

## THE INTERDEPENDENCE BETWEEN ACTIVITY STRUCTURE AND LEVEL OF ECONOMIC DEVELOPMENT – CASE STUDY OF SERBIA

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### *Summary*

*The goal of the paper is to examine the hypothesis whereby a higher level of diversification in the structure of activities of a certain settlement indicates a higher level of its economic development. The absolute predominance of employment in the tertiary-quaternary sector in the total employment in Serbia's municipal centres has been brought in correlation with their level of economic development. The nature of this interdependence has been the subject of a detailed analysis in this paper. Using the methods elaborated for the needs of this research, conclusions have been drawn indicating the emergence of a large number of centres where the quantitative prevalence of the tertiary-quaternary sector, along with the distinct incidence of employment in public services, is not accompanied by corresponding qualitative and quantitative changes that would result in a higher level of economic development. Insufficiently developed centres have been identified in order to facilitate decision makers to take proper and timely actions and enable relevant institutions and organisations to apply adequate measures to support balanced economic development.*

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## Zusammenfassung

### ZUR INTERDEPENDENZ VON ERWERBSTÄTIGENSTRUKTUR UND ENTWICKLUNGSSTAND – FALLSTUDIE SERBIEN

*Das Ziel dieses Artikels ist es, die Hypothese zu testen, dass ein höherer Diversifizierungsgrad der Erwerbstätigenstruktur der Bevölkerung eines bestimmten Territoriums ein höheres Niveau seines wirtschaftlichen Entwicklungsstands anzeigt. In diesem Kontext wird der Zusammenhang zwischen der absoluten Dominanz der Beschäftigung im tertiär-quartären Sektors in den städtischen Zentren Serbiens mit deren Entwicklungsstand analysiert. Untersucht wird – unter Verwendung der für diesen Untersuchungszweck definierten Methoden –, ob eine derartige Korrelation besteht und welche Ausprägungen sie aufweist. Als Ergebnis der Analyse werden Schlussfolgerungen gezogen, die auf die Entstehung und das Vorhandensein einer Vielzahl von Zentren hinweisen, in denen die quantitative Dominanz des tertiär-quartären Sektors, gefolgt von einer ausgeprägten Dominanz der Beschäftigung im öffentlichen Dienst, nicht begleitet wird von angemessenen qualitativen und quantitativen Veränderungen, die zu einem höheren wirtschaftlichen Entwicklungsstand führen würden. Die Erfassung gefährdeter Entwicklungszentren soll den Entscheidungsträgern eine rechtzeitige und angemessene Reaktion ermöglichen, sowie den relevanten Institutionen und Organisationen Grundlagen bieten, Maßnahmen zur Förderung einer ausgewogenen Entwicklung angemessen umzusetzen.*

*Schlagwörter:* Tätigkeitsstruktur, Erwerbsstruktur, tertiär-quartärer Sektor, wirtschaftliche Entwicklung, Zentren, Serbien

## 1 Introduction

In light of the regularity identified long ago that every phenomenon undergoing growth, i.e., development, is characterised by changes in its structure, the subject of the analysis in this paper is employment differentiated by activities and their sectors as an important indicator to determine the nature, quality and level of economic and social development. The initial hypothesis is that both diversity or uniformity of the structure of activities reflect general socio-economic development and the social division of labour (Tošić 2018; Interreg VI 2021–2027).

The decline in the participation of classical industry in creating the gross domestic product and employment in the developed countries results from the development of activities that provide a high level of newly created values. Therefore, postmodern and postindustrial societies maintain high productivity in agriculture and industry where less workforce is employed, and service and administrative activities have become the predominant source of employment.

The hypothesis whereby a higher level of diversification in the structure of activities in a settlement indicates a higher level of its economic development, based on economic models by Clark and FISHER (FISHER 1939; CLARK 1940; BRADFORD and KENT 1977), has been questioned through various theoretical examinations, and the opinion has been expressed that this model is incomplete (PERROUX 2004). Namely, in both undeveloped and developing countries, where development has stagnated in recent decades and which often face recession, there has been a sudden rise in the share of the population employed in the tertiary-quaternary sector. However, the causes and effects of such structures of activities are essentially different from those in the developed countries, which reached their level of development following a theoretically defined sequence of events.

Since municipal centres in Serbia have crossed the so-called line of functional equilibrium of developmental activities (i.e., the balanced participation between the secondary sector on one side and the tertiary-quaternary sector on the other) and are quickly departing from this equilibrium in the direction of the absolute predominance of employment in tertiary-quaternary activities (Tošić et al. 2017), this research of this study examined the expected correlation between a higher level of development and diversification of activities in the observed centres.

The results of the analysis indicate the emergence of a large number of municipal centres of the lowest level of development where employment in the tertiary-quaternary sector has absolute predominance. The nature of this predominance was examined, that is, the analysis of the structure of the tertiary-quaternary sector was conducted, and finally the importance of the individual activities that comprise this sector, particularly public services that do not create revenue in respect to the number of their employees.

Using the model elaborated for the needs of this research, a group of potentially economically unsustainable centres was obtained in which the predominance of the tertiary-quaternary sector in total employment is accompanied by a low overall employment rate with a high share of employment in public services. These are actually settlements that “live” due to their status of a municipal centre and the functions that go along with such a status.<sup>1)</sup> So, the centres with low overall employment and high employment in activities that do not create revenue (non-revenue-generating activities), that is, centres with insufficiently developed activity structure, are considered as potentially economically unsustainable.

The results obtained should facilitate decision makers when deciding about future actions concerning the development of municipal centres and their surroundings, with the aim of promoting more intensive economic development, employment, investments, etc., in order to reach more balanced regional development and decrease in regional inequalities and consequential differences between municipalities. Based on the obtained

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<sup>1)</sup> The largest number of employees work in healthcare centres, courts of law, police stations, schools, and particularly in administrative jobs. Since the municipalities in Serbia are among the largest in Europe by the size of their population (around 50,000 on average) and area (500 km<sup>2</sup> on average), the need to break them up is often recognised. In practice, this does not happen, primarily because it is impossible to establish all services needed in each municipality (personnel cannot be employed and basic infrastructure does not exist, buildings and premises in particular). On the other hand, in sporadic cases where there is a need to merge smaller municipalities into a larger one, this does not happen in order not to lose the jobs.

results, future development strategies should be formed at higher levels of territorial administration.

### 1.1 Tertiarisation – A global development factor

Changing economic conditions are reflected by the constant spatial and professional mobility of the population, which in a constant circle of cause and effect cause further changes in the demographic and economic structure of the population. The structure of the active population (labour force) is a direct reflection of changes in the structure of activities, which can have a very regular tendency – from the predominance of the primary and the secondary sector to the greatest share of the tertiary-quaternary sector in the highest phase of development.

Namely, all activities that experience unobstructed and gradual growth go through the stages presented in Table 1. The structure of activities where the tertiary-quaternary sector prevails is a necessary but not a sufficient condition to claim that the economy of the observed territory is in the postindustrial phase of economic development. If other preconditions are also fulfilled (Table 1), then this can be stated with sufficient certainty.

Features	pre-industrial society	industrial society	post-industrial society
the leading sector of the economy	primary	secondary	tertiary-quaternary
resources	natural power	energy produced	information and knowledge
strategic resource	raw materials	financial capital	human capital
technology	human work	production plants	intellectual technology
work methods	physical work	division of work	networking
production method	extractive economy	industrial production	information processing

Source: BELL 1999

Table 1: From a pre-industrial to a post-industrial society

Technological progress results in enhanced service sector and rising quality. The share of the employed in these activities increases and the sector contributes more extensively to gross domestic product (GDP), particularly in highly developed countries. This process is called tertiarisation,<sup>2)</sup> and can be defined as the predominant result of major socio-economic

<sup>2)</sup> Contrary to this, according to ŠERÝ et al. (2018), a decline in service activities occurs in the case of intensive and constant depopulation, which leads to less demand for services. The same process is possible when large production plants or energy facilities are opened that employ a significant share of the labour force within the secondary sector, especially in areas affected by de-industrialisation.

changes, with an extremely visible impact at the level of economies (SANCHEZ-MORAL et al. 2008; GENARO and MELCHOR 2010; CERCLEUX et al. 2015).

The two processes in this interaction – de-industrialisation and tertiarisation, have a major impact on the growth of the standard of living and the transformation of space (MONTRESOR and MARZETTI 2011; CERCLEUX et al. 2015). According to Graham and Spence (1995) de-industrialisation and tertiarisation were evident in the economic changes that took place in London in the 1980s, making its economy much more productive. CRAMPTON (1999) asserts that the process of tertiarisation has a stronger effect than changes in overall employment. Also, the example of Asian cities demonstrates that the urban economic development policy gives weight to services, particularly in larger urban areas (MORSHIDI 2000). In Indonesia, for example, before the economic crisis in mid-1997, there was a large-scale transfer of employees from the agricultural sector to the trade and services sector (MCGEE and FIRMAN 2000).

Since service activities became the fastest growing segment of the economy with a recognised role in the competitiveness of the region, geographers and regional scholars turned their attention to these sectors and to the uneven spatial development resulting from the increased spatial concentration of services toward the top of the urban hierarchy (SHEARMUR and DOLOREUX 2008). It is also considered that the ascendancy of one sector, in combination with failing to keep up with technological progress and the increasing importance of the tertiary sector, has become an encumbrance for many cities in the USA and Europe (MARTINEZ-FERNANDEZ et al. 2012; WIECHMANN and PALLAGST 2012; ŽIVANOVIĆ et al. 2021).

The development of the tertiary-quaternary sector provides the integrity, independence, financial stability and sustainability of a state (SAVLOV 2012). Regardless of the fact that the growth of the service sector contributes to the sustainability of global development, both ecological through the preservation of natural resources and social through the greater use of human capital, the primary and secondary sector must also participate in the overall structure of activities, primarily in order to satisfy the existential needs of the population and to meet some demands related to the standard of living.

A decrease in the number of employees in the secondary sector does not necessarily indicate a reduction of industrial production, nor a decline in the revenue in that activity. In many countries, industry has not disappeared, and its importance has not diminished as well as industrial production has not decreased, but the structure of production and the number and structure of employees are changing (PERAČKOVIĆ 2011). There are forecasts that by 2080 the secondary sector will participate with less than one percent in the structure of the economy (HIRATA 2016). Today, services generate almost two-thirds of the world GDP (in the most developed countries 70 to 80 percent), while their share in the 1980s was only one-half.

The process that resulted in the predominance of employees in the tertiary-quaternary sector in the total employed population in the centres in Serbia is usually fundamentally different from the theoretically defined course. The post-industrial phase in Serbia most often does not have the characteristics of a higher developmental phase compared to the industrial phase but is a consequence of the collapse of the industry, primarily of the industrial giants, which employed a huge number of workers in many, mainly monofunctional

urban settlements. PERAČKOVIĆ (2011) also confirms that the period of the 1990s, as a transition period, was especially important for the tertiarisation process, due to the impact of technological modernisation, demographic changes, and the unsuccessful privatisation process that led to mass extinction of industrial activities.

With the collapse of the industry and the overall stagnation of the secondary sector in Serbia in the 1990s, the conditions for the emergence of the so-called quasi-tertiarisation were created, which is reflected, among other things, in the illusory compensation of the reduction in the number of employees in the secondary sector by its increase in the service sector. However, the quantity of services was not followed by adequate quality, which would imply a significant increase in revenue generated in that sector and a higher level of development. This is evident in the large number of underdeveloped municipalities, with small centres in whose structure of employment the tertiary-quaternary sector is absolutely dominant (TOŠIĆ and ŽIVANOVIĆ 2015).

## 2 Research methodology

According to the Law on Regional Development, the methodology to calculate the level of economic development is established by the Government of Serbia. The basic indicator for determining the level of development is GDP per capita (MILETIĆ et al. 2009).

The level of economic development is defined at the municipal level. In the absence of data related to settlements, for the purposes of this analysis the data at the municipal level can be considered a relevant indicator, taking into account that the level of municipal economic development is predominantly determined by the development of the functions of its centre.

The level of economic development of a municipality is determined by applying the basic and corrective indicators of economic development of a municipality. The basic indicator for measuring the level of economic development of a municipality is the sum of the mass of salaries and pensions in the municipality and revenues of the municipal budget expressed per capita after excluding funds received from other bodies for eliminating the consequences of natural disasters (LRD 2009).

Corrective indicators for measuring the level of economic development of a municipality are the following (cf. Government Regulation 2011):

- 1) Demographic decline or growth: An indicator of demographic changes and depopulation in a municipality is measured by the growth rate of the total population in the observed year in relation to the census data from 1971. The values of this indicator were assessed as an appropriate criterion with long-term consequences on the development of a municipality – and based on that, the following corrective values have been derived (Table 2):
- 2) Unemployment rate: This indicator of social and economic development of a municipality is measured by the unemployment rate of the working age population, i.e., it represents the number of the unemployed in the population aged 15 to 64 in the observed year. The corrective value of this indicator is 5 for values above 15 percent.
- 3) Population density (Table 3):

Negative population growth rate in the observed year in relation to 1971	Corrective value	Positive population growth rate in the observed year in relation to 1971	Corrective value
Higher than 80 %	-20	over 50 %,	20
50 to 79.99 %	-15	30 to 49.99 %	15
30 to 49.99 %	-10	20 to 29.99 %	10
15 to 29.99 %	-5	10 to 19.99 %,	5
5 to 14.99 %	-3	Above average of the Republic of Serbia to 9.99 %	3

Source: Government Regulation 2011

Table 2: Growth rate and corrective values

Population density (number of inhabitants/km <sup>2</sup> )	> 170	157 to 169	150 to 156	95 to 149	74 to 94	64 to 73	53 to 63	34 to 52	20 to 33	15 to 19	< 14
Corrective value	10	8	6	4	0	-2	-4	-6	-8	-10	-20

Source: Government Regulation 2011

Table 3: Population density and corrective values

The results obtained by the applied methodology for defining the level of economic development are further correlated with the results of the analysis of the structure of activities and different size categories estimated according to the size of a centre’s population.

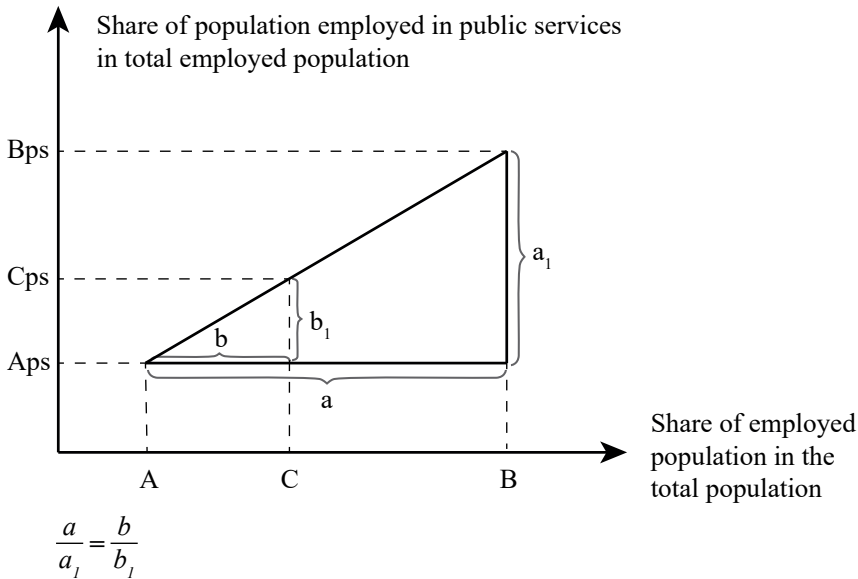
The characteristics of the structure of activities in Serbia, i.e., the character of the indisputable dominance of the tertiary-quaternary sector, have been examined using various mathematical and statistical methods. The participation of employees in the total population has been analysed, the structure of activities by sectors (percentage of employees by sectors in the total population), the structure of the tertiary-quaternary sector by activities (the participation of employees in public services as the base of the quaternary sector and in trade as the base of the tertiary sector, in total employment, etc.).

Furthermore, a proposal has been given (Table 4) for distinguishing potentially economically unsustainable centres as those with a developed activity structure (indicated by the dominance of the tertiary-quaternary sector in the employment structure) but also a low percentage of employees in the total population and a high employment in public services in the total number of employees. A group of 127 centres was observed, which are less developed than the national average (see Figure 1: Groups II, III, IV and V).

	Employment	Employment in public services
Potentially economically unsustainable centres	Below average in group of 127 centres (< 30.33)	Above average in group of 127 centres (> 28.65)

Table 4: A proposal for isolating potentially economically unsustainable centres in a group of centres that are less developed than the national average

In order to determine the threshold value of participation of employees in public services in the total employed population (Cps) in centres whose level of development is below average (for a selected group of centres), Thales' theorem has been applied (Graph 1).



respectively;

$$a (AB) : b (AC) = a_1(ApsBps) : b_1(ApsCps)$$

- A is the average participation of the employed population in total population, for centres whose share of the employed population in total population is below average (for the selected group of centres).
- Aps is the average participation of the employed population in public services in total employed population, for centres whose share of the employed population in total population is below average (for the selected group of centres).
- B is the average participation of the employed population in total population, for centres whose share of the employed population in total population is above average (for the selected group of centres).



- B<sub>ps</sub> the average participation of the employed population in public services in total employed population, for centres whose share of the employed population in total population is above average (for the selected group of centres).
- C is the average participation of the employed population in total population for all observed centres.
- C<sub>ps</sub> represents the required participation of employees in public services in total employed population, which a centre with below-average share of employees in total population can have in order to be classified in the category of settlements whose activity structure is evenly developed.

$$\begin{aligned}
 a &= B - A \\
 a_1 &= B_{ps} - A_{ps} \\
 b &= C - A \\
 b_1 &= a_1 \times b / a \\
 C_{ps} &= b_1 + A_{jc}
 \end{aligned}$$

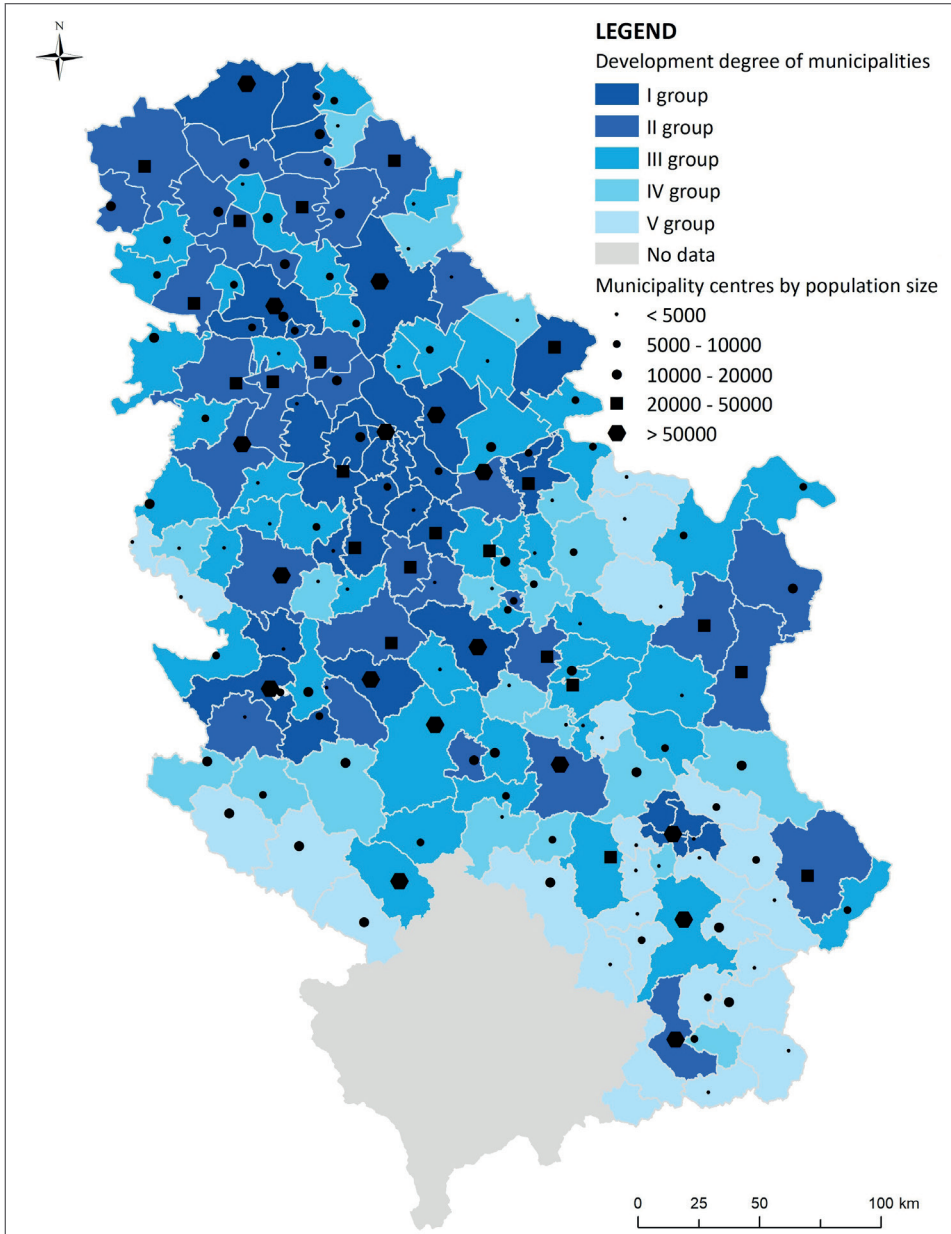
Therefore, the aim was to distinguish centres that have higher values than the obtained threshold percentage (C<sub>ps</sub>) – i.e., the share of employees in public services in total employed population – in order to select those centres in which non-revenue-generating activities dominate. With greater share of the service sector, and especially with a higher participation of employees in certain service activities (e.g., management), this method has quantitatively proven greater unsustainability of these centres that have very few economic or production activities. Furthermore, they are more unsustainable because of greater limitations that exist in their further development. Their identification created the basic preconditions for defining planned measures in order to overcome the problems of their further development.

### 3 Research results

#### 3.1 Level of economic development

By applying the methodology for calculating the level of economic development, the municipalities were divided into five groups:

- I – the most developed municipalities whose level of economic development is above the national average
- II – municipalities whose level of economic development is between 80 and 100 percent of the national average
- III – underdeveloped municipalities whose level of economic development is 60 to 80 percent of the national average
- IV – highly underdeveloped municipalities whose level of economic development does not exceed 60 percent of the national average
- V – devastated areas, consisting of municipalities whose level of economic development is below 50 percent of the national average (Figure 1)



Source: Authors' analysis. – Graphic: Authors' design

Figure 1: Municipalities divided into groups according to the level of economic development<sup>3)</sup>

<sup>3)</sup> Two macro-regions of Serbia (Central Serbia and Autonomous Province of Vojvodina) with available data.

### 3.2 Structure of activities

The increase of participation of employees in activities of tertiary-quaternary sector in Serbia has become more intense as data in each population census show (in the last census, as much as 12 percentage points). A balanced structure of activities was established in the period 1981–1991 (Table 5). The results of the conducted analysis indicate to the completed deagrarisation process in municipal centres, but also to the strong deagrarisation process and the prevalence of the tertiary-quaternary sector in the settlements in their surrounding area. Changes in the secondary sector are intensive in the centres, as a decrease of 15 percentage points has been recorded. The share of the tertiary-quaternary sector recorded a significant growth in all settlements of Serbia (around 21 percentage points), and in urban settlements, at the end of the observed period, the share of these activities was almost 71 percent<sup>4)</sup> (Table 5). Moreover, in the areas neighbouring the centres, the increase is slightly higher in relation to the centres themselves, which is consistent with the well-known regularity – if the development starting position is lower the change that follows is more intense (BANERJEE and JESENKO 2015).

Year	Sector of activity								
	primary			secondary			tertiary-quaternary		
	Serbia	centres	surrounding areas	Serbia	centres	surrounding areas	Serbia	centres	surrounding areas
1991	29.66	5.27	55.02	33.17	40.73	25.31	37.17	54.00	19.67
2002	22.01	3.67	45.01	31.42	34.87	27.11	46.56	61.46	27.89
2011	15.90	3.46	35.71	25.69	25.70	25.67	58.41	70.84	38.62

Source: Statistical Office of the Republic of Serbia

Table 5: Structure of activities in Serbia – centres and surrounding areas, in percent

Among the activities of the tertiary-quaternary sector, in municipal centres, the largest number of inhabitants is employed in trade (about 17 %). The following are non-economic activities: public administration, education and health (Table 6).

When the participation of employees in activities solely within the tertiary sector is analysed, it is trade that absolutely dominates with an average of 52 percent. Also, extremely high participation of employees in trade is observed in centres with lower levels of economic development (Figure 1: groups II, III, IV, V).

In the participation of employees in the activities of the quaternary sector in centres, it is the state administration, education and health and social services that are almost identically represented (21–25 %). Extremely high participation of employees in the state administration has been recorded again in centres with a lower level of development.

<sup>4)</sup> In 1962, tertiary-quaternary activities accounted for 62 percent of the structure of the economy of New York and London (MARETIĆ 1996).

Activities in tertiary-quaternary sector	Serbia		Municipal centres		Surrounding areas	
	Number	% <sup>a)</sup>	Number	% <sup>a)</sup>	Number	% <sup>a)</sup>
<b>Tertiary-quaternary sector (total)</b>	<b>1,331,214</b>	<b>57.78</b>	<b>995,469</b>	<b>70.35</b>	<b>335,745</b>	<b>37.75</b>
<b>Tertiary sector</b>	<b>637,449</b>	<b>27.66</b>	<b>464,653</b>	<b>32.84</b>	<b>172,796</b>	<b>19.43</b>
1. Wholesale and retail trade, repair of motor vehicles and motorcycles	339,371	14.73	241,383	17.06	97,988	11.02
2. Traffic and storage	121,878	5.29	79,972	5.65	41,906	4.71
3. Accommodation and food services	67,773	2.94	47,580	3.36	20,193	2.27
4. Information and communication providers	53,281	2.31	46,919	3.32	6,362	0.72
5. Financial and insurance activities	50,964	2.21	45,155	3.19	5,809	0.65
6. Real estate	4,182	0.18	3,644	0.26	538	0.06
<b>Quaternary sector</b>	<b>693,765</b>	<b>30.12</b>	<b>530,816</b>	<b>37.51</b>	<b>162,949</b>	<b>18.32</b>
7. Professional, scientific, innovative and technical activities	79,722	3.46	67,175	4.75	12,547	1.41
8. Administrative and support service activities	45,196	1.96	32,209	2.28	12,987	1.46
9. State administration and defence; mandatory social security	180,580	7.84	134,080	9.47	46,500	5.23
10. Education	149,034	6.47	114,314	8.08	34,720	3.90
11. Health and social care	158,345	6.87	119,918	8.47	38,427	4.32
12. Art, entertainment and recreation	34,916	1.52	29,191	2.06	5,725	0.64
13. Other service activities	43,833	1.90	32,208	2.28	11,625	1.31
14. Household as an employer and its activities; activities of households that produce goods and services for their own needs	615	0.03	293	0.02	322	0.04
15. Activities of extraterritorial organizations and bodies	1,524	0.07	1,428	0.10	96	0.01

<sup>a)</sup> Percentage share of the total employed population in Serbia respectively of the municipal centres and the surrounding areas.

Source: Statistical Office of the Republic of Serbia, economically active population, by activities, by settlements (table in electronic form, unpublished data, 2011)

Table 6: Employed population in the tertiary-quaternary sector in 2011

The observed negative correlation between the level of economic development and the share of the activities within the tertiary-quaternary sector directly questions the validity of the hypothesis the research was based on. Namely, in the case of Serbia, the high percentage of employees in public services indicates the underdevelopment of the activity structure in these settlements.

Once observed regularity that large cities (measured by population) tend to be “more tertiary-sector-oriented” than smaller centres (MARETIĆ 1996, p. 73) has been proved by the data on intensification of predominance of tertiary-quaternary sector in total employment in small, medium and big centres. Although this regularity exists on the territory of Serbia (Table 7), there is a relatively high share of service activities in centres with fewer than 5,000 inhabitants (almost 59.71 %), which does not necessarily indicate their high level of economic development (Figure 1).

Number of inhabitants in the centre	Number of centres	Participation of employed population	Average participation of ... in the total employed population (in %)		
			Employees in tertiary-quaternary sector	Employees in trade	Employees in public services
> 100,000	4	36.00	75.98	18.29	29.40
50,000–100,000	13	31.15	66.31	17.27	28.46
20,000–50,000	23	31.29	60.98	15.04	27.47
5,000–20,000	66	29.93	60.03	15.15	27.26
< 5,000	48	31.77	59.71	13.68	29.58
<b>Total / average</b>	<b>154</b>	<b>33.47</b>	<b>70.46</b>	<b>16.93</b>	<b>28.59</b>

Note: Public services: Administrative and support services; state administration and defense; compulsory social insurance, education, health and social work.

Source: Statistical Office of the Republic of Serbia, economically active population, by activities, by settlements (table in electronic form, unpublished data, 2011)

Table 7: Analysis of employees in the tertiary-quaternary sector according to the number of inhabitants in 2011

In big centers, over 100,000 inhabitants, deviations in all indicators are most evident compared to other centres. These four centres have the largest share of the employed population, the largest share of the tertiary-quaternary sector and a slightly higher share of employees in trade. In centres of other sizes, the values are mostly balanced in all indicators.

On the relation: demographic size of a settlement (measured by the number of inhabitants) and the level of economic development, the regularity has been noticed according to which the level of economic development of the centres decreases with the reduction of their size (Figure 1). Namely, out of 39 centres with more than 20,000 inhabitants, only five have a level of economic development that is less than 80 percent of the national average. In contrast, smaller centres are generally of lower level of economic development, often lower than 50 percent of the national average.

Level of development of the municipalities in 2011 compared to the republic average (in %)	Number of municipalities	Average participation of employed population in the total population (in %)	Average participation of ... in the total employed population (in %)		
			Employees in tertiary-quaternary sector	Employees in trade	Employees in public services
1. > 100 %	27	35.09	75.71	17.92	28.55
2. 80 – 100 %	33	31.66	61.00	15.36	27.02
3. 60 – 80 %	47	28.81	65.09	16.18	30.26
4. 50 – 60 %	20	30.13	60.23	14.35	29.63
5. < 50 %	27	28.28	60.43	13.09	32.57
<b>Total / average</b>	<b>154</b>	<b>36.10</b>	<b>75.44</b>	<b>17.75</b>	<b>27.67</b>

Source: Government Regulation 2011; Statistical Office of the Republic of Serbia, economically active population, by activities, by settlements (table in electronic form, unpublished data, 2011); own calculation

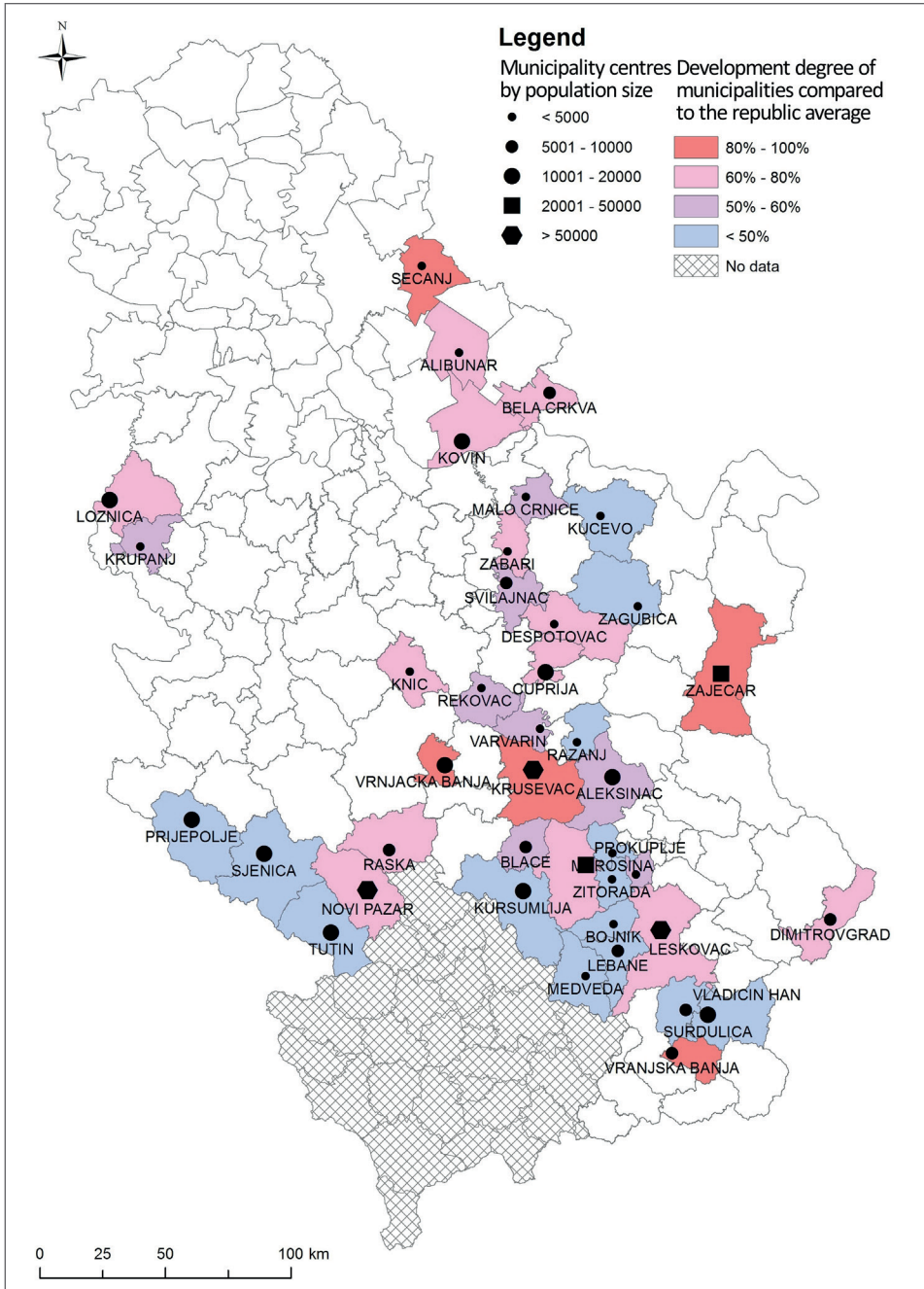
Table 8: Share of employees in tertiary-quaternary activities according to the level of economic development in 2011

Comparison of data on the level of economic development and the participation of employees in public services indicates the existence of the regularity in the sense that those centres that have the lowest level of economic development have slightly higher share of employees in public services in the total employed population (Table 8). The group of municipalities whose level of economic development is above the national average has the most favourable values in all the above indicators.

If we start from the hypothesis that settlements and their functions are the main factors in the organisation of space, and that the number of employees and the structure of activities of the employed population are directly conditioned by functional development and orientation of the labour centres (Tošić 2018, p. 132), then data on the participation of employees in public services as the backbone of the quaternary sector can be considered worryingly indicative. Therefore, since these non-revenue-generating activities do not affect economic development on the one hand, and on the other hand the underdevelopment of the structure of activities in labour centres presents a serious limiting factor for the development of the surrounding areas the population seeks employment in non-agricultural productive activities in the centres.

### 3.3 Potentially unsustainable centres

According to the proposed model, centres with less than 30.33 percent of the employed population have been singled out (which is the average value for all centres developed below the national average). There are 65 of them. Among them, there are 46 centres with more than 28.65 percent of employees in public services (average in the group of below the average developed centres). These are the most unsustainable centres (Figure 2).



Source: Authors' analysis. – Graphic: Authors' design

Figure 2 Potentially unsustainable centres in Serbia

A conditionally accepted term “potential unsustainability” indicates centres whose development of activity structure is not confirmed by sufficient representation of economic activities, based on defined parameters that assess potential development opportunities according to the share of employed population in non-revenue-generating activities.

### *Application of Thales’ theorem*

By applying Thales’ theorem, we have reached the required threshold value of employees in public services

$$a(AB) : b(AC) = a_1(\text{ApsBps}) : b_1(\text{ApsCps})$$

$$A = 27.38$$

$$\text{Aps} = 23.99$$

$$B = 32.86$$

$$\text{Bps} = 33.34$$

$$C = 30.33$$

$$a = B - A = 32.86 - 27.38 = 5.48$$

$$a_1 = \text{Bps} - \text{Aps} = 33.34 - 23.99 = 9.35$$

$$b = 30.33 - A = 30.33 - 27.38 = 2.95$$

$$b_1 = a_1 \times b / a = 9.35 \times 2.95 / 5.48 = 5.03$$

$$\text{Cps} = b_1 + \text{Aps} = 5.03 + 23.99 = 29.02$$

Therefore, the centres that have a lower share of employees than the national average and more than 29.02 percent of employees in public services will be considered *potentially unsustainable centres* in Serbia. These are mostly smaller municipal centres. Forty such centres have been identified. They were also distinguished in the research conducted applying the previous model, so once again their potential unsustainability has been confirmed (Figure 2).

## 4 Conclusion

The purpose of this paper was not to confirm the well-known fact that the structure of activities in Serbia is dominated by the tertiary-quaternary sector (by the number of employees), but to examine the possibility of generating a logical conclusion about Serbia’s entry into the post-industrial era – based on the analysis of one of the fundamental indicators of this process – the structure of activities. In other words, the goal was to prove that the dominance of tertiary-quaternary activities is not a confirmation that this is a higher developmental phase of the Republic of Serbia.

The results of the research clearly indicate that after the intensive process of reducing the number of employees in the primary sector after the Second World War, that is, the process of deagrarianisation, it was since 1981 that a gradual process of deindustrialisation started, that is, reduction of the share of industrial and other production jobs. Alongside



the mentioned processes, the process of tertiarisation began. However, the observed situation of the absolute dominance of the tertiary-quaternary sector in total employment in all centres is not the basis for the theoretically expected classification of such centres in the group of those with a developed activity structure, i.e., a higher level of economic development.

Using the methodology elaborated for this paper, we have determined that there are as many as 40 centres in Serbia, which have been distinguished as potentially unsustainable settlements in which the dominance of tertiary-quaternary activities is accompanied by low total employment and high share of public service employees. In most centers, this indicates low employment in economic activities, due to the lower production process and underdevelopment of service activities that generate revenue (production), which confirms their low level of development (Figure 1). However, in Serbia there are several medium-sized centres (with 20,000 to 100,000 inhabitants) in which below-average total employment and above-average share of employees in public services can be accompanied by a somewhat more diversified structure of activities that provides a medium level of development (Groups II and III).<sup>5)</sup>

We can certainly conclude that the results of the research confirmed the existence of centres in Serbia that are affected by the so-called process of *quasi-tertiarisation*. The main characteristic of this phenomenon is the large proportion of employees in the activities of the tertiary sector, which is not accompanied by a proportional share of revenue earned in that sector within the total revenue. As data on revenue is not transparent, it cannot be used to directly confirm the previously mentioned (the processed GDP data was the basis for defining the level of economic development, but only for categories of employees in statistical services of the Republic of Serbia, for whom the data on revenue on a local level was available), we decided to name the selected centres “potentially unsustainable”.

The general conclusion that can be drawn is that post-industrialisation in Serbia does not have the same character as in more developed countries, i.e., that the hypothesis that a higher degree of diversification of the structure of activities on a certain territory indicates a higher level of social and economic development has not been proven. The service sector in the observed centres, which we conditionally called potentially unsustainable, did not acquire the function to initiate and sustain economic development. This leads to the conclusion that Serbia experienced a transition from an agrarian society, through intensive industrialisation and unsuccessful deindustrialisation, and that it has not become a developed post-industrial society, but rather a society of cheap servants-/services,<sup>6)</sup> quite far from the knowledge society and modern skills required in more developed countries.

The results of the research should not lead to the conclusion that the problems in the unsustainable centres would be overcome by reducing or limiting employment in the non-revenue-generating activities. The existence of public services is necessary to meet

<sup>5)</sup> Data on revenue, which is not available for the local level in Serbia, would have contributed to the correctness of the conclusions drawn and would have indicated a distinct process of quasi-tertiarisation.

<sup>6)</sup> Or, as PERAČKOVIĆ says for Croatia in one paper, “from a farmer to a waiter” (PERAČKOVIĆ 2007).

the needs of citizens and is considered a key factor in improving the standards and social status of the population.

However, the development of activities of predominantly economic sectors in urban settlements (secondary and tertiary-quaternary) ensures integrity, independence, financial stability, and sustainability. Opportunities for future development lie in entrepreneurship and competitiveness of the area. The activities that actors at the local and higher levels should define include incentive measures that will encourage any production, and development of service activities within the economic sector in accordance with the potentials of the area. Appropriate measures should also prevent activities of the population that take place beyond the interests and control of the state.

In order to avoid extreme differences in development between the municipalities, and the regions, i.e., to create preconditions for more intensive convergent and balanced development, adequate economic policy measures must be devised in Serbia. Their ultimate goal should be to provide conditions in which the development gap between prosperous and non-prosperous areas is reduced, with each of them still being able to maintain an accelerated pace of development. These measures should be implemented in accordance with the available financial capabilities of a particular territory, i.e., potentials for the development of the area, and also according to the possibility of taking over the strategic guidelines defined in the European documents. Conclusions stated present a useful guide for the economic policy makers in defining planning measures whose ultimate goal should be sustainability, competitiveness, territorial cohesion, and territorial cooperation.

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