia, in the first place, as a zone of strategic interests, which provides a larger, comparing to their own country, market share and gives insurance against production, sale and technology cycling. This result of the expertise proves to be unexpected and interesting, since it shows that instable economy of Russia can still be seen as a sort of buffer which diminishes instability in one's own country. Economic, financial criteria as such (benefits of mass production and low production costs) have been put by the investors in the last place in their value chain. This situation allows forecasting potentially possible appeal of the innovative business for foreign investors.

The contemporary situation in the Russian economic system characterizes with inconsistency and instability of the business environment for all economic agents, which results in increased instability of investment processes. The aforementioned negative trends significantly diminish opportunities to use multi-vehicle funding for innovative organizations and make them pay more attention to the mechanism of foreign investments attraction. All agents of the economic system whose interests, preferences and activities affect the uncertainty of investment processes (increasing or decreasing risks) are to be seen as participants (partners) of the investment process. Participants' (partners') interests, objectives and spheres of influence have hierarchical and contradictory character. The basic contradiction appears when implementing regulatory function (federal and regional legislative and executive bodies have it) and ownership and user functions (this function is primarily that of investing companies and partner companies in the recipient country). It is related with the necessity to take decisions in the field of investment climate and implement innovative projects, whose implementation periods can exceed considerably the periods of power authorization, established by the political system [6].

The effectively functioning mechanism of investments attraction is possible on the basis of accommodated strategic criteria for taking investment decisions. The condition for reduction of the environmental uncertainty, affecting uncertainty of investment processes in Russia, is appearance of legal treatment of investments which is based on the ownership function prevailing over regulatory function [7]. This will ensure the priority of economic interest for agents performing ownership and user functions (the investor and investor's partner company) in comparison with the interests of agents with regulatory function (government bodies). Such legal treatment helps reduce corruption risks, which are bound to arise in case there is no accommodation of interests in the investment process.

It is reasonable to use the multi-dimensional expertise as a mechanism to identify the investor's value chain in the specific Russian conditions. Approbation of the proposed methods for expert survey has shown, that an opportunity to expand sales market and level off the effects of the economic recession (opportunity of anti-cycling influence) has proved to be of most interest for foreign investors. The obtained results can be used to form a system of measures to improve the investment climate on the level of a region, as well as to work out strategic plans of investment development by innovative organizations. The results of the expertise, carried out on the methodologically justified and correct basis, if being used, allow increasing the strategic planning quality and create prerequisites for risk reduction in innovative business. If the aforementioned prerequisites are implemented, possibility that the foreign investors' interests will shift from strategic priorities, mainly related with marking their presence in the Russian market, towards financial criteria, expressed in the grown profitability of investments, increases.

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