

# Output Convergence between Western Balkans and EU-15

Valerija Botrić

*Institute of Economics, Zagreb*

*Trg J. F. Kennedy 7, 10000 Zagreb, Croatia*

*Phone: +385 12362280, fax: + 385 12335165, e-mail: vbotric@eizg.hr*

## Abstract

46

This paper analyses the relative position of the Western Balkan countries (ex-Yugoslavia countries and Albania) in comparison to more advanced European economies in the context of possible further EU enlargement. First, the question of convergence between Western Balkan countries and the EU-15 is empirically estimated. The paper also discusses the evolution of the gap and the possible determinants that could act in the direction of its decrease. The main findings are that Western Balkan countries show no sign of convergence. Furthermore, the factors that should contribute to closing the gap are not widely featured in the analysed countries.

JEL classification codes: F15, O11, P2

Keywords: South Eastern Europe, European integration, convergence

## Acknowledgements

The author gratefully acknowledges the referee's constructive comments. A previous version of this paper with the title "South Eastern Europe: closing the gap or falling behind?" was presented at the 12th EACES conference at Paisley, 6–8 September 2012. The author acknowledges the beneficial comments from the participants. The usual disclaimer applies.

## 1. Introduction

The issue of economic convergence between countries has become important and extensively explored in the economic literature. Questions of the equalisation of living standards through production factors, mobility or the success of economic inequality reduction programs are still without definitive answers. The research has gained yet another stimulus with the context of the EU integration process. Therefore, not only the question of whether relatively poor countries tend to catch up with wealthier countries over time (Durlauf and Quah, 1999; Durlauf et al. 2005), but also the issue of European integration sustainability has come into focus (Pesaran, 2007). These two separate processes intertwine and the outcomes are difficult to predict. The political consequences of economic non-convergence within the European Union might be far reaching. Consequently, this is an interesting topic for additional research.

The concept of convergence is not straightforward. As de Juan and Arroyo (2009) explain, we can distinguish at least the following approaches addressed in the literature:

- $\beta$ -convergence, where the poorer countries tend to grow faster than the wealthier countries, depending on their initial relative positions;
- the independence of the economy's future growth prospects on the original position of the country;
- $\sigma$ -convergence, where dispersion in income levels among countries diminishes over time;
- persistence in income disparities between regions.

The extensive interest in convergence issues was summarised almost a decade ago by Abreu et al. (2005). Subsequently, unresolved issues continued to produce additional interest in the topic. The focus of the present paper is, however, specifically on the convergence of Western Balkan countries to EU levels, in the context of the EU integration process. The analysis covers Albania, Bosnia and Herzegovina (B&H), Croatia, FYR Macedonia (FYRM), Montenegro and Serbia. From the perspective of these countries, the integration process is viewed as something that would encourage the speed of convergence, and therefore, enable attaining higher income levels. In order to address whether there are reasons for such assumptions, we will not pursue the concept of beta-convergence as motivated in the literature inspired by Barro and Sala-i-Martin (1995)<sup>1</sup>. We are also not interested in the concept of sigma convergence. The focus here is on the relationship between the specific group of countries that exhibit some common features with the countries they have expressed interest in integrating with. Since Western Balkan countries are next in line for the EU integration process<sup>2</sup>, the question of their economic convergence with the incumbent members seems necessary to explore. The overall concept of convergence is beyond the scope of this paper.

The main issue we want to explore is whether these specific countries are converging with members of the European Union. A positive finding in regard to catching up would imply potential benefits for these countries as well as overall stability from the European Union, once they become full members. From the perspective of the analysed countries,

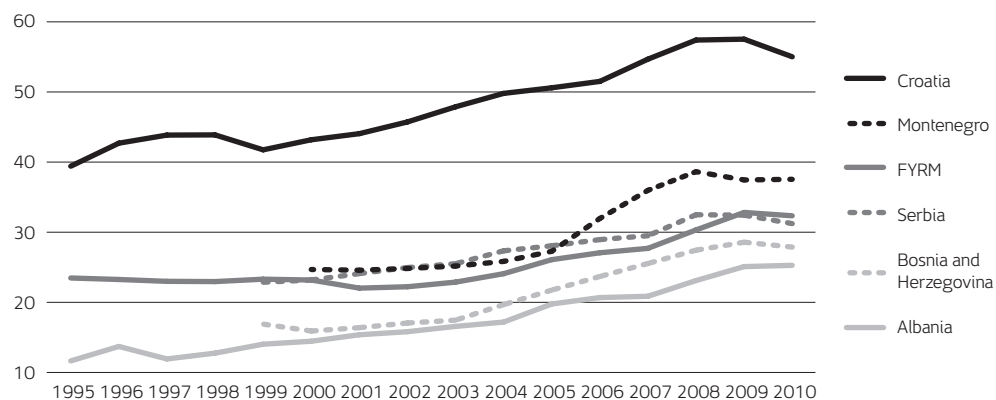
<sup>1</sup> See Polanec (2004) for discussion on transition countries convergence within this framework.

<sup>2</sup> The countries are at different stages of integration. Croatia gained status of candidate country in 2004 (and is expected to become member in 2013), FYR Macedonia in 2005, Montenegro in 2010, Serbia in 2012.

confirming the convergence hypothesis would imply that their standards of living are relatively improving, and that the transition process and other economic policy measures have resulted in affirmative repositioning. From the perspective of the European Union, integrating stagnant or declining economies could pose a severe threat to the long-term economic prospects of the common market.

In order to obtain an initial impression of the potential convergence process in the analysed countries, we explore the economic distance of the countries to the average level in old EU member states, using GDP per capita in purchasing power parities. The indicator is presented in Figure 1.

Figure 1. GDP per capita in EUR PPP, EU15=100



Source: WIIW.

The data presented in Figure 1 imply that there is a relatively slow process of catching up with the average standard of living level of the EU-15 countries. This process has slowed or even reversed in most countries, as a consequence of the recent economic crisis. The relative positions of the countries in terms of distance from the EU level are as expected. Croatia, which ended the EU negotiation process by the end of 2011, has the highest relative income level. The other countries seem to be clustered. The dynamics of the convergence process looks similar, but deserves further attention, which we turn to in the remainder of the paper.

The analysis of convergence within the EU integration process is relatively widespread in the literature. Empirical contributions can be broadly divided into examples exploring convergence within European Union countries and/or regions (Islam, 2003; de Juan and Arroyo, 2009; Canova, 2004; Hein and Truger, 2005; Soukiazis and Castro, 2005; Le Pen, 2011) and those exploring convergence of transition countries to the EU level (Kočenda, 2001; Kasman, Kirbas-Kasman and Turgutlu, 2005; Kutun and Yigit, 2009; Matkowski and Prochniak, 2007). Analyses of the convergence process of Western Balkan countries to the EU level are relatively scarce in the literature, probably due to the significant data constraints arising from the former Yugoslavia disintegration process<sup>3</sup>. The notable exceptions include Bonetto, Redžepagić and Tykhonenko (2009), El Ourdighi and Somun-Kapetanović (2009)

<sup>3</sup> Transition process requires, among other things, redesign of the country statistical system in accordance with market economies methodologies. In case of the countries analysed in this paper, a researcher has to deal with the sequential appearance of the new observation entities, which results in relatively short period of analysis.

and Tsanana, Katrakilidis and Pantelidis (2013). The main contribution of the present paper can consequently be found in filling this existing gap in the literature by providing detailed analysis of the convergence process of the analysed countries.

The structure of the paper is as follows. The next section explores convergence to the EU-15 level as well as the possibility of bilateral convergence to some of the EU-15 member states. Section 3 analyses the potential contribution of several economic variables to the narrowing/widening of the gap between the analysed countries and the average EU-15 level. Section 4 discusses similar factors within the bilateral framework. The last section offers some conclusions.

## 2. Western Balkans and the European Union: Converging or Diverging?

A frequently addressed issue in public policy discussions is that the process of accession to the European Union for the analysed countries should have some positive effects on their respective economies (i.e. EU integration process should lead to convergence of income levels). We first explore whether the Western Balkan countries converge to the average EU level. To that end, we have chosen the longest possible period for empirical analysis using annual data from 1995–2010, depending on the availability of the data in each of the countries in the sample. This principle has been followed throughout the paper. When considering the European Union, we have chosen only old member states – EU-15 – as a point of comparison. The new members only joined the European Union as of 2004, and considering we have longer periods under analysis, this would require specifying a structural break. The instability of the convergence process has been emphasised in the literature more recently by Prochniak and Witkowski (2013). Having in mind that the data quality in the analysed countries is not very high in general, additional modeling would only cloud some of the processes and not contribute to finding more convincing conclusions. Thus, throughout this paper we have resolved to use simple, but diverse methods.

In order to test whether the Western Balkan countries converge to the EU level during their accession process, we have first utilised a number of unit root tests, which is a relatively common approach in the literature (Carlino and Mills, 1993). As Pesaran (2007) argues, for two countries to be convergent, the difference in their log outputs should be stationary. Thus, we have first explored whether the countries in question converge to the average EU-15 level. In order to do so, we explore the pair-wise unit root tests to GDP per capita in EUR PPP series, with the data coming from the WIIW databases. Specifically, we test for the presence of a unit root in the gap between the GDP for the EU-15 average and the GDP of the respective country. Two tests have been utilised: the ADF test, which has a null for a unit root process, and thus is perceived as a test of divergence (Pesaran, 2007); followed by the KPSS test, which has a null for a stationary process, which thus has the null of convergence. Each time the test is performed with a constant and a deterministic trend. Based on the applied methodology, convergent results would imply that output series are co-trended, which provides the rationale for the inclusion of the trend in the unit-root testing procedure. We have not considered testing for structural breaks, even though this might seem plausible<sup>4</sup>,

<sup>4</sup> The structural breaks might arise due to some underlying changes in the analysed economies. Having in mind the recent history of the analysed countries, such assumptions are more than likely to be validated.

due to the short period of data available for analysis. Since the analysed period is short and the tests used might be unreliable in such cases, a conclusion on the process is offered only if both tests point in the same direction. Convergence can be found if we reject the null of the unit root and the deterministic trend in the ADF test, and are not able to reject the null of trend-stationarity in the KPSS test. The results are presented in Table 1.

**Table 1.** Unit Root Testing Relative to the EU-15 Level

Country	ADF test statistics	KPSS test statistics	Convergence
Albania	-3.23	0.14*	-
Bosnia and Herzegovina	-0.73 (1)	0.12	?
Croatia	-3.10 (1)	0.11	?
FYR Macedonia	-1.23	0.17*	-
Montenegro	-2.96 (1)	0.10	?
Serbia	-4.09* (1)	0.50*	?

*Note:* \* denotes rejection of the null hypothesis at 5 percent significance level. Lags, where present, are presented in parentheses and have been chosen based on the SIC criteria (starting with the maximum of 3 lags). + (convergence); - (divergence); ? (inconclusive).

*Source:* Author's estimates based on WIIW data.

The results are inconclusive for most of the countries. Based on these tests, it could be said that Albania and FYR Macedonia are more likely to be diverging from the average EU-15 level, than converging. It has to be noted that, with the exception of the ADF test for Bosnia and Herzegovina, in all other specifications the trend seemed to be significant. Pesaran (2007) argues that non-convergence combined with growth convergence (which is revealed through the trend significance) is a sign of important country-specific factors that contribute to highly persistent output gaps. Thus, even if there might be common technological progress that affects all the countries, certain factors are adverse for income level convergence.

The shortness of the period under analysis has motivated the subsequent approach in the analysis<sup>5</sup>, which tries to reassess the same question from different perspectives in order to offer more firm conclusions. The countries do not need to converge to the EU-15 level, since the literature has not concluded whether the countries within the EU converge at all (Le Pen, 2011; Siklos, 2010). Thus, we have also explored the possibility that the countries in the sample converge only to some of the countries within the EU-15. The methodology is similar, but the data sources included for individual EU countries are from Eurostat. The variable under analysis is the log difference in respect to GDP per capita in EUR. If we consider the ADF test as the test with the null hypothesis of divergence, and the KPSS test as a test with the null hypothesis of convergence, it would be interesting to know how many (out of total 15) tests were able to reject the null. These results are presented in Table 2, combined with the indication of the trend significance in the ADF specification.

<sup>5</sup> As kindly reminded by the referee, unit root tests have very low power in small samples. Since data constraints prevent us from obtaining a larger sample, we resolve this by applying a wider set of estimation methods.

**Table 2.** Null Hypothesis Rejection, Number of Cases

	Albania	B&H	Croatia	FYRM	Montenegro	Serbia
ADF	1	1	2	0	3	1
ADF-trend	0	14	5	13	3	10
KPSS	10	1	3	13	2	7

*Note:* Trend refers to the number of pair-wise specifications in which trends were significant.

*Source:* Author's estimates

The proportion rejecting the null of divergence is relatively low – lowest in the case of FYR Macedonia and highest in the case of Montenegro. This is combined with a higher proportion of rejecting the null of convergence, which is lowest in the case of Bosnia and Herzegovina and highest again in the case of FYR Macedonia. These results seem to confirm the previous conclusion that Albania and FYR Macedonia did not exhibit convergence behavior during the analysed period. For some of the other countries, trend significance has to be taken into account. A more detailed result of the pair-wise unit root testing is summarised in Table 3.<sup>6</sup>

**Table 3.** Pair-wise Unit Root Test Exercise Summary

	Albania	B&H	Croatia	FYRM	Montenegro	Serbia
Austria	? *	?	? *	–	+ *	?
Belgium	? *	?	? *	?	+ *	?
Denmark	? *	?	?	–	? *	–
Finland	"_**"	?	+ *	–	–	? *
France	"_**"	?	? *	–	? *	?
Germany	? *	?	*	?	*	?
Greece	? *	?	?	–	? *	?
Ireland	"_**"	? *	–	– *	?	"_**"
Italy	"_**"	?	? *	–	?	–
Luxembourg	"_**"	?	?	–	+ *	? *
Netherlands	"_**"	?	? *	–	? *	?
Portugal	"_**"	?	? *	–	? *	?
Spain	"_**"	?	?	–	? *	"_**"
Sweden	? *	?	? *	–	? *	"_**"
UK	"_**"	?	? *	"_**"	? *	–

*Note:* + (convergence); – (divergence); ? (inconclusive); \* (significant trend in ADF unit root test).

*Source:* Author's estimates based on WIIW and Eurostat data.

Before discussing the results, we have to explain a few methodological points. Following the previous EU-level analysis, convergence and divergence is identified only in those cases where both the ADF and KPSS tests point in the same direction. When they point in different

<sup>6</sup> Individual results of unit root testing can be obtained from the author upon request.

directions, the results are considered inconclusive. Keeping this in mind, it could be said that there is a large share of inconclusive results. This could be attributed both to the relatively short period of analysis as well as to the poor quality of the data for the sampled countries. What is even more problematic is that the number of identified convergence cases is small. For Croatia, there seems to be some convergence with Finland. For Montenegro, there could be convergence with Austria, Belgium and Luxembourg. None of these statistically identified cases of convergence could be explained using specific economic relations between these countries. Cases of divergence identified by both tests outnumber cases of convergence. This, again, brings us to the conclusion that Western Balkan countries in general have not converged with the European Union in the analysed period.

Finally, since the individual unit root tests have low power, we have also utilized panel unit root tests. For each country in the sample, the output gap relative to each EU-15 country has been set as a cross section, and the available data determined the time period. Since the sample consists of fixed  $N$  and  $T$ , and we cannot assume the same autoregressive parameter for all the countries in the sample (as this would require the assumption that all countries have the same unit root process, which is contrary to the previous evidence), the Im-Pesaran-Shin test seems the most appropriate in this case<sup>7</sup>. In this test, the null hypothesis is that all panels contain a unit root, against the alternative that some panels are stationary. The results are presented in Table 4.

**Table 4.** Panel Unit Root Test

	Albania	B&H	Croatia	FYRM	Montenegro	Serbia
Statistics	-2.55*	1.59	-2.02*	3.54	-2.22*	-1.25

*Note:* \* indicates the rejection of the null hypothesis of the unit root at the 5 percent significance level.

*Source:* Author's estimates.

Based on the panel unit root tests, we were able to reject the unit root (i.e. divergence) hypothesis for three countries – Albania, Croatia and Montenegro. The panel unit root test thus suggests that in the case of these countries, convergence with at least one of the EU countries exists during the analysed period. Taking into consideration the results of the previous analysis, we could conclude that convergence is more likely in the case of Croatia and Montenegro. For Croatia, the argument is that it has advanced most in the EU integration process and is expected to become a full member in 2013. For Montenegro, the main argument for such a finding could be the adoption of the euro as the national currency.

The previous analysis revealed that the gap between the Western Balkan countries and the EU exists, and that it shows no signs of convergence for most countries. To explore the factors behind the gap between the Western Balkan countries and the old EU member states, two approaches have been used. The first approach analyses the factors behind the economic distance to the average EU-15 level, and tries to identify common factors for the sampled

<sup>7</sup> Im, Pesaran and Shin (2003) developed a test that does not require balanced panel and under the null hypothesis allowed for panel-specific autoregressive parameter. In order for test to have a well –defined asymptotic distribution, it is required that either  $N$  goes to infinity while  $T$  is fixed (that is, it is suitable for large panels with short durations) or that  $N$  and  $T$  are both fixed (which is the case in our sample). However, as with most econometric test, this one has also its limitations. See, for example, Harris et al. (2010).

countries as a group. The second approach deals with the factors behind the bilateral gap between each country in the Western Balkans and the EU-15, aiming to identify individual factors for every country. Both approaches are explained in detail in the following sections. Section 3 explains the first approach, presents the empirical results and discussion. Section 4 provides the same for the second approach.

### 3. Exploring the Factors Behind the Gap to EU-15 Level

The measure of the gap in this segment of the analysis is GDP per capita in euro PPP relative to EU-15 levels. A few methodological notes have to be made here. First of all, the decision to measure catching up in euro terms is frequent in the literature. Kočenda, Kutan and Yigit (2006) formalise three reasons for using the common currency approach – increased share in bilateral trade, national currencies tied to the euro for political reasons, and the prospects of exchange rate convergence due to the Maastricht Treaty. In addition, some of the countries, such as Croatia, are already in practice highly euroised. Montenegro went even further, and since the beginning adopted the euro as the national currency.

Potential factors behind the gap (explanatory variables) considered in the empirical analysis include<sup>8</sup> gross fixed capital formation share in GDP, FDI net inflows share in GDP, inflation premium, imports share in GDP, exports share in GDP, current account balance share in GDP, general government balance share in GDP, share of goods trade with EU-15 in total trade, domestic credit to the private sector share in GDP, and gross domestic savings share in GDP. The choice to include specific factors is explained further in the text. Although there are also other possible factors that might significantly influence the catching-up process, they were not included due to data limitations.

Since the aim of all the analysed economies is to join the European Union, and consequently the EMU, they will be required to meet the Maastricht criteria of convergence in terms of inflation, interest rates, exchange rates and government deficit some time in the future. The abovementioned criteria have more or less influenced the policy making process in the analysed countries since they are inclined to accommodate their economic policy goals towards the targets specified by the European Union as the date of accession approaches. Although it is somewhat unusual that the countries, which are actually still some way from accession to the European Union, at the same time they are focusing on policies designed for and by the EU. This is so widespread that almost each new policy measure introduced is promoted by policy makers in the EU integration context.

From the Maastricht Treaty criteria, we have included two variables for consideration. Due to the history of hyperinflation, which almost all of the transition countries went through, macroeconomic stability is often considered one of the preconditions for a sustainable growth path in these countries, even though low inflation has been recorded for most countries throughout the period analysed. Since, according to the Maastricht criteria, relative inflation to inflation in 3 countries with the lowest inflation rates is relevant, we have translated this condition as relative inflation in the Western Balkan countries to the average inflation of the countries in the euro zone. The actual indicator for the Western Balkan countries is not the inflation rate itself, but the GDP deflator. There are two reasons for this.

<sup>8</sup> Some of these were also considered in Gardo and Martin (2010), where Croatia is one of the analysed countries.



The first is that the methodology estimating inflation in the transition economies is going through significant changes. The consumer price index commonly used in the European Union as a measure of inflation was not that common in the analysed countries, where inflation used to be measured using the retail price index or cost of living index. Although there are methodological similarities, the desire to use the longest available period for the analysis would require modeling some sort of structural break. The other reason is that the countries still retain some administratively regulated prices, in particular when it comes to public utilities, where prices are formed on the basis of tariffs. The changes in prices for these products might be hidden in a widely monitored indicator, such as inflation, but is probably less concealed in the GDP deflator.

The second Maastricht Treaty variable is the budget deficit, represented in the analysis by the share of the government balance in GDP in the analysed countries. Some countries in the sample have experienced problems in maintaining fiscal stabilities, which were not parallel to those at the beginning of the transition, and in most cases not persistent, but still cause some concern. If we consider that the government sector maintains a relatively larger share in the economy than in those countries referred to as “early reformers”, it could be argued that the role of the fiscal deficit in the convergence process should not be neglected. Another way to capture the role of private sector development, and therefore the speed of market development is through the share of domestic credit to the private sector in GDP. This variable could capture the declining role of the government sector, but also the speed of private sector development, and private sector investment dynamics, for which credit financing is needed.

Most studies on the development of transition economies emphasise the role of liberalisation processes and increased trade openness, as factors that could boost catching up. The share of imports in GDP, exports in GDP, current account balance in GDP, and goods trade with EU-15 in total trade are considered separately. Unfortunately, trade liberalisation in transition economies is frequently accompanied by growing trade deficits, which require financing. In that context, financing through foreign direct investment is considered highly important (European Commission, 2009) due to the inadequacy of available domestic funds. The availability of domestic funds is represented by including the share of gross domestic savings in GDP in the analysis.

Another important reason for the inclusion of FDI in the estimation equation is that FDI in these countries is not only considered a supplement to domestic investment, but also a means of increasing overall productivity. In particular, FDI in transition economies was frequently related to the privatisation process (Brada, Kutun and Yigit, 2006) through cherry picking and consequently oriented away from manufacturing. The expected gains from this type of investment are not so related to the new production (greenfield investment), but rather to the possibility of knowledge spillovers, the introduction of new product (which is related to service sectors, like banking or telecommunications), and improved managerial skills. FDI could by itself, or through externalities, increase productivity and consequently boost the catching-up. More importantly, it could be argued that any country that was able to attract more FDI was judged by foreign investors as more attractive. Since foreign investors take many more factors into consideration in making their investment decisions than we could include in the equation, this variable could be treated as a proxy for the general business environment.

The development model that the countries adopted frequently relied on foreign sources of financing and imports of technology. The European Commission (2009) confirms that capital accumulation in the selected group of countries is relatively low in comparison with

other similar countries. Foreign investments cannot fully take over the role of domestic investments in the longer run. Although we have a relatively short time span in the analysis, and the long-run relationships cannot be established within the dataset, it was deemed necessary to include the investments share in GDP, as a proxy for the sustainability of the convergence path. The lack of investments in the short run could be supplemented by investments from abroad, but if this situation is perpetuated, the country would not be able to catch up with other growing economies.

To identify possible factors contributing to the income distance of the analysed country to the average EU level, a series of correlations were estimated using the following specification:

$$GDP\_lag_{i,t} = \alpha + \beta X_{i,t} \quad (1)$$

Where  $X$  represents one of the possible factors contributing to the gap. The expression is estimated using the pooled OLS method, as well as a fixed effects panel due to heteroskedasticity and strong evidence of separate factors being important for specific countries<sup>9</sup>. Obviously, this approach can result in simple correlations between the possible factors and the existing gap. A question may arise, why not estimate a more elaborate model. In answer, we would have to point again to the lack of available data for estimating even simple models as well as correlations among some analysed variables. Data sources for the selected countries are not adequate to follow the methodologies presented in, for example, Kutun and Yigit (2009) or Egert (2011). Until the data sources are more reliable to enable comparative analysis, we rely on more simple methods for which the results are presented in Table 5:

**Table 5.** Correlation of the Relative GDP Lag of the Analysed Countries to the Average EU15 Level and Possible Explanatory Factors for the Period 1999–2010

Variable	Beta-coefficient (OLS)	Beta-coefficient (fixed effects)
Current account balance	-0.01	-0.07**
Central government balance	-0.13	0.18**
Domestic credit to private sector	0.34***	0.09***
Exports share	0.65***	-0.13**
Imports share	-0.12	0.02
Trade with EU-15	-0.15	0.05
Foreign direct investments	0.39	-0.04
Gross fixed capital formation	0.59**	0.16***
Gross domestic savings	0.55***	-0.01
Inflation premium	-0.11	0.02

*Note:* \*\*\* denotes significance at the level of 1 percent; \*\* at the level of 5 percent and \* at the level of 10 percent.

*Source:* Author's estimates.

<sup>9</sup> However, it has to be emphasised that fixed effects estimates all had a coefficient of determination close to one. This is probably a consequence of relatively poor data quality from the analysed countries combined with the short period analysed, so that all variance is attributed to differences across the panel and time.

The methodology applied searched for common factors that would explain the gap for all of the countries in the sample. Only four examined factors were found significant in both specifications. The highest positive factor is attributed to export share in GDP in the OLS specification. Thus, if the country is more export oriented, it will be positioned closer to the average EU level. However, the fixed effect specification also implies the negative correlation of the same indicator. A similar result was also found with the share of savings in GDP, and central government balance.

The two variables that have been found positive and significantly correlated are gross fixed capital formation and domestic credit to the private sector. These results provide some indication that frequently mentioned factors – investment, higher share of private sector in the economy – are also decisive factors for Western Balkan countries narrowing the gap to the old EU member states. However, these results can only be considered an initial indication that deserves additional research efforts in the future.

## 4. Gap Factors: Bilateral Perspective

As in Section 2, when trying to detect the convergence, we also wanted to explore whether the factors behind the gap are different if we concentrate on bilateral relationships between countries. The reason is that each country within the EU-15 has its own income level dynamics, but also some other specific economic structures, as well as economic and trade relations with Western Balkan countries. A similar methodology to that explained in the previous section has been applied to the bilateral framework. There are, however, few exceptions. The “dependent” variable in this context is the log difference in GDP per capita in purchasing power parity EUR, which has also previously been tested for unit root presence in the bilateral context (see Section 2). The list of potential factors has also been somewhat altered due to data availability problems. The common set of potential factors already discussed in Section 3 are inflation premium, gross domestic savings in GDP, gross fixed capital formation in GDP, domestic credit to the private sector in GDP, exports and imports<sup>10</sup>. The rationale for their inclusion has already been explained. One has to keep in mind that the actual indicators used in further analysis always presents a difference between the indicators in Western Balkan countries to the respective indicator in EU-15 countries.

Additional indicators included in the bilateral analysis include the share of government final consumption expenditure in GDP, to include the relative share of the government sector. In the case of transition economies, a lingering of government influences might have adverse effects on economic growth. Therefore, we would expect the higher share of government in the economy to lead to slower catching up.

In order to incorporate technology improvements, we have also considered the number of internet users as a proxy for the technological capacity of the population. The effect of ICT development on productivity growth is emphasised by the World Bank (2008). A number of more suitable indicators that would capture ICT development can be considered. However, due to data availability for the analysed countries, we have included just this indicator in the analysis.

<sup>10</sup> In Section 3, we have used the share of relative exports and imports in GDP. In this Section, actual exports and imports between the analysed countries (e.g. between Albania and Austria) are used.

The basic specification of the estimates can still be represented by equation (1). It has to be noted that only fixed effect results are present. Even though there might still be the same issues related to fixed effect specifications as mentioned before, the bilateral concept allows us to utilise more variation in the data and to rely on a larger sample. The fixed effects were highly significant in every specification, thus justifying initial assumptions that controlling for other country-specific factors in the specification might be important. In Table 6, we only present the signs and the significance of the estimated beta coefficients. The actual coefficients are of little importance<sup>11</sup> since they depend on the actual scale of the phenomena.

**Table 6.** Bilateral Correlation of the Relative GDP Lag of the Analysed Countries and Possible Explanatory Factors

Variable	Albania	B&H	Croatia	FYRM	Montenegro	Serbia
Inflation premium	–	+	–	–	+ ***	+
General government final consumption expenditure	–	– ***	–	–	– ***	– *
Domestic credit to private sector	+ ***	+ **	+ ***	+ ***	+	+ **
Exports bilateral	+ ***	+ ***	+ ***	+	–	+
Imports bilateral	+ ***	+ ***	+ ***	–	+	+
Gross fixed capital formation	+ ***	+ *	+ ***	+ ***	+ **	+ *
Gross domestic savings	+ ***	+ ***	+ ***	+ ***	+ ***	+ ***
Internet users (per 100 people)	–	+	–	–	– *	– *
Period of analysis <sup>a</sup>	1995–2010	1999–2010	1995–2010	1995–2010	2000–2010	1999–2010

Note: \*\*\* denotes significance at the level of 1 percent; \*\* at the level of 5 percent and \* at the level of 10 percent; <sup>a</sup> denotes longest available period (some of the estimates are for shorter periods).

Source: Author's estimates.

The bilateral correlations confirm the previous results of investigations of the EU-15 level catching-up process for all countries in two cases – share of gross fixed capital formation and gross domestic savings in GDP. The correlation is significant for all countries, and the coefficient is positive. In order to interpret the sign of the coefficient, we have to remember that the LHS variable is negative, and as it grows to zero, the distance between the analysed Western Balkan country and the respective EU-15 country is smaller. A positive sign means that the higher the relative share of investment in the Western Balkan country (in comparison to the respective EU-15 country), the lower the distance between the two countries. This means that increases in investment and savings should be considered as positive contributors to the catching-up process.

Similar reasoning can be found for the share of domestic credit to the private sector (which has been found to be significant in Section 3), although the results are not clear in the case of Montenegro. Considering that the period under analysis for Montenegro is relatively shorter than for the other economies (and this specific estimate relies only on the data for the

<sup>11</sup> The full set of results can be obtained upon request from the author.

2002–2010 period), a significant relationship might be found when sufficient data is gathered. Somewhat puzzling results are found for bilateral trade. It would be expected that bilateral trade, both exports and imports, helps to decrease the economic distance between the countries. The empirical analysis in the present paper has been able to confirm this only in the cases of Albania, Bosnia and Herzegovina and Croatia. These results were not found for FYR Macedonia, Montenegro and Serbia. Part of the explanation could probably also be offered by the relative shorter periods under analysis for Montenegro and Serbia. Nevertheless, an additional factor relates to the actual stagnant trade between those countries and the European Union. More recent EU integration process advances for FYR Macedonia, Montenegro and Serbia should help induce more trade with the EU.

The two variables with negative correlations, and significance for only some of the countries in the sample are government share and internet users. The former implies that the higher the relative share of the government sector in the analysed Western Balkan country relative to its EU counterpart, the higher the economic distance to the respective EU country. This is in line with expectations, although not always found to be significant.

In the case of the ICT indicator, we have to remember that Western Balkan economies lag in technology dispersion, so the number of internet users throughout the analysed period is lower than in most of the respective EU economies. However, a negative sign actually implies that the higher the relative lag in internet adoption the smaller the economic distance to the respective EU country. This can be attributed to the speed of internet adoption. Actual lag in the first phases of the analysed period in the relative number of users was relatively smaller, but as the technology advanced more rapidly in the developed economies, the distance between the technology levels measured by this indicator actually increased. This indicates that technological advances did not seem to contribute to catching up.

## 5. Conclusions

58

The main question analysed in this paper is whether the Western Balkan countries converge to the European Union. The importance of this analysis lies in the fact that, with the exception of Iceland, these countries are considered to be next in line for EU accession. If their economic distance (measured in the paper using relative GDP per capita in purchasing power parity EUR) does not decrease in time, then we can assume that their integration into the common market and their consequent performance would be more difficult.

The relative lack of data for the analysed countries has influenced the estimation strategy in this paper. Even though we tried to compensate for the data issues with the variety of methods used, the reader should be cautious with the presented results. The analysis based on the unit root testing reveals that the countries in the region neither converge to the EU-15 level nor bilaterally to individual member countries. There are some cases when convergence can be detected, but this seems to be more an exception than the rule. Thus, the countries in the region during the analysed period did not benefit from the introduction of more market-oriented policies. This lack of convergence poses questions related to their relative success in implementing the common market policies and their relative success as future EU members.

An investigation into potential factors contributing to the narrowing/widening of the existing gap pointed to the need for increased investment and increased need for domestic savings. Additional arguments can be found for advocating more intensive export

orientation. However, this macroeconomic view deserves the development of many small microeconomic steps, which frequently depend on the rigid and inadequate institutional setting. Thus, the question remains whether the countries in the region will be able to achieve more decisive steps towards integration in the common market. Another possibility is that the relative lag will persist, which is a prospect desired neither by the incumbent nor future EU members.

When discussing the relative economic distance measured using relative GDP, one has to bear in mind that Western Balkan countries have a relatively higher share of the unofficial economy (Schneider, Buehn and Montenegro, 2010). There are at least two reasons why this could cloud judgment in estimating the absolute economic distance between the two groups of countries. First, GDP estimates for EU economies follow Eurostat guidelines that prescribe including estimates of unrecorded economy using the exhaustiveness approach, which is still under development in Western Balkan countries. Second, the dynamics of the unofficial economy, and in particular its behavior during the recent crisis, is still an unexplored issue that deserves additional attention in future research, but at the moment presents limitations for providing firm conclusions based on the results presented in this paper.

## Appendix: Data sources

Indicator	Countries	Source
GDP per capita in EUR PPP	EU-15 countries	Eurostat
	South-East Europe countries, EU-15 average	WIIW
Inflation	All analysed countries	World Bank: WDI database
General government final consumption expenditure	All analysed countries	World Bank: WDI database
Domestic credit to private sector	All analysed countries	World Bank: WDI database
Exports bilateral	All analysed countries	Eurostat: COMEXT database
Imports bilateral	All analysed countries	Eurostat: COMEXT database
Exports share	South-East Europe countries	World Bank: WDI database
Imports share	South-East Europe countries	World Bank: WDI database
Gross fixed capital formation	All analysed countries	World Bank: WDI database
Gross domestic savings	All analysed countries	World Bank: WDI database
Internet users (per 100 people)	All analysed countries	World Bank: WDI database
Current account balance	South-East Europe countries	EBRD
Central government balance	South-East Europe countries	EBRD
Trade with EU-15	South-East Europe countries	WIIW
Foreign direct investments	South-East Europe countries	World Bank: WDI database

## References

- Abreu, M., de Groot, H. and Florax, R. 2005. A Meta-Analysis of  $\beta$ -Convergence: the Legendary 2%. *Journal of Economic Surveys*, Vol. 19, No. 3, pp.389-420.
- Barro, R.J. and Sala-i-Martin, X. 1995. *Economic Growth*. New York: McGraw-Hill.
- Bonetto, F., Redžepagić, S. and Tykhonenko, A. 2009. Balkan Countries: Catching Up and their Integration in the European Financial System. *Panoeconomicus*, Vol. 56, No. 4, pp. 475-489.
- Brada, J.C., Kutan, A.M. and Yigit, T.M. 2006. The Effects of Transition and Political Instability on Foreign Direct Investment Inflows: Central Europe and the Balkans. *Economics of Transition*, Vol. 14, No. 4, pp. 649-680.
- Canova, F. 2004. Testing for Convergence Clubs in Income per capita: A Predictive Density Approach. *International Economic Review*, Vol. 45, No. 1, pp. 49-77.
- Carlino, G.A. and Mills, L.O. 1993. Are US Regional Incomes Converging? A Time Series Analysis. *Journal of Monetary Economics*, Vol. 32, No. 2, pp. 335-346.
- De Juan, A. and Arroyo, A.S.M. 2009. European Incomplete Catching-up. *Empirical Economics*, Vol. 36, No. 2, pp. 385-402.
- Durlauf, S.N. and Quah, D.T. 1999. The New Empirics of Economic Growth. In: Taylor, J.B., Woodford, M. (Eds.). *Handbook of Macroeconomics*, Vol. 1A, pp. 235-308. Amsterdam: North-Holland.
- Durlauf, S.N., Johnson, P.A. and Temple, J.R. 2005. Growth Econometrics. In: Aghion, P., Durlauf, S.N. (Eds.), *Handbook of Economic Growth*, Vol. 1A, pp. 555-677. Amsterdam: North-Holland.
- Egert, B. 2011. Catching-up and Inflation in Europe: Balassa-Samuelson, Engel's Law and other Culprits. *Economic Systems*, Vol. 35, No. 2, pp. 208-229.
- El Ouardighi, J. and Somun-Kapetanović, R. 2009. Convergence and Inequality of Income: the Case of Western Balkan Countries. *The European Journal of Comparative Economics*, Vol. 6, No. 2, pp. 207-225.
- European Commission. 2009. The Western Balkans in Transition. *European Economy Occasional Papers*, No. 46, May, European Commission Directorate-General for Economic and Financial Affairs. Available at [http://ec.europa.eu/economy\\_finance/publications/publication15155\\_en.pdf](http://ec.europa.eu/economy_finance/publications/publication15155_en.pdf).
- Gardo, S. and Martin, R. 2010. The Impact of the Global and Financial Crisis on Central, Eastern and South-Eastern Europe: A Stock-taking Exercise. *European Central Bank Occasional Paper Series*, No. 114, June.
- Harris, D., Harvey, D.I., Leybourne, S.J. and Sakkas, N.D. 2010. Local Asymptotic Power of the Im-Pesaran-Shin Panel Unit Root Test and the Impact Initial Observations. *Econometric Theory*, Vol. 26, No. 1, pp. 311-324.
- Hein, E. and Truger, A. 2005. European Monetary Union: Nominal Convergence, Real Divergence and Slow Growth? *Structural Change and Economic Dynamics*, Vol. 16, No. 1, pp. 7-33.
- Im, K.S., Pesaran, M.H. and Shin, Y. 2003. Testing for Unit Roots in Heterogenous Panels. *Journal of Econometrics*, Vol. 115, No. 1, pp. 53-74.
- Islam, N. 2003. What have We Learnt from the Convergence Debate? *Journal of Economic Surveys*, Vol. 17, No. 3, pp. 309-362.



- Kasman, A., Kirbas-Kasman, S. and Turgutlu, E. 2005. Nominal and Real Convergence between the CEE Countries and the EU: a Fractional Cointegration Analysis. *Applied Economics*, Vol. 37, No. 21, pp. 2487-2500.
- Kočenda, E. 2001. Macroeconomic Convergence in Transition Countries. *Journal of Comparative Economics*, Vol. 29, No. 1, pp. 1-23.
- Kočenda, E., Kutan, A.M. and Yigit, T.M. 2006. Pilgrims to the Eurozone: How Far, How Fast? *Economic Systems*, Vol. 30, No. 4, pp. 311-327.
- Kutan, A.M. and Yigit, T.M. 2009. European Integration, Productivity Growth and Real Convergence: Evidence from the New Member States. *Economic Systems*, Vol. 33, No. 2, pp. 127-137.
- Le Pen, Y. 2011. A Pair-wise Approach to Output Convergence between European Regions. *Economic Modelling*, Vol. 28, No. 3, pp. 955-964.
- Matkowski, Z. and Prochniak, M. 2007. Economic Convergence between the CEE-8 and the European Union. *Eastern European Economics*, Vol. 45, No. 1, pp. 59-76.
- Pesaran, M.H. 2007. A Pair-wise Approach to Testing for Output and Growth Convergence. *Journal of Econometrics*, Vol. 138, No. 1, pp. 312-355.
- Polanec, S. 2004. Convergence at Last? Evidence from Transition Countries. *Eastern European Economics*, Vol. 42, No. 4, pp. 55-80.
- Prochniak, M. and Witkowski, B. 2013. Time Stability of the Beta Convergence Among EU Countries: Bayesian Model Averaging Perspective. *Economic Modelling*, Vol. 30, No. 1, pp. 322-333.
- Schneider, F., Buehn, A. and Montenegro, C.E. 2010. Shadow Economies all over the World: New Estimates for 162 Countries from 1999 to 2007. *World Bank Policy Research Working Paper*, No. 5356.
- Siklos, P.L. 2010. Meeting Maastricht: Nominal Convergence of the New Member States towards EMU, *Economic Modelling*, Vol. 27, No. 2, pp. 507-515.
- Soukiazis, E. and Castro, V. 2005. How the Maastricht Criteria and the Stability and Growth Pact affect Real Convergence in the European Union: A Panel Data Analysis. *Journal of Policy Modeling*, Vol. 27, No. 3, pp. 385-399.
- Tsanana, E., Katrakilidis, C. and Pantelidis, P. 2013. Balkan Area and EU-15: An Empirical Investigation of Income Convergence. In: A. Karasavoglou and P. Polychronidou (Eds.). *Balkan and Eastern European Countries in the Midst of the Global Economic Crisis*, pp. 23-34. Berlin: Springer.
- World Bank. 2008. Unleashing Prosperity: Productivity Growth in Eastern Europe and the Former Soviet Union. Available at: <http://go.worldbank.org/NS2LJ69070>.