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SURVEY OF REGIONAL RISK ASSESSMENT TECHNIQUES

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Risks are present in all spheres of our life. It's impossible to plan the development of the region's economy without of the accounting the risk factors. That's why the identification of risks, which make up the regional risks structure, is extremely important.

Assessment the level of risk is the main part of the overall risk management system. Regional risk assessment techniques are mostly reduced to building ratings which give us a comparative characteristic of the region. As for regional risk measuring methods they are divided into following groups: qualitative and quantitative methods as well as combined approach [1]. Some of these methods are common and typical, and some of them are more rarely used.

The aim of this paper is to give only a general overview of regional risk assessment techniques. Due to limited space, it isn't gives very deep and comprehensive information.

So, it's necessary to determine the degree of risk in a quantitative or qualitative way. The main tasks of qualitative analysis are: the identifying possible types of risks and the definition and description of the causes and factors affecting the level of this type of risk. The basis of qualitative methods is the methodology of weighing factors, based on expert assessments [2]. The main disadvantage of these methods is subjectivity.

Applying quantitative methods, it is used the most meaningful risk indicators. So, the resultant value of the risk indicator is a multifactorial function named "Integral risk indicator". This approach is very useful for researcher because of giving accurate and clear quantitative estimates. There are two ways to construct this function. The first one uses only those factors which have accurate quantitative values. In this way, the result will be representative as the following function [3]:

$$R = f(x_1, x_2, \dots x_n) = R\,(x_i), i = 1, 2, \dots, n$$

The second way of risks calculation uses the set of quantitative risk estimates. So, the risk indicator is a multifactorial function or risks [4]:

$$R = f(r_1, r_2, \dots r_n) = R\,(r_j), j = 1, 2, \dots, m$$

According to these models using econometrical tools it is carried out statistical information processing. It allows to find the forecasting values of the risk indicator.

As it was mentioned earlier quantitative approach is more useful and it is applied in the most of models which use the risk calculation. But in practical tasks it is often happened the situation when some of considering variables haven't quantitative values, but only qualitative ones. In this way, the Integral risk indicator includes estimates of different kinds of risks – objective (quantitative) and subjective (qualitative). This situation allows to realize the combined approach [5].

There are many different methods and techniques of risk assessment today. All of them gave different bases, nature and direction of using. But in this paper, will be shown the simple overview of some of these methods and it will be given the classification of them according to the main stages of the risk assessment process.

The given classification shows how the methods and techniques use to each step of the risk evaluation process.

On the first stage, it is doing the *Risk identification*. According to it it's identified the following methods of risk analysis [7]:
- consequence analysis;
- qualitative, semi-quantitative or quantitative probability estimation;

• assessing the effectiveness of any existing controls;

• estimation the level of risk.

On the next stage, it is carried out the *Risk evaluation*. There is a series of methods, that can realize this step. The main factors, that influence to selection of risk assessment techniques and methods are described as follows:

• The degree of the task complexity and the techniques to analyzing it.

• The nature and degree of the risk assessment uncertainty.

• The set of financial and scientific required resources, as well as resources of time.

• Whether the method can provide a quantitative output.

Among of huge variety different available techniques, which are using by scientists of all the world it was selected only some sample of methods-techniques for risk assessment. This method can be used in the procedure of risk assessment on the reginal microlevel also.

• Brainstorming.

• Delphi technique.

• Preliminary hazard analysis (PHA).

• HAZOP (the acronym for HAZard and OPerability study).

• Toxicity assessment (TA).

• Structured "What-if" Technique (SWIFT).

• Scenario analysis (SA).

• Business impact analysis (BIA).

• Root cause analysis (RCA).

• Failure modes and effects analysis (FMEA) and failure modes and effects and criticality analysis (FMECA).

• Fault tree analysis (FTA).

• Cause-consequence analysis.

• Cause-and-effect analysis.

• Layers of protection analysis (LOPA).

• Decision tree analysis.

• Human reliability assessment (HRA).

Most of these methods are presented and supported by different software applications. Sometimes it is sufficient to use only one of these methods, but in other cases are needed to combination of them. So, most of these methods can stand alone or might be incorporated into complex process of higher management – quality management.

Detailed using of these methods in assessment the degree of regional risks will be considered in the future articles.

Bibliography

1. Куликова Е. Е. Управление рисками. Инновационный аспект. – М.: Паблишинг, 2009. – 204 с.

2. Шапкин А. С. Теория риска и моделирование рисковых ситуаций / А. С. Шапкин, В. А. Шапкин. – М.: Дашков и Ко, 2005. – 544 с.

3. Станиславчик Е. Н. Риск-менеджмент на предприятии. Теория и практика. М.: «Ось-89», 2009. – 80 с.

4. Хитрова Е. М. Методы оценки регионального риска и управления им // Известия ИГЭА. 2008. №2 – С. 56–59.

5. Чернова Г. В. Практика управления рисками на уровне предприятия. – СПб: Питер, 2011. – 176 с.

6. Valis, D., Koucky, M., Selected overview of risk assessment techniques, Problemy Eksploatacji, Wyd. Instytutu Technologii Eksploatacji – PIB, Z. 4, (75), pp. 19-32, Radom 2009.