

THE POSITION OF REGIONS ACCORDING TO THE SELECTED INDICATORS OF THE LABOUR MARKET*

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The paper is focused on evaluation of regions of the Czech Republic. The evaluation is based on selected structural measures of employment according to the Lisbon Strategy. We used multiple dimensional statistical methods with special attention to the employment rate in agriculture. The Lisbon Strategy is a key document of EU, which deals with the priorities and measures for stimulation of economic, social and ecological renewal of member states in the period of the years 2000–2010. There are more than 130 structural measures from the spheres of national development, employment rate, research and innovations, economic reforms, social coherence, and living environment. These measures are used for evaluation and quantification of the modernization process and improvement of the global competitiveness of the European economics. We propose methodological approaches suitable for the analysis of indicators of some structural measures. The proposal of correct methodology is highly complicated due to the miscellanea of the variables. The multiple dimensional statistical methods seem to be useful especially because of their ability of complex evaluation of variables and their mutual relations. The method of an average distance from a fictive goal enables us to make a sequential list of regions. We applied an index analysis for the changes in the number of persons employed in agriculture. Multidimensional statistical methods with regard to their complex assessment are the most appropriate methods for the analysis of the structural indicators.

regions of the Czech Republic; Lisbon Strategy; structural indicators; labour market; multivariate statistical methods; average distance from fictive object; index analysis

INTRODUCTION

The paper is focused on evaluation of regions of the Czech Republic. We propose some methodological approaches suitable for the analysis of indicators of some structural measures.

The definition of a region unit can be based on many criteria. The wide spread approach is to use the historical borders. In case of the Czech Republic, the traditional division is in Bohemia, Moravia, and Silesia. The regional politics is generally focused on lowering the differences between the regions (Svatošová, 2005).

High unemployment in the 1990s developed responses at supranational as well as national levels. The result was the European Employment Strategy (Bernard, 2004).

The European Council has approved the Lisbon Strategy for the ten years' period 2000–2010. The 'Strategy' represents a new approach to solution of the problems with the labour market and social and economic policies of the European Union member

states. A crucial attention is given to the education and professional training corresponding with the real demand of the labour markets in member states.

Now the evaluation of the past ten years is in the process and strategy for the following ten years' period – Europe2020 – will be proposed. The predominant part of the evaluation is based on the essential characteristics of the commented measures – see below (Pecáková, 2008).

The goal of the strategy can be applied to member states and also to their more detailed structures (NUTS2, NUTS3) (Nomenclature of Units for Territorial Statistics). The territory of the Czech Republic is now divided into 14 independent regions. This structure was settled in 1997 and established on January 1, 2000. The region is a basic unit of the state arrangement.

Lisbon Strategy

The main objectives of the Lisbon Strategy are as follows:

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(1) transformation to an economic based on knowledge, information society, research, and technological development,

(2) modernization of European social model throughout investments into the labour capital,

(3) keeping of 'healthy' economic perspective and growth.

We can say that the set of measures and tasks is a dynamic system with continually extended and adjusted goals (Pelkmans, 2006).

The different member states have both different levels of economy and different conditions (geographical, political, social, etc.). These factors influence the monitored indicators in many ways (Baldwin, Cave, 2002; Urban, 2002). The Lisbon Strategy has traced out 9 main directions of the development of the economy and employment (Es-Agraa, 2007).

Evaluated Indicators

The regular evaluation of completing the Lisbon Strategy goals is realized on the basis of structural indicators (now there are more than 130 of them). The 2004 report proposed 14 or 15 indicators, respectively, with the purpose to simplify evaluation and analysis of the Lisbon process (Es-Agraa, 2007).

The data can be obtained from the Czech Statistical Office (Eurostat, 2010). It is possible to compare the published data thanks to the unified method of retrieving. The input data are standardized.

Structural indicators: gross domestic product (GDP) *per capita* in purchasing power parity, labour productivity per inhabitant in parity of a purchasing capacity, employment rate total (age 15–64), employment rate of women (age 15–64), employment rate of elders (age 55–64), secondary school degree for age group 20–24, science and research expenditures as a share of GDP, investments as a share of GDP, current price level, exposure to poverty, level of an unemployment rate, emission of glasshouse gases, energy consumption as a share of GDP, goods transport as a share of GDP, regional dispersion of an unemployment rate.

A complex analysis based on above described indicators is necessary for the overall evaluation of regions. This complex analysis is provided by multiple dimensional statistical methods; the most frequently used are the analysis of main components and the factor analysis.

MATERIAL AND METHODS

Single dimension data analysis

Both classical and modern statistical methods can be used for the analysis of the structural indicators. These methods can be used for the choice of indicators as well as for their proceeding. The classical techniques of data processing are based on a presumption of

independency of randomly chosen variables with the same probability distribution (normality of data). It means that the data selection should be homogenous, the elements are mutually independent and the parent population has normal distribution. The extreme and atypical values call for special attention. The evaluation of such values means investigation whether they are correct. Very effective tool for this purpose is a data search analysis (Meloun, Militký, 2004).

Multiple dimension data analysis

The methods belong to the group of explorative methods, which do not have hypotheses defined in advance that can be either accepted or rejected as a result of the analysis. These methods are tightly dependent on the experience of users, on their knowledge and familiarity with the investigated problems. The analysis of main components and the cluster analysis are most frequently used.

The method of a mean distance from a fictive object can be used in the case of a precisely given goal. The fictive objects are, in our case, the goals defined by the Lisbon Strategy for chosen indicators. The distances x_{oj} of real values x_{ij} from the fictive values (the goal value of the indicator) can be calculated. The distance is Euclidean. The average distance d_{ij} is then calculated using the formula:

$$d_{ij} = \frac{1}{p} \sum_{j=1}^p (x_{ij} - x_{oj}), \quad (1)$$

($i = 1, 2, \dots, n; j = 1, 2, \dots, p$, where i is the number of units and j is the number of variables.

Another possibility is to use the index analysis with a choice of suitable indicators. Citation (Meloun et al., 2004) underlines the importance of aggregate indicators, which contains important and characteristic measures of development. They can be coefficients or indexes.

We used multiple dimensional statistical methods for the structural indicators reviews (Biagi, 2000; Kuprová, Kamenický, 2006; Alves et al., 2010).

RESULTS AND DISCUSSION

We chose the method of an average distance from the fictive goal as the best method to evaluate of implementation of the Lisbon Strategy. In accordance to it, the goals for the regions are:

The employment rate for age 15–64: 70%

The employment rate for women 15–64: 60%

The unemployment rate for age 55–64: 50%

We employed 14 regions of the Czech Republic to demonstrate the method. Each region has its specifics and different local policy. The data come from the years 2000 and 2009. We evaluate meeting the Lisbon Strategy goals for the indicators of the labour market

Table 1. The order of region according to the applied methodology for the years 2000 and 2009

Regions (NUTS III)	2000	2009
Praha	1	1
Central Bohemian	7	2
South Bohemian	6	3
Plzeň	5	4
Karlovy Vary	2	5
Ústí nad Labem	12	13
Liberec	4	10
Hradec Králové	3	9
Pardubice	14	14
Vysočina	10	8
South Moravian	8	7
Olomouc	11	11
Zlín	9	6
Moravian Silesian	13	12

Source: authors' work

using the distance from the above listed values. If the real value of the indicator is positive, it means that the member state has reached its goal. The negative values mean not meeting the goals. We make the order of regions according to the real values of indicators. The results are in Table 1. The requirements of the European Commission are met only in Prague. All other regions do not satisfy the set up goals. Therefore the policy in regions should be focused on the implementation of the Lisbon Strategy.

We analyze the number of persons employed in the Czech agriculture using available time rows from 1993 to 2009. To analyse of changes of the number of persons in agriculture we use the ratio indexes.

In 1993, there were 358.5 thousand people employed in agriculture. It was 7.36% from the total number of 4 873.5 thousand employed in all sectors. In 2009, there were 153.8 thousand people employed in agriculture out of 4 934.3 thousand, what was 3.1%.

We found that the number of people employed in agricultural sector has decreased by 25.0%. We compared this value with other EU states and found

the differences in particular states, e.g., Greece 2.6%, Estonia 55.0%. The highest values of the decrease were recorded in the new EU states – in average 31%. The percentage of persons employed in agriculture was in the last year of investigation (2009): Belgium 1.7%; Germany 2.5%; France 2.5%; Latvia, Lithuania and Slovakia 7.5%.

Eurostat (2010) has published also information about the productivity of work. The productivity of work in the original EU states (15) is six times higher than in new 12 countries.

The percentage portions of people employed in agriculture were then calculated for each region of the Czech Republic. The regions with under average portion are 'non-agricultural regions' and the regions with over-average portion are 'agricultural regions'. The evaluation was made for both the years 1993 and 2009. The average numbers for each year for the whole republic are in the previous paragraph.

Table 2 shows the shift of Central Bohemian and South Moravian regions out of the group of agricultural regions to the group of non-agricultural regions. We add Fig. 1 for better image of the rapid decrease in the percentage employed in agriculture in the above-mentioned regions.

CONCLUSION

The importance of the Lisbon Strategy consists in coordination of economic policies of EU member states. It was necessary to set up indicators, which can be used for evaluation and comparisons of economies of member states. That is why a set of 15 indicators was defined as a basis for assessment and quantification of modernization of the European economy. The quantification can be made not only using the simple analytical methods (index analysis, absolute increases or decreases) but also using the multiple dimensional statistical methods, which help us to find mutual relations among groups of variables as well as inside groups.

The multiple dimensional statistical methods have been proved as suitable for a complex evaluation

Table 2. The regions divided according to the percentage of persons employed in agriculture

1993 (7.36%)		2009 (3.12%)	
'non-agricultural'	'agricultural'	'non-agricultural'	'agricultural'
Praha	Central Bohemian	Praha	South-Bohemian
Karlovy Vary	South-Bohemian	Central Bohemian	Plzeň
Ústí nad Labem	Plzeň	Karlovy Vary	Hradec Králové
Liberec	Hradec Králové	Ústí nad Labem	Pardubice
Zlín	Pardubice	Liberec	Vysočina
Moravian-Silesian	Vysočina	South-Moravian	Olomouc
	South-Moravian	Zlín	
	Olomouc	Moravian-Silesian	

Source: authors' work

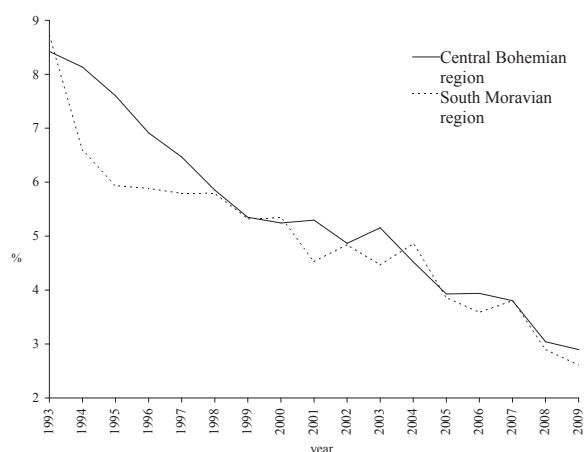


Fig. 1. The part of persons employed in agriculture in the total number of employed in the Central Bohemian and South Moravian regions

of the regions. The most appropriate method is the method of the average distance from a fictive object. The applied method brought results (Table 1), which divided the regions into two groups and ordered them according to their fictive distance from the average value. The capital Prague is in both cases on the first position due to its exceptional state. The reasonable solution is to exclude Prague from further investigation. The greatest differences were observed for the Central Bohemian region (increased by 5 positions) and for the Liberecký region (decreased by 6 positions). The Central Bohemian region took advantage of the closeness and prosperity of the capital. The regions Moravian-Silesian, Ústí nad Labem and Pardubice are on the worst position, i.e., on the end of the table.

'Europe 2020' is a proposal of a ten-year plan, which was published by the European Commission in March, 2010, and it was intended as a substitution of the Lisbon Strategy. The goals mentioned here should ensure the modernization of the EU economy and its sustainable development.

The two main goals are connected with rising of the employment rate. The first of them deals with raising the employment rate in the age group 20–64 to 75% in the whole EU in 2020. The member states are now working on their national plans for increasing the employment rate in this age group. The age group is different from the Lisbon Strategy (15–64 years). The newly proposed age group would be able to capture the economically active inhabitants better. The reason lies in the shift of the completion of education and consequently in latter entering the economical life by young people.

The agriculture is one of the sectors with the lowest number of employed people and this number is steadily falling down. The regions of the Czech Republic are either 'agricultural' with the above-average percentage or 'non-agricultural' (under-average). The decline of number of people employed in agriculture during the investigated period is apparent – the number of 'bel-

low average regions' went up even though the average value decreased. Another continuing decrease can be forecasted for next years.

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Pozice krajů na základě ukazatelů trhu práce

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Předkládaný článek je zaměřen na hodnocení krajů České republiky na základě zvolených strukturálních ukazatelů zaměstnanosti Lisabonské strategie pomocí vícerozměrných statistických metod. Zvláštní pozornost byla věnována hodnocení pracujících osob v zemědělství ČR a následnému porovnání s členskými státy EU. Lisabonská strategie je klíčovým dokumentem o prioritách a opatření s cílem stimulovat hospodářský růst a zaměstnanost v období 2000–2010. S Lisabonskou strategií je spojeno více jak 130 ukazatelů z oblasti národohospodářského vývoje, zaměstnanosti, inovací a výzkumu, ekonomické reformy, sociální soudržnosti a životního prostředí, na základě kterých je možné hodnotit a kvantifikovat modernizaci evropské ekonomiky a zvýšení její globální konkurenceschopnosti. Cílem tohoto příspěvku je navrhnout vhodný metodologický přístup k analýze zvolených strukturálních ukazatelů, zhodnotit dosažení cílů v jednotlivých krajích ČR a analýza osob zaměstnaných v zemědělství. Vícerozměrné statistické metody se zdají být užitečné zejména kvůli své schopnosti komplexního hodnocení proměnných. Pro splnění prvního cíle byla aplikována metoda průměrné vzdálenosti od fiktivního cíle, která umožňuje sestavit pořadí krajů na základě dosaženého cíle. Počty osob zaměstnaných v zemědělství byly analyzovány pomocí indexní analýzy. Vícerozměrné statistické metody jsou vzhledem ke svému komplexnímu hodnocení nevhodnějšími metodami pro analýzu strukturálních ukazatelů.

kraje České republiky; Lisabonská strategie; strukturální ukazatele; vícerozměrné statistické metody; průměrná vzdálenost od fiktivního objektu; indexní analýza

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