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Toward of the spatiality of the Information and Communication Technologies sector: Case study from the Slovak Republic

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Rapid diffusion of ICT has produced significant changes in the way and place for the production of goods and provides services. This implies that ICT had an impact on the industrial structure and geographical location of regions. The ICT industry in the Slovak Republic has been one of few industries in which the employment has continuously grown and this sector has the lowest unemployment rate of all sectors of the economy and permanently grows. All these findings have caused the author to measure the concentration of ICT sector in the Slovak Republic at the regional level. The aim of this paper is to map the regional disparities in the ICT sector in the Slovak republic. The analyses developed for this manuscript are based on two main methodologies: regional and cluster analyses. The existence of disparities between regions is indisputable. All the characteristics and calculations confirmed large disparities in the ICT sector in individual regions. As finding showed, the ICT sector is the driving force of the Slovak economy and economic development. The results call for greater attention to regional disparities in ICT sector in the Slovak Republic.

JEL Classifications: P25, D80, L8

Keywords: ICT sector, regional disparities, spatiality, cluster analysis

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Introduction

Many authors have been interested in concepts that include a variety of phenomena which can be evaluated through quantitative and efficacious indicators (Caschili et al., 2015). The development of a region is affected by concepts linked to the ability to lagging economic conditions. This paper primary focuses on the spatiality of the sector of Information and Communication Technologies (further ICT) in the Slovak Republic.

ICT services represent one of the key innovations of the last century. ICT consists of a wide range of technologies in the domain of products and services, including computer hardware, software and services, and telecommunications functions. Rapid diffusion of ICT has produced significant changes in the ways and places for the production of goods and services, in the nature of these products and services, as well as in the distribution channels. This implies that ICT had an impact on the industrial structure and geographical location of regions of different industries, not only in the European Union but throughout the world. ICT have also affected the relationship between consumers and suppliers, as

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well as the way of organization for many markets of semi-finished and finished products and services (Mijačič et al., 2011; Katič et al., 2013)

The ICT industry in the Slovak Republic (according to the Statistical Office of the Slovak Republic) has been one of few industries in which the employment has continuously grown. This sector has the lowest unemployment rate among all sectors of the economy and it distinguishes with the permanently grows. As concerns the exports, the ICT sector follows the automotive industry by a narrow margin, with the relative share of imports as well as exports of the Slovak ICT sector being one of the highest in the world (Madleňák, Madleňáková, 2015). All this statistical data have caused the author to measure the concentration of ICT sector in the Slovak Republic at the regional level.

The aim of this paper is to map the regional disparities in the ICT sector in the Slovak republic. Recent studies of European countries indicate that the contribution of the ICT sector to the regional economy is weakening and slowing economic growth. (Rohman, 2012). On the other hand, some economists have long recognized that technological change is one of the most important forces driving economic growth, together with human capital and knowledge accumulation. This conclusion can be found, for instance, in (Romer, 1986) and (Maddison, 1991). Romer (1990) incorporated a knowledge factor as an input in the production function and found that, instead of generating a traditional declining returns on the production function, human capital supports increasing return to scale.

Rohman (2012) investigated the output multiplier for ICT sectors and compared its value with the non-ICT sectors in the European economy, and presented a comparison between these two groups. According to this study, each euro of spending in the ICT sectors' final demand increased in 1995 the economic output by as much as 1.53 euro.

Literature review

The significance of the ICT sector for the economic growth of the country is confirmed in many studies. Fagerberg et al. (1997) focused on a connection between the ICT sector and unemployment rate. Later on, the ICT is not mentioned only in the relation to the economic growth but increasingly mentioned in the context of the knowledge-based economy (Steinmuller and Edward, 2000; Antonelli, 2000; Mantegazza, 2001). Šipikal et al. (2003) examined the software industry in the Slovak Kosice region and explained the knowledge creation and acquisition processes in this area. ICT sector is researched in terms of the development of the ICT sector in relation to the knowledge-based economy as well (Caragliu, 2013; Šipikal et al., 2013). In the context of the knowledge-based economy, the authors' interests focus on the causes for localization of the ICT firms and on the issue of the regional disparities (Mantegazza et al., 2005; Hudec and Šebová, 2011; Rehak et al., 2013). Increasing concentrations of firms in the region indicate the appropriate location for future business conditions, thereby further deepening concentration (Suir and Vicente, 2009). Currently, the ICT sector is mentioned along with the knowledge-based economy and in relation to the creative economy. Balog et al. (2014) conducted a study that explores the various already established approaches to specifying the creative economy, proposes the classification for cultural and creative industries in the Slovak Republic, which also includes the part of the ICT sector, namely Computer programming and Consultancy relating to computers. Bucek et al. (2015) studied digital media in Košice Region as well.

Methods: Regional and cluster analyses

The analyses developed for this manuscript are based on two main methodologies: regional and cluster analyses. The goal of the primary research was to estimate the role of the regional disparities economic and social development in the ICT sector. Data were used from the SK NACE classification of economic branches, information from INFOSTAT and from the Statistical Office of the SR. The firm database included 7 452

firms from all the regions of the Slovak republic, operating in ICT sector in the Slovak republic. The ICT sector according to the Statistical Office of the SR (SK NACE rev.2) includes: Wired telecommunications activities, Wireless telecommunications activities, Satellite telecommunications activities, Other telecommunications activities, Computer programming activities, Computer consultancy activities, Computer facilities management activities, Other information technology and computer service activities, Data processing, hosting and related activities, Web portals, News agency activities, Other information service activities.

The research focused on:

- Concentration of ICT sector in individual Slovak regions
- Level of concentration in the Bratislava region and the discrepancy between concentration in this region and other Slovak regions
- The highest and lowest concentration
- Existence of any cluster

For the purposes of detecting industrial specialization, the geographical and spatial concentration of ICT sector, the regional metric models have been chosen, such as Index of Concentration (ICG), Location quotient (LQ) and Hoover index (H). Ellison and Glaeser (1999), Guimaraes et al. (2009), Rehák et al. (2011), Hudec (2012), Hudec and Šebová (2012), Stephen (2012), Hlaváček et al. (2014) provide the theoretical justification for using the regional economy methodology to estimate industrial specialization, geographical and spatial concentration.

The cluster analysis (Wilmink and Uytterschaut, 1984) was used to find out if there is any existence of clusters in this sector. Once the different clusters have been identified, they could then be examined in greater detail to establish what the differences are and what they mean in terms of more quality or sinter properties such as human capital and knowledge accumulation.

Index of Concentration (ICG) compare the intensity of the phenomenon in the region with the intensity of the phenomenon in the region, there the intensity is the highest.

$$ICG = \frac{CG}{CG_{max}} \tag{1}$$

Where, the CG means intensity in the region and the CG_{max} - the level in the region of maximum intensity of the phenomenon.

Location quotient (LQ) measures a region's industrial specialization relative to a larger geographic unit. An LQ is computed as an industry's share of a regional total for some economic statistic divided by the industry's share of the national total for the same statistic. LQ of 1.0 means, that the region and the nation are equally specialized.

$$LQ = \frac{\frac{a_x}{c}}{\frac{b_x}{d}} \tag{2}$$

Where, a_x means employment in the i-th sector in the selected region, c is total employment in the selected region, b_x means employment in the i-th sector in the whole country and d means total employment in the relevant country.

Hoover index (h), also known as the Robin Hood index is equal to the portion of the total community income that would have to be redistributed (taken from the richer half of the population and given to the poorer half) for there to be income uniformity.

$$h = \frac{\sum_{i=1}^{n} |x_i - f_i|}{2} \tag{3}$$

Where, (0 - perfect distribution, 100 - maximum concentration), x_i mean studied phenomenon and f_i a phenomenon that is considered to be the distribution destination.

To be able to answer all the research questions, each data point has been defined in the agglomerative and hierarchical approach consequently existing clusters were combined at each step. Every object was considered as a separate cluster of objects. Subsequently, the objects and clusters have been associated based on the distance between them. Finally, all the objects formed a cluster. The criterion for determining similarity and distance between cases, the criterion for determining which clusters are merged at successive steps and the number of clusters needed was taken into account.

$$d_{t,r} = \min\ (d_{p,r}\ ; d_{q,r}) \tag{4}$$

$$d_{t,r} = \frac{n_p}{n_p + n_q} . d_{p,r} + \frac{n_q}{n_p + n_q} d_{q,r} - \frac{n_p . n_q}{\left(n_p + n_q\right)^2} d_{p,q} \tag{5}$$

$$d_{t,r} = max\ (d_{p,r}\ ; d_{q,r}) \tag{6}$$

$$d_{t,r} = \frac{d_{p,r} + d_{q,r}}{2} - \frac{d_{p,q}}{4} \tag{7}$$

$$d_{t,r} = \frac{n_p\ . d_{p,r} + n_q . d_{q,r}}{n_p + n_r} \tag{8}$$

$$d_{t,r} \frac{(n_r + n_p) d_{r,p} + (n_r + n_q) d_{r,q} - n_r . d_{p,q}}{n_t + n_r} = \tag{9}$$

In a process of clustering, we linked to clusters of the most similar clusters (we refer the *q,p*), where d_{tr} mean a distance between clusters.

In Single linkage (4), the distance between two clusters was defined. There is the minimum distance between any single data point in the first cluster and any single data point in the second cluster in the single linkage. Average linkage (8) defines the distance between two clusters as the average of the distances between all pairs of regions in which one member of the pair is from each of the clusters. For each cluster, the means for all variables were calculated in Ward´s method (9). Then, for each case, the squared Euclidean distance to the cluster means was calculated. Centroid method (5) calculates the distance between two clusters as the sum of distances between cluster means for all of the variables. In the centroid method, the centroid of a merged cluster is a weighted combination of the

centroids of the two individual clusters, where the weights are proportional to the sizes of the clusters. The Median method (7) was used because of the existence of the disadvantage in the centroid method, because if the sizes of two groups are very different, then the centroid of the new group will be very close to that of the larger group and may remain within that group. The Median method takes into consideration the size of a cluster, rather than a simple mean. In *Complete linkage* (6), the maximum distance between two clusters was defined, the maximum distance between any single data point in the first cluster and any single data point in the second cluster.

It is appropriate to express the degree of correlation between the properties of objects and the resulting process of aggregating by exact indicator, even when the properties of clustering algorithms are known. For the purposes of this cluster analysis, the Cophenetic Correlation Coefficient - CPCC has been chosen. This is a correlation coefficient between the primary elements of the distance matrix D objects and elements of the cophenetic matrix C. The Cophenetic matrix is the triangular matrix, which elements make up the distance between the object clustering at the time when they were first added to the cluster. The cophenetic coefficient CPCC is calculated on the basis of the relationship (10)

$$CPCC = \frac{cov_{c,c}}{s_d \cdot s_c} \tag{10}$$

Where, *d* is an element of primary matrix and *c* is an element of cophenetic matrix. This coefficient has been chosen for the reason that the higher is the value of cophenetic correlation coefficient, the lower is the information loss, generated in the process of clustering. All the calculus were calculated in Matlab and graphically drawn in Statistica program by dendogram.

Results

As mentioned above, a positive aspect of the ICT sector is higher wages than in other sectors. Even when the number of employees in the sector is below the overall employment of the Slovak republic (2.5%), the share of the total tax levy is 4.7%. This results from the high-wage sector. The share of ICT firms' income tax was 9.6% in 2015. Table 1 presents the Number of ICT firms in the Slovak Republic in comparison with EU in years 2005-2013.

TABLE 1. THE NUMBER OF ICT FIRMS IN THE SLOVAK REPUBLIC IN COMPARISON WITH EU

Number of ICT firms	2005	2006	2007	2008	2009	2010	2011	2013
EÚ 27	716 000	745 000	780 487	802 333	796 242	872 839	906 343	104 560
Slovak Republic	2 051	2 448	2 805	2 980	935	12 120	14 512	14 760
Percentage of representation for Slovak Republic (%)	0.28	0.32	0.35	0.37	0.11	1.38	1.60	1.406

Source: Statistics Office of the Slovak Republic.

As can be seen in Table 2, the most interesting dramatic decline was in 2009 and the subsequent more than the 12time increase occurred in 2011.This is the reason, why economic indicators by the year 2011 are compared with economic indicators in the year 2013.

TABLE 2. REGIONAL ECONOMIC DATA 2011-2013

INDICATORS	GDP[1] (%)		UR[2] (2013, (%)	RGVA[3] 2011, (mil. €)	Share of ICT to RGVA (2011, %)	EAR[4] 2013 (%)	ANMW[5] 2013 (€)
	1995	2011					
Slovak Republic	100.0%	100.0%	13.50	68 974	4.6		824
Bratislava Region	215.6%	246.8%	6.17	17 207	5.4	64.2	1 205
Trnava Region	108.9%	111.8%	9.16	7 171	4.0	62.2	860
Trenčín Region	93.8%	88.1%	10.74	6 055	2.5	56.6	821
Nitra Region	85.2%	89.5%	12.52	7 137	3.0	57.9	789
Žilina Region	80.6%	86.4%	12.51	6 880	4.8	58.0	839
Banská Bystrica Region	82.8%	70.1%	18.26	5 351	4.4	60.7	798
Prešov Region	64.3%	58.5%	19.35	5 505	4.1	58.7	736
Košice Region	87.1%	77.5%	17.23	7 091	6.1	57.2	883

Source: Statistics Office of the Slovak Republic.

Note: [1] GDP Per Capita (Monetary measure of the market value of all final goods and services produced in a year). [2] The Unemployment Rate (A number of unemployed people as a percentage of the labour force). [3] Regional Gross Value Added (The increase in value of the economy due to the production of goods and services. [4] Economic Activity Rate (The percentage of the population - both employed and unemployed, that constitutes the manpower supply of the labor market, regardless of their current labor status). [5] Average Nominal Monthly Wage.

The main contribution of the ICT sector across the economy is the promotion of economic growth of the country. However, if the country wants these effects to grow, it is needed to create better conditions in this sector. The Slovak ITC sector should propose in two areas: the business environment and the human capital.

Before 1989, the former Czechoslovakia showed one of the smallest regional disparities in Europe. But, it was only at the cost of reducing the competitiveness in "stronger" regions. After the transformation to a market economy (1989), the disparities have started to grow rapidly. As can be seen in Table 2, even when there are large disparities in the unemployment rate in individual regions, the regional gross value added disparities in ICT are not as significant. Bratislava region achieves the best results. ICT firms, even though they operate in different regions of Slovakia, have headquarters in Bratislava region (which the capital city Bratislava). This fact greatly distorted research finding. The most companies operate in divisions of "O*ther information technology and computer service activities* and *Data processing, hosting and related activities"*. In last decades, the division of computer programming activities is supported by the state (Table 3).

TABLE 3. THE STRUCTURE OF THE ICT SECTOR IN THE SLOVAK REPUBLIC 2013

Activity/Number of ICT firms (%)	Region								Overall
	BB	BA	KE	NR	PO	TN	TT	ZA	
Wired telecommunications activities	2.55	0.41	2.92	0.94	1.29	1.91	0.34	0.54	0.97
Wireless telecommunications activities	2.01	0.38	1.37	0.59	1.29	0.96	1.55	0.54	0.79
Satellite telecommunications activities	0.55	0.06	0.00	0.24	0.00	0.00	0.52	0.00	0.13

TABLE 3. THE STRUCTURE OF THE ICT SECTOR IN THE SLOVAK REPUBLIC 2013

Activity/Number of ICT firms (%)	Region								Overall
	BB	BA	KE	NR	PO	TN	TT	ZA	
Other telecommunications activities	4.20	2.37	2.23	1.65	3.23	1.67	2.59	1.80	2.40
Computer programming activities	12.96	24.89	22.64	13.58	13.33	20.57	23.62	16.37	20.85
Computer consultancy activities	10.22	8.45	23.50	30.58	7.10	8.61	7.41	6.83	12.00
Computer facilities management activities	0.73	1.71	1.37	1.30	0.43	0.72	2.07	1.98	1.48
Other information technology and computer service activities	29.74	29.18	28.82	10.01	32.26	41.39	36.72	46.04	29.74
Data processing. Hosting and related activities	35.58	30.33	14.58	40.38	38.92	20.10	23.79	24.82	29.67
Web portals	0.18	0.55	1.03	0.59	0.86	1.67	0.17	0.72	0.63
News agency activities	0.00	0.09	0.00	0.00	0.00	0.24	0.00	0.00	0.05
Other information service activities	1.28	1.59	1.54	0.12	1.29	2.15	1.21	0.36	1.29

Source: Own elaboration.

Note: BB - Banská Bystrica Region, BA - Bratislava Region, KE - Košice Region, NR - Nitra Region, PO - Prešov Region,TN - Trenčín Region, TT - Trnava Region, ZA - Žilina Region.

As can be seen in Table 4, here occurs the problem of different performance in the column of sales. Even when Index of concentration achieves zero values, the number of employees and firms is not so low. For this reason, Bratislava region achieves the best score in Index of Concentration as well. For this reason, it is really very hard to find out the real disparities in this sector.

Banská Bystrica Region - the largest region with the lowest density (69.5 inhabitants per km^2), since 1997 unsuccessfully struggling with population decline. Fairly rugged terrain with massive mountains of the north complicates the development of various forms of transport. Pillars of the economy are tourism, production of metals and metal products. Bratislava Region - the smallest Slovak region, with the capital city Bratislava. Most economic indicators are at the highest level in this region (Tables 1-4). The advantage of this region is excellent transportation position. Košice Region - the fourth largest region with a positive natural growth but negative migration tendency. According to GDP, Košice region is the most important region of SR. Nitra region - the natural increase is negative in the long term. The region has a significant industrial sector and the utilized agricultural area. Prešov Region - is the region with the largest population. Prešov region is well known as a tourism industry. Trenčín Region is a small region with the uneven population. The natural decreases are accompanied by an aging population. Nature of the economy is the industrial and agricultural region with important rail routes. Trnava Region - the second smallest region. The development of natural increase rate is negative as well. On the other hand, Trnava region is one of the most productive agricultural regions, the agricultural land takes up 69.7%. Žilina Region - the third largest region on 6th place in

population density rate. Economic performance can be assessed as moderate. Žilina region has an excellent international transport position.

TABLE 4. INDEX OF CONCENTRATION ACCORDING TO ICT PARAMETERS

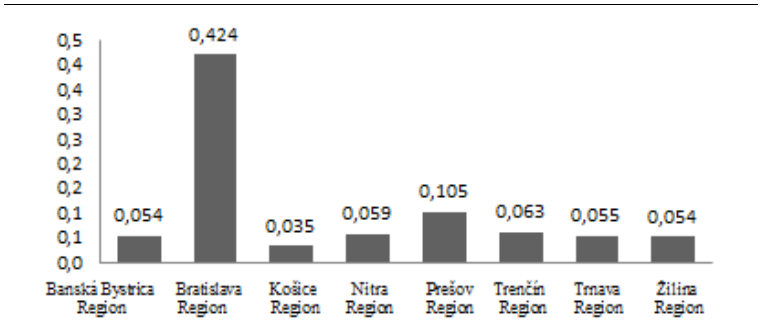
ICG	Net Sales (19<employees)	Wage	Number of employees	Sale-employed person in ICT sector	Number of firms	Labor costs	Average
BB	0.00	0.67	0.09	0.31	0.13	0.062	0.2117
BA	1.00	1.00	1.00	1.00	1.00	1.000	1
KE	0.05	0.73	0.24	0.28	0.16	0.179	0.2747
NR	0.01	0.47	0.09	0.26	0.21	0.040	0.1787
PO	0.00	0.60	0.03	0.30	0.12	0.016	0.1769
TN	0.00	0.56	0.04	0.26	0.11	0.024	0.1667
TT	0.00	0.56	0.02	0.30	0.15	0.009	0.1736
ZA	0.02	0.63	0.12	0.29	0.14	0.076	0.2126

Source: Own elaboration.

Note: ICG - Index of Concentration. BB- Banská Bystrica Region, BA - Bratislava Region, KE - Košice Region, NR - Nitra Region, PO - Prešov Region, TN - Trenčín, Region, TT- Trnava Region, ZA - Žilina Region.

According to Hoover index, Figure 1 shows average values. The inclusion of population rate in the calculation of the Hoover index (in comparison with Index of Concentration) was enough to alter the order of the other regions. However, the Hoover index showed, that to have the ICT sector without disparities, we would have to regroup 42% of the sector: 38% of firms, 22% of self-employed persons, 50% of employees and 42% of expenditures on wages from Bratislava Region to the other Slovak Regions.

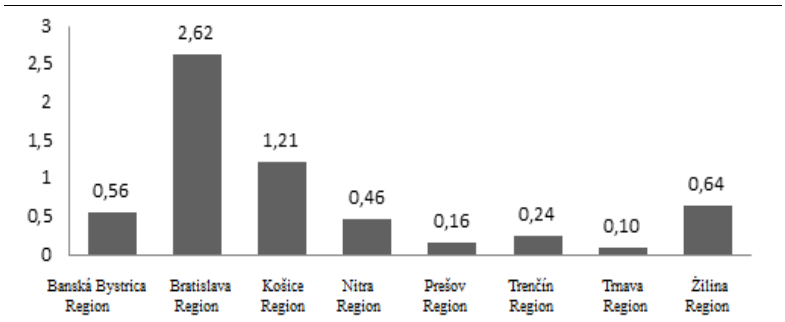
FIGURE 1. HOOVER INDEX WITH AVERAGE VALUES



Source: Own elaboration.

Location quotient showed clear leadership of Bratislava Region, but Košice Region and Žilina have quite a good score of value quotient as well. Such a high score in Košice Region could be also thanks to the Košice IT Valley Cluster. The aim of this cluster is to create suitable conditions for the creation and development of ICT center of excellence in the territory of Eastern Slovakia and make socio-economic environment in the region attractive, especially for young people. (See Figure 2)

FIGURE 2. ICT SECTOR LOCATION QUOTIENT



Source: Own elaboration.

The methods of cluster analysis were used to cluster ICT sector in the Slovak republic. The Squared Euclidean distance was used to measure the distance. Degree of correlation between the properties of objects and the resulting process of aggregating by the exact indicator was evaluated by the Cophenetic Correlation Coefficient - CPCC. As can be seen in Table 5.

TABLE 5. CLUSTER ANALYSIS

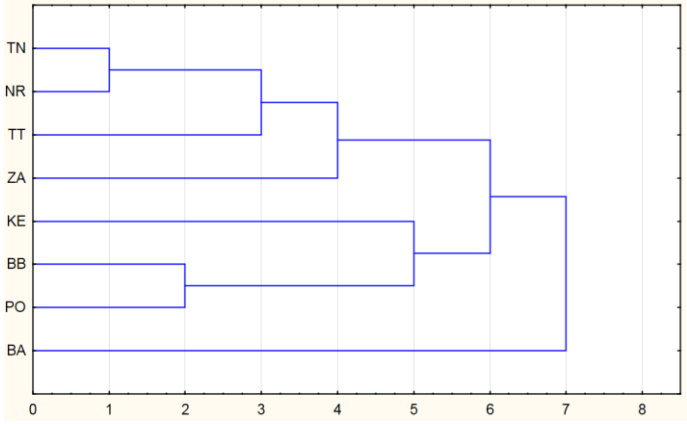
Metric	Method/linkage	Cophenetic correlation coefficient
Euclidean metric	Average linkage	0.9715
	Centroid method	*not appropriate*
	Complete linkage	0.9676
	Median method	0.9686
	Single linkage	0.9579
	Weighted	0.9705
	Ward´s method	0.9489

Source: Own elaboration.

The most appropriate according to CPCC is the average linkage. This linkage defines the distance between two clusters as the average of the distances between all pairs of regions in which one member of the pair is from each of the clusters.

It can be stated, that the ICT sector consists of two different clusters in terms of spatial disparities Figure 3. The Bratislava Region (BA) and the other regions. All the best "indicator scores" are influenced by the statistics organization, as written above, most of the ICT firms have headquartered in Bratislava region, or are registered in Bratislava region, but truly operate in different Slovak region. There is a huge potential of human capital and knowledge accumulation in Košice and Žilina Regions also for the reason of the largest Slovak universities are located in this regions aimed at training professionals for the ICT sector and The university can positively influence the ICT company value chain as well.

FIGURE 3. CLUSTER ANALYSIS: DENDROGRAM



Source: Own elaboration.

FIGURE 4. ICT SPATIAL CLUSTERS

Source: Own elaboration.

Therefore, the current situation in the ICT sector the best presents the third level, with the first cluster - Bratislava Region (BA), the second one with Banská Bystrica Region (BB) and Prešov Region (PO), the third one Košice Region (KE), the fourth one Žilina region (ZA) and the fifth one the Trnava, Trenčín and Nitra regions (TT, TN, NR).

Conclusion

The existence of disparities between regions is indisputable. The greatest differences are not only in regional GDP but also in spatial differentiation. The most concentrated is the

sector in the capital city Bratislava, the least in regions of Prešov and Trenšín. Surprisingly, the disparities in the regions in the middle of the order are not so significant.

Quantification of relative values showed, that these disparities are worthy of attention. Even when Slovak Republic has got quite a good position in ICT rates, finding showed, that it is important to blur these regional disparities. As findings showed, the nature of the ICT sector allows to start a business wherever, what can be also seen at the relatively uniform deployment of ICT firm in individual regions. The sector is not tied to physical location. With sensible intervention and selective location support, the state could achieve much faster removal of the regional disparities.

All the characteristics and calculations confirmed large disparities in the ICT sector in individual regions. Not positive fact is, that these disparities are significantly large scale. As Hoover index showed, up to 42 % should be regrouped to obtain no or low disparities in ICT sector. Not surprisingly, all findings and calculations confirmed the primacy of the Bratislava region, especially the capital city Bratislava.

According to aggregation methods, the smallest concentration of ICT sector is in Prešov region. In generally, this is the poorest region in Slovakia.

The location theories have to bear in mind portability demand, which is thanks to the IT particularly high. As the results show, ICT companies are less fixed to the physical place than other sectors. In next two years, the deficit of labor market will be three to five thousand people. Nonproduction ICT sector can be extremely mobile, and if there are bad business conditions, there is no problem to move to countries with different business conditions.

It is difficult to answer the question, how quickly will the Slovak ICT sector progress. It depends on mainly upon what direction will develop conditions, particularly in term of quality of the business environment and the level of skilled labor. The aim should be to promote the education in the sector and improve conditions in the business environment. In some issues of environmental quality, such as last enforcement, is the Slovak Republic in the last ten rankings nearly 150 countries, including several developing countries.

For all these reasons mentioned above, the authors think, that such significant disparities in the ICT sector represent the problem. As mentioned before, these disparities "inflated" strong concentration large, international enterprises in the capital city, but even apart from this fact, it is not appropriate, when one region concentrate half amount of firms and more than 60% of employees in the ICT sector. The sector do not expect active financial support, only the better business conditions and better quality in education system in the Slovak Republic in the area of the ICT sector, reduce the administrative burden (especially e-government), reduced rate of income tax burden at least for start-ups, or create a new simple legal forms of business.

As stated in literature review, there are several studies focused on the regional disparities in the ICT sector in the Slovak Republic. The individual studies do not assess comprehensively all the parts of the ICT sector in all regions of the Slovak Republic. These studies, mentioned in the Literature review, mostly research the Bratislava and Košice Regions and profitable fields of the ICT sector, such as the computer programming and digital media.

As written before, the goal of this paper is to research the existence of the regional disparities in the ICT sector in the Slovak Republic. The complex research of the whole sector in all the regions can in the future eliminate weaknesses, reinforce strengths and address the opportunities and risks of this sector and consequently help to economic growth across the country.

As finding showed, the ICT sector is the driving force of the Slovak economy and boots economic development all these are reasons why to pay attention to regional disparities in ICT sector in the Slovak Republic.

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