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ARTICLE



Convergence clubs in different regions of Serbia

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ABSTRACT

This paper investigates the existence of club convergence on the NUTS (Nomenclatures des Unités Territoriales Statistiques) 3 level in Serbia. While a common approach in investigating convergence is based on dividing units of observation a priori into individual groups based on some of their particular characteristics, we use a method developed by Phillips and Sul that allows identification of clusters of convergence on the basis of an algorithm that is data-driven and thereby avoids a priori classification of the data into subgroups. We use data on real gross valued added (GVA) per capita for the NUTS3 level in Serbia for the period 2001–2017. Our results show that there are two convergence clubs in Serbia, while the Belgrade district shows no signs of convergence with any of the other clubs.

KEYWORDS

Club convergence; log t test; Serbia; convergence

JEL CLASSIFICATION

C33; C80; O40; O47

1. Introduction

Economic growth in Serbia has been regionally uneven during the past almost two decades, which has contributed to deepening of existing regional inequalities. At the same time, the spatial aspect of the development has not received enough attention from the Republic of Serbia. In fact, regional disparities in Serbia are among the largest in Europe (Manić, Popović, and Molnar 2013; Manić, Popović, and Đorđe 2016). Occasional and uncoordinated activities aimed at supporting the development of the particular regions give only isolated and unsustainable results, significantly inhibiting a more successful growth and development of the country as a whole. The revival of interest in regional convergence is partly triggered by a growing interest in issues related to economic growth and its determinants. The club convergence concept is closely related to the concept of conditional convergence. If there is an absolute convergence of economic systems, it means that there is a unique equilibrium state that every individual system converges to. In the case of conditional convergence, the equilibrium states of economic systems differ, and each of them converges to a unique equilibrium or stationary state. In contrast, club convergence assumes the existence of so-called ‘multiple equilibria’ (Durlauf

and Johnson, 1995; Galor, 1996). Which of the equilibrium states the economy will converge to depends on the initial position of the economic system as well as on its other characteristics. Empirical evidence confirms the existence of convergence clubs both internationally (Monfort, Cuestas, and Javier 2013; Borsi and Metiu 2015; Barrios, Flores, and Ángeles Martínez 2019) and regionally (Bartkowska and Riedl, 2012; Tian et al. 2016; Mendoza-Velázquez et al. 2020). Whether regional disparities in per capita incomes increase or decrease is an important issue for policy-makers, while identification of the factors that lie behind the changes in regional inequality is of great significance for understanding these processes. An increase in regional disparities signals that there is a need for a different approach and a stronger regional policy. The aim of this work is to investigate the presence of regional convergence on the NUTS 3 level in Serbia. With this objective we apply the methodology of testing club convergence based on Phillips and Sul (2007, 2009). In this way, we study whether there has been absolute convergence or, on the contrary, convergence in clubs in the period 2001–2017 among the 25 NUTS 3 level districts of Serbia. The paper contributes to the existing literature by providing evidence of a club convergence process across Serbian regions in the

period 2001–2017. It also identifies the relative transition path of each club with respect to the panel data average and those for divergent regions. Following the introduction, the paper is divided into four sections. In the second we describe the data, followed by the empirical results in section three. The last section provides the conclusions.

II. Data

For testing convergence hypothesis among the 25 NUTS 3 level districts, due to lack of data on gross domestic product on NUTS 3 level in Serbia, we employ yearly data on the GVA per capita in the period 2001–2017¹. Data on NUTS 3 level of GVA in current prices in Serbian dinars (RSD) were transformed to real GVA by using national deflators for the observed period and estimated number of inhabitants on the NUTS 3 level provided by the Statistical Office of the Republic of Serbia.

III. Empirical analysis

Results of the ordinary least squares estimation of $\log(t)$ are presented in Table 1. We can see that slope coefficient is equal to -0.9140 , with the heteroscedasticity and autocorrelation-consistent standard error of 0.0227 , and a t -statistic of -40.2296 (clearly below the critical value of -1.65). Thus, the null hypothesis of overall convergence was rejected at the 5% significance level and we can say that the Serbian NUTS 3 districts did not converge to the same steady state equilibrium. Then, we proceeded to the clustering mechanism to check the existence of subgroup convergence, and in the first iteration we identified 3 subgroups and one diverging regions (Table 2). Positive

t -statistics reported for all three clubs suggests evidence of conditional convergence within them.

The largest number of the NUTS3 districts are part of Club 1, showing an estimated speed of convergence² of 0.0001 , the lowest among clubs, as well as the lowest degree of convergence ($t = 0.005$). Club 2 contains 10 districts, with most of them located in the southern part of Serbia. This group represents the intermediate speed of convergence (0.2813). Club 3 consists of only two districts, but they are showing the highest speed (2.096) as well as the degree of the convergence ($t = 3.7642$). In addition, the Belgrade district shows no signs of convergence with any of the other clubs. In the next iteration, we tested whether some of the clubs could be merged. According to the t statistics shown in Table 3, clubs 2 and 3 can be joined since the value of the t statistics is larger than the critical value (-1.65). After merging clubs 2 and 3, we obtained a final classification of the districts in Serbia, which is shown in Figure 1.

Figure 2 shows the transition paths³ across the two clubs and for one divergent region. As we can see, the first club is a little above average, and the second (which is composed of Clubs 2 and 3 obtained in the first iteration) is below average. The relative transition path for Belgrade, a divergent region, is clearly above the average. These results, although obtained by a more sophisticated methodological approach, are in line with previous research which showed that Serbia has the centre-periphery model of growth (Molnar and Maja 2019). There is a large centre, Belgrade (the capital city), with its own growth trajectory path. On the other hand, are the remaining NUTS 3 units, which form two different convergence clubs. Our empirical results show also that the regional polarization of Serbia (developed north and underdeveloped

Table 1. Log (t) test statistics.

	β	s.e.	t Statistic
log (t)	-0.9140	0.0227	-40.2296

n – individuals: 25.

Time periods: 15.

The first 4 periods are discarded before regression.

¹Data for 2011–2012 are not calculated on NUTS3 level by Statistical Office of the Republic of Serbia (SORS), so that these years are omitted from the series.

²The coefficient ' β ' provides a scale estimator of the speed of convergence parameter α , specifically, $\beta = 2\alpha$. See Appendix B in Phillips and Sul (2007).

³Under the assumption of convergence for the full panel of regions, the relative transition path should tend to unity, all should converge to the same level of GVA per capita.

Table 2. Convergence club classification.

	No. of regions		t Statistic	β
Club 1	12	South Banat, South Bačka, North Bačka, Central Banat, Srem, Zlatiborska, Kolubara, Moravica, Šumadija, Bor (district), Braničevo, Pirot (district)	0.0050	0.0002
Club 2	10	West Bačka, North Banat, Mača, Pomoravlje, Raška(district), Rasina, Zaječar (district), Jablanica, Niš (district), Toplica	4.1913	0.5626
Club 3	2	Podunavlje, Pčinja	3.7642	2.0459
Divergents	1	Belgrade (district)		

Table 3. Test of possible clubs merging.

log (t)	β	s.e.	t Statistic
Club1 + 2	-0.5981	0.0205	-29.2279
Club2 + 3	0.0558	0.0611	-0.9139

**Figure 1.** Convergence clubs.

south) has not changed or mitigated significantly in the transition period (after 2000). The advantage of the northern areas of Serbia lies in relatively higher per capita income and employment and in the created preconditions for development—built infrastructure, position on international corridors, and relatively more developed industry. In contrast, areas in southern Serbia are homogeneously underdeveloped over a wide area. With these types of

regional disparities, no regional convergence can be expected in the near future, at least not without a strong regional policy response.

IV. Conclusions

The subject of our research was testing for the presence of club convergence in GVA per capita among the sub regions (NUTS 3 level) of the

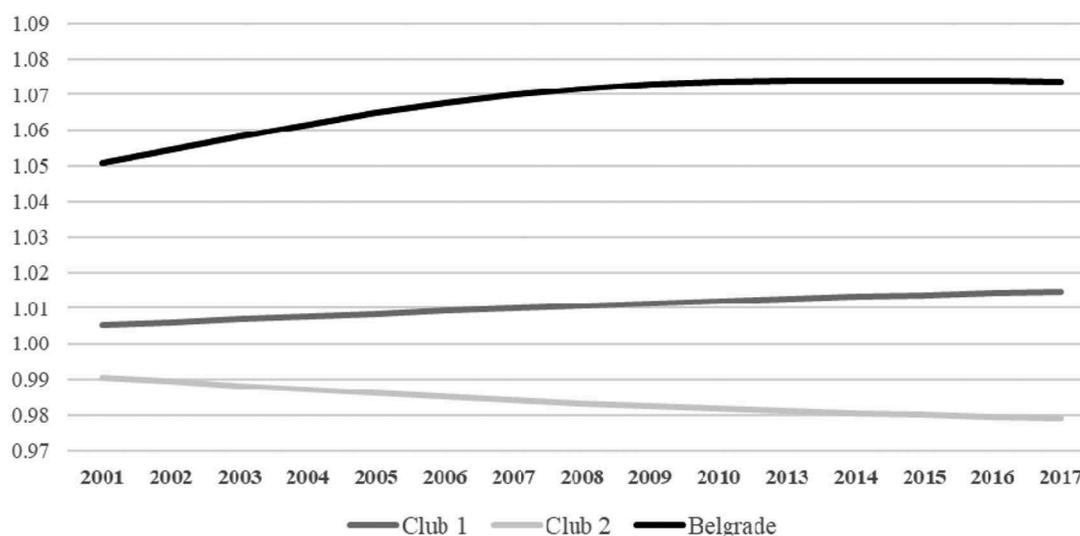


Figure 2. Transition path.

Republic of Serbia in the period 2001–2017. Using the methodology based on Philips and Sul (2007) it has been established that there is a club convergence among districts in Serbia. Belgrade, the capital city, has its own development path and a steady state, which means that without changes in regional development policy, further growth in regional disparities can be expected in the forthcoming period. Modernization of the institutions and adopting a functional regional policy with a high-quality action plan is an indispensable task. At the same time, the focus should be on the implementation of the EU's Cohesion Policy, especially regarding its mechanisms and measures to reduce regional inequalities. Finally, regarding the regional policy measures, the so-called place-based concept should be applied. It is based on adapting policy interventions to specific regional circumstances and their spatial relationships as well as on mobilizing and gathering the knowledge and advantages of local actors. Also, for cohesive regional development, it is necessary that local self-governments gradually adopt the standards of the EU regional policy through their active participation in the national regional policy system.

Disclosure statement

No potential conflict of interest was reported by the authors.

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