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REGIONAL SPECIALIZATION IN SERBIA DURING THE PERIOD 2001–2015

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Abstract: In this paper, the specialization of regional economic structures—regional specialization in Serbia is analyzed by areas NUTS 3 level (oblasti) in the period 2001–2015 by using the Herfindahl index (indicator of absolute specialization) and Krugman specialization index (indicator of relative specialization). Cross-region analysis shows that the sectoral structure of activities by areas have converged (a decline in the degree of regional absolute specialization), and at the same time they became dissimilar in relation to the sectoral structure on the national level (an increase in the degree of regional relative specialization). As well as in other post-socialist countries in Central and Eastern Europe a change of employment structure by economic activities was initiated by intensive deindustrialization and, consequently, tertiarization, relocation of employment to service activities. A comparative analysis of research results of regional specialization in Serbia with research in several new EU member states, has shown similarities, particularly in regard to the decrease of regional absolute specialization and representation of different sectoral structures in the region of capital relative to other regions in the national context. As well as in CEE, the transition process in Serbia has additionally emphasized the polarized and spatially different pattern of regional development.

Keywords: transition; regional specialization; sectoral structure of activities; employment; Serbia

1. Introduction

The transition of Central and Eastern Europe (CEE) countries from a centrally-planned economy to a market-orientated economy since the 1990s is a complex process accompanied by changes in different aspects of development. At the same time, the intensification of European integration flows and the establishment of a single European market have made the transition process more complex. A decade later, relative to CEE countries, Serbia enters a phase of intensive transitional reforms. The time gap followed due to the events at the turn of the century: the political and economic disintegration of the former country, war conflicts, international sanctions, Kosovo and Metohija crisis, the United Nations (UN) protectorate over a part of Serbia's territory—the Autonomous Province of Kosovo and Metohija (AP Kosovo and Metohija; according to the UN Security Council Resolution No. 1244/1999). At the beginning of the 21st century, the process of intensive political and economic transition in Serbia began, and the spatial reintegration of Serbia at the international level (Jakopin et al., 2016; Jakšić, 2019; Mijatović, 2008; Mićić et al., 2018;

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Vujošević et al., 2010, etc.). In 2012, Serbia gained the candidate status of EU membership, and the opening of accession negotiation began in early 2014 (Lopandić, 2017).

Serbia covers an area of 88,499 km^2, with 6,945,235 inhabitants (population estimate as of June 30, 2019), excluding AP Kosovo and Metohija. "Starting from 1999 the SORS does not have those data at its disposal and cannot provide certain available data relative to AP Kosovo and Metohija and therefore those data are not included in the coverage for the Republic of Serbia" (Statistical Office of the Republic of Serbia [SORS], 2020a, p. 36). On the existing territorial organization and administrative division (Ustav Republike Srbije, 98/2006; Zakon o teritorijalnoj organizaciji Republike Srbije, 129/2007, 18/2016, 47/2018, 9/2020), Nomenclature of Territorial Units for Statistics (NUTS is a French acronym for "Nomenclature des unités territoriales statistiques") is based on and harmonized with the EU standard (European Parliament & Council of the European Union, 2003). The national structure of NUTS is shown on Figure 1 (Uredba o nomenklaturi statističkih teritorijalnih jedinica, 109/2009, 46/2010; Zakon o regionalnom razvoju, 51/2009, 30/2010, 89/2015).

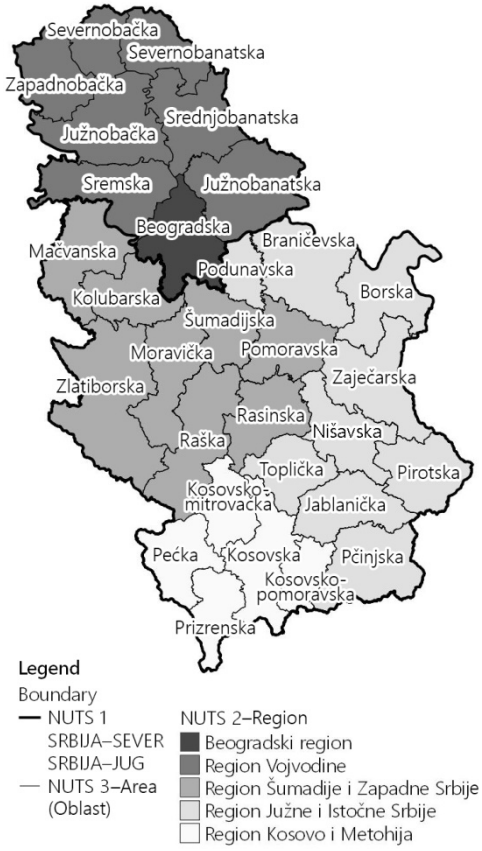

Figure 1. Classification of territorial units for statistics in Serbia.

Note. Data used for the representation of statistical units are obtained from *Open data of National Spatial Data Infrastructure (NSDI)* [Data set], by Republic Geodetic Authority, n.d. (https://geosrbija.rs/en/services-eng/open-data-of-nsdi-eng/). In public domain.

The basic pattern of regional development in Serbia is the polarization of demographic, economic, and spatial development between north and south, and the metropolis and the rest of the country, urban areas and axes of development in contrast to rural, peripheral, hilly-mountainous and border areas (Jakopin, 2018; Jakopin et al., 2016; Miletić et al., 2017; Miljanović et al., 2010; Molnar, 2016; etc.). In 2019, the share of Beogradski region in the value of the national gross domestic product (GDP) was 41.7%, with level indices of regional GDP per capita of 170.8 (Serbia = 100), while the shares of other regions were smaller, and level indices of regional GDP per capita were lower (SORS, 2020b). Serbia, as well as most of the new EU members states (NMS), has emphasized the monocentric pattern of development with pronounced differences between the performance of the capital region and other regions (European Commission [EC] & Eurostat, 2019). The national average GDP per capita for Serbia in 2017 was lower than 50% of the EU-28 average, and only Beogradski region was on 60% average of EU-28 (EC & Eurostat, 2019).

This research is conducted on NUTS 3 level areas (oblasti) in Serbia. The subject of study is the regional specialization based on the employment structure by sectors of economic activities. The aim of the research is to use the selected indicators (Herfindahl index and Krugman specialization index) to analyze the evolution (degree and direction of change) of regional specialization, to identify the basic patterns of structure of activities, and compare the results of the regional specialization in Serbia with similar research in some NMS. The contribution of this research is in determining the degree of regional specialization by taking into account all the sectors of economic activities, unlike previous research, which were mostly based on studying the specialization of the manufacturing sector in regional and national contexts. The limitation in this research refers to the conditional comparability of employment data presented by different classifications of activities that were applied in the selected years. The structure of this study is as follows: section 1 provides an overview of the circumstances and development features and organization of Serbia in the past two decades; section 2 provides an overview of relevant theoretical-methodological and empirical literature with an emphasis on the topic of specialization in post-socialist countries. After describing the sources and methods of data processing and methodology in section 3, the results of the research with discussion were presented in section 4, and the conclusion in section 5.

2. Literature review

During the last decade of the 20th century, CEE countries were faced with a process of transition from a centrally-planned economy toward a market economy and integration with the EU. Both processes affected the polarization and geographically differentiated pattern of the regional development between CEE countries in favor of metropolitan areas, with the western border regions as the winners of the transformation (Gorzelak, 1998, 2020; Petrakos, 2001). Gorzelak (1998, 2020) also singles out the older industrial regions as losers and rural, eastern regions as laggards. In this view, within the EU, two contrary processes are simultaneously occurring: a convergence of the level of economic development of CEE countries in comparison with EU-15 countries, and a growing unevenness of the regional development within CEE countries. The impact of transition and integration on various aspects of the regional development in CEE countries was a subject of numerous studies (Bourdin, 2015; Kallioras & Petrakos, 2010; Klamár et al., 2020; Lux & Horvát, 2018; Marelli, 2007; Smętkovski, 2013; and in numerous country-specific studies of internal dimension of regional development). In the first years of transition in post-socialistic countries, the recession was started by a significant decline of the manufacturing sector (particularly in employment), and, since the middle of the 1990s, most of the countries were on the road of economic recovery (as a result of progress in the reforms, and an influx of foreign investment; Havlik, 2014). Deindustrialization, tertiarization, and reindustrialization were unfolding in different intensity and with different effects during transition process (Barta et al., 2008; Kuttor & Hegyi-Kéri, 2014; Lengyel et al., 2017; Lux, 2009; Müller et al., 2005; Stojčić & Aralica, 2018; etc.). The eastern enlargement of the EU after the year 2000 continues the process of changes in the sectoral and spatial patterns by economic activities on the national and regional level in both NMS and old EU member states (OMS).

Numerous studies about the dynamics and direction of transformation of the structure of economic activities are mutually different (Aiginger, 1999; Hallet, 2000; Krieger-Boden & Traistaru-Siedschlag, 2008; Kopczewska, et al., 2017; Palan, 2010; etc.). They include: analysis of

various territorial units (countries, regions, cities) and perspectives of the analyzed structure changes (specialization, concentration); measures (absolute, relative) and indicators for the quantification of the levels of sector and spatial distribution of activities; the examination of variables (employment, production, etc.); different coverage of economic activities, etc.

According to the subject of this paper, attention was given to the studies that were, by methodological approach and empirical content, relevant to this research. Aiginger (1999) defined specialization as the distribution of the shares of sector/industries in the given geographical units, regions, or countries. According to Palan (2010), for indicators of absolute specialization the referential level is a uniform distribution of employment share in all the sectors, and the degree of specialization of a given territory is changing during time regardless of the development of other territorial units. For indicators of relative specialization, the referential level is the average distribution of employment share for an "arbitrarily" chosen referential level; and point to a dissimilarity in structure of activities of a region/country in comparison to the structure of the referential level.

In the following text, an overview is given of several empirical studies with a theme of regional specialization in CEE countries. Some of them include OMS as well as accession countries, while others consider regional specialization from a national perspective (mostly using employment data by region of different NUTS level). The evolution of specialization of sectoral structure in accession countries was observed firstly from an aspect of regional manufacturing specialization, and later research include the rest of the economic activities.

One of the first studies of the effects of economic integration on the changes of patterns of regional specialization of manufacturing was conducted by Traistaru et al. (2002). They point out that geographical proximity to the European core was crucial for the location of industries in the accession countries. In this regard the regions bordering the EU mostly had better economical and demographical performances. Based on the analysis of specialization and convergence of EU countries and regions, Marelli (2007) concludes that there has been a decrease in the regional disparity between EU-15 OMS regions and an increase in EU-10 NMS; a decrease in relative specialization in most of the countries in relation to the average EU-15; and higher index of relative specialization in most NMS in relation to OMS. The study on the spatial impact of EU integration and enlargement of the EU on regional structural change and cohesion, at level EU-15 and EU-10, and country-specific studies have also confirmed that core-peripheral patterns of polarization persist in both the national and wider EU level and in general, "regional specialization increases from the core to peripheral countries and regions of Europe" (Morgenroth & Petrakos, 2008, p. 289).

Analysis of regional specialization in Visegrád group of countries—Czech Republic, Hungary, Poland, and Slovakia, according to Hegyi-Kéri (2013), showed that regional absolute specialization decreases in all countries, but there are different directions of change of relative specialization. Research on regional specialization from a national perspective in Hungary is focused on the evolution of manufacturing specialization. According to Iara and Traistaru (2004), the relocation of manufacturing to border regions has led to an increase in the average regional index of absolute specialization, but with different changes by regions depending on their bordering position. Wandel (2010) has shown that reduction is predominant of relative manufacturing specialization in most of the regions (including the capital region). The average of specialization levels for the group of Western regions were slightly lower than the group of Eastern regions. From the aspect of reindustrialization,

Lengyel et al. (2017) conclude that only a few counties can be defined as specialized. Changes in regional sectoral structure in Romania are analyzed by Ceapraz (2008) and Goschin et al. (2009). The authors have come to similar results: the absolute specialization is declining in the majority of regions and the increase of relative specialization is recorded in most regions and the specialization of Bucharest—Ilfov is different from other regions and compared to the structure at the national level. According to Puljiz (2009), a decline of the relative specialization index is evident in most counties in Croatia, while the changes of manufacturing specialization by counties occur in divergent directions.

There is a lot of research on the effects of transition of structure of activities in Serbia, particularly concerning the change in manufacturing sector, the leading activity in sectoral composition (employment, GDP). Savić et al. (2015) point to the fact that manufacturing notes a larger decline in employment structure in relation to the decrease in the share of gross value added (GVA) in GDP, in comparison to the smaller and milder decrease of the share of employment and GVA in the selected NMS. There was an absence of forming a more modern structure in the manufacturing sector due to a long-term deindustrialization of the economy, devastation of manufacturing, premature tertiarization, and a slow process of transformation (Mićić, 2015). The study of specialization in Serbia is mainly considered from the aspect of industrial/manufacturing specialization. According to Mićić et al. (2018), the specialization index of industrial sector for Serbia is at a low level (2015) in relation to the EU-28 average and most NMS. With the lowest GDP per capita, Serbia is specialized for a lower number of manufacturing subsections, which are subsections with low- and middle-low-technology-intensive production which generate a smaller GVA. The changes in industrial specialization (by employment) in two planning regions: Belgrade region (as Beogradski region, region NUTS 2 level) and Danube region (Podunavlje, as planning region which includes 24 municipalities along Corridor VII) are presented by Zeković et al. (2014). In both, a decline in the degree of specialization is an indicator of intensive tertiarization and a long-term weakening of the manufacturing function. The basic conclusions of analysis of regional industrial specialization index by Jakopin et al. (2016) are the following: regional specialization in Serbia is in its initial phase; specialization of developed regional areas with a diverse industrial structure (lower index level) is more competitive than regional specialization in underdeveloped regions (mostly have a higher index level); privatization efficiency quotient strongly influences regional specialization; and regional specialization affects regional economic growth.

3. Data and research methodology

The study area is Serbia on NUTS 3 level areas (Figure 1). The five areas in the Region Kosovo i Metohija (region NUTS 2 level) were not the subject of this study. Data used for regional specialization analysis is the number of employees by sector of activities for 2001 and 2015 by areas (25), from relevant publications of the SORS (2003, 2015a). The analysis encompassed employees at legal entities (companies, enterprises, institutions, cooperatives, and other organizations), but did not include entrepreneurs and their employees.

The data on employees at legal entities in 2001 are presented by the sector of activities according to Classification of Activities 1996 (CA 1996) (Zakon o Klasifikaciji delatnosti i o Registru jedinica razvrstavanja, 31/1996, 12/1998, 59/1998, 74/1999), which is based on the standard EU NACE Rev. 1 (EC & Eurostat, 1996; NACE is French acronym for "Nomenclature statistique des activités économiques dans la Communauté européenne"). Numbers of

employees are published as annual average based on two dates, as of March 31 and September 30. In the year 2015, the data used are on employees at legal entities as of March 31 which are comparable to the 2001 data by the methodology of data collection (SORS, 2015a). Data are shown by the sector of activities, according to Classification of Activities 2010 (CA 2010) (Uredba o Klasifikaciji delatnosti, 54/2010) which is based on the standard EU NACE Rev. 2 (EC & Eurostat, 2008). Presentation of the data by territorial distribution was performed according to the Regulation on Nomenclature of Statistical Territorial Units (Uredba o nomenklaturi statističkih teritorijalnih jedinica, 109/2009, 46/2010). Given the fact that the employee distribution in 2001 and 2015 is presented according to a different classification of activities, for analytical purposes some economic activities were aggregated, so that the data could be compared, reducing newer CA 2010 to the previous CA 1996 according to the broad correspondence between the sectors of NACE Rev. 1.1 and NACE Rev. 2 (EC & Eurostat, 2008). The hierarchical structure of sectors is identified by an alphabetical code of NACE Rev 2. Two sectors of activities were not included from both of the classifications (Activities of households as employers and Activities of extraterritorial organizations and bodies). It is important to mention that since 2015, SORS has applied a new methodology for measuring employment—registered employment with wider coverage of the modalities of employment (SORS, 2015b).

For the research of regional specialization at areas NUTS 3 level in Serbia, two most commonly used indicators were: Herfindahl index (HI) as a measure of absolute specialization, and Krugman specialization index (KSI) as a measure of relative specialization. These indicators are also used to measure the geographic concentration of economic activities. Herfindahl index (often called Herfindahl-Hirschman index) is a measure that describes absolute specialization, and represents the sum of squares of the sector shares in the total economy of a given territorial entity (Aiginger, 1999). The indicator used in this paper was defined in a similar way as Ceapraz 2008, Kopczewska et al., 2017, and Palan (2010) modified for this research. From a viewpoint of a regional sector structure, the calculation formula is as follows:

$$HI = \sum_{i=1}^{n} (s_{ij})^2 \tag{1}$$

and

$$s_{ij} = \frac{x_{ij}}{\sum_{i=1}^{n} x_{ij}} = \frac{x_{ij}}{x_j} \tag{2}$$

where i – sector of activity; j – region; n – number of sector of activities; x_{ij} – employment in sector of activity i in region j; x_j – total employment in region j; s_{ij} – share of sector of activity i in total employment in region j.

The value of the index increases with the level of regional economic specialization. The bottom limit of the index is 0, that is, the lowest level of specialization is $1/n$ in the case of an even share distribution of activities in the regions' economic structure (in the context of this study 1/14, this is 0.0714). The upper limit is 1, in a case where the region is specialized in only one sector (Palan, 2010). Both authors (Aiginger, 1999 and Palan, 2010) underline that the index value is influenced mostly by activities with a large share in the economic structure, and that the sectors with a small "weight" are neglected.

Krugman specialization index, also known as Krugman dissimilarity Index, as a measure of relative specialization, compares the sector structure of two geographical areas (territorial units, of the same, or more commonly, different level of territorial aggregation; Palan, 2010). It is the sum of absolute differences of sectoral shares between the analyzed territorial areas (e.g., regions, countries) and a chosen referential level (often the national level, or the level of a group of countries, e.g., EU). The indicator used in this paper was defined in a similar way as Krugman (1993), Marelli (2007), and Traistaru et al. (2002) modified for this research. The calculation formula is as follows:

$$KSI = \sum_{i=1}^{n} \left| s_{ij} - s_i \right| \tag{3}$$

and

$$s_i = \frac{X_i}{\sum_{i=1}^{n} X_i} = \frac{X_i}{X} \tag{4}$$

where is X_i – national employment in a sector of activity i; X - total national employment; s_i - share of sector of activity i in total national employment.

The higher the index value, the more the regional economic structure deviates from the structure of the reference group. The limit of KSI starts from 0, when a sectoral structure of a region is identical to the structure of the referential level, and 2, when there is a complete dissimilarity/diversity of the sectoral structure of region and the referential level (Kopczewska et al., 2017; Palan, 2010). "Since absolute differences are added together, problems do not arise from relations, and the weight assigned to small industries is correctly sized" (Aiginger, 1999, p. 17).

4. Results and discussion

The degrees of absolute and relative regional specialization in 2001 and 2015 are shown in Figure 2. Cross-region analysis by HI has indicated a declining trend in absolute specialization in all NUTS 3 level areas, and with that a convergence of their sector of activities structure. The capital area, Beogradska oblast, with diversified structure of activities, noted the lowest degree of absolute specialization in 2001 and in 2015 (0.1090 and 0.1053). The highest degree of absolute specialization in Pirotska oblast (0.3346 and 0.2505) is profiled by high manufacturing share in sectoral structure (55.8% and 46.2% respectively, the highest share compared to the other areas).

The relative regional specialization KSI noted an increase in almost all areas in 2015 in relation to 2001 (except in three areas: Južnobačka, Braničevska, and Borska oblast), which is an indicator of a rise in dissimilarity, that is, in a diversity of sectoral structures in areas compared to the structure at the national level. Južnobačka oblast, with the lowest degree of relative specialization in 2015, has a structure of activities similar to the structure at the national level. On the contrary, the highest degree of relative specialization in 2015 in Toplička and Pirotska oblast indicate dissimilarity of their sectoral structures, because they retain a high manufacturing share (38.8% and 46.2%) in relation to the national level (21.3%); like in Braničevska oblast with high shares of activities in electricity and water supply, or in Borska oblast with high share of activities in mining and quarrying.

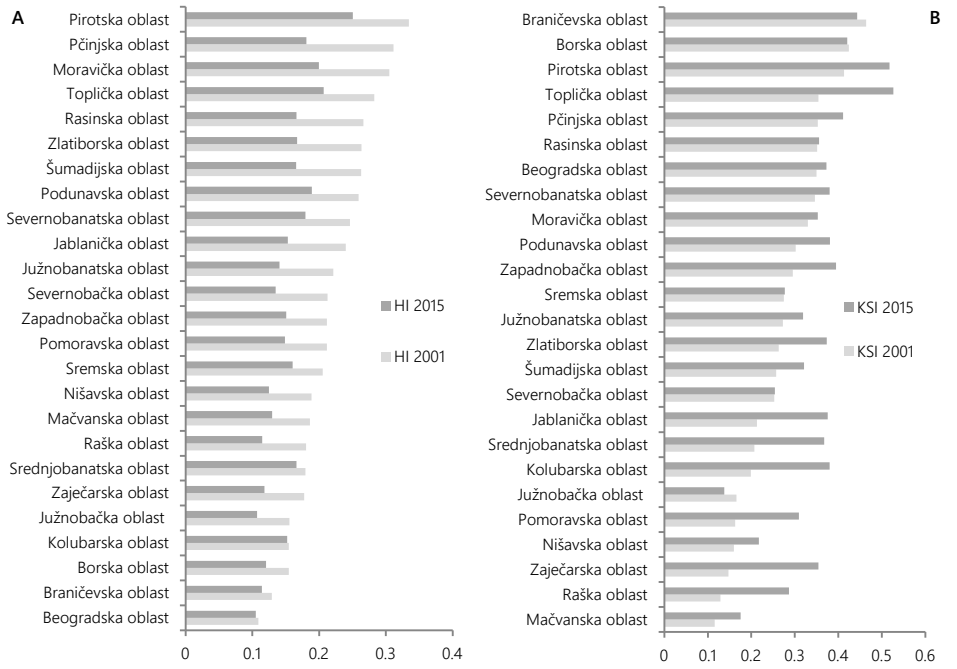

Figure 2. Herfindahl index (HI) and Krugman specialization index (KSI) for areas NUTS 3 level, 2001 and 2015 ranked by increasing Herfindahl index (A) or Krugman specialization index in 2001 (B).

Note. Data used for the presentation of results are calculated based on *Municipalities of Republic of Serbia 2002*, by SORS, 2003 (https://publikacije.stat.gov.rs/G2003/Pdf/G20032002.pdf). In public domain; *Employees in the Republic of Serbia, 2015 – As of March 31st*, by SORS, 2015a (https://publikacije.stat.gov.rs/G2015/PdfE/G20151195.pdf). In public domain.

The evolution of regional specialization is a reflection of the change of sectoral distribution of employees in the regional economies initiated by intensive deindustrialization and reallocation of employment toward the services sector. Deindustrialization in Serbia is the result of inadequate institutional and structural reform, but also the economic development model in the previous period (Savić et al., 2015). Even with the expansion of the services sector, structural changes are slow with a low number of sectors that are noting intensive changes and dynamic growth rates (Mićić, 2015). In the period 2001–2015, the number of employees in Serbia decreased by 13.4% (from 1,555,035 to 1,346,768) caused by a decline in manufacturing which was left without 49.7% employees (83,661), and an increase in services activities, particularly in the sector of grouped activities L, M, and N, and activity G (Figure 3). The share of manufacturing was reduced from 36.7% (2001) to 21.3% (2015), a significant increase was noted by activities G (from 8.1% to 13.8%), and L, M, and N (from 2.6% to 7.6%). The three-sector structure of activities changed from a similar share of secondary and tertiary sectors in 2001 (47.6% vs 47.5%) to a disproportional one in favor of the tertiary sector in 2015 (32.4% vs 65.3%), with a decrease of the primary sector from 4.9% to 2.3%.

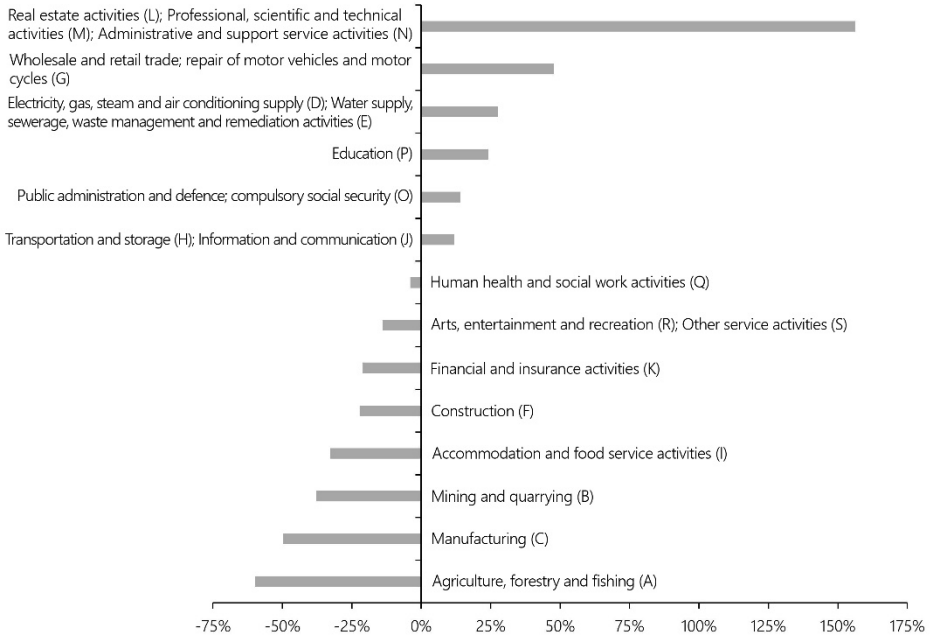

Figure 3. Employment change by economic activities 2001–2015 as percent of 2001.

Note. Data used for the presentation of results are calculated based on *Municipalities of Republic of Serbia 2002*, by SORS, 2003 (https://publikacije.stat.gov.rs/G2003/Pdf/G20032002.pdf). In public domain; *Employees in the Republic of Serbia, 2015 – As of March 31st*, by SORS, 2015a (https://publikacije.stat.gov.rs/G2015/PdfE/G20151195.pdf). In public domain.

Observed on the regional level, the employment decline in 2015 in relation to 2001 is evident in 23 areas (Figure 4). Deindustrialization is present in all areas, and is particularly evident in 14 areas, with a decrease of manufacturing employment larger than 50%. At the same time, the non-market services (public services) note an increase in employment in most of the areas (in an absolute and relative values); while the market services mostly note an increase in the employment structure even with a decrease of the number of employees (Figure 5). A deviation from this pattern is the increase in employment in market services in several areas, in size mostly in Beogradska and Južnobačka oblast (the only areas with an increase of employment in 2015), with the biggest contribution in the increase of the tertiary sector in the national economy. In the three-sector structure of activities, the tertiary sector is dominant in all areas, except in Pirotska oblast (with a leading secondary sector).

An employment analysis by sectors of activities in 2001–2015 has shown a retainment of a similar pattern of the five leading activities in areas (as on the national level). In general, in the employment structure, the primary role is occupied by manufacturing (C) in all areas in 2001 (from 22.3% in Beogradska oblast to 55.8% in Pirotska oblast), and it maintains that position in almost all areas in 2015, but with a smaller share (from 10.3% to 46.2% respectively). Then follow activities Q, G, P, and grouped activities H and I in most areas in 2001, with variations in the order of the above mentioned activities, and similarly in 2015. However, several different patterns of the most significant activities stand out by areas. In 2001, sector A belongs to the

set of the leading activities in all (seven) areas in Region Vojvodine; activity B and grouped activities D and E in Braničevska and Borska oblast; activity B in Zaječarska oblast; and activity F in Beogradska, and Srednjobanatska oblast. In 2015, sector A remains as one of the leading activities in two areas in Region Vojvodine; activity B in Borska and Zaječarska oblast, and is also relevant in Kolubarska oblast; activities D and E are leading in Braničevska oblast (18.5%). In Jablanička, Toplička, and Pčinjska oblast, activity O joins the set of significant activities next to P and Q, such that 1/3 of the total number of employees works in public services. And naturally, Beogradska oblast is the only area where the leading positions in the employment structure is occupied by the three activities of market services G; grouped L, M, and N; and grouped H and J (4.7%).

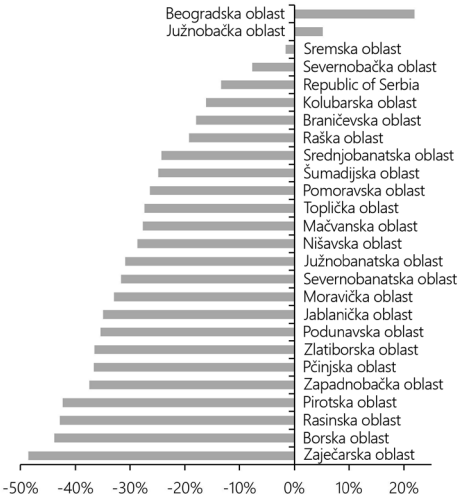

Figure 4. Employment change by areas NUTS 3 level 2001–2015 as percent of 2001.

Note. Data used for the presentation of results are calculated based on *Municipalities of Republic of Serbia 2002*, by SORS, 2003 (https://publikacije.stat.gov.rs/G2003/Pdf/G20032002.pdf). In public domain; *Employees in the Republic of Serbia, 2015 – As of March 31st*, by SORS, 2015a (https://publikacije.stat.gov.rs/G2015/PdfE/G20151195.pdf). In public domain.

With the structural dimension, deindustrialization in Serbia, has a pronounced spatial dimension. During the 1990's the collapse of economic activities began, especially in production, which were exposed to various transformation processes during the following decade. In these circumstances, large industrial centers, carriers of development of the wider area, were faced with numerous problems (Grčić & Ratkaj, 2006; Jakopin & Bajec, 2009; Miletić et al., 2009; Zeković, 2009). The capital and large cities, and development zones along corridors represented the zones with favorable conditions for the concentration of population, employment, and economic activities (Jakopin, 2018; Zeković et al., 2014).

For instance, research has shown the diversity of the sectoral structures (the lower degree of specialization) in Beogradska and Južnobačka oblast compared to other areas (Figure 2). It is reflection of significance of two of the largest urban centers in the urban hierarchy in Serbia, and the most important nodal centers—the capital city and Novi Sad, the administrative center of the Autonomous Province of Vojvodina, in spatial-functional organization of Serbia. The wide field of gravitational influence of these centers (partially overlapping) includes parts of the neighboring NUTS 3 level areas, and their urban areas form a metropolitan area with numerous centers of different ranks (the Government of the Republic of Serbia [GRS], Ministry of Construction, Transport and Infrastructure [MCTI], 2021; Krunić, 2012; Živanović et al., 2020; Živanović et al., 2021). With a concentration of one third of inhabitants in Serbia, Beogradska and Južnobačka oblast are the most densely populated areas in Serbia, and a place of work for 45.8% of the total number of employees, 63.3% of employees in market services, and 25.5% of employees in manufacturing in 2015 in Serbia (SORS, 2015a). Also, a more pronounced diversified structure of activities (and similar

specialization index) is presented by Nišavska oblast, areas of Niš, third largest urban center, as nodal center, and wide spheres of influence in Region Južna i Istočna Srbija, and, Severnobačka oblast, area of Subotica, fifth largest urban center in Serbia, and second in Region Vojvodine, located in bordering zone with EU. Jablanička and Pčinjska oblast are the areas of urban centers Leskovac and Vranje, with a lower position in the urban hierarchy, characterized by a significant decline of manufacturing, a slight increase in market services (Figure 5), and a significant increase in the absolute and relative importance of public services in regional economies (e.g., 40.1% in Jablanička oblast). These are the centers of development in the traditionally underdeveloped area of Serbia, where, except Leskovac and Vranje, the rest of the municipalities belong to the group of underdeveloped areas with a degree of development less than 60% of the national average (Uredba o utvrđivanju jedinstvene liste razvijenosti regiona i jedinice lokalne samouprave za 2014, 104/2014). Šumadijska oblast, areas of Kragujevac, the fourth largest urban center in Serbia, located near Corridors X, retains a higher degree of specialization index, due to a more pronounced industrial function based on revitalization of primarily subsections of manufacturing of vehicles and complementary activities (Drobnjaković et al., 2021; Miletić et al., 2011).

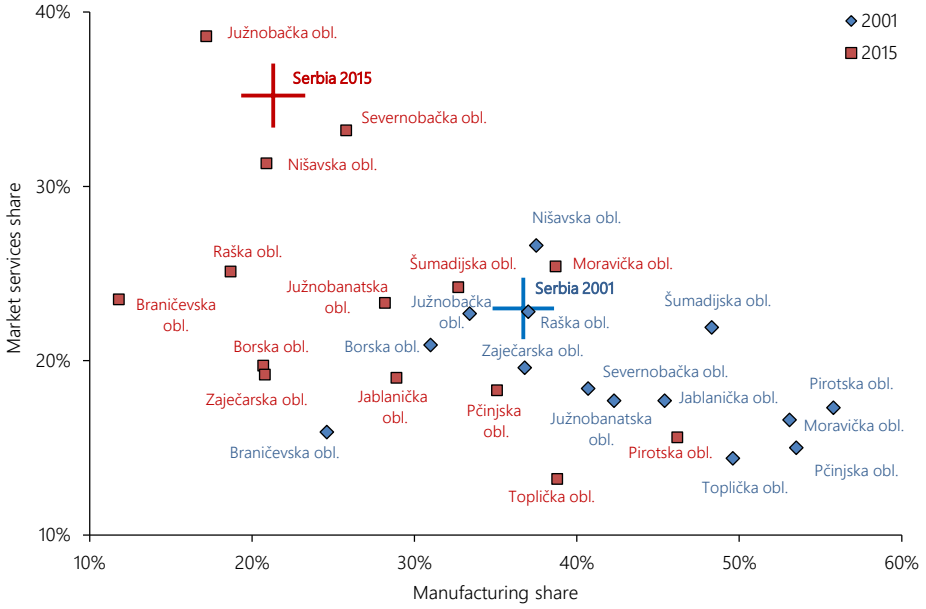

Figure 5. Distribution of selected areas NUTS 3 level by employment shares of manufacturing and market services in 2001 and 2015.

Note. Data used for the presentation of results are calculated based on *Municipalities of Republic of Serbia 2002*, by SORS, 2003 (https://publikacije.stat.gov.rs/G2003/Pdf/G20032002.pdf). In public domain; *Employees in the Republic of Serbia, 2015 – As of March 31st*, by SORS, 2015a (https://publikacije.stat.gov.rs/G2015/PdfE/G20151195.pdf). In public domain.

Based on an analysis of employment trends in Serbia in the period 2000–2018 (manufacturing and total employment; and share of manufacturing in total employment), Hadžić and Zeković

(2019) have defined a deindustrialization type for the national level: 1) the period of absolute process of deindustrialization (period 2000–2014), and the period of (initial) reindustrialization (period 2015–2018). The same patterns of employment trends are present in all regions NUTS 2 level: Region Vojvodine, Beogradski region, Region Šumadije i Zapadne Srbije, and Region Južne i Istočne Srbije. The revitalization process of the manufacturing sector which started in 2015 was a result of advancements of business ambient, government subsidies, and an influx of Foreign Direct Investments in some subsections of the manufacturing sector (GRS, MCTI, 2021; Jakopin et al., 2016; Savić et al., 2015). With the insight in the change of registered employment (employees in legal entities and entrepreneurs) by sector of activities (A to S) in the period 2015–2019, an increase in employment was noted on a national level by 10.8% (SORS, 2016, 2020a). An increase in employment is noted in 13 out of 19 sectors of activities (including manufacturing, by 20.8%), as well as in all areas, with divergent directions of change by activities, which is reflected in the change of sectoral structure at the regional level, and the degree of regional specialization.

A comparison of results in research of regional specialization (by employment data) in Serbia with similar research in some NMS points to the following conclusions. The same direction of change of regional specialization in Serbia, that is, the decrease in absolute specialization according to HI and convergence of sectors' structure are present in most regions in Romania (Ceapraz, 2008), that is, in all the regions (Goschin et al., 2009). Also, the declining trend is evident in regions in Visegrád group of countries (Hegyi–Kéri, 2013). When looking at relative regional specialization according to KSI, certain similarities are observed in the direction change, because in the mentioned countries, there are notable divergent directions of change, unlike the growing trend of relative specialization in almost all areas in Serbia. Also, the differences in comparison to changes in regional specialization of counties in Croatia are observed, where the overwhelming trend is in the decline of relative regional specialization (Puljiz, 2009).

The sectoral structure of the capital of Serbia is significantly different from the structure of other areas, with the lowest Herfindahl index and higher Krugman specialization index for Beogradska oblast. A similar pattern of regional specialization of the capital in a national frame was noted in Bucharest–Ilfov in Romania (Goschin et al., 2009), and Bratislavský kraj in Slovakia with the lowest index of absolute specialization (Hegyi–Kéri, 2013). Unlike the previously mentioned, capital regions—Prag, Central Hungary (which includes Budapest and Pest region) and Mazowieckie (Warsaw region) have the highest degree of absolute specialization in the national context. From a viewpoint of relative specialization of capitals, there exists a partial similarity in the degree of specialization of Beogradska oblast (higher index) with patterns of specialization of Bucharest–Ilfov, Prague, and Central Hungary (the highest index), and Bratislavský kraj (higher index), but a pattern different from Mazowieckie (Warsaw region) which has a lower index in the national context. The expressed conclusions should be considered as indicative because the research of regional specialization in selected NMS and Serbia (even though the same specialization indicators were used), differ in relation to the territorial and sector data disaggregation, as well as the research period, which greatly limits the complete comparison of the research results.

The transition in Serbia has, as well as in the NMS, further stressed the existing regional unevenness in favor of the development of the capital, the bigger urban centers, and development belts along major traffic corridors, as well as attractive areas for a continuation of the concentration of population, and economic activities, as opposed to the demographically devastated and underdeveloped areas with limited economic activities (Jakopin, 2018;

Miljanović et al., 2010; Zeković et al., 2014). In contrast to the polarized development in most NMS in which the capitals and mostly western bordering regions note better economic performances (Klamár et al., 2020; Morgenroth & Petrakos, 2008; Smętkovski, 2013; Traistaru, et al., 2002; etc.), in Serbia, the polarization is most notable in a north–south relation, that is, in Beogradski region and Region Vojvodine as opposed to Region Šumadije i Zapadne Srbije and Region Južne i Istočne Srbije (Jakopin, 2018; Miletić et al., 2017).

5. Conclusion

The analysis of regional specialization in Serbia during 2001–2015 conducted on NUTS 3 level areas, has shown that the extent of employment change by sector of activities is different by area, while the direction of changes is mostly the same. Several different patterns of change in regional specialization are observed: (1) a decrease in the absolute regional specialization and the convergence of activities' structure in regional economies; (2) an increase of relative regional specialization in almost all areas, as an indicator of dissimilarity/diversity of sectoral structure in areas in comparison to the structure of activities on the national level; (3) the capital area, Beogradska oblast, is characterized by a diversified structure of activities, which is shown by the lowest degree of absolute specialization, and higher degree of relative specialization; (4) even though the decrease in employment in manufacturing is quite emphasized, manufacturing remains the leading activity in almost all areas; (5) according to broader sectoral structures, the service sector is the leading one in all the regional economies (except Pirotska oblast with the leading secondary sector).

The change in regional specialization by areas in Serbia is similar to other CEE countries, a consequence of intense deindustrialization and accelerated tertiarization, that is, the relocation of employment toward service activities. There is a partial similarity between the changes in regional specialization in Serbia with the processes in several NMS. However, other than the same indices of regional specialization, the researches differ in territorial and sector data disaggregation as well as in the research period, which greatly limits the complete comparability of the research results. Also, the transition process in Serbia has additionally stressed the polarized and spatially divided pattern of regional development in favor of the capital and its region as well as the large urban centers, as opposed to the rural and peripheral zones, traditionally underdeveloped areas, especially in the border region. Areas in the southern part of Serbia—Pčinjska, Jablanička, and Toplička oblast, and Raška oblast in the southwestern part of Serbia are characterized by decades of underdevelopment; level indices of regional GVA per capita were about 50% of the national average (Serbia = 100) in 2019 (SORS, 2021). To accomplish a more even regional development, it is necessary to establish an efficient institutional framework and strategic planning, decentralization, and polycentric regional development (GRS, MCTI, 2021; Jakopin, 2018).

With respect to the current employment trends from 2015 (an increase in employment in most sectors of activities and in all areas NUTS 3 level), a more detailed analysis of the impact of the distribution change of employees on the degree of regional specialization is an interesting topic for further research. Furthermore, future studies should be complemented with other indicators on a regional level (such as demographic, economic, socio-economic, etc.), and especially with a comparative analysis of similarity/difference of patterns of regional specialization between different group of areas according to their geographical location (for example between internal and bordering areas, etc.).

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