

# Balkan Area and EU-15: An Empirical Investigation of Income Convergence

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This paper empirically explores the issue of income convergence of the Balkan economies with the European Union's-15 average (EU-15) over the period 1989–2009. The adopted econometric methodology has been suggested by Nahar and Inder (2002) and is considered more efficient in detecting possible catching up effects compared to the relevant conventional methods. The findings of this paper point out the existence of dissimilarities among the examined Balkan economies in the process to catch up with the EU-15. In particular, the results support income convergence with the EU-15 only for Greece and Slovenia.

## 1 Introduction

The German reunion and the breakup of Yugoslavia and the Soviet Union invoked the dramatic change of the socialistic schemes of Central and Eastern Europe (CEE). In 1989, two contradictory trends appeared in the Balkan zone. The first concerned the openness to the West leaving back the communist regimes. Besides, the reawaken nationalism among the nations of Yugoslavia resulted in conflicts and created a new framework for the future relations between the Balkans and the international community (Papasotiriou, 1994).

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Over the last decades the Balkans' future in Europe has attracted the interest of the academic community and the European Commission. Despite the past tendencies, the European Union (EU) considered the Balkans and the CEE countries as a matter of priority and developed the conditions for its enlargement towards the Easter Bloc. The first enlargement, though not in terms of GDP, took place in 2004 by including eight CEE countries. According to Gros and Steinherr (2001), the transition of the CEE countries was completed in 1997 though some differences remained between the states of Central Europe and the Baltic region and the rest of the countries. Cavenaile and Dubois (2011) supported that there has been still a long way for the CEE countries towards income convergence. These countries, though aiming at joining the EU were not forming a homogenous group of economies with similar characteristics. The events of 1989 shocked the CEE economies resulting in significant drawbacks in production (Rosenberg 2000).

The notion of convergence has been a subject of discussions and theoretical analyses since the eighteenth century. Convergence is inherent to the theory of economic growth, as it describes a process within which a certain level of growth defined as target is approached. It also refers to the narrowing of the difference between two values over time.

The roots of convergence are found to the neoclassical growth model of Solow, a mathematical approach aimed at explaining convergence. Modern growth theory has been grounded on Solow's dynamic model (Solow 1956). However, the neoclassical theory was initially presented by Sala-i-Martin (1996) as a methodology to bibliography. The main idea was that poor economies tend to grow faster than the rich ones. The movement of a country towards a group leader addresses the topic of catching up.

Regarding the empirical evidence on convergence, the relevant research efforts appeared during the last decades when larger data sets became available (Baumol 1986). Concerning the literature for the Balkan economies in particular the majority of the research efforts used samples that included only a limited number of countries from the full Balkan group (Amplatz C. (2004), Baldwin et al. (1997), Bjorksten (2000), Bonetto et al. (2009), Breuss (2001), European Commission (2001), Del Bo et al. (2010), Doyle et al. (2001), Figuet and Nenovsky (2006), Lejour et al. (2001), Martín et al. (2001), Marini (2003), EEAG (2004), Kutan and Yigit (2004), Fidrmuc and Korhonen (2004), El Ouardighi and Somun-Kapetanovic (2007, 2009), Sarajevs (2001), Sideris (2010), Szeles and Marinescu (2010), Zbigniew and Prochniak (2004, 2007)).

This paper aims at detecting possible income catching up between the Balkan economies and the EU-15 average. The contribution of this paper lies in the use of a recent testing methodology for convergence, suggested by Nahar and Inder (2002). The adopted time series methodology is less restrictive as far as it allows non stationary processes to converge. Besides, a researcher is allowed to identify countries within a group that may not be converging. A further contribution could be the enrichment of the relevant literature by testing the full set of countries in the Balkan area.

The paper is structured as follows: Sect. 2 provides a short description of the examined Balkan economies over the period 1989–2009. Section 3, illustrates the

background of the adopted empirical methodology. Section 4, presents the data used and the results of the empirical analysis. Finally, Sect. 5 summarizes and concludes.

## 2 Economic Performance of the Balkan Zone

The Balkan area is situated in the Southeastern Europe and consists of 13 countries, which are either fully, or partially or outside this area: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, FYROM, Greece, Kosovo, Montenegro, Slovenia, Serbia and further times Romania. Four of them (Bulgaria, Greece, Romania and Slovenia) have already gained their membership to the EU and have reached a higher level of growth closer to the EU. The rest of the countries are either candidates (FYROM) or, potential candidates (Albania, Bosnia and Herzegovina, Serbia) or in negotiations (Croatia). Each one of these countries has particular characteristics along with dissimilarities in the growth process.

The participation of the Balkan countries in international organizations has strengthened their international presence. Their performance in terms of per capita income is plotted in Fig. 1, using the  $GDP_{PC}$  series in natural logs:

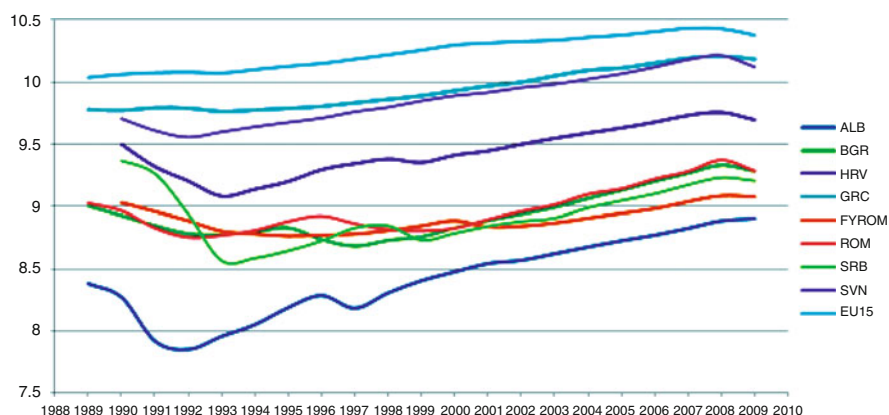
The first impression is that all countries are below the EU-15 average with the income gap from EU being obvious. According to Fig. 1, Greece and Slovenia move closer to the EU-15 average while Albania and Bosnia and Herzegovina present the lowest income levels and are placed last. The period until 2000 is clearly characterized by several fluctuations that smooth over after 2000, as it can be observed from Fig. 2 below. Furthermore, there is an obvious decrease in the GDP differentials from the EU-15 average providing a more clear evidence of convergence.

*Albania.* Albania is a potential candidate for EU accession since 2009 and is already member of the United Nations (UN), North Atlantic Treaty Organization (NATO), Organization of Security and Co-operation in Europe and other international organizations. The most important problems of Albania are the huge informal economy and the lack of energy and transportation infrastructure. The basic economic activity seems to be agriculture as it occupies more than half of the population but surprising represents only the one-fifth of GDP. In addition, the economy is based a lot on remittances from abroad. The global crisis has severely affected growth in Albania decreasing from the 6% during 2004–2008 to a 3% in 2009–2010.

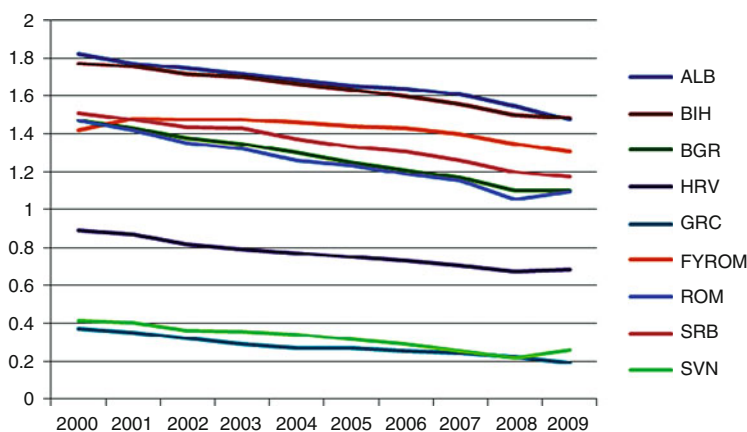
*Bulgaria.* Bulgaria is one of the oldest countries in Europe in the heart of the Balkan Peninsula that participated in the Eastern Bloc<sup>1</sup> until 1989. Bulgaria joined NATO in 2004, the EU in 2007 and is also a member of the UN, the World Trade Organization (WTO), the Organization for Security and Co-operation in Europe and is one of the founders of the Organization of the Black

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<sup>1</sup> A union of the former Communist states of Eastern and Central Europe.



**Fig. 1** The performance of GDP<sub>PC</sub> series over 1989–2009



**Fig. 2** The performance of the GDP<sub>PC</sub> differentials from EU15 average

Sea Economic Cooperation. Concerning the economic activity, Bulgaria is an industrialized economy with an extremely good performance recently. However, the recent global crisis has had a negative impact on its economy especially in oil industry.

*Croatia.* After the Second World War, Croatia became part of Yugoslavia. Nationalism and conflicts were usual due to the population mixture. In 1992, Croatia won its independence and in the same year became a member of the UN. Since 2009, Croatia has the biggest biogas plant in Europe. Over the period 2000–2007 Croatia showed signals of improvement holding a steady rate of growth. Croatia has participated in international organizations and is going to be a member of the EU on July the 1st 2013.

*FYROM.* FYROM became an independent nation in 1991 and since 2005 has applied for joining the EU. The majority of its trade relations are among the other

countries of the former Yugoslavia. It keeps on having one of the lowest per capita GDP in Europe. Regarding the economic structure, services' sector has the largest share in GDP while industry follows with textiles, iron, and steel being the basic exports goods. Agriculture represents only a small part of GDP though wine and vegetables are significant export goods. Its macroeconomic stability was achieved after 1996 and managed to record a positive growth rate in 2010.

*Greece.* Greece is the country with the longest history in Balkans. Right after the world war, Greece joined NATO<sup>2</sup> and since then was settled the basis of its economic stabilization. During the period 1953–1972 the Greek economy developed rapidly and structured within international events. In 1981, Greece joined the European Community (EC) being the tenth member and the first among the Mediterranean countries after Italy. A new phase for Greece came with the Cold War's ending and Greece oriented to the West located in a really advantageous position. It was the most developed country in economic terms and had the most homogeneous population among the Balkan countries. However, Greece's progress was not the expected mainly due to bad governmental choices. Greece entered the euro zone in 2001. The recent global crisis revealed a number of serious problems of the Greek economy and in 2010 the government signed a memorandum with International Monetary Fund in order to cover its borrowing needs and face with the difficulties more efficiently.

*Romania.* Romania has been a member of the EU since 2007 and of NATO since 2004. It gained its independence from the Ottoman Empire in 1877. After 1989, the country had a large period of economic imbalance. There was a need of structural reforms and industrial renewal. From 2000, the Romanian economy showed macroeconomic stability expressed through high growth rates, low unemployment and low inflation rates. The global crisis affected the economy and a decline in growth rate was marked down. It should be mentioned that Romania has significant natural resources and important industrial activities such as metallurgy, petrochemicals and machinery.

*Serbia.* In 1989, Slobodan Milosevic became president of Serbia's Republic and aimed at following the dream of "Great Serbia". His desire of Serbian domination ended up to the violent breakup of Yugoslavia. As a result, Croatia, FYROM and Slovenia declared their independence in 1991 and Bosnia and Herzegovina in 1992. Since 1992, Serbia remained united only with Montenegro but in a new state union, under the name new Federal Republic of Yugoslavia (FRY). As it was expected, Serbia faced with ethnic campaigns and as a result FRY was expelled from UN. The leadership of Milosevic did not change its direction not even in 1998, when it was obliged to face an Albanian insurgency in the province of Kosovo. Serbia indicated a non international reaction by rejecting a proposed settlement. This situation led to NATO's intervention with the well known consequences.

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<sup>2</sup>It has to be mentioned that in 1974 Greece retired its military participation to NATO in order to protest against the Turkish advance in Cyprus and rejoined in 1980.

*Slovenia.* Slovenia became a member of EU in 2004. It used to be also a part of Yugoslavia since 1929. In 1991, Slovenia managed to win its independence. Its secession from Yugoslavia was easier because there were not any Serbian minorities living in the state and besides, it was the first one reacting. Slovenia faced with a lot of economic problems and nowadays its economy is oriented to the services' sector and especially in the field of information technology. The basic and most developed economic sectors are pharmaceutical, automobile industry, food industry, and industry of electrical devices, metal processing and chemicals.

### 3 Methodological Issues

The selected method that was recommended by Nahar and Inder (2002), examines convergence as a movement of a set of countries with similar characteristics toward a group leader. It is oriented to the creation of a time trend function. Following Nelson and Plosser (1982), the selected time series convert to stationaries after removing their trend. A researcher is allowed to identify countries within a group that may not be converging. The adopted methodology is less restrictive as far as it concerns stationarity in comparison with the unit root tests as it allows non stationary converging processes. Nahar and Inder (2002) pointed out with this test that it is more appropriate for a set of countries that have the same steady state to have as point of reference the output level of the leader. They also denied connecting stationarity with convergence as they supported that several times it is rejected convergence when it really exists. It is assumed also that the technical change among the economies of the sample is common through the following analysis.

Let  $y_{it}$  be the logarithm of  $GDP_{PC}$  for any economy  $i (i = 1, 2 \dots N)$  during  $t (t = 1, 2 \dots T)$  period of time. Taking into consideration the neoclassical growth model we should underline for economy  $i$  that:

$$\lim_{n \rightarrow \infty} E_t (y_{it+n} - a_{t+n}) = \mu_i \quad (1)$$

where  $a_{t+n}$  is a common parameter determined as benchmark,  $\mu_i$  is a balanced growth path of economy  $i$ .  $\mu_i$  is non zero except from the case of similar countries. In case of absolute convergence, the relation (1) is written as follows:

$$\lim_{n \rightarrow \infty} E_t (y_{it+n} - a_{t+n}) = 0 \quad (2)$$

that is, the long run average of the difference  $y_{it+n} - a_{t+n}$  should converge to zero through time. In addition, the group leader can be the country or the group of countries with the best per capita economic performance. Therefore, the other countries should converge to the leader. The leader in our case is the average of EU-15. This average results from a group of developed economies that have high growth rates.

Firstly, we will define as  $d_{it}$  the per capita output gap:

$$d_{it} = y_{it} - \bar{y}_{EU15,t} \quad (3)$$

where  $\bar{y}_{EU15,t}$  represents the steady state of the countries in the EU-15 area. As the output per capita's (GDP<sub>PC</sub>) distance between a country and the EU-15 group (which is set as the steady state) declines and approaches zero through time, convergence is noticed. When  $d_{it}$  heads towards to zero during time, the rate of change in  $d_{it}$  has to be positive for convergence to hold:

$$\frac{\partial}{\partial t} d_{it} > 0 \quad (4)$$

The definition of absolute convergence in (2) is transformed based on (3) as follows:

$$\lim_{n \rightarrow \infty} E_t (d_{it}) = 0 \quad (5)$$

since  $d_{it+n} > 0$  and its rate is positive with  $d_{it+n} \rightarrow \infty$  as  $n \rightarrow \infty$ . The positive average slope function ( $\frac{\partial}{\partial t} d_{it} > 0$ ) is used to determine convergence. In order to calculate  $\frac{\partial}{\partial t} d_{it}$ , the  $d_{it}$  should be expressed as a function of time trend  $t$ :

$$d_{it} = f(t) + u_{it} \quad (6)$$

The general equation (6) is analyzed:

$$d_{it} = \theta_0 + \theta_1 t + \theta_2 t^2 + \theta_3 t^3 + \dots + \theta_{k-1} t^{k-1} + \theta_k t^k + u_{it} \quad (7)$$

where  $\theta_0, \theta_1, \theta_2, \theta_3, \dots, \theta_{k-1}, \theta_k$  factors are situated in front of each trend and  $u_{it}$  is the error term whose mean is equal to zero. There is one function for every country of the sample. The estimation is done using Ordinary Least Squares (OLS). The Akaike Information Criterion (AIC) was chosen to find the optimal time trend polynomial.

Moreover, in order to test the convergence's hypothesis the rate of change in  $d_{it}$  should be positive:

$$\frac{1}{T} \sum_{t=1}^T \frac{\partial}{\partial t} d_{it} > 0 \quad (8)$$

Analyzing further (7), the following equation comes out: where  $r_k$  is defined as follows:

$$r_k = \frac{k}{T} \sum_{t=1}^T t^{k-1} \quad (9)$$

Convergence is tested posing the following pair of hypotheses:

$$\begin{aligned} H_0 : r'\theta &\leq 0 \sim \text{no catching up} \\ H_1 : r'\theta &> 0 \sim \text{catching up} \end{aligned}$$

To answer the question of catching up, we can perform a Wald test and determine the statistical significance.

## 4 Data and Empirical Results

### 4.1 Data

The data used in this empirical analysis were downloaded from the World Bank's database. The sample used includes eight Balkan countries: Albania, Bulgaria, Croatia, FYROM, Greece, Romania, Serbia and Slovenia. The analysis uses GDP<sub>PC</sub> series, expressed in PPP, in US Dollars and in constant prices of 2005. When GDP<sub>PC</sub> (GDP<sub>PC</sub> = GDP/population) is equivalent to PPP a common background for the countries' set is established as all currencies' matters are solved. Following Maddison (2001), it is the best indicator to compare the economic performance of countries in an international level. The period examined is 1989–2009 and as benchmark is set the EU-15 average of the same indicator. It should be mentioned that not all the countries of our sample have data available for the entire period. Actually, Albania, Bulgaria and Greece have data from 1989, Croatia, FYROM, Serbia and Slovenia from 1990.

### 4.2 The Results of the Empirical Investigation

This paper follows the methodology of Nahar and Inder (2002) to test convergence. The analysis is performed for eight countries of the Balkan area and the dataset covers the period 1989–2009. First of all, we create the variable  $d_{it}$  and we determine a model for every country based on the relation (7). We estimate several models including dummy variables in order to reach the appropriate number of time trends  $t$  variables by means of AIC. Next, we calculate the  $r_k$  index and in conjunction with the estimated coefficients of the time trends we perform a Wald test to conclude over the existence of convergence. Table 1 summarizes the chosen polynomial order of time trend variables, the average slopes, the results of the convergence test based on the output gap values and the period examined:

The findings for Slovenia and Greece indicate convergence for both countries since they present a positive average slope and the Wald tests suggest the rejection of the null hypothesis of no convergence. In the cases of Bulgaria and Romania, we



**Table 1** Results of Nahar and Inder methodology

Leader: EU-15

Countries	Order of t	Average slope	Wald test	P-value	Period
Albania	5	-0.003072955	0.27447	0.600	1989–2009
Bulgaria	2	0.0012302	0.98657	0.321	1989–2009
Croatia	5	-0.035741786	73.1448	0.000	1990–2009
FYROM	4	-0.02576585	414.3412	0.000	1990–2009
Greece	2	0.0037518	51.5021	0.000	1989–2009
Romania	2	0.000306	0.024158	0.876	1989–2009
Serbia	4	-0.05776455	49.1172	0.000	1990–2009
Slovenia	3	0.00537568	9.7465	0.002	1990–2009

find a positive average slope for both countries though statistically insignificant. Therefore, we conclude in favor of no convergence for these two countries.

Similar conclusions are provided for Albania, Croatia, FYROM and Serbia. These countries present negative average slopes hence supporting evidence in favor of no convergence with the EU-15 average. The lack of convergence in these countries could be also explained through the regional disparities. As Petratos (2009) mentioned *... a significant part of regional inequalities is due to the inability of the least advanced regions to close the development gap and converge towards the national average.*

## 5 Summary and Concluding Remarks

In this paper the issue of catching up between the Balkan countries and the EU-15 average is investigated. The analysis has been performed for eight Balkan countries during the period 1989–2009. The data set has been downloaded from the World Bank's database. In the context of the empirical analysis, the methodology of Nahar and Inder is performed to investigate catching up convergence. The results revealed the existence of dissimilarities among the examined Balkan economies in the catching up process towards the EU-15. It seems that the performance of the examined Balkan economies has been negatively affected by the political and economic conditions of the recent past as many conflicts and populations' movements along with political instability had occurred. The Balkan wars and the trade embargo imposed on Yugoslavia affected the whole region and the economic reform policies were not well appeared (Sarajevs, 2001). More particularly, the empirical evidence supported convergence with the EU-15 only for the cases of Greece and Slovenia. An obvious explanation is that these two countries have already joined EU and EMU. Our findings are partially in line with Sarajevs (2001), Bonetto et al. (2009), Szeles and Marinescu (2010) and Del Bo et al. (2010). In the above studies convergence with EU was confirmed for certain Balkan economies being a small club of countries within a wider sample used for the

empirical analysis. However, Estrin and Urga (1997) found no evidence of convergence between the communist block and the West.

The first indications of development at the end of 1990s along with the stability after 2000, only helped towards reducing the disparities among Balkan countries. However, the income gap relative to the EU-15 for a considerable number of Balkan economies remained significant. In this direction, our results argue that EU integration process is one of the main driving forces for reforms aiming at growth and development. Concluding, it seems necessary for a number of Balkan Countries and especially for the ones that are candidates and potential candidates for further policy actions such as convergence in monetary policies (Brada and Kutan 2002) and financial systems (Bonetto et al. 2009), in order to establish and strengthen a more feasible catching up effort and thus to prepare effectively the accession in the EU.

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