Economic Development of a Selected Region: Mathematical Modeling

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ABSTRACT

Macro-economic aspects and further factors influence the economic development of a region. Two new indicators (Index of Citizens' Financial Provision and Risk of Regional Economic Development) are introduced in this paper. These indicators enable people to evaluate the financial provision of citizens and the economic risk of a region in more detail. To demonstrate a function of these new indicators in economic practice, the authors focus on the selected region (Vysočina, Czech Republic) due to the following specific characteristics. Economic performance of the Vysočina Region in comparison with other regions of the Czech Republic is below the average. When calculating GDP per capita the Vysočina Region ranks eleventh position from fourteen regions in the Czech Republic. The input data for examples given in this paper are based from the Czech Statistical Office. Mathematical modeling of the new developed indicators has been created in Microsoft Excel program. To design Indicator Risk of Regional Economic Development the fuzzy sets logic has been used.

Keywords: Citizens, Economic Development, Economic Practice, Financial Provision, Indicators, Region

INTRODUCTION

The evaluation of the level of a region comes in reality from economic, social and environmental aspects. Individual countries have also strategic documents closely connected to this type of evaluation, the Czech Republic is not an exception. Evaluation indicators are defined in relation to the Strategy of Regional Development in the Czech Republic and are assigned with information sources (the Strategy of Regional Development in the Czech Republic and appendices, 2009).

Considering the number of partial priorities and indicators designed to them, we find ourselves in a situation in which the evaluation of the level of a region is quite difficult. We are faced with the following questions:

- What is the position of the region with respect to other regions in the Czech Republic?
- Are there significant disparities?
- Which priorities should be given special care?

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• What is the weight of individual evaluating indicators?
• And others

Moreover, individual pillars of the Strategy of Sustainable Development contain other indicators delimited for regional observation which are used even in statistical surveys conducted by district statistical offices. Presently, 42 basic indicators are used at a regional level in the course of statistical research. Indicators were selected according to their relevance and data availability at a regional level (Czech Statistical Office, 2009), but in previous years different indicators where considered. This can lead to the distortion of the current situation of regions and to inaccurate conclusions of the conducted analyses.

One of the main tasks of this chapter is to find such indicators which are observed in long term periods, have sufficient predicative potential at a regional and country level and can be utilized for the economic evaluation of certain area. Another task is to design indicators which would help us assess the economic aspects of a region in greater detail and which could be modeled and predicated. It is therefore necessary to delimitate suitable tools and methods. In relation to this task we can state the third task, to demonstrate the usability of the design through case studies. The methodology process is elaborated so that a reader would be able to apply the obtained knowledge on various data, but also be able to modify it in the design of other indicators.

A proposal of new indicators based on the system concept, i.e. that the region is seen as a system characterized by a set of elements in mutual interaction and output function, is suggested. The purpose of the proposed criteria is supplemented by a set of indicators for the assessment of the region as a whole.

MACROECONOMIC INDICATORS USED IN ECONOMIC DEVELOPMENT EVALUATION

The evaluation of the economic development of a country is possible by means of macroeconomic indicators and their trends (Aghion & Durlauf, 2005). Macroeconomic balance characterized by such level of gross domestic product, which brings balance to aggregate supply and demand, is constantly being disturbed by destabilizing factors. In special literature (for example Froyen, 2008; Baumol, Blinder, 1994; Parkin, Powell, Matthews, 2005; Shim, Siegel, 2005; Dwivedi 2005) the basic indicators are assumed to be the annual rate of growth of real domestic product, annual rate of unemployment, annual inflation rate and rate of balance of trade to nominal gross domestic product in percent. The maximal fulfillment of all indicators is in practice not possible, certain compromises can be achieved by fulfilling some of the goals at the cost of obtaining poor results of other goal(s). Baumol and Blinder (1994) paid great attention to the unemployment rate and inflation; the significance of these values is also stressed by Miles and Scott (2005).

Many important economists from various countries in various time periods occupy themselves with the analysis of macroeconomic indicators and the consequences of their development (e.g. USA: Carnes, Slifer (1992), Wilison, Clark (1993); post-communistic countries: Blanchard (1998); Great Britain: Layard, Nickell, Jackman (2005); Brazil: McEachern (2008)).

If we accent unemployment as a fundamental problem influencing country development, we can assess it from a number of aspects: macroeconomic, microeconomic and even political (see Layard, Nickell, Jackman, 2005).

These indicators are often linked to the strategy and economic policy of a state (see Arnold, 2008; Stimson, Stough, Roberts, 2006).