

Regional Disparities of Unemployment Rates in Regions of Slovakia and Czech Republic

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Abstracts

The Member States of the European Union (EU) have understood the very important role of reducing regional disparities. The aim of reducing regional disparities in the EU Member States is enshrined in the EU Treaty. It is important to measure disparities for the regions and also to follow the changes and the development of the regional disparities. We decided to measure the regional disparity using two indicators: Gini index and the coefficient of variation (CV). Regional statistics cover the principal aspects of the economic and social life, including demography, economic accounts and labour market data.

The focus of the article is to follow regional unemployment data of the Czech Republic and Slovakia and to discover whether the unemployment rates show a convergence or a divergence trend over time. For analyses purposes of regional unemployment rate we used the NUTS 3 hierarchy level of economic territory: Slovakia is divided into 8 regions and the Czech Republic is divided into 14 regions. Comparing the indicators of the regional disparities in unemployment rates in Slovakia and in the Czech Republic, we can see that the regional disparity is higher in Slovakia compared to Czech Republic.

Keywords: coefficient of variation, Gini index, unemployment, regional statistics

1. Introduction

Regional statistics cover the principal aspects of the economic and social life, including demography, economic accounts and labour market data. The focus of the article is to follow regional unemployment data of the Czech Republic and Slovakia and to discover whether the unemployment data show a convergence or a divergence trend over time. The main problem with economic analysis at the sub-national level is the very unit of analysis, i.e., the region. The word “region” can mean very different things both within and between countries (Spiezia, 2003). Traditionally, smaller regions have often been administered as part of larger regions which, in turn, make up the nation state (European Regional and Urban Statistics Reference Guide, 2010).

At the beginning of the 1970s, Eurostat set up the “Nomenclature of Statistical Territorial Units” (NUTS) as a single, coherent system for dividing up the European Union’s territory in order to produce regional statistics for the Community (for the latest status of NUTS, see the RAMON classifications server on the Eurostat Internet site epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction).

2. Analysis methods

For analytical purposes we decided to use two indicators for measuring the regional differences of the unemployment rates: the coefficient of variation and the Gini index.

Coefficient of variation (CV)

Because the standard deviation of data should be understood in the context of the mean of the data, the CV is a very useful statistics; it is calculated as the ratio of standard deviation to the mean.

The CV is independent of the unit in which the measurement has been taken, it is a

dimensionless number usually calculated as a percent.

$$CV = \left| \frac{s_x}{\bar{x}} \right| \cdot 100$$

Gini index

As an appropriate measure of territorial disparities in the article we used the Gini index. Gini index is the most popular index of inequality. It ranges between 0 and 1. The minimum level of zero means that there does not exist any inequality; it expresses perfect equality where all values of the unemployment in the regions are the same. The maximum level of one means that the inequality is maximal (extreme example: only one region of the country would have an unemployment level and the other regions would not have any unemployment levels). We used the following unweighted formula for the calculation of the Gini index:

$$G = \frac{\sum_{i=1}^n \sum_{j=1}^m |x_i - x_j|}{2 \cdot n^2 \cdot \bar{x}}$$

In the formula n means the number of the regions in a selected country, the \bar{x}

represents the average value of the unemployment for all regions, and the differences

$$|x_i - x_j|$$

are the absolute values of all possible differences of the regional levels of unemployment in a country.

3. Regional unemployment in Slovakia

The data used in the analysis was taken from the regional database of the Statistical Office of Slovak Republic (<http://px-web.statistics.sk/PXWebSlovak/>). The data are collected from 2001 to the actual level of unemployment in 2011 for all 8 regions at the NUTS 3 level (see tab. 1).

Tab. 1 Regional unemployment, %, Slovakia

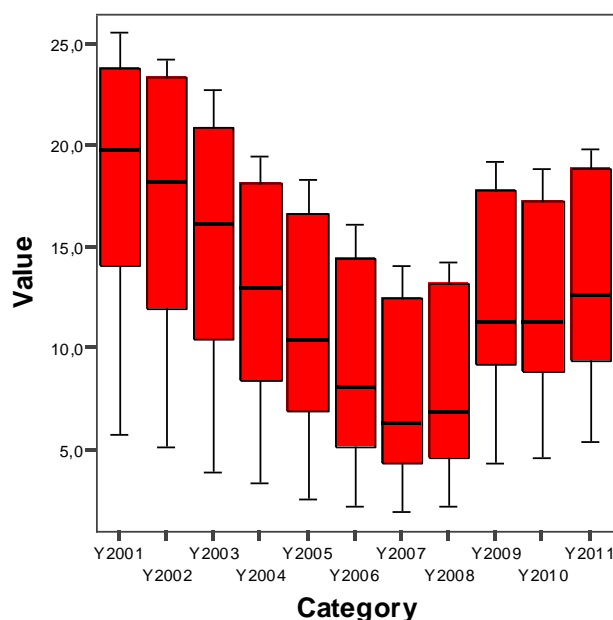
Region	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Region of Bratislava	5,8	5,2	4,0	3,4	2,6	2,3	2,0	2,3	4,4	4,6	5,4
Region of Trnava	15,5	13,0	11,1	8,8	7,2	5,2	4,3	4,3	8,4	8,2	8,9
Region of Trenčín	12,7	10,9	9,9	8,1	6,8	5,2	4,5	5,0	10,1	9,5	10,0
Region of Nitra	23,1	21,5	19,1	14,8	11,4	9,1	7,1	7,4	11,7	11,8	13,3
Region of Žilina	16,4	14,7	13,2	11,1	9,3	7,0	5,6	6,2	10,9	10,9	11,9
Region of Banská Bystrica	23,6	23,8	22,8	19,5	18,3	16,1	14,1	14,3	19,2	18,9	19,8
Region of Prešov	24,0	23,0	19,6	17,5	15,8	13,7	12,1	12,9	18,3	17,8	19,0
Region of Košice	25,6	24,3	22,2	18,9	17,5	15,2	13,0	13,5	17,3	16,8	18,8
coefficient of variation	37,8	41,7	44,1	45,6	51,0	56,2	58,7	56,7	42,0	41,1	39,9
GINI index	0,192	0,215	0,230	0,240	0,269	0,295	0,305	0,294	0,219	0,216	0,209

According to the data in tab. 1 we can see that the lowest level of unemployment in Slovakia were in Region of Bratislava, it means in the region of the capital city. The lowest unemployment was reached in 2007 (2.0 %), it means that the lowest unemployment was seen shortly before the economic crises. The highest levels of the unemployment are in the Eastern Slovakian regions – Region of Prešov and Region of Košice, and also in the Region of Banská Bystrica.

The highest unemployment in selected years was in Region of Košice in 2001 (25.6 %). The unemployment in regions of Slovakia decreased from 2001 to 2007, after the economic crises begin to broaden the unemployment rates also increases (see chart 1).

The increase in 2008 was only moderate, but stronger increases in unemployment rates are in 2009-2011.

Chart 1 Regional unemployment in Slovakia, % (NUTS 3)



Tab. 2 Regional unemployment by gender, %, Slovakia

Region	Men											
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
Region of Bratislava	5,7	5,1	3,6	3,1	2,4	2,0	1,8	2,1	4,6	4,6	5,1	
Region of Trnava	15,5	13,5	10,8	7,8	6,3	4,4	3,5	3,6	8,0	7,5	7,8	
Region of Trenčín	13,9	12,3	10,6	7,8	6,3	4,6	3,9	4,4	10,3	9,1	9,4	
Region of Nitra	23,5	22,0	18,8	14,0	10,4	8,1	6,1	6,2	10,8	10,7	11,7	
Region of Žilina	17,4	16,2	13,4	9,8	7,8	5,5	4,5	5,1	10,3	10,2	10,9	
Region of Banská Bystrica	23,9	25,0	23,1	18,5	17,2	14,5	12,2	12,5	19,0	18,1	19,1	
Region of Prešov	25,7	25,3	20,6	16,9	14,7	12,2	10,3	11,3	17,8	17,0	18,2	
Region of Košice	27,3	26,5	22,5	18,0	16,6	13,9	11,5	12,3	17,2	16,7	18,6	
coefficient of variation	38,3	42,1	44,8	47,4	53,0	58,8	59,9	58,1	42,2	42,4	42,7	
GINI index	0,191	0,213	0,230	0,253	0,287	0,323	0,337	0,322	0,221	0,224	0,222	
Region	Women											
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
Region of Bratislava	5,9	5,3	4,3	3,7	2,8	2,6	2,2	2,4	4,1	4,7	5,8	
Region of Trnava	15,5	12,5	11,4	10,0	8,2	6,2	5,3	5,2	8,8	9,1	10,2	
Region of Trenčín	11,3	9,4	9,0	8,5	7,4	6,0	5,2	5,6	9,9	10,1	10,7	
Region of Nitra	22,7	21,0	19,4	15,8	12,6	10,3	8,3	8,9	13,0	13,2	15,3	
Region of Žilina	15,1	13,2	13,0	12,8	11,2	9,0	6,9	7,7	11,7	11,8	13,2	
Region of Banská Bystrica	23,2	22,5	22,4	20,7	19,6	18,0	16,4	16,4	19,5	19,8	20,7	
Region of Prešov	22,0	20,5	18,3	18,2	17,2	15,6	14,4	14,9	18,9	18,7	19,9	
Region of Košice	23,6	21,9	21,8	20,0	18,6	16,8	14,8	15,0	17,4	16,9	18,9	
coefficient of variation	37,6	41,5	43,6	44,0	49,1	53,8	57,5	55,5	41,9	39,9	37,2	
GINI index	0,198	0,227	0,232	0,229	0,253	0,274	0,284	0,277	0,217	0,208	0,196	

The lowest levels of the CV (37.8) and the Gini index (0.192) were in 2001. So the regional disparities in the regional unemployment were low in this year. But the economy of Slovakia began to grow quickly and the strong increase of the economy (measured by real growth of the GDP) was correlated with an increase in regional disparities of the unemployment rates. The highest level of the regional disparities according to the level of CV (58.7) and also to the level of the Gini index (0.305) was

in 2007. So the expansion of the Slovak economy was related to an increase of the regional disparities. Again a change is visible after the economic crises began. The slowdown of the economy affected also the decrease of the CV and the Gini index of regional disparities of unemployment rates.

The CV declined from its 2007 level of 58.7 to 39.9 in 2011. The Gini index declined from its 2007 level of 0.305 to 0.209 in 2011. Similar situation is comparing the development of the unemployment by gender. From 2004 the CV and the Gini index are higher in men unemployment compared to the disparities in women unemployment rates.

4. Regional unemployment in Czech Republic

The data used in the analysis of the unemployment rates were taken from the regional database of the Czech Statistical Office¹. The data are collected from 2001 to the actual level of unemployment in 2010 for all 14 regions at the NUTS 3 level (see tab. 3).

The unemployment rates show very similar development as the Slovak figures. The lowest unemployment rates were in the Region of Praha, the region of the capital city of Czech Republic. The lowest level of the unemployment in Region of Praha was in 2008 (1.9 %), but again the economic crises was expressed also in unemployment data, which began to grow. The highest unemployment rates were reached in Moravskoslezský Region, Ústecký Region, Královéhradecký Region.

Tab. 3 Regional unemployment, %, Czech Republic

Region	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Region of Praha	3,9	3,6	4,2	3,9	3,5	2,8	2,4	1,9	3,1	3,8
Jihočeský region	5,6	5,0	5,2	5,7	5,0	5,1	3,3	2,6	4,3	5,3
Jihomoravský region	8,5	7,6	8,0	8,3	8,1	8,0	5,4	4,4	6,8	7,7
Karlovarský region	7,4	7,5	6,4	9,4	10,9	10,2	8,2	7,6	10,9	10,8
Královéhradecký region	6,1	4,2	5,8	6,6	4,8	5,4	4,2	3,9	7,7	6,9
Liberecký region	6,2	4,7	6,1	6,4	6,5	7,7	6,1	4,6	7,8	7,0
Moravskoslezský region	14,3	13,3	14,7	14,5	13,9	12,0	8,5	7,4	9,7	10,2
Olomoucký region	10,4	9,6	9,6	12,0	10,0	8,2	6,3	5,9	7,6	9,1
Pardubický region	6,4	7,2	7,6	7,0	5,6	5,5	4,4	3,6	6,4	7,2
Plzeňský region	5,8	4,7	5,3	5,8	5,1	4,6	3,7	3,6	6,3	5,9
Středočeský region	6,7	4,9	5,2	5,4	5,2	4,5	3,4	2,6	4,4	5,2
Ústecký region	13,3	12,7	13,0	14,5	14,5	13,7	9,9	7,9	10,1	11,2
Region of Vysočina	6,1	5,1	5,3	6,8	6,8	5,3	4,6	3,3	5,7	6,9
Zlínský region	8,5	7,9	7,5	7,4	9,4	7,0	5,5	3,8	7,3	8,5
coefficient of variation	38,3	43,8	41,6	40,9	44,4	43,2	40,4	43,2	32,1	29,1
GINI index	0,192	0,225	0,205	0,209	0,235	0,227	0,216	0,229	0,174	0,159

The highest levels of the CV were in 2002 (43.8) and 2005 (44.4). Accordingly highest levels of the second indicator of regional disparities, the Gini index were in 2005 (0.235) and 2008 (0.229). The situation of the development of the CV and the Gini index was similar than the development of these indexes in Slovakia.

In years when the economy showed a strong grows the regional disparities were high, after the economic crises began to influence the Czech economy the indicators of the regional disparities of the unemployment rates began to decrease. In 2010 we can see the lowest CV (29.1) and the lowest level of the Gini index (0.159).

Comparing the indicators of the regional disparities in unemployment rates in Slovakia and in the Czech Republic, we can see that the regional disparity is higher in Slovakia compared to Czech Republic.

¹ http://www.czso.cz/csu/redakce.nsf/i/regiony_mesta_obce_souhrn

5. Conclusions

For analytical purposes to measure the differences in unemployment rates in regions of Slovakia and Czech Republic we decided to use two indicators: the coefficient of variation and the Gini index. We followed the unemployment rates in Slovakia since 2001 till 2011 and in Czech Republic also since 2001 until 2010.

The lowest levels of the CV (37.8) and the Gini index (0.192) in Slovakia were in 2001. So the disparities in the regional unemployment were low in this year. But the economy of Slovakia began to grow quickly and the strong increase of the economy (measured by real growth of the GDP) was correlated with an increase in regional disparities of the unemployment rates. The highest level of the regional disparities according to the level of CV (58.7) and also to the level of the Gini index (0.305) was in 2007. The slowdown of the economy affected also the decrease of the CV and the Gini index of regional disparities of unemployment rates. The CV declined from its 2007 level of 58.7 to 39.9 in 2011. The Gini index declined from its 2007 level of 0.305 to 0.209 in 2011.

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