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ANALYSIS OF COMPONENTS OF REGIONAL AND STRUCTURAL CHANGES FOR SOUTHEST AND POLOG REGION

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Abstract

The paper presents economic development and the economic structure in the two regions mentioned above. Given the fact that the economic structure is strongly related to the development whether of the region or of the national economy, which is presented with GDP, and it is taken as an indicator of analysis.
The purpose of the research in this paper is to identify the economic areas which are carriers of development in the two regions mentioned above, which are one of the most underdeveloped regions of North Macedonia.
The paper uses an empirical method - analysis of changes in regional components, which reveals economic sectors that are larger or smaller contributors to GDP in the two regions. The analysis shows that in these regions depressive economic structures dominate. The highest contribution to the formation of GDP in the two regions was made by trade (the best option with allotment effect 4), a sector which has limited accumulative capabilities and as such can't give impetus to economic development.
The worst option sector in both regions is that of agriculture, in Polog it marks the aloof effect1 and in the southwest the aloof effect 2.
The results of the empirical analysis show that in these regions government policies should be much more active with state instruments to help the economic structure to improve.

Keywords: GDP, proportional participation, regional participation, structural difference, differential distance, allotment effect.

1. Introduction

The Structure Sector in a national economy and across regions is the object of economic sciences. It is the most loyal presenter of national and regional economic development. The high level of economic economy between economic sectors also reports further balanced regional and economic development. The processes of sectorial change and economic growth developed in mutual dependence. (Petrit. P. 2008, p. 9). The sectorial and regional structure in an economic economy is defined by socio-economic factors, but it can also be influenced by the political factor which by not taking the basis of possible economic criteria may be an obstacle to economic development. Such is the case of Northern Macedonia, which is characterized by significant regional development differences. Regions in which most of the population is Albanian are less developed. They have higher unemployment rates, 24.0% in the Southwest region and 24.8% in the Polog region, compared to 16.4% of the national economy in 2020 and a lower level of social economic well-being. While the same year the GDP per capita at the national level was 5,800 $, in the Polog region it does not reach as much as half of it (2,800 $) and in the Southwest region it reaches 4500 $. (Regions in the Republic of Northern Macedonia 202, pp. 37, 44). It should be noted that in the regions themselves there are significant developmental differences, Albanian settlements are even

more underdeveloped compared to the regional average.

Significant regional differences in Northern Macedonia have been influenced by symbolic public investments as well as inadequate support of business in these regions.

The paper claims to identify economic fields which are carriers of economic development and to confirm the unfavourable structure in these regions. In achieving this objective, the empirical analysis component of regional changes is applied

From the title of the paper, the analysis of regional components and structure has been applied for two regions in North Macedonia (Southwest and Polog regions for last six years). With the empirical analysis are used the concrete data for the regions of North Macedonia

The analysis of the regional components change identifies which sectors of the region, in the present case in the two regions mentioned above, develop faster and which grow more slowly compared to the national average. The economic structure of the two regions mentioned above is presented through the economic specialization across sector in formation of GDP. Specializations are presented with numbers: 1, 2, 3, 4. Where any number presented different allotment effect. The best option is allotment effect 4 (sectors have comparative advantages and as such are specialized). Then comes allotment effect 3, which presents the sector which have advantages but are not specialized and allotment effect 2 sector comparatively weak and not well specialized. And finally comes allotment effect 1, (worst option) which is the worst economic sector for the contribution of GDP. It is a sector comparatively weak and specialized as such.

2. Review of structural changes with related empirical support

Shift analysis is based on Kramer's research in the location industry since 1942, Daniel Creamer, 1942, Shifts of Manufacturing Industries, in Industrial Location and Natural Resources Planning Board, U, S, A. The techniques were developed and used as analysis tools in the 1960s by Zelinsky, Fuchs, Dunn, Ashby, Perloff and other, (Wilbur Zelinsky,1958, pg. 1939-49, Victor R. Fuchs, 1962, Economic Census Studies 1, Edger S. Dunn, Jr. 1960, pg. 97 – 112, Lowell D. Ashby, 1966, pg. 577 – 581, Lowell D. Ashby, 1967, pg. 423 – 425

According to Perloff, the structural effect raises questions as why education in some sectors of the national economy is growing faster than in other sectors. The effect of regional factors raises another question, why employment is growing faster in the same sector in some regions and slower in others, H.S. Perloff, how (1963), A Region Growths, Supplementary Paper No. 17, Committee for Economic Development, New York, take from Ç. Ociç (1994), Struktura I efikasnost, Grmeç – Privredni pregled, Beograd, pg. 8

The differential effect as part of changes in indicators which is a result of differences in the value of indicators of the same sector across different regions and if it is positive indicates that in those regions sectors grow faster than globally and vice versa has studied economists: Henry W. Herzog, Jr & Richard J. Olsen, (1977), Shift-Share Analysis Revisited: the allocation Effect and the Stability of Regional Structure, Journal of Regional Science, New York, pg.441-454

Keeble D. E. and Hauser D. P. (1972) Reg.Studies 6, 11-36. Analyze the multiple regression of the interurban spatial model for output growth in Southeast England for the years 1960/67. Employment growth from economic growth directly changed unemployment rates, population growth, economic potential and expectations for improving the industrial structure. The growth of industrial space has been positively related to the availability of labour force, population growth, urban size and unemployment rate, but negatively to the specialization indices.

Bishop K. C. and Simpson C. E. (1972), Reg. Studies 6, 59-68. The article reviews some of the

problems of interpreting the results of the components of the change technique as applied in the analysis of regional employment growth. The pragmatic use together with other regional analysis techniques produces an interpretation problem for alternative definitions of individual structural components. A synthesis of methods is proposed, enabling more meaningful interregional and inter-temporal comparisons of the effects of industrial structure.
Paris J. D. (1970), Reg. Studies 4, 425-443. Regional and structural analysis of population change aims to identify some of the sources of regional growth change. The differences between regional growth rates and those at the national level are explained by two components: the first one reflects the structural capacity of a region which enables slow or rapid growth; second, the regional component, measures the region's ability against other regions (competitive migration.) Understanding these two components helps not only in historical analysis, but also provides reasonable data for forecasting migratory population movements.
Francesca Mameli, Alessandra Faggian & Philip Mccann, 2013, The aim of this paper is to identify the possible problem of parameter heterogeneity in growth regressions. Data from the Italian economy are used mainly in the manufacturing and services industries.
Frenken K., Van Oort F. and Verburg T. (2010) pg. 685–697. Distinguish the variety of the source of regional knowledge dissemination, called Jacob's externalities, and variety as a portfolio that protects a region from external shocks. It is argued that Jacob's externalities are best measured by diversity linked within sectors, while the portfolio argument is best captured by unrelated diversity between sectors. Using data at NUTS 3 level in the Netherlands for 1996–2002, it was found that Jacob's externalities increase employment growth, while the unrelated variety dilutes unemployment growth. Productivity growth can be explained by traditional determinants including investment and research and development spending.

3. Empirical method - Analysis of regional change components

This method identifies the specialization of economic fields in the contribution of macroeconomic indicators.
Selected indicator in some sectors, respectively in some regions is growing faster compared to others. (H, S, Perloff, 1963,). Dunn estimates that Regional Analysis enables the identification of a) components that operate globally (although operating differently in particular regions) and b) components that operate specifically in special regions (Edgar S, Dunn Jr, 1960, pg.97)
The symbols that will be used in the research method are as follow:

X i j - Value of the indicator for sector i in region j

X j - = ∑i x I j - Value of the indicator across sectors in region j, respectively the value of the indicator at the level of region j

Xi = ∑i x I j - The value of the indicator in the sector i across regions, respectively the value of the indicator in the whole analysed region

X = ∑i∑ j x i j- The value of the indicator in the sector i across regions, respectively the total value of the indicator in the whole researched region.

The sign 0 indicates the values of the indicator in the base year
The t sign indicates the values of the indicator in the last year
The analysis of regional variations in algebraic form can be expressed as follow:

(1) $F j = X t j - X 0j$
(2) $P j = \sum i\ pi\ j = \sum i\ (x0ij\ X\ t / X0 - x0ij)$
(3) $S j = \sum i\ s\ i\ j = \sum ix0ij\ (X\ t\ i / X0i – X\ t / X0)$

(4) $D\,j = \sum i\, d\, i\, j = \sum i\, (x\, t\, i\, j - x0ij\ X\, t\, i / X0i)$
(5) $D\,'j = \sum i\, d'\, i\, j = \sum i\, [(x\, t\, i\, j / x0ij - X\, t\, i / X0j)\ X0j\ X0i / X0]$
(6) $D''j = \sum I\, d''\, i\, j = \sum i\, [(x\, t\, i\, j / x0ij - X\, t\, i / X0i)\ X0j\ (x\, t\, i\, j / X0j - X0i / X0)$
(7). $D\,j = D'\,j + D''\,j$
(8) $F\,j = P\,j + S\,j + D\,j$

Symbols present:

F j - The real changes of the indicator, in this case of GDP

P j - Proportional regional partaking which represents the hypothetical changes in the value of the indicator in the region, if the value of the indicator in the region in year t compared to the base year 0 has increased or decreased according to the average rate of the researched region.

S j - Structural difference represents the part of changes in the value of the indicator, which is a consequence of the sectorial structure and suggests the answer to the question whether the chosen indicator, the structure of the region is appropriate (mostly represented sector whose growth is above average) or inappropriate (representation of sectors whose growth is lower than average)

D j – Total differential distance represents part of the changes (value) of the indicator which is a result of changes in the increase of the value of the indicator in the sector of the same sector at the globe level. The differential distance is positive in those regions in which the economic spheres grow faster than those of the global level otherwise the differential distance will be negative. This difference is conditioned by the different specifics of the region, and consists of pure defecation distance and the allocation effect (J. M. Esteban- Maquilas, A, 1972, pp. 249-255)

D' j - The net differential distance represents the shared impact of the competitive position which is gained by eliminating the influential specifics of the regional structure, so that the true value of the indicator (GDP) will be realized if the national economy had the same structure as the global.

D'' j - The allocation effect indicates whether the region is specialized. The value of the indicator allocated to those sectors in which there is growth above average indicates competitive advantages and the value of the indicator above average indicates competitive disadvantage. (Çaslav, O. 1994, p. 10). The symbol of the allocation effect depends on the difference of regional participation and total participation in the aggregate value of the indicator (x 0ij / X 0j - X0i / X0) and the difference of the growth coefficient in the sector region i in general level (x 0ij / X 0j – X t i / X0i). Four possible combinations of regional specializations and comparative advantages are presented in the table below.

Table 1. Types of allocation effect

Allocation effects	Description d'' i j		Specialization (x 0ij / X 0j - X0i / X0)	Comparative advantages (x 0ij / X 0j - X t i / X0i).
1	Comparatively poorly specialized	-	+	-
2	Comparatively weak non-specialized	+	-	-
3	Comparatively good, not specialized	-	-	+
4	Comparatively good, specialized	+	+	+

Sources: Ç. Ociç (1994), Struktura i efikasnost, Grmeç – Privredni pregled, Beograd, pg. 10

3.1. Analysis of the components of regional GDP changes for Southwest Region in North Macedonia: The analysis includes GDP, across sectors of the economy for the region mentioned above calculated according to current prices expressed in national currency (Denars), for last six years (2013/19)

The obtained data are presented in the table below and constitute information on the real changes, proportional participation, structural and differential distance for all sectors of the region, in this case for Southwest Region. The total differential distance is divided into pure differential distance and allocation effect.

Table 2. Analysis of the components of regional GDP changes for Southwest Region

Description	F j	P j	S j	D j	D j'	D j''	Allotment effects
Total	14326	12927	-667	2071	5492	-3412	--
Agriculture, forestry and fishing	-290	845	-578	-557	-980	423	2
Mining and quarrying; *	3288	1951	1464	-125	143	18	3
Construction	-492	1160	-878	-773	-708	69	2
Wholesale and retail ** trade;	5899	3275	1229	1397	1164	233	4
Information and communication	302	36	11	257	3656	-3399	3
Financial and insurance activities	1251	261	10	1019	1603	-584	3
Real estate activities	2056	2775	-1796	1080	691	389	4
Professional, scientific and technical active. ***	519	228	158	133	261	-128	3
Public administration and defence; ****	1248	2058	-534	-280	-253	-27	1
Arts, entertainment and recreation; *****	505	338	247	-80	-85	5	2

Sources: Regions in the Republic of North Macedonia 2018, pg. 45, 46, 47. 2019, pg. 47, 48, 49. 2020, pg. 47, 48. 2021,46, 47, 48.

** Mining and quarrying; Manufacturing; Electricity, gas, steam and air conditioning supply; Water supply; sewerage, waste management and remediation activities,*

*** Wholesale and retail trade; repair of motor vehicles and motorcycles; Transportation and storage; Accommodation and food service activities,*

**** Professional, scientific and technical activities; Administrative and support service activities,*

***** Public administration and defence; compulsory social security; Education; Human health and social work activities,*

****** Arts, entertainment and recreation; Other service activities; Activities of households as employers; undifferentiated goods- and services producing activities of households for own use.*

From the data in the table above we can see that in this region in the last 6 years the fastest-growing sector has dominated compared to those at the national level. Such a performance is shown by the higher sum of the true changes, (F j = 14326) than what the proportional percentage suggests (P j = 12927). Such a difference is the contribution of the total differential distance (D' j = 2071) which over 3 times exceeds the negative differential distance (S j = - 667). Wholesale and retail trade (1397) had the highest contribution to the total differential distance for this six-year period, while

the following sectors contributed to the negative differential distance: real estate activities (-1796), construction (-878), agriculture, forestry and fishing (-578) and public administration and defence (-534)

In South Region in the years analysed there were two sectors (Wholesale and retail trade and real estate activities) which are characterized by the allocation effect 4, which means that it was the two comparatively good field and as such specialized. The other four sectors (mining and quarrying, information and communication, financial and insurance activities, professional, scientific and technical active) are comparatively good but non-specialized areas (allocation effect 3). The three sectors (agriculture, forestry and fishing, construction, and arts, entertainment and recreation) are characterized by the allocation effect 2, which means that these sectors in the economy of Southwest Region were comparatively weak but not specialized. The comparatively weak and specialized sector as such was that of public administration and defence; (allocation effect 1).

3.1.1. Analysis of the components of regional GDP changes for Polog Region in North Macedonia:
Same as in the Southwestern region and that of Polog, the analysis includes GDP, in the sectors for this region according to current prices expressed in national currency (Denars) for the same six years (2013/19).

The data presented in the table below constitute information on real changes, proportional participation, structural and differential distance for all sectors for the mentioned region

Table 3. Analysis of the components of regional GDP changes for Polog Region

Description	F j	P j	S j	D j	D j'	D j''	Allotment Effects
Total	11354	12387	-2268	1233	2301	-1068	--
Agriculture, forestry and fishing	-521	2230	-1526	-1225	-785	-440	1
Mining and quarrying; *	2672	1382	1037	253	394	-140	3
Construction	1437	681	-516	1272	1891	-619	3
Wholesale and retail ** trade;	3335	2145	803	387	472	-85	3
Information and communication	117	107	36	-26	-112	86	2
Financial and insurance activities	89	56	3	30	210	-180	3
Real estate activities	1824	2903	-1882	803	473	330	4
Professional, scientific and technical active. ***	416	302	209	-95	-143	48	2
Public administration and defence; ****	1517	2339	-609	-213	-166	-47	1
Arts, entertainment and recreation; *****	467	243	177	47	67	-20	3

Sources: Regions in the Republic of North Macedonia 2018, pg. 45, 46, 47. 2019, pg. 47, 48, 49. 2020, pg. 47, 48. 2021,46, 47, 48.
* Mining and quarrying; Manufacturing; Electricity, gas, steam and air conditioning supply; Water supply; sewerage, waste management and remediation activities, ** Wholesale and retail trade; repair of motor vehicles and motorcycles; Transportation and storage; Accommodation and food service activities,
*** Professional, scientific and technical activities; Administrative and support service activities,
**** Public administration and defence; compulsory social security; Education; Human health and social work activities,
***** Arts, entertainment and recreation; Other service activities; Activities of households as employers; undifferentiated goods- and services producing activities of households for own use.

The analysis of the components of regional changes shows that the real changes (F j = 11354) in Polog Region, were smaller than the proportional participation (P j = 12387). This means that in Polog Region have dominated sectors with lower growth compared to those at the national level. This difference is the contribution of the negative structural difference (S j = - 2268) which was nearly one time bigger than total differential distance (D j = 1233). On the total differential distance (D j = 1233), net distance had a positive role (D' j = 2301), while allocation effect had a negative role (D" j = -1068).

The largest contribution of the total differential distance was given by the sector of construction (1272) and real estate activities (803), while the largest negative role had agriculture, forestry and fishing (-1225).

In the Polog Region in the years analysed there was only sector (real estate activities) comparatively good and specialized as such (allocation effect 4). Five sectors (mining and quarrying, construction, wholesale and retail trade, financial and insurance activities and arts, entertainment and recreation) are characterized by the allocation effect 3 (comparatively good but not specialized). The other two sectors (information and communication and professional, scientific and technical active) are characterized by the allocation effect 2 (comparatively weak but not specialized as such). Agriculture, forestry and fishing and public administration and defence.

4. Conclusions

The above presentation lets us understand that in Northern Macedonia there are deep regional differences. They are a consequence of insufficient public investment in certain regions on the one hand and the lack of monetary and fiscal stimulus packages on the other. Such developments have resulted in underdeveloped infrastructure and a depressing economic structure.

The empirical method (analysis of changes in regional components) has identified that trade during the 6 years analysed has been a carrier of development in both the Southwest and Polog region. This sector was the comparatively good sector and specialized as such (allotment effect 4) or the best possible option. From the empirical analysis we can see, the stagnation of the driving sector such as that of informatics and communication and that of scientific and professional activities, which in the Polog region are characterized by allotment effect 2 (relatively weak sector but not specialized as such.) and in the Southwest region both sectors appear as relatively good but non-specialized areas (allotment effect 3).

From the empirical analysis we can see, with the stagnation of the propulsive sector such as that of informatics and communication allotment effect 2 (relatively weak but not specialized sector as such) and in the Southwest region are presented as relatively good but not specialized areas (allotment effect 3). Surprising is the fact that the agricultural sector for which large sums of money are allocated each year (about 1.5% of GDP) and in the empirical analysis is identified as the worst option, allotment effect 1 for the Polog region (relatively weak and specialized as such) and allotment effect 2 for the Southwestern region (relatively weak but not specialized as such). Such

a position of this sector shows that agricultural subsidies do not reflect expectations, perhaps in their distribution there are corrupt elements, and the money does not go to farmers.
The manufacturing sector can be a propulsive field with positive effects for other sectors as well, but in the regions analysed even at the national level it can't play such a role because the light processing industry dominates. This sector which in the statistical data is presented together with mining, gas, energy, water, etc. in the two analysed regions is characterized by the allotment effect 3 (relatively good but not specialized as such).
From the above, North Macedonia, depending on the available material and human resources, needs to improve its economic structure. Structural strategy should be one of the objectives for the future. Regarding regional development, although such plans exist on paper but have never been realized, concrete steps must be taken. The level of 1% of GDP for underdeveloped regions defined and by law must be realized in full, in the years left behind it has not been realized even 10%. Businesses in underdeveloped regions also need financial and monetary packages specifically for these regions. Such stimulus packages would certainly improve and advance the economic structure

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