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A TARTALOMBÓL:

Seyr, Bernhard F.

Die drei Dimensionen des Wissensmanagements: Empirische Studie anhand des 3-D-Modells zur Selbstevaluation von Organisationen

Szendi, Nikoletta – Székely, Csaba
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Dél-Tirol példáján keresztül

Pataki László – Kenesey Zsófia
A betétbiztosítás növekvő szerepe Európában és hazánkban

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TARTALOM

TANULMÁNYOK	3
Die drei Dimensionen des Wissensmanagements: Empirische Studie anhand des 3-D-Modells zur Selbstevaluation von Organisationen <i>Seyr, Bernhard F.</i>	3
Analysis of Knowledge Sharing Process in Automotive Industry Projects <i>Szendi, Nikolettta – Székely, Csaba</i>	26
Labor specialization and its impact on spatial patterns of unemployment <i>Mariš, Martin – Marišová, Eleonóra</i>	39
Integráció, autonómia és gazdaságfejlesztés Dél-Tirol példáján keresztül <i>Szász Jenő</i>	56
A betétbiztosítás növekvő szerepe Európában és hazánkban <i>Pataki László – Kenesey Zsófia</i>	72
NEKROLÓG	87
Meghalt Horváth Gyula Professzor – egy személyes hangvételi írás <i>Szirmai Viktória</i>	87
KÖNYVISMERTETÉS	89
Az „elit tagjának saját népe szolgájává kell válnia” – A Biblia és a Korán politika- és gazdaságképe <i>Frang Gizella</i>	89
Európai integráció és növekedés a válság előtt és azon túl <i>Füstös Hajnalka</i>	95
ABSTRACTS IN ENGLISH	101

Labor specialization and its impact on spatial patterns of unemployment

Mariš, Martin⁸ – Marišová, Eleonóra⁹

ABSTRACT: Nowadays, the unemployment is crucial problem and challenge for the competitiveness of each economics. In connection with the failure of a socialistic regime in Central and Eastern Europe countries (CEE countries) and establishment of the market economy, unemployment became a permanent component of their national economy. Currently, each CEE country is touching with the unemployment, which varies according the age, gender, ethnicity and also by the region. Most common features of this phenomena is that the employment or unemployment is spatially distributed very unevenly. Slovak republic is one of the smallest economics among the CEE countries, but it has proved significant shift in market restoration towards the building competitiveness in global scale. At the same time Slovakia in long term faces to persistent elevated level of unemployment rate and stubbornly high level of structural unemployment. We may consider that deployment of these phenomena is conditioned also spatially. Our research task is based on looking for some continuity between the unemployment and labor market in structural depressed areas. For this purpose, we use statistical methods for determining the spatial conditionality of unemployment for assessing labor structure in regions of Slovakia. Our results may show on the relation between the high unemployment rate and dominance of economic sectors, which we can consider as structurally weak in regions of Slovakia.

KEYWORDS: unemployment, spatial conditionality, localization and specialization, structural weakness

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Introduction

Current condition, shape and trend of the labor market in Slovakia has deep roots in its history. Region of Slovakia has a long tradition especially in agriculture and mining. Mining of ore and non-metallic minerals had experienced its golden age, especially during the Middle Ages. Mining, metallurgical, chemical and paper industry located in Slovakia had already a firm place in the economic structure of Austria-Hungarian monarchy (Kováč et al., 1998).

During the socialism between the 1948–1989, labor market in (Czech)Slovakia became the object of the central planning system. Manufacturing plants and labor force had been deployed by the administrative-bureaucratic way (Buček, 1998).

In the process of the socialist industrialization, there had been favoured localization of enterprises close to the eastern border. In a number of cases had been created industrial structures with low added value. Many industrial centers became the base of the economy of the whole region, which means high vulnerability of the region and low adaptation potential (Falt'an, Pašiak, 2004).

In the 70. years became to the strong spatial differentiation between the regions. Concentration of economic activities and also citizens acquired selective character. Gainers became industrial regions and bigger cities. The regions became polarized along the urban axis and strips. Low urbanized areas of the regions and border regions, located on the south and east of the Slovakia became highly marginalized. (Falt'an, Pašiak, 2004)

Since the fall the socialism in 1989, Czechoslovakia has become an independent state. Later in 1993, Czechoslovakia split on two sovereign states. Both states suffered from the transformation depression caused by internal and external shocks. Both states have opted for method of “shock therapy” during the transformation process (Židek, 2006).

During the period of transformation depression, Slovakia was hit by the crisis stronger. Between the 1990–1993, GDP slid by the 6,8% and the unemployment rate stood at 14,4%. The cause of the sharp decline in GDP growth and unemployment was a particularly steep decline in industrial production by an average of 10,8% and agricultural production by an average of 11,5% accompanied by a decrease in other components of GDP (EBRD, 2003).

It was due to the launch of economic reforms. The unemployment rate culminated in 2001 reaching the astounding 19,2% (30% in some regions) and Slovakia ranked among the European countries with the highest unemployment rate (Michálek, Podolák, 2011).

Transformation made more transparent problems of some regions and created problems in other ones. Economic transformation and independence of Slovakia brought in the last 30-year run a high development dynamics in the Bratislava region and the Považie region (North-western part of territory), and on the other hand, highlighted the economic stagnation in the southeastern and North-eastern parts of the territory of Slovakia (Klimovský et al, 2014; Baláž, 2004; Bezák, 1990; Falt'an and Pašiak, 2004; Gajdoš and Pašiak, 2008; Gajdoš, Moravanská and Falt'an, 2009; Kling, 2003; Korec, 2004; Želinský, 2010).

It has been created model “center–periphery” from Bratislava through the districts of southern and northern Slovakia to the east. In the western part of Slovakia, development is concentrated to the economic triangle Bratislava–Nitra–Trnava. Along the Czech border (Považie region), there are located economic centers, Trenčín–Dubnica n. Váhom–Púchov–Považská Bystrica–Žilina–Martin, creating and developing axis, so called “metal belt”, with the concentration of the machinery, rubber and electro-technical industry. To the other more developed regions of Slovakia we could add the regions located in the middle, Banská Bystrica and Zvolen and Zilina in the north. In the middle of Slovakia in the basin of the river Hron, there was created an economic development axis forming a chain in the direction of Žiar n. Hronom–Zvolen–Banska Bystrica–Podbrezová dominated by metallurgy, woodworking and other types of industry. In the eastern part of Slovakia, dominating part is a city of Kosice. There is the local development axis between the cities Prešov–Košice with multi-form manufacturing structure.

Relatively weak presence of the industry is located in the north of Slovakia in Čadca, Dolný Kubín and Namestovo (Zilina region). In the case of eastern Slovakia, it is Kežmarok districts as like Sabinov, Svidník, Stropkov, Medzilaborce and Snina (Presov region). In the southern Slovakia, it is an area of Veľký Krtíš, Krupina, Lučenec, Rimavská Sobota, Poltár, Revúca (Banska Bystrica and Kosice) and others. These regions can be classified as structurally weak or disadvantaged. They have a

higher degree of the rurality and they are characterized by a wider complex, interrelated problems, from which the unemployment is one of the most significant. (Zubriczky, 2009) and (Dorlng Kindersley llt, 1999).

High unemployment became the Achilles heel of Slovakia's economic performance and the country's most pressing social problem. Since the fall of socialism, unemployment has risen in every region of the country – although much more in some regions than others – and among all groups of workers (World Bank, 2001).

East of the Slovakia is the most lagging part, due to its location, predominantly rural character, poor infrastructure, decline in agriculture, long-term unemployment and poor qualification (Valentovič, 2008.)

Unemployment is not evenly distributed across the Slovak regions. The most dramatic decreases in employment and growths of unemployment are associated predominantly with structural changes in the economy were recorded in the Košice, Banská Bystrica, Žilina and Prešov region. (Divinský, 2007).

Typology of regional differentiation is the object of the concern of several authors, for instance (Výrostová, 2010; Korec, 2005; Džupinová et al., 2008; Kožiak, 2008 etc.). The worst situation in terms of high and long-term unemployment rate was recorded in districts located in the south of Slovakia (Revúca, rimavská Sobota, Rožňava) in Banská Bystrica region, with some set-back in the northeastern part of Slovakia (Medzilaborce, Snina, Stropokov and Svidník).

Lauko, Križan and Gurnák (2009) have identified from a spatial perspective, line of unemployment between the west and east of Slovakia in the direction of the southwest – southeast (Dunajská Streda, Poprad).

The unemployment rate is the fifth highest in the OECD and is set to remain high in the coming years. With a share of long-term unemployed at around 64% of job seekers, almost twice the OECD average the incidence of long-term unemployment was among the largest in the OECD 2011 and is expected to increase further because of hysteresis effects (OECD, 2012).

Material and Methods

In our empirical research, we are focusing on two crucial aspects: labor concentration and spatial conditionality causes of unemployment. Our research was based on secondary data sources collected in the statistical database of Slovakia (www.statistics.sk).

In our first research task we were concerned with the spatial conditionality causes of unemployment. We are concerned with the hypothesis according to which, the regional spatial differentiation within regions of Slovakia acquires more or less regular pattern. So, it proves that regional imbalance of unemployment is conditioned also spatially. By measuring we are coming out from first law of geography, formulated by respected geographer and cartographer W. Tobler: *everything is connected with all, but near things are related more than remote* (Stehlíková, 2002).

Based on gathered data we should formulate hypotheses:

H_0 = in base period within regions of Slovakia, there is no or only very low spatial autocorrelation between the examined regions

H_1 = in base period within regions of Slovakia, there is mild or substantially significant spatial autocorrelation among the examined regions

As a basis for the measurement we took indicator of unemployment rate based on average time series data 2001–2013. As a key method of spatial statistical analysis we opt for *Moran coefficient* for assessing the spatial autocorrelation rate. Coefficient take the values within the range of *-1 to +1*. Studied character (unemployment rate) is dichotomous, i.e. it shall take two possible values. In our research, the first value within our sample is the unemployment rate in regions of Slovakia above the national median and the second value is unemployment rate below the national median. We assess these statistical character on level of NUTS IV (districts). If a given character has a value which converges to +1, talking about the strong positive autocorrelation, if the value converges to -1, talking about negative autocorrelation. For values converging to $1/(n-1)$, studied phenomenon is randomly distributed in space (Stehlíková, 2002).

Moran coefficient can be formally specified as follows:

$$I = \frac{n}{2A} \frac{\sum_{i=1}^n \sum_{j=1; j \neq i}^n \delta_{ij} (x_i - \bar{x})(x_j - \bar{x})}{\sum_{i=1}^n (x_i - \bar{x})^2} \quad (1.1)$$

where

n – number of areas

A – number of borders

δ_{ij} - 1 if area i and j neighbours, $\delta_{ij} = 0$ otherwise ($i, j = 1, 2, \dots, n$)

x_i ($i = 1, 2, \dots, n$) value of examined character i

In case of positive autocorrelation, regions with similar intrinsic value tend to be clustered next to each other, negative autocorrelation indicates their spatial distribution in a “checkerboard” shape and the last case (where values close to 0) tend to be randomly distributed. Mentioned hypothesis we will statistically verified by means of two-sided test at significance level = 0.05 α significance of the spatial distribution of unemployment rate. The basic procedure for the adoption or rejection of the null hypothesis and rejection, or adoption of an alternative hypothesis, according to Moran (1950), can be formally specified as follows:

The expected value of Moran coefficient under the null hypothesis of no spatial autocorrelation is

$$E(\mathbf{I}) = \frac{-1}{N-1} \quad (1.2)$$

Its variability equals to $\text{Var}(\mathbf{I}) = \frac{N S_4 - S_3 S_5}{(N-1)(N-2)(N-3)(\sum_i^n w_{ij})^2}$; where (1.3)

$$S_1 = \frac{1}{2} \sum_i \sum_j (w_{ij} + w_{ji})^2 \quad (1.4)$$

$$S_2 = \frac{\sum_i (\sum_j w_{ij} + \sum_j w_{ji})^2}{1} \quad (1.5)$$

$$S_3 = \frac{N^{-1} \sum_i (x_i - \bar{x})^4}{(N^{-1} \sum_i (x_i - \bar{x})^2)^2} \quad (1.6)$$

$$S_4 = \frac{(N^2 - 3N + 3)S_1 - NS_2 + 3(\sum_i \sum_j w_{ij})^2}{1} \quad (1.7)$$

$$S_5 = S_1 - 2NS_1 + \frac{6(\sum_i \sum_j w_{ij})^2}{1} \quad (1.8)$$

Resulting value of Moran coefficient we transform on statistics with normal distribution for testing the hypothesis of spatial autocorrelation at significance level $\alpha = 0.05$.

$$U = \frac{I - E(I)}{\sqrt{\text{Var}(I)}} \sim N(0, 1)$$

In our second empirical task we are concerned about labor concentration in selected industries to map out, if there are significant differences between the certain industries in our two samples of the regions. We suppose that we should find differences between these selected industries: agriculture and forestry, manufacturing sector¹⁰, and sector of services¹¹ solely provided by the private sector without participation of the state. These industries were aggregated into the three groups, calculated the share of workforce for each group for each region on NUTS IV level, respectively. For calculating shares of the workforce on the industries we have used national census data conducted in 2011. We suppose that the differences between these industries could be statistically significant between the advancing regions and lagging ones, sampled according the first task. We formulate the hypothesis:

H₀ = at NUTS IV level, there are not statistically significant differences in the labor market among the two regional samples based on the share of the workforce involved in the particular industry

H₁ = at NUTS IV level, there are statistically significant differences in the labor market among the three population samples based on the share of the workforce involved in the particular industry.

Regions at NUTS IV level were divided according the median of unemployment rate into the two categories: advanced and lagging ones, de-

¹⁰ Note: manufacturing sector consists: food, textile, woodworking & furniture, petrochemical, metallurgy, machinery, electro technical, automotive and glass industry

¹¹ Note: service sector includes solely services provided by private enterprises: wholesale and retail sale, transportation and storage, postal service, catering and accommodation, telecommunication, financial service, real estate market service, administrative service, legal and accounting service and others.

noted by $a_i, i = 1, 2$. We are examining the character $Y_i, i = 1, 2 \dots n$; denoting the share of the workforce in a particular industry. Character Y_i can be written:

$$Y_{ij} = M_y + a_i + e_{ij} \quad (1.9)$$

Where M_y is mean by examining character, industry is denoted by $a_i, i = 1, 2, 3$ and e_{ij} denotes impact of random effects and j represents the region.

For the variance of an unemployment rate of region applies:

$$\delta_y^2 = \delta_a^2 + \delta_e^2 \quad (2.0)$$

Where δ_a^2 is a component of the region's employment rate variability due to the structural backwardness. δ_e^2 component of the region's employment rate variability due to other influences, including random effects.

In the analysis of variance further assume that the variables applies (Bakytová et al., 1979):

- variables a_i are independent, they share a common mean and variance δ_a^2 ¹²
- variables e_{ij} are independent of each other and have a common variance δ_e^2
- variable y has a normal distribution with mean M_y and variance δ_y^2 ¹³.

Given that the analysis of variance we consider only the single-factor, we separate the sample into our m groups, with $n_i (i = 1, 2, \dots m)$ is the frequency of the i -th group. In each group, we find a group average, which is an estimate of the group mean value M_{yi} in sample

$$\bar{y}_i = \frac{1}{n} \sum_{j=1}^{n_i} y_{ij} \quad (2.1)$$

and group sample variance, which is an estimate of the variance σ_i^2 in the sample

$$S_{1i}^2 = \frac{1}{n_i - 1} \sum_{j=1}^{n_i} (y_{ij} - \bar{y}_i)^2 \quad (2.2)$$

¹² Note: Common assumption about the variance of variables a_i for each group we verify by setting confidence interval for the proportion of variances $\frac{\sigma_1^2}{\sigma_2^2}$ (F statistics): $(d, h) =$

$$\left(\frac{\frac{s_1^2}{s_2^2}}{F_{1-\frac{\alpha}{2}}(n_1-1, n_2-1)}, \frac{\frac{s_1^2}{s_2^2}}{F_{\frac{\alpha}{2}}(n_1-1, n_2-1)} \right)$$

¹³ Note: This assumption has been verified in all regions of the sample through a test of skewness and kurtosis rate

To estimate the mean M_y use the total sample average

$$\bar{y} = \frac{1}{n} \sum_{i=1}^m \sum_{j=1}^{n_i} y_{ij} \quad (2.3)$$

As the numbers of groups (n_i) are not the same, i.e. $n_1 \neq n_2 \neq \dots \neq n_m$ and $\sum_{i=1}^m n_i = n$, account the different weight groups in the calculation of sample characteristics. The simple weighted average of the group means.

$$\bar{y} = \frac{1}{n} \sum_{i=1}^m \bar{y}_i n_i \quad (2.4)$$

Variance estimates are selective characteristics

$$est\sigma_y^2 = \frac{1}{m-1} \sum_{i=1}^m (\bar{y}_i - \bar{y})^2 n_i \quad (2.5)$$

$$F = \frac{\frac{1}{m-1} \sum_{i=1}^m (\bar{y}_i - \bar{y})^2 n_i}{\frac{1}{n-m} \sum_{i=1}^m \sum_{j=1}^{n_i} (y_{ij} - \bar{y})^2} \quad (2.6)$$

Results

In our first task we have been concerned with the spatial causes of unemployment. For our research intensions we developed matrices of neighborhood area, which includes all districts of the Slovakia. In our case, we consider a symmetric matrix:

$$[79 * 79]$$

Median of the unemployment rate for all districts was set at 12,59%. The final calculation we proceeded as follows:

$$I = \frac{79}{366} * \frac{42,38}{19,02} = 0,4809$$

Thus, in the case of Slovakia we can speak about positive spatial autocorrelation. Moran coefficient reached 0.4809, which indicates a strong degree of positive spatial autocorrelation.

On significance level $\alpha = 0.05$, we tested the hypothesis of spatial autocorrelation based on the median of unemployment rate in the districts of Slovakia In the calculations we proceed as follows:

$$S_1 = \frac{1}{2} \sum_i \sum_j (w_{ij} + w_{ji})^2 = 756$$

$$S_2 = \frac{\sum_i (\sum_j w_{ij} + \sum_j w_{ji})^2}{1} = 8848$$

$$\begin{aligned}
 S_3 &= \frac{N^{-1} \sum_i (x_i - \bar{x})^4}{(N^{-1} \sum_i (x_i - \bar{x})^2)^2} = \mathbf{1,000641} \\
 S_4 &= \frac{(N^2 - 3N + 3)S_1 - NS_2 + 3(\sum_i \sum_j w_{ij})^2}{1} = \mathbf{4270952} \\
 S_5 &= S_1 - 2NS_1 + \frac{6(\sum_i \sum_j w_{ij})^2}{1} = \mathbf{738612} \\
 \text{Var}(\mathbf{I}) &= \frac{NS_4 - S_3S_5}{(N-1)(N-2)(N-3)(\sum_i^n w_{ij})^2} = \mathbf{0,005162}
 \end{aligned}$$

The Moran index for regions of V4 countries transform on the normal distribution statistics for testing the hypothesis of spatial autocorrelation at significance level $\alpha = 0.05$.

$$\begin{aligned}
 U &= \frac{I - E(I)}{\sqrt{\text{Var}(I)}} \sim N(\mathbf{0}, \mathbf{1}) \\
 u &= \frac{\mathbf{0,480931} - (-\mathbf{0,01282})}{\sqrt{\mathbf{0,005162}}} = \mathbf{6,872}
 \end{aligned}$$

To determine the confidence interval on significance level $\alpha = 0.05$ we find in tables of normal distribution quantile $u_{0,975} = 1,96$. The confidence interval for the alternative hypothesis is $(-\infty; -1,96) \cup (1,96; \infty)$. Our calculated value is realized in the given interval, and therefore we should accept the alternative hypothesis about the significance of spatial autocorrelation of regions of V4 countries at NUTS II with at least a 95% probability.

We are verifying statistical significance of differences on the labor market in regions at NUTS IV level based on the share of the workforce in industry. We take first sample, measuring the agriculture and forestry. So, we formulate hypothesis:

$$H_0: M_{y_1} = M_{y_2}$$

Total number of regions $n=79$, $n_{i1} = 40$, $n_{i2} = 39$, and $m = 2$.

First, calculate the totals in groups:

$$\sum_{j=1}^{40} y_{ij} = \mathbf{168}; \sum_{j=1}^{39} y_{2j} = \mathbf{231}$$

calculate the group means:

$$\bar{y}_1 = \mathbf{4,22}; \bar{y}_2 = \mathbf{5,93}$$

and squares group means:

$$\bar{y}_1^2 = \mathbf{17,77}; \bar{y}_2^2 = \mathbf{35,18}$$

overall average $\bar{y} = \mathbf{5,06}$ and its square $\bar{y}^2 = \mathbf{25,63}$

Next, we compute an estimate of the variance of group averages

$$\text{est } \sigma_y^2 \frac{1}{2-1} \mathbf{58,14} = \mathbf{58,14}$$

and finally calculate test characteristics

$$F = \frac{\frac{1}{2-1} \mathbf{58,14}}{\frac{1}{79-2} \mathbf{273,04}} = \mathbf{16,39}$$

In table of F distribution we find the critical value F_α for $k_1 = 2$ a $k_2 = 77$ degrees of freedom. At significance level $\alpha = 0,05$ is $F_{0,05} = 3,13$ and $\alpha = 0,01$ is $F_{0,01} = 4,92$. Calculated test characteristics is far higher than both critical values and therefore we reject the null hypothesis test of the equality of mean values of the labor market in regions. Thus the differences between the labor concentration in agriculture and forestry in advanced and lagging regions are statistically significant.

Analogously repeat test with second sample, measuring the labor concentration in the manufacturing sector. So, we formulate hypothesis:

$$H_0: M_{y1} = M_{y2}$$

Total number of regions $n = 79$, $n_{i1} = 40$, $n_{i2} = 39$, and $m = 2$.

First, calculate the totals in groups:

$$\sum_{j=1}^{40} y_{ij} = \mathbf{945,35} ; \sum_{j=1}^{39} y_{2j} = \mathbf{930,47}$$

calculate the group means:

$$\bar{y}_1 = \mathbf{23,63} ; \bar{y}_2 = \mathbf{23,86}$$

and squares group means:

$$\bar{y}_1^2 = \mathbf{558,54} ; \bar{y}_2^2 = \mathbf{569,208}$$

overall average $\bar{y} = \mathbf{23,74}$ and its square $\bar{y}^2 = \mathbf{563,79}$

Next, we compute an estimate of the variance of group averages

$$\text{est } \sigma_y^2 \frac{1}{2-1} \mathbf{0,994} = \mathbf{0,994}$$

and finally calculate test characteristics

$$F = \frac{\frac{1}{2-1} \mathbf{0,994}}{\frac{1}{79-2} \mathbf{3863,16}} = \mathbf{0,02}$$

In table of F distribution, we find the critical value F_α for $k_1 = 2$ a $k_2 = 77$ degrees of freedom. At significance level $\alpha = 0,05$ is $F_{0,05} = 3,13$ and

$\alpha=0,01$ is $F_{0,01} = 4,94$. Calculated test characteristics is much lower than both critical values and therefore we accept the null hypothesis test of equality of mean values of the labor market in the regions. Thus the differences between the labor concentration in the manufacturing sector in advanced and lagging regions are statistically nonsignificant.

Finally we took the third sample sector of services, excluding public ones. So, we formulate hypothesis:

$$H_0: M_{y1} = M_{y2} = M_{y3}$$

Total number of regions $n = 79$, $n_{i1} = 40$, $n_{i2} = 39$, and $m = 2$.

First, calculate the totals in groups:

$$\sum_{j=1}^{40} y_{ij} = 1577,59 ; \sum_{j=1}^{39} y_{2j} = 1329,48$$

calculate the group means:

$$\bar{y}_1 = 39,44 ; \bar{y}_2 = 34,09 ;$$

and squares group means:

$$\bar{y}_1^2 = 1555,49 ; \bar{y}_2^2 = 1162,08$$

overall average $\bar{y} = 36,79$ and its square $\bar{y}^2 = 1354,12$

Next, we compute an estimate of the variance of group averages

$$est \sigma_y^2 \frac{1}{2-1} 565,28 = 565,28$$

and finally calculate test characteristics

$$F = \frac{\frac{1}{2-1} 565,28}{\frac{1}{79-2} 3488,76} = 12,47$$

In table of F distribution we find the critical value F_α for $k_1 = 2$ a $k_2 = 77$ degrees of freedom. At significance level $\alpha=0,05$ is $F_{0,05} = 3,13$ and $\alpha=0,01$ is $F_{0,01} = 4,94$. Calculated test characteristics is much higher than both critical values and therefore we reject the null hypothesis test of equality of mean values of the labor market in the regions. Thus the differences between the labor concentration in service sector excluding public ones in advanced and lagging regions are statistically significant.

Discussion

The results of our empirical analysis agree with statements concerning about the spatial deployment of the disparities on labor market across the regional structure of the Slovakia.

Figure 1. represents a spatial deployment of the unemployment rate in the districts of Slovakia. We can see relatively great differences in unemployment rates across various districts of Slovakia. Unemployment rates vary between 2,97–31,71%, respectively. The districts with the biggest unemployment rate, above the median, are peripheral districts, located alongside the southern border of Slovakia with Hungary and also some located in the north-eastern part near the border with Poland. Elevated unemployment also persists in middle and eastern part of Slovakia. Just one bright spot is represented by urban districts of Kosice city with unemployment well below the median. Generally, these districts are afflicted by structural conversion of industry, enhanced by the decay of internal markets and undermined by the undeveloped infrastructure which contributes to their poor performance.

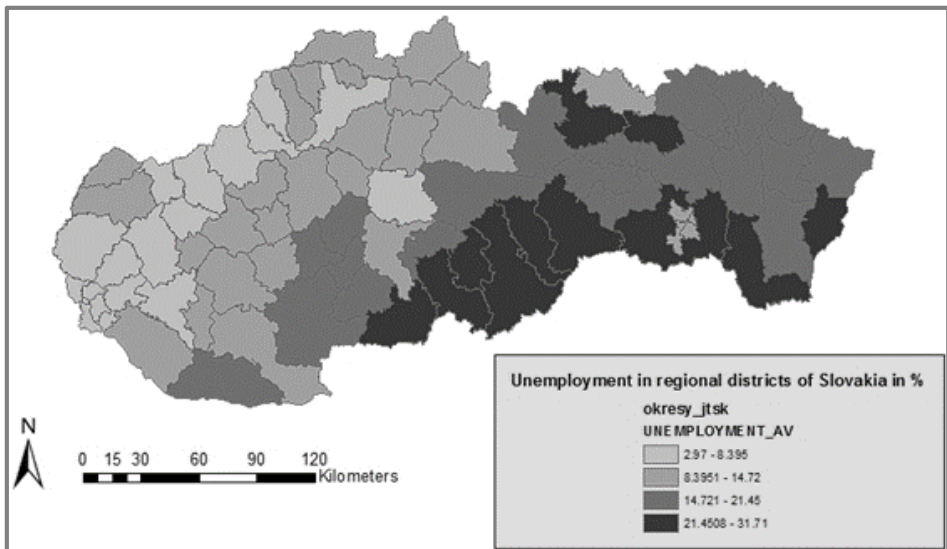


Figure 1.: Spatial deployment of the unemployment rate in the districts of Slovakia

Source: Own calculations, www.statistics.sk

Conversely, districts at least afflicted by unemployment are located on the west and in the north-western part of the Slovakia well below the median. Alongside the Czech border is formed „metal belt” districts chain, consisted by machinery, metalworking and automotive industry, backed by the strong service sector. In the middle part of the Slovakia are located districts with a mediocre level of unemployment. These districts are partially affected by industrial decline in some industries which are further eroding remaining potential.

Figure 2. shows unemployment in spatial perspective, which is closely copying the unemployment pattern in Figure 1. The Empirical analysis confirmed relatively strong degree of spatial autocorrelation in case of unemployment rate in regional structure of Slovakia. The districts above and below the median are forming clear clusters.

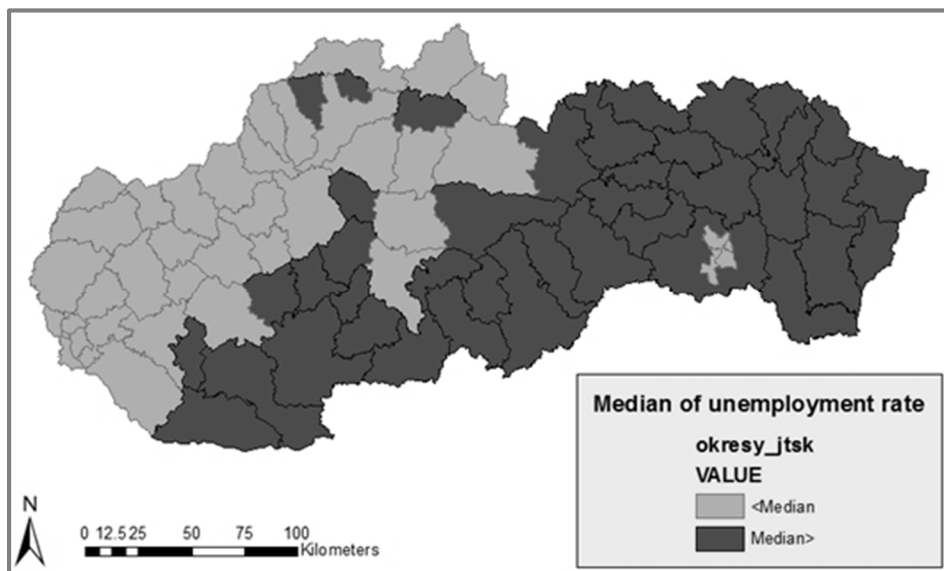


Figure 2.: Unemployment in spatial perspective, Slovakia

Source: Own calculations, www.statistics.sk

In our second task we were concerned with examining the labor market structure of all regions. We were looking for finding some differences in the labor market between our two samples. We examined the composition of labor stock in two samples according aggregated industries: agriculture and forestry, manufacturing sector, and sector of services.

Through analysis of variance of shares of these industries on the labor stock in our two samples, we found out, that statistically significant differences were confirmed only in the case of the agriculture and forestry and in the case of the market services. Differences in the case of manufacturing sector were statistically insignificant. These findings mark a little surprise, namely in the case of the manufacturing sector, since the base of the economy is the manufacture. Very similar size shares of the labor stock incorporated in the manufacturing sector both in two samples should support the development of the strong sector of the services and thus lowering the unemployment rate.

Conclusion

The paper was concerned about labor specialization of the workforce within the regional structure of Slovakia and its impact on spatial patterns of unemployment. The empirical results show up clear patterns of (un)employment. Spatially, according the prevailing unemployment rate in districts, we can divide Slovakia on several bands with the increasing unemployment rate from west to east. Empirical results have confirmed statistically significant differences between employment–unemployment within the districts of the Slovakia, as a difference in labor stock incorporated in economic sectors of the Slovakia. In despite of, results have not proofed enough significance of labor specialization and its impact on patterns of unemployment, however we should not rule it out.

So, we need to take into account the other external factors, which have not been assessed. In general, regions mostly affected by the unemployment belongs to the peripheral and rural regions, which means lower population density and poor infrastructure, transport one notably. The market in these regions in general, is thin due to these circumstances. The wages in these regions are among the lowest in the whole country and these regions are famous with the relatively high concentration of marginalized social groups. These conditions deter the investments and enterprising, which leads to further marginalization of these areas. It is necessary to continue in further research, deepening the empirical evidence and examination the further factors, which are influencing labor mobility and manufacturing localization in advanced and lagging regions in Slovakia.

References

- Bakytová, H., Ugroň, M., Kontšeková, O. (1979): *The basic of the statistics*. [in Slovakia: Základy štatistiky]. Bratislava: Alfa. 63-555-79.
- Buček, M. (1998): *Regional policy in the Slovak republic*. [in Slovakia: *Regionálna politika v Slovenskej republike*]. In: MAIER, G. , TODLING, F.1998. *Regional and urban economy 2: Regional development and policy*. [in Slovakia: *Regionálna a urbanistická ekonomika 2: Regionálny rozvoj a regionálna politika*.] Bratislava: Elita. ISBN 80-8044-049-2.
- Divinsky, B. (2007): *Labor market – migration nexus in Slovakia: time to act in a comprehensive way*. International Organization for Migration. Bratislava. ISBN 978-80-89158-17-1
- Falťan, Ľ., Pašiak, J. (2004): *Regional development of Slovakia: Background and current status*. [In Slovakia: *Regionálny rozvoj Slovenska: Východiská a súčasný stav*]. Bratislava. Slovak Academy of Sciences. ISBN 80-85544-35-0
- Lauko, V., Križan, F., Gurňák, D. (2009): *Temporal-spatial aspects of unemployment in Slovakia in the process of economic transformation and crisis*. [in Slovakia: *Časovo-priestorové aspekty nezamestnanosti na Slovensku v procese ekonomickej transformácie a krízy*] In: XII. Medzinárodné kolokvium o regionálnych viedach: zborník príspevkov z kolokvia. Bořetice 17.-19. června 2009. Brno: Masarykova univerzita. ISBN 978-80-210-4883-6, p.58-65
- Klimovský, D. et al. (2014) *Innovation policy as a New Development Driver of the Regions in Slovakia: Does Activity of Regional Self-government Matter?* *International Review of Social Research*, Vol.4, p.27-47
- Kováč, D. et al. (1998): *The chronicle of Slovakia 1*. [in Slovakia: *Kronika Slovenska 1*]. Praha. Fortuna Print. ISBN: 807153174X
- Michálek, A., Podolák, P. (2011): *Impact of key socio-economic disparities on migration in Slovakia: Economic diversification vs. traditional pattern*. *European spatial research and policy*. Vol.18
- Stehlíková, B. (2002): *Spatial statistics*. [in Slovakia: *Priestorová štatistika*]. Nitra: SPU. ISBN 80-8069-046-4.
- Valentovič, M. (2008): *Regional development and countryside*. [in Slovakia: *Regionálny rozvoj a vidiek*]. Slovensko 2007: Súhrnná správa o stave spoločnosti. Bratislava. IVO.
- Výrostová, E. (2009): *Regional economics and development*. [in Slovakia: *Regionálna ekonomika a rozvoj*]. Bratislav. Iura Edition. ISBN 978-80-8078-361-7
- Zubriczký, G. (2009): *Geography of world states*. [in Slovakia: *Geografia štátov sveta*]. Bratislava. Kasico. ISBN 978 80 8067 227 0
- Dorling Kindersley Book (1999): *Atlas*. [in Slovakia: *Atlas*]. Bratislava. IKAR. ISBN 80-7118-769-0

European Bank for Reconstruction and Development (2003): *Transition report 2003*.
In: Integration and regional cooperation. UK. London. EBRD publication desk.
ISBN 1 898802 23 8

OECD (2013): *Investing Efficiently in Education and Active Labor Market Policies in Slovakia*. ECO/WKP (2013)9 *Market Study*. 80-968155-4-7

World Bank (2001): *Slovak Republic, Living Standards, Employment and Labor*. ISBN 80-968155-4-7