Chapter 14

Multi-Criteria Fuzzy Analysis of Competitiveness:
Comparative Evaluation of Regional Development

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ABSTRACT

The article presents the possibility of using multi-criteria fuzzy analysis for assessing the regional competitiveness. This estimation can be used for place marketing strategy development and based on results of socio-economic development. The proposed approach is characterized by comparative estimation, when the level of development of one region is determined by the development of other areas. The final evaluation is the level of the cluster which the object being analyzed belongs. This allows ignoring minor fluctuations in total indexes. The results of robust and fuzzy groups of regions are analyzed. This grouping is characterized by similar levels of development and helps to define the directions of further development of the regions.

INTRODUCTION

Economic objects and processes are very difficult nowadays. Most of them we can describe as a system which includes different elements. The properties of the system are determined by the relationships between these elements and the nature of its interdependence. The characteristic of object includes not only criteria for the whole system but for its elements as well. As a result most of economic problems become multi-criteria. And the special methods of analysis are used for solving these problems. In this chapter the fuzzy methods of multi-criteria analysis will be described.

The proposed methodology is universal and it can be adapted to different objects. The test area in this chapter is regional socio-economic development evaluation. The results of this analysis are useful for place marketing strategy development. In this case the region's position is a base for subsequent economic growth. The comparative analysis of regional competitiveness lets to receive the position of

estimated region between others and the degree of similarity of current situation with others. Based on this information we can work out place marketing strategy for the region including the result of previous development and the leaders of economic growth experience.

The purpose of this chapter is to show the benefits of fuzzy methods for analysis of economic objects and to determine the circumstances of its using. For this purpose we'll make multi-criteria analysis by different methods (robust and fuzzy) and compare results. The methods will be applied to regional socio-economic strategic decision-making. We'll take into analysis the results of economic growth and life quality of lower level of counties. The experimental calculations were carried out on the example of counties of Grodno region (Belarus) in 2008-2013.

The multi-criteria fuzzy sets are useful for region's marketing strategy development. It was found that multi-criteria fuzzy clusters can describe the comparative competitiveness. In this paper the estimation of the competitiveness is based on the values of the membership functions to a particular cluster. It's possible to use this result for identifying of membership function value and forecasting the future positions. Single fuzzy clustering (based on one integral criterion) is easier for interpretation and visualization, but it cannot make multi-faced analysis.

The chapter is structured as follows: In beginning the basic definition like local region, socio-economic development evaluation and regional competitiveness are clarified. Then the methodology of research is presented. Then the experimental part of the chapter is considered. It includes data collection based on system of indexes of regional evaluation and it analysis, single and multi-dimensional fuzzy clustering of Grodno counties in dynamic and as a whole over the period. At the end the conclusions are made.

BACKGROUND

The problem of regional competitiveness, its investment attraction and place marketing attracts more attention nowadays. Moreover the modern conditions require revising existing concepts and methods of its evaluations. Globalization and high-tech industry development lead to the regional competitive grows. It means that regions become active participants in the struggle for resources (labor, technological, investment) and markets (tourism, investors, products). The distinctive feature of this process is that regions act as goods and as producers simultaneously. Dijkstra (2012) notes that it's impossible to apply the firm's competitiveness concept to the regions level:

The framework describing a firm's capacity to compete, grow and be profitable is relatively uncontested, but applying the same concept to countries or regions has been subject to much debate.

Golovikhin S. (2012) notes that the concept of regional competitiveness shouldn't lead to increase of regional separatism.There're different approaches to the regional competitiveness definition: based on productivity (Schwab and Porter, 2007), rising income and improving livelihood (Meyer-Stamer, 2008), as an environment for firms (Boschma, 2010). Moreover Nasser (2012) claims that regional competitiveness on national or global level is not the end in itself:

Maintaining a high level of competitiveness is not a goal by itself, it is a goal within another: development and growth for the present and future generations. (Nasser, 2012)

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