STRUCTURAL CHANGES OF THE CZECH ECONOMY AT REGIONAL LEVEL

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Abstract: This paper deals with regional industry structure of the Czech Republic and structual changes that have occured in last twenty years in the Czech regions. It attends to the industry structure between the years 1998 and 2008 in more detail. There was used cluster analysis to sort regions and create a classification of them in accordance with their similar characteristics.

Keywords: Structural Changes, Regions, Cluster Analysis, Industries, Economic Performance

1. Introduction

Every region[1] is characterized by certain specifics that are related to historical, natural, geographical, demographical, economical, political and other aspects which determine the economical growth of region. Prosperous region is characterized by prosperous microeconomic subjects. The market substantially influences the level of fruitfulness of firms and the usage of their products. This influence must be in accordance with presumption of continuous persistency of firm [9]. The above mentioned regional specifics are the local factors which are in particular important for determination of sources of wealth of region. These sources are the production factors like labour, capital and land. The quality, quantity and productivity of production factors, the influence of multiplier effects, the influence of redistribution processes and the rate of leakages from region are important for economical growth of region. Needs of production factors and their features vary at particular sectors (and regions). Despite of privilege of manufacturing industry in the Czech economy each region has different structure of branches, differs in own productivity or in rate of employment and the other characteristics. These aspects determine the economical productivity and competitiveness of region and influence the interregional disparities.

Other articles already deal with similar topics in terms of "Scientific Papers of the University of Pardubice" as well. The article "Disparity krajů ČR" [8] deals with evaluation of disparities of regions by means of method of cluster analysis. This analysis will be used in this paper as well. Various socio-economical characteristics were used for cluster analysis there. The result of this analysis was division of regions into four groups. The findings of article "Modelování konkurenceschopnosti regionů v podmínkách globalizace" [12] were among other that extraordinary successful regions contain capital cities or these regions are identify with the capital cities. Above

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[1] Region at the level of NUTS III is thought in this article.

mentioned question which is related with production factors is solved in paper "Vývoj produktivity z pohledu sektorů národního hospodářství v kontextu vývoje členských států EU" [11]. The impact of productivity of factors labour and capital on progress of GDP is solved in mentioned article. The paper "Measurement of regional disparities and economic competitiveness of regions" [13] deals with factors of regional competitiveness and with indicators of regional disparities in context of regional competitiveness.

The classification of regions at the level of NUTS III in the Czech Republic according to the structure of braches in years 1998 and 2008 and according to rate of structural changes in mentioned years is the aim of this article.

2. Structure of Czech Economy

Before the year 1989 the predominance of industry over tertiary sector was typical for Czech economy. This situation was already due to historical evolution from epoch of Austria-Hungary and of the so called first republic. The existence of central planed economy in the second mid-20th century contributes to this situation. In the first mid-1990s the Czech economy was indifferent to structural changes. The low rate of unemployment was the evidence of the absence of structural changes. [2] It happen by the subsequent transformation to leave of uneconomical production, liquidation of "automatic" industrial credits, privatization, implementation of trade and price liberalization, reform of system of law transition to free convertible currency. The structural changes were created at the micro-level and than were made at macro-level. These changes manifested the change of importance of particular sectors in Czech economy – the importance of tertiary sector was grown. The Czech industry moved to branches with higher added value, with higher stress to export (e.g. the share of industrial production in export increased[2]) and the productivity of labour grew as well. The Czech economy reoriented at energy-saving and less damaging the living environment production. The growing rate of unemployment especially in regions with concentration of suppressed production related to the structural changes. Only the part of redundant workers was absorbed by tertiary sector. This absorption was different in regions. And this made the higher regional differentiation of employment. Nevertheless the structural and local lack of labour forces has become by limiting factor after the year 2008. [4]

The high inflow of foreign direct investments linked to transformation. These investments flew into important centres with industrial tradition and with qualified labour forces (especially the areas of car industry and related electrotechnics, manufacturing of machinery, production of plastic material etc. are mentioned there). These investments supported the regional specialization[3]. The foreign investors built "on greenfields", thereby the previous specialization was changed[4]. In 1995 – 2005 the substantial size of investment flew into areas of transport, stocking, post and

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[2] In 2000 the sales from direct export shared in total industrial sales by 37,5 % and in 2006 shared by 43,8 %. [3]

[3] E.g. the creating of joint-venture of Bosch Diesel and local traditional firm Motorpal i Jihlava.

[4] E.g. investment into branch of manufacturing industry, electronic, computer technology. See the firms TPCA in Ovčáry at Kolín, Panasonic in Plzeň or Foxconn in Pardubice.

telecommunication, activities linked with immovables, with leasing, computer technologies, research and development and services for enterprises. [2] The size of investment decreased in primary sector. This decrease was evoked by alternative ways of purchases of tangible assets, by exhausting of potential of building of big projects concerning the production and electricity distribution. The agriculture stagnated in this decade and the importance of extractive industry decreased as well. This decrease was evoked by decreasing of investment in coal-mining industry. When we want to explore the dynamics of investment, we can see above-average growth in manufacturing industry and in branch of other public, social and personal services and in civil engineering as well. The branch of agriculture, hotel industry and accommodation, extractive industry, electrical industry and financial enterprises embodied undersized dynamics of growth of investment. [1]

The manufacturing industry plays the key role in Czech industry. Employment, sales, count of firms and reaching profit or size of investment grew thanks this industry. The position of manufacturing industry strengthened over the years thanks to strong changes in ownership. E.g. the car industry showed a loss over 5,2 milliard CZK in 1997, while in 2004 made profit 15,6 milliard CZK. [4] The medium-high-tech branches are the centre of gravity of manufacturing industry. These branches have the largest growth potential whereas these branches are equally spatially allocated than high-tech branches. [4] In 2000 the metallurgy dominated in Czech industry. The metallurgy shared in sales in manufacturing industry by 16,2 %. In 2006 the car industry already dominated there (the share is 20,4 %). [3]

The largest growth of share was in branch of production of electrical and optical instruments whose share in sales of manufacturing industry increased about 7,1 %. [3]

3. Regional industry structure

Regions differ in their socio-economic parameters and have been developing over the time differently. A very important factor is industry structure, because industries differ in the level of the labour productivity and determine wage regional level. The following Tab. 1 shows how each industries in each regions participated in gross value added in 2008.

Tab. 1: Proportion of each industries in each regions in the creation of gross value added in 2008 (in %)

Sector[5]/Region[6]	HMP	SCK	JCK	PLK	KVK	USK	LBK	KHK	PAK	VYS	JHM	OLK	ZLK	MSK
A	0,2	3,1	5	4,2	2,7	1,3	1,5	4,6	4,5	7,3	3,1	4,2	2,5	1,6
B	0	0	0,1	0	0	0	0	0	0	0	0	0	0	0
C	0,1	0,2	0,4	0,1	10,4	6,1	-0,3	0,5	0,1	-0,2	1,1	0,4	0,1	6,8
D	8,4	**34**	**23,8**	**30,5**	**21,7**	**26,9**	**37,1**	**31,2**	**30,3**	**36,3**	**23**	**28,9**	**39,1**	**31,8**
E	4,9	2,8	11,7	3,9	4,7	10,3	1,6	5,5	5,3	8,4	2,4	1,9	1,8	4,6
F	5	5,7	6,9	6,8	6,3	8,3	7,6	6,8	7,6	6,7	8,3	7,8	7,9	6,7
G	16,8	14,2	10,5	11,2	10,4	8,4	10,3	10,3	11,1	8,6	14,6	11	11,9	11,4
H	2,5	1,3	2,2	1,6	4,2	1,4	1,8	1,9	1,4	1,2	1,6	1,4	1,5	1,2
I	12,5	12,5	10,9	9,2	8,8	10,2	9,7	9,1	10,5	9	9,3	11,4	8,1	8
J	9,3	1,9	1,7	1,9	1,7	1,2	2,7	1,6	2,7	1	2,2	2,1	1,4	1,3
K	**23,5**	11,5	9,5	13,6	9,4	7,6	10,5	9,3	10,4	8,3	16,4	10,7	11,1	9,4
L	6,3	4,4	6,1	5,6	5	6,5	4,1	6,9	4,3	3,5	5,7	6,7	3	5,2
M	3	3,2	4,5	4,3	4,3	4,1	5	4,6	4,7	4	5,4	5,4	4,7	4,8
N	2,8	3	4,4	4,6	6,9	4,5	4,8	5,3	4,5	4,1	4,2	5,1	4,1	4,7
O	4,7	2,2	2,4	2,5	3,6	3	3,5	2,5	2,6	1,7	2,6	3	2,7	2,6

Source: own elaboration based on [5]

Tab. 1 illustrates that in all regions except the Capital city of Prague, where the largest proportion had the "Real estate, renting and business activities", showed the highest proportion the "Manufacturing" in gross value added. Economic performance of regions, according to [6], was influenced by a composition of manufacturing, which consists of various sub-sectors with a different labour productivity[7]. A significant role in the manufacturing industry played manufacture of machinery and equipment, electrical and optical equipment and transport equipment manufacture in the Czech Republic. There was decreasing the importance of textile production, leather, chemicals and ceramics and glass industries.

When it comes to the regional industry structure in 2008, there showed the "Trade; repair of motor vehicles, motorcycles and personal and household goods", "Transport, storage and communications" and "Financial intermediation and instance" a higher proportion than "Manufacturing" in gross value added in the Capital city of Prague. A

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[5] A = Agriculture, hunting and forestry; B = Fishing, C = Mining and quarrying, D = Manufacturing; E = Electricity, gas and water supply; F = Construction; G = Trade; repair of motor vehicles, motorcycles and personal and household goods; H = Hotels and restaurants; I = Transport, storage and communication; J = Financial intermediation and instance; K = Real estate, renting and business activities; L = Public administration and defence, compulsory social security; M = Education; N = Health and social work; O = Other community, social and personal service activities. (Sector by OKEČ = Industrial Classification of Economic Activities.)

[6] HMP = Capital city of Prague; SCK = Central Bohemia Region; JCK = South Bohemia Region; PLK = The Plzen Region; KVK = The Karlovy Vary Region; USK = The Usti Region; LBK = The Liberec Region; KHK = The Hradec Kralove Region; PAK = The Pardubice Region; VYS = The Vysocina Region; JHM = The South Moravian Region; OLK = The Olomouc Region; ZLK = The Zlin Region; MSK = The Moravian-Silesian Region.

[7] High levels of labour productivity is achieved mainly in the banking and insurance sectors as well as in commercial services. By contrast, in agriculture, education, accommodation and catering industry and in public and social services, labour productivity is lower. [6]

high proportion of the "Manufacturing" showed the Central Bohemia Region and the Zlin Region, which had the highest proportion within the Czech Republic.

In the South Bohemia Region, there was a lower proportion of the "Manufacturing " but the highest proportion of the "Electricity, gas and water supply" and also this was a single region which showed the "Fishing" industry – a very low proportion in the creation of gross value added though. The Plzen Region was characterized by a slightly higher proportion of the commercial services compared to other regions (excluding the Capital city of Prague and The South Moravian Region).

The highest proportion of the "Mining and quarrying" and the "Health and social work" in gross value added within all regions showed The Karlovy Vary Region. The Usti Region had a high proportion of the "Electricity, gas and water supply", as well as the South Bohemia Region, and a higher proportion of the "Construction" , compared to other regions. Relatively low proportion had the "Trade; repair of motor vehicles, motorcycles and personal and household goods" and the "Real estate, renting and business activities" in this region.

In the Liberec Region, there was a high proportion of the "Manufacturing" and the lowest proportion of the "Electricity, gas and water supply" within the Czech Republic. The Hradec Kralove Region showed a high proportion of the "Manufacturing" and a higher proportion of the „Agriculture, hunting and forestry" compared to other regions, the Pardubice Region was similar to the Hradec Kralove Region in industry structure characteristics a lot.

The Vysocina Region was typical of the highest proportion of the "Agriculture, hunting and forestry", of a high proportion of "Manufacturing", a relatively high proportion of the" Electricity, heat, water, and of the lowest proportion of the "Financial intermediation". The South Moravian Region was characterized by a relatively low proportion of manufacturing and commercial services, while the Olomouc Region had a higher proportion of the "Transport, storage, communications, and a low proportion of the "Electricity, heat and water". The Zlin Region showed the highest proportion of "Manufacturing" in the Czech Republic and a relatively high proportion of "Trade; repair of motor vehicles, motorcycles and personal and household goods". The Moravian-Silesian Region was not significantly different from the national average, except a higher proportion of the "Mining and quarrying".

Four sectors, which represent the highest proportion in the creation of gross value added in each regions, show the following Tab. 2 and Tab. 3, the first one for the data of 1998 and the another one for the data of 2008.

Tab. 2: Industries with the highest proportion in the creation of gross value added in each regions in 1998

Rank/ Region	HMP	SCK	JCK	PLK	KVK	USK	LBK	KHK	PAK	VYS	JHM	OLK	ZLK	MSK
1.	K	D	D	D	D	D	D	D	D	D	D	D	D	D
2.	G	I	I	K	G	I	G	G	I	A	K	K	K	G
3.	I	G	G	G	I	F	K	I	K	I	G	I	G	I
4.	D	K	F	I	C	K	F	F	F	G	I	F	I	K

Source: own elaboration based on [5]

Tab. 3: Industries with the highest proportion in the creation of gross value added in each regions in 2008

Rank/ Region	HMP	SCK	JCK	PLK	KVK	USK	LBK	KHK	PAK	VYS	JHM	OLK	ZLK	MSK
1.	K	D	D	D	D	D	D	D	D	D	D	D	D	D
2.	G	G	E	K	C, G	E	K	G	G	G	K	I	G	G
3.	I	I	I	G	C, G	I	G	K	I	E	G	K	K	K
4.	J	K	G	I	K	G	I	I	K	K	I	F	I	I

Source: own elaboration based on [5]

Based on the data of Tab. 2 and Tab. 3, there can be compared structural changes in regions over the time. There can be seen that the order of proportion of four major industries did not change over the time in the Plzen Region and the South Moravian Region. Slight changes occurred in the Capital city of Prague, the Central Bohemia Region, the Olomouc Region and the Moravian-Silesian Region. Generally, there occurred a decline in the "Construction" and an increase in the "Electricity, gas and water supply" and "Trade; repair of motor vehicles, motorcycles and personal and household goods", the "Manufacturing" still holds a leading position over the time horizon of ten years.

4. Classification of regions using the cluster analysis

To create a classification of regions and identify regions with similar characteristics, there was used a cluster analysis. Input data were the statistical data of regional industry structure at NUTS III level in the Czech Republic. To determine a situation and development of industry structure, there were analyzed the data of 1998 and 2008. The analysis was performed in the SPSS program.

With regard to the objective of this article, there was chosen the cluster analysis which can reveal a structure of studied objects. Advantage of this approach is also the fact that surveyed regions are divided into internally homogeneous clusters. Objects within a cluster are as similar as possible and objects in different clusters are diverse vice versa. Examined objects were the NUTS III regions within the Czech Republic, criterions were proportion of fifteen industries (according to the OKEČ classification) in the creation of gross value added.

For the analysis was chosen the hierarchical aglomerativ approach, which is characterized by the reliance on individual objects and their gradual merging with

building a hierarchical system of subsets. To calculate a distance among regions, there was used the squared Euclidean distance. Because the input data are in the same units, there was not necessary to norm the data. To clustering was used the Ward method, which tends to eliminate small clusters, thus forming clusters of roughly equal size, see Hebák [7]. Graphical representation of a hierarchical structure of found groups is performed by a hierarchical tree (dendrogram), which shows the gradual process of clustering.

For determining the number of clusters can be used the heuristic approach. This approach determines the number of clusters based on finding gaps among connections along axis showing the distance among clusters. A good solution is associated with a sudden jump among the coefficients distance, see Vrtěnová [14].

Results of the cluster analysis are illustrated in the following Fig. 1-3 and Tab. 4 – 6. As mentioned above, there were examined regional data for the years of 1998 and 2008, and for monitoring of structural changes were used changes in dates between the examined years as input values. The cluster analysis was followed by the method of comparison, there were examined similarities and differences in industry structure of each regions.
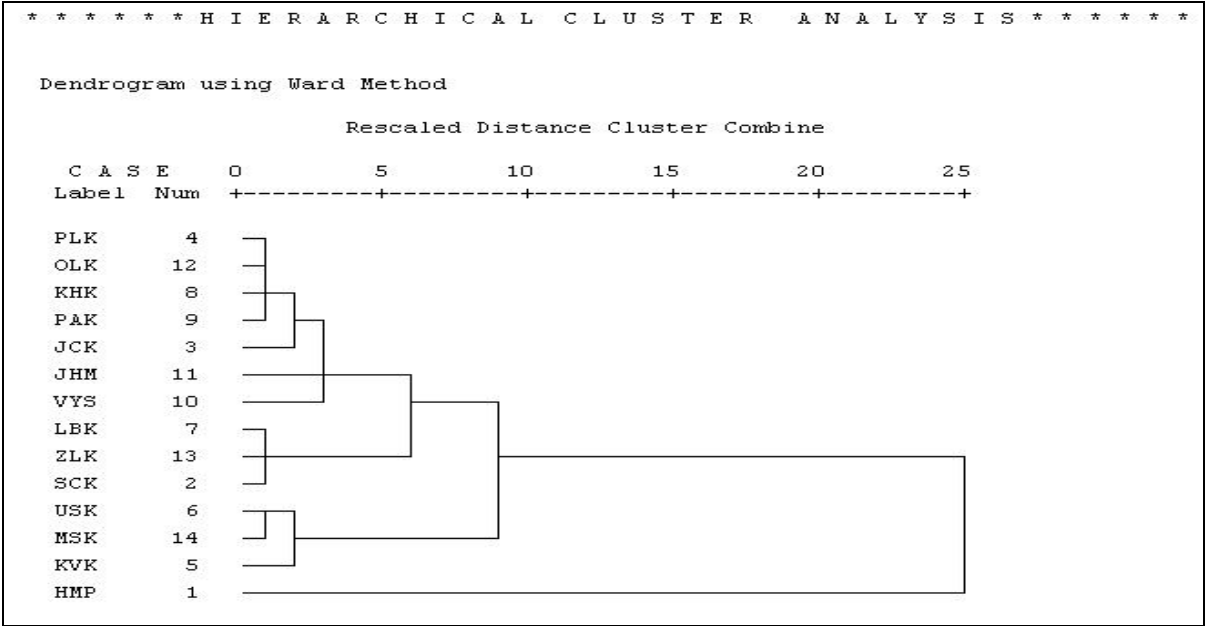

Fig. 1: Dendrogram of clusters of regions in 1998

Source: own elaboration based on [5]

Tab. 4: Clusters created from the data of 1998

Cluster	Regions
1	PLK, OLK, KHK, PAK, JCK, JHM, VYS
2	LBK, ZLK, SCK
3	USK, MSK, KVK
4	HMP

Result of the cluster analysis for the data of 1998 is four clusters listed in Tab. 2. The first cluster, which includes most of regions, namely it is the Plzen Region, the Olomouc Region, the Hradec Kralove Region, the Pardubice Region, the South Bohemia Region, the South Moravian Region and the Vysocina Region, is characterized by a high proportion of the „Agriculture, hunting and forestry" in comparison with other regions. Most of other indicators approximated the countrywide average. In the second cluster, there are included the Liberec Region, the Zlin Region and the Central Bohemia Region. These regions showed the highest proportion of the „Manufacturing" in gross value added. The Usti Region, the Moravian-Silesian Region and the Karlovy Vary Region are included in the third cluster, which combines regions with a high proportion of the „ Mining and quarrying" and the „Health and social work", whereas with a low proportion of the „Real estate, renting and business activities". Last, the fourth, cluster consists only of the Capital city of Prague and showed a high proportion of the "Trade; repair of motor vehicles, motorcycles and personal and household goods", the "Transport, storage and communication", the "Financial intermediation and insurance", the "Real estate, renting and business activities" and the "Other community, social and personal services activities " industry. It is also characterized by its low proportion of the "Manufacturing" and, of course, of the "Agriculture, hunting and forestry".
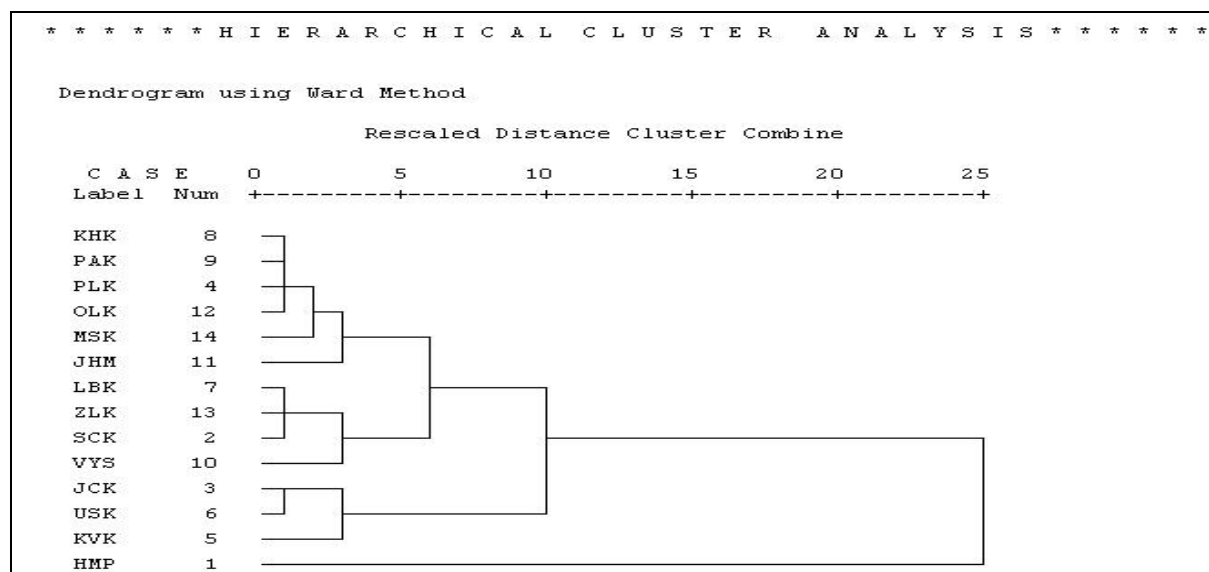

Fig. 2: Dendrogram of clusters of regions in 2008

Tab. 5: Clusters created from the data of 2008

Cluster	Regions
1	KHK, PAK, PLK, OLK, MSK
2	JHM
3	LBK, ZLK, SCK
4	VYS
5	JCK, USK
6	KVK
7	HMP

Source: own elaboration based on [5]

Different results were obtained from a cluster analysis realized from the data of 2008. Regions were divided into 7 clusters. The first cluster consists of the Hradec Kralove Region, the Pardubice Region, the Plzen Region, the Olomouc Region and the Moravian-Silesian Region. These regions are characterized by higher proportion of the "Agriculture, hunting and forestry". Then can be noted that the values are at about the national average in this cluster. The second cluster is represented only by the South Moravian Region, which showed a low proportion of the „Manufacturing", compared to other regions, a high proportion of the "Trade; repair of motor vehicles, motorcycles and personal and household goods" and a high proportion of the "Real estate, renting and business activities". This industry structure is significantly affected by the presence of the city of Brno in the South Moravian Region, this city has strengthened the urban characteristics.

The Liberec Region, the Zlin Region and the Central Bohemia region represent the third cluster. There was the highest proportion of the „Manufacturing", whereas a low proportion of the „Electricity, gas and water supply". The fourth cluster is represented by the Vysocina Region. For this region was typical the "Agriculture, hunting and forestry". Specific is the fact that this region contributed with the highest proportion of the agricultural production in the Czech Republic. There was also the lowest proportion of the „Trade; repair of motor vehicles, motorcycles and personal and household goods", the „Financial intermediation and insurance" and a high contribution of the „Manufacturing" in gross value added. The Usti Region and the South Bohemia Region represent the fifth cluster, for this one was typical the highest contribution of the „Electricity, gas and water supply". In the case of the South Bohemia Region, there has played an important role putting a nuclear power station into operation in Temelin since 2000. The sixth cluster is represented by the Karlovy Vary Region, which was characterized by the highest proportion of the "Health and social work" in gross value added, which was probably caused by the importance of the spa industry there. This region was also characterized by the highest proportion of the "Mining and quarrying" and with a low proportion of the "Manufacturing". The last, the seventh cluster, includes only the Capital city of Prague, for which was specific a low proportion of the „Manufacturing", compared to other regions, and also a very low contribution of the "Agriculture, hunting and forestry" again. Typical for Capital city of Prague is a high proportion of industries with high value-added of capital and labour as the "Trade; repair of motor vehicles, motorcycles and personal and household goods", the "Real estate, renting and business activities" and the "Other community, social and personal services".
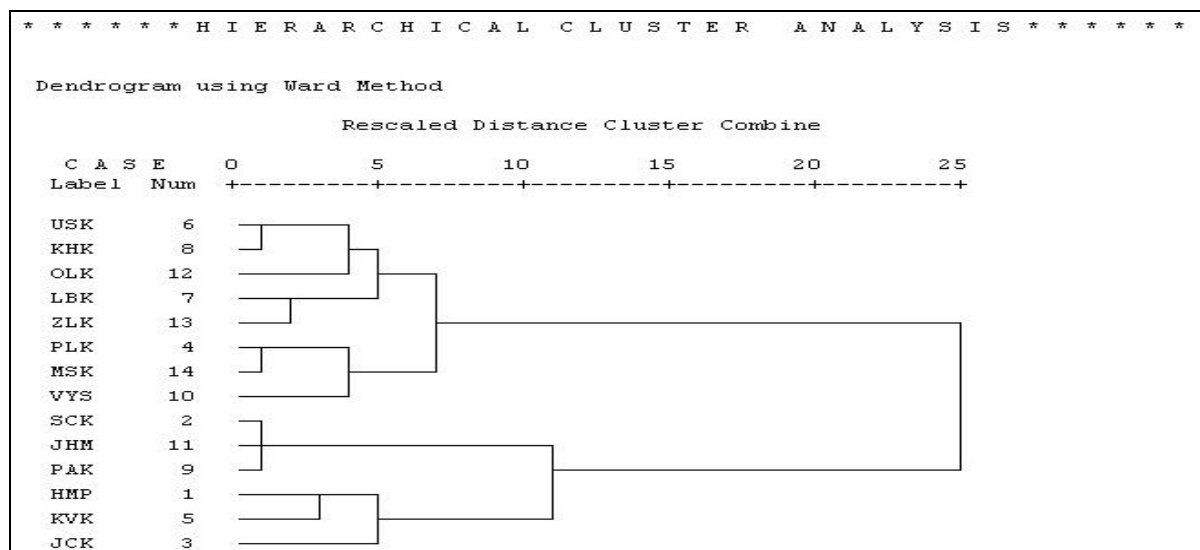
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* * * * * H I E R A R C H I C A L   C L U S T E R   A N A L Y S I S * * * * * *

 Dendrogram using Ward Method

                    Rescaled Distance Cluster Combine

   C A S E     0         5        10        15        20        25
  Label   Num  +---------+---------+---------+---------+---------+

    USK      6  ─┐
    KHK      8  ─┤
    OLK     12  ─┤
    LBK      7  ─┤
    ZLK     13  ─┤
    PLK      4  ─┤
    MSK     14  ─┤
    VYS     10  ─┤
    SCK      2  ─┤
    JHM     11  ─┤
    PAK      9  ─┤
    HMP      1  ─┤
    KVK      5  ─┤
    JCK      3  ─┘
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Fig. 3: Dendrogram of clusters of regions based on changes in industry structure between 1998 and 2008

Source: own elaboration based on [5]

Tab. 6: Clusters created for „jump" changes between 1998 and 2008

Cluster	Regions
1	USK, KHK, OLK, LBK, ZLK
2	PLK, MSK, VYS
3	SCK, JHM, PAK
4	HMP, KVK, JCK

Source: own elaboration based on [5]

Cluster analysis was also applied to the data representing changes occurring in regional industry structure by comparison the data of years 1998 and 2008. This analysis was searching regions with similar development of industry structure in principle. Essential was not an overall representation of different industries, but a trend in industry structure.

Fig. 3 and Tab. 6 show results of the analysis. Regions were divided into four clusters. The first cluster consists of the Usti Region, the Hradec Kralove Region, the Olomouc Region, the Liberec Region and the Zlin Region. There were no significant common changes in these regions during the ten-year horizon. There was the lowest frequency of changes in industry structure in these regions. In the second cluster, there are the Plzen Region, The Moravian-Silesian Region and the Vysocina Region. Typical of them was a high increase in the „Manufacturing". The Central Bohemia Region, the South Moravia Region and the Pardubice Region represent the third cluster, which had the highest increase in the „Trade; repair of motor vehicles, motorcycles and personal and household goods" industry and a dramatic fall in the „Agriculture, hunting and forestry". Interesting is the fourth cluster, which consists of the Capital city of Prague, the Karlovy Vary Region and the South-Bohemia Region. Of this cluster was typical a significant decline in the „Manufacturing" in favor of the „Real estate, renting and business activities". There is evident that the structure in

itself was different in both regions, but both regions went through similar changes in industry structure.

The analysis enabled a segmentation of regions according to similarities in industry structure in the Czech Republic, and then also dividing into several groups - clusters. There was created a typology of regions this way. Given the limitations of this article, there was carried out a classification of regions only by industry structure, a similar analysis would be possible also with other statistical indicators. Each analysis of regions showed different distribution among different clusters in different years, even when examining changes between years. An example might be a different inclusion of the Pardubice Region and the Hradec Kralove Region in two different clusters in the case of changes in industry structure. When examining the structure of each year, these regions are always included in one cluster together. Then, there is necessary expanding the number of input parameters for such analysis.

5. Conclusion

A premise of economic growth of regions is their appropriate production factors endowment and productivity of these ones. Since each industry is differently labour and capital demanding, and the above mentioned productivity is diverse, industry structure is one of the determining factors of economic performance. The Czech Republic has experienced significant structural changes with a trend of decline in the primary sector in favor of the tertiary sector in the creation of gross value added in last twenty years. It meant focus on industries with higher labour and capital productivity. Although there has been a leading role of the „Manufacturing" industry, there have been specific differences in industry structure among regions, and there is possible to search some similarities and some differences among them. That is why cluster analysis was performed, the regions were divided into hommogenous clusters, the criterions were contributions of each industries in gross value added.

The cluster analysis was performed for the years 1998, 2008 and for changes in dates between the given years. Result for the data of 1998 was four clusters, the first one was typical of intensive agricultural characteristics, the second cluster showed the highest proportion of manufacturing industry and of the third one was typical a high proportion of the „Mining and quarrying", and the „Health and social work" in the creation of gross value added. The fourth cluster was formed only by the Capital city of Prague, which was characterized by an intensive contribution of industries with high labour and capital productivity even in 1998. There were found structural changes in 2008 compared to the data of 1998, thus there was changed the classification of regions. There were separated the South Moravia Region, the Karlovy Vary Region, the Vysocina Region and, of course, the Capital city of Prague. Significant was analysis of the data representing changes which occurred when comparing the years 1998 and 2008. This classification was based on changes in industry structure of regions when essential was a trend of their development. As results of the cluster analysis show, the Usti Region, The Hradec Kralove Region, the Olomouc Region, the Liberec Region and the Zlin Region did not experienced any significant common changes during the ten-years horizon. The Plzen Region, the Moravian-Silesian Region and the Vysocina Region were characterized by a high increase in the

„Manufacturing". The third cluster consists of the Central Bohemia Region, the South Moravia Region and the Pardubice Region, for that was common the greatest increase in the „Trade; repair of motor vehicles, motorcycles and personal and household goods" and a significant decline in the „Agriculture, hunting and forestry" industry. Interesting is, that in this case the Capital city of Prague is not separated, but showed as significant decline in the „Manufacturing" in favor of the „Real estate, renting and business activities", as the Karlovy Vary Region and the South Bohemia Region experienced.

Based on the cluster analysis, there was performed the classification of regions according to similarities in industry structure. But regional economic performance is influenced not only by industry chracteristics, therefore there would be usefull to divide regions into clusters on multiple input parameters for more general regional classification.

Acknowledgement

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