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Methodology of Analyzing and Managing the Riscs of Integration of the Subjects of Innovation Processes

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Abstract: The study deals with the problems of development of methodology of analyzing and managing the risks of integration of the subjects of innovation processes in connection with the fact that the complex theoretic and applied works considering management of innovation risks in terms of integration of innovation processes subjects do not exist. Assuming that the risks arising in integration of the subjects of innovation processes have negative influence on innovation activity and considerably lower its eventual result, the researchers offer to expand opportunities of managing innovation risks by means of developing methodological apparatus of their evaluation. It has been offered by the researchers the algorithm of risk management in the framework of integration of innovation process subjects, the scheme of formalization of interrelation of assessment and mechanism of managing innovation risks, the system of indicators of performance assessment of integration of innovation subjects. The results of the empirical studies to be carried out confirmed the feasibility of practical use of the suggested methodological support in obtaining predictive estimates of innovation risks.

Key words: Integration of innovation processes subjects, innovation risks, formalization, interrelation, mechanism of estimating and managing risks of integration of innovation processes subjects

INTRODUCTION

The task of growth of innovation potential of Russia and also the necessity of modernization of the economy based on using technologies of sixths setup require adoption of new approaches to integration of the subjects of innovation processes and methods of its intensification. It is integration of the subjects of different levels that increases innovation potential, efficiency of the economy on the whole, provides competitive capacity and leadership on Foreign market (Doroshenko, 2013).

Introducing the forms of integration interaction of innovations is connected with high risks that are needed to minimize (financial, personnel, legal and so on). The main resources of these risks are, on the one hand, objective insufficiency of information and on the other hand, subjectivity of information perceiving and possibility of wrong decision making. Unfortunately, the issues of managing risks in the sphere of innovation have not been duly studied so far: there is no clear definition of essence and features of risk-management in innovation sphere and also the mechanism of managing innovation risks in the context of integration of innovation process subjects has not been thoroughly worked through (Vaganova, 2012). An important component of this process must be not only the inquiry into causes and conditions of arising risk-situations but also elaboration of estimates in mechanism of managing innovation risks. It is necessary to not the fact that it is impossible to manage risk in the full sense of the word, one can only impact on the factors of a definite risk-situation (Vaganova, 2013).

MATERIALS AND METHODS

Analysis theory in managing innovation risks: The algorithm of managing risks in the framework of integration of innovation process subjects is to include the following stages (Fig. 1).

Note that every stage of the suggested algorithm of innovation risks management has a definite purpose and is implemented on basis of the use of concrete methods. From our point of view, the most important are the first two stages exposing the contents of the analysis of innovation risks (Sivtsova, 2014). The main purpose of qualitative analysis, exposure and identification of risks is in detection of causes, events and factors destabilizing and increasing the risk in innovation activity. To the tasks of qualitative analysis of innovation risk one refers:

- Identification of risks, relating to activity of an enterprise
- Location of potential risk zones
- Revelation of possible positive and negative consequences of the process of decision making

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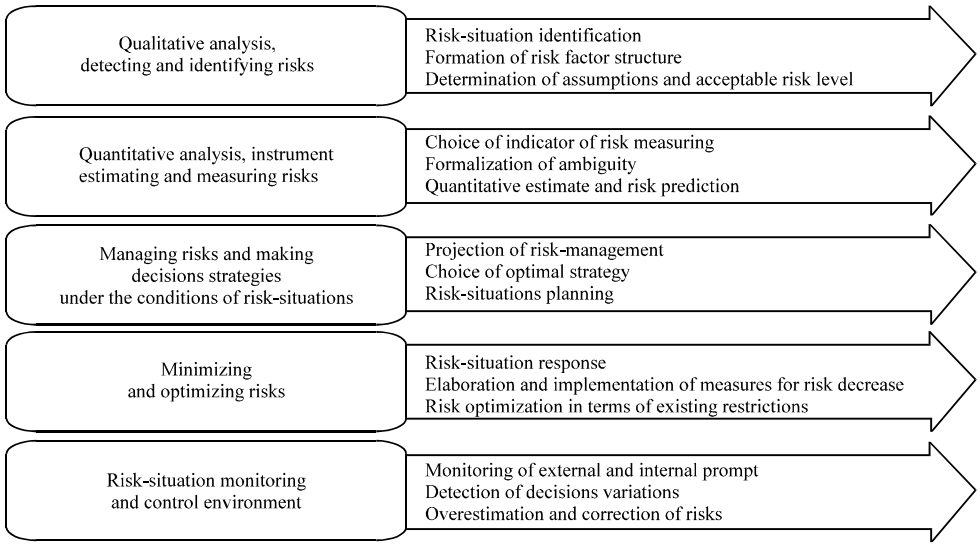

Fig. 1: Algorithm of managing innovation risks

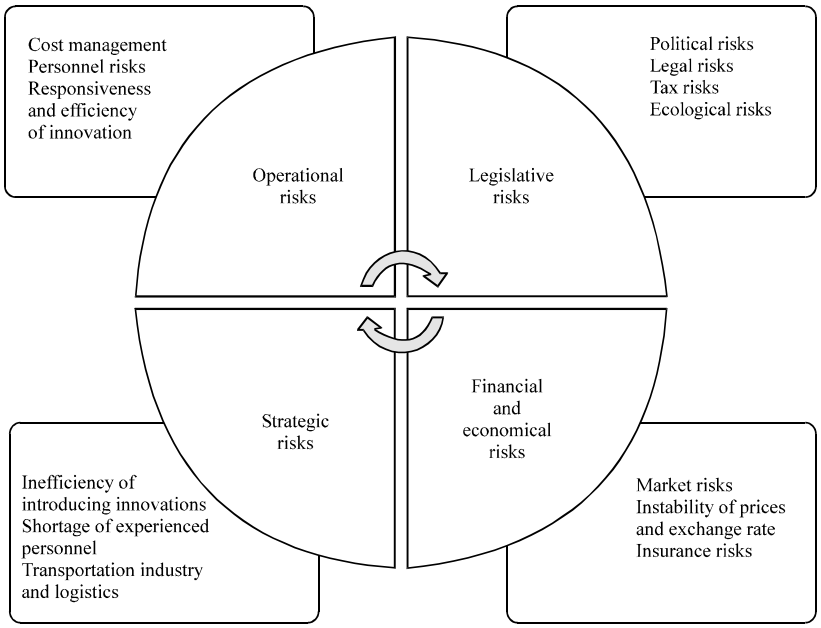

Fig. 2: Identification of segments of innovation risks

In point of the factors of innovation risks, it should be remembered that, firstly, they can be revealed fully not in all cases, secondly, not all these factors can be effectively neutralized via realization of appropriate management decisions. It means that well-defined determinacy of risk situation is impossible in principle and estimate of risk level will be always approximate. Exactly from these positions one is to extend and correct the major problems of complex management of innovation risks (Glagolev, 2013).

In consideration of the above-stated aspects and analysis of the innovation system of the region, one can draw field segmentation of their emergence in the following way (Fig. 2).

The distinguished segments of the factors of innovation risks form the conditions of innovation activity. Preventive impact on the indicated segments will allow to realize innovation system management, to increase its efficiency and be directly reflected in the

results of macro and meso-economic development (Vladyka *et al*., 2014a). The results of qualitative analysis are reference base for qualitative measuring a risk.

Quantitative risk estimate is a quantitative definition of risk extent on the basis of an available model or totality of models where occurs appropriation of quantitative measure for qualitative parameter. This estimate allows to compare and contrast all risks.

At this stage, it is determined the occurrence of either risk events, it is calculated the indicators characterizing a degree of risk and its ultimate (manageable) level in terms of quantity. Quantitative indicator of estimated risk allow to reveal:

- Discrepancy between the results of activity and regulatory requirements
- Possible losses of resources (resource base)
- Possible divergence between effective yield and anticipated one

At that quantitative assessment reflects only expected risk magnitude, its real magnitude becomes definite only when real risk event occurs. To the main methods of quantitative assessment of risks one refers:

- Analytical methods (a method of analysis of expenditure suitability; methods of evaluation of different indicators of financial and economic activity; methods on assessement of enterprise failure risks; game models)
- Statistical methods (based on loss estimates; based on estimates through variability of possible result)
- Expert methods
- Analog methods

The methods above have both strengths and weaknesses. The choice of the most relevant methods is determined by the content of statistical information, its accuracy and validity. Moreover, the choice must be oriented to risk managing and decision making.

In estimating risks of integration of innovation processes subjects in quantitative terms, it is necessary to use predictable values. Besides, one should reject a traditional notion of prediction as the result of direct extrapolation and derivation of a univariant point estimate. It is appropriate to direct define several variants of development of the future situation. The availability of alternatives in predictive estimate of ionization risks will allow to move up to qualitatively new level of its analysis.

RESULTS AND DISCUSSION

Mechanism of assessing a risk-situation in innovation risk management: In mechanism of management an innovation risk is treated as regulator of basic tendencies of safe socioeconomic development as essential resource of improving stability of regional economy under conditions of increasing ambiguity. The process of interconnection of estimate and mechanism of management of risks is represented in Fig. 3.

Interconnection of estimate and mechanism of innovation risks management is represented in three blocks (Fig. 3): monitoring of internal and external environment of functioning innovation system; estimate of efficiency of managing innovation activity; results of managing innovation activity.

It should be noted, that the system of risk management includes binding stage of monitoring and estimate of a development factor of internal and external environment necessary for identification and selection of the risks, on the one hand and on the other hand, their use as destructive element (Vladyka *et al*., 2014b). The information characterizing current impact on selected segments of innovation risks is input to controlling mechanism (Fig. 2).

In the second block, the preliminary results of this impact is analyzed and the effectiveness of integration process is estimated. As a result of analytical studies, it is determined potentially probable undesirable events to which realization of any strategic decision may lead.

If the obtained value of risk level does not exceed the threshold of an acceptable risk, the controlling function ends and one draws up a report on risk and refers to the third block. If the level of risk turns out to be unacceptable then it is taken the measures allowing not to decrease the level of risk to the fixed limits, once more it occurs the analysis and estimate of the risk level in block II. This process repeats until an acceptable risk level will have been provided. If it does not occur, it is implemented the deviation from primarily offered decision. To perform the function of management in subsystem of risk management it is required concentration of all necessary information in block III.

The third block is connected with estimate of efficiency of innovation processes and effectiveness of their use in integration of innovation subjects. To estimate the effectiveness of integration of innovation process subjects is possible on the basis of investigation of the following indicators (Table 1).

Corresponding to the indicators of effectiveness of innovations represented in Table 1 one can also not only

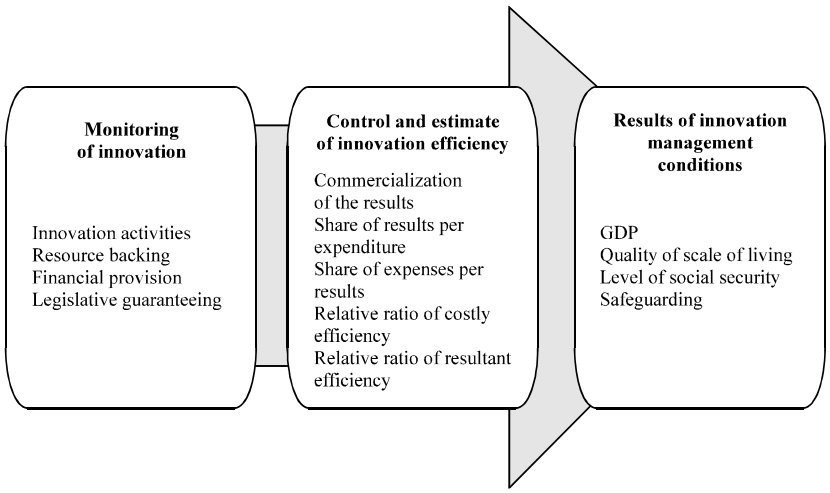

Fig. 3: Scheme of formalization of interconnection of estimate and mechanism of innovation risk management

Table 1: Indicators of estimating effectiveness of integration of innovation subjects

Stages	Characteristics
Indicators of estimating conditions of innovation environment	GDP per head; population's income level; level of accounts receivable and payable; level of nature and resource potential; level of Foreign trade turnover; level of taxation
Indicators of estimating conditions of innovation activity	Investments in innovations; rate of investments in innovations at the expense of budgetary funds; rate of innovation enterprises
Indicators of estimating long-term goals of development	Gross profit of innovation enterprises per unit of gross receipt; rate of export-oriented innovation productions in gross revenue

define predictive estimates of innovation activity but competently arrange the process of integration of innovation subjects.

The suggested scheme of formalization of interconnection between estimate and mechanism of innovation risk management is based on the conception of active dynamic control implying system transformation of a risk in the process of purposeful impact on conditions and environment, resources, subjects and objects, processes and results of their functioning with the aim of: on the one hand, reflection of arising threats and protection of economy from negative factors of socioeconomic transformation; on the other hand, direction of the resources towards increasing socioeconomic potential and realizing positive factors of socioeconomic development.

In this mechanism of management risk is considered as a regulator of basic tendencies of integration of innovation process subjects.

CONCLUSION

Efficiency of innovation process is possible in the presence of adequately built system of managing its risks. In forming system of innovation risk management, it is reasonable to combine the elements of strategic management (fulfillment of designated mission of the system, achievement of its goals and objectives), day-to-day management (realization of mechanisms of system advancement to its goal achievement), risk management (minimizing deviation of system from achievement of its own goals). The algorithm of innovation risk management in the framework of integration of innovation process subjects must include the following stages: qualitative analysis, revelation and identification of risks; quantitative analysis; risk estimate and measurement; risk management and making management decision in a risk-situation; risk minimization and optimization; risk-situation monitoring and control.

In mechanism of innovation risk management three blocks are distinguished: monitoring of internal and external environment of functioning innovation regional system; estimate of efficiency of innovation activity; the results of innovation activity management. The suggested scheme of formalization of the mechanism of innovation risk management is based on the conception of active dynamic control and must be oriented to estimate of effectiveness of each dedicated block.

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