

## Western Balkans countries income convergence in the context of EU membership – dynamics and determinants

Gjorgji Gockov\* • Angela Antovska\*\*

**Abstract** The Western Balkan countries face relatively low levels of income over a longer period of time, indicating insufficient dynamics and intensity of income convergence, compared to the developed EU economies. The issue of income convergence of Western Balkan countries is particularly important in the context of their EU membership. The paper tests the existence and dynamics of income convergence of the Western Balkan Economies using both sigma ( $\sigma$ ) and the beta ( $\beta$ ) measures of real convergence. The evaluation of the appropriateness of the income convergence dynamics of the Western Balkan Economies is derived on the basis of a comparative analysis with the achievements of the New Member States, Baltic countries and EU - 14 in the last 20 years. The results outline that Western Balkan countries are stagnating, and they have the slowest convergence. In addition, this paper makes an overview by fixed effects panel data model of the determinants of the convergence process in the Western Balkan countries to the EU-14, taking them as complementary part of this process. The results show that Western Balkan countries should focus mainly on agriculture and banking sector reforms in order to speed-up the convergence process.

**Keywords:** Income convergence, GDP per capita, Western Balkans countries, Dispersion, Panel regression.

**JEL Classification:** O47, O11, F43, F15

### Introduction

In the 1990s, as other small countries of Eastern Europe implemented reforms progressively and began a rise toward prosperity, parts of the Western Balkans have spent those years in armed conflict and lagged in making structural changes to their

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legacy socialist systems. In the past two decades all the economies in the Western Balkan countries<sup>1</sup> have made strides in transformation to market economy, reform their public finances and banking systems and rekindled economic growth. Besides these developments, the region is still far behind EU economies. The countries are held back by weak institutions, corruption and government dominance in some industries. Western Balkans countries need to tackle their low productivity and speed up reforms in all fundamental areas such as increasing exports, investments, and employment.

The issue of convergence is very important from an economic point of view because it describes the progress of a country towards elimination of disparities in the levels of outputs and income. European developing economies lay their hopes on the expectation that the process of European integration will lead to a significant increase in living standard and thus to approach the level of income in developed European countries. The key issue in this paper is whether the process of EU membership of Western Balkan countries will accelerate the pace of growth and income convergence and catch up to the living standard of developed European economies?

Even though there are many papers that cover the convergence path of New member states and Baltic states compared to the EU core countries, still not so many papers examine the convergence process between EU countries and the Western Balkan. This paper will try to enrich the literature on WB convergence path towards EU complementing the existing papers by confirming that like in Stanisić (2016) and Meksi and Xahja (2017) the speed of income convergence is slowest in WB and the global crises had a negative influence and had interrupted this process. Apart from this in the paper is added simple convergence analysis on WB and BC as a separate group to prove that the BC have the fastest convergence and that we have convergence path similar of the New Member States. In addition, the paper is focusing on the level of income convergence of the selected countries before and after their EU accession, supporting the premise of the positive effects of the EU membership on the dynamics of real convergence, as an important acquirement for the candidate countries.

Income convergence can be proved in two ways and the paper tests the existence and dynamics of income convergence of the Western Balkan Economies using both sigma ( $\sigma$ ) and beta ( $\beta$ ) measures of real convergence. In evaluating the performance of Western Balkan countries (WBC), the so-called New Member States<sup>2</sup> and Baltic countries<sup>3</sup> are taken in account. Therefore, an additional objective is to analyse the income convergence not only of WBC in the context of the old EU core, but also to have a clear picture of the income convergence process of NMS and BC compared with EU-14<sup>4</sup>. The discussion will be based on the classical approach of economic convergence for developing countries. The data source is the database of the IMF Outlook and Eurostat. The paper is structured in five sections. After the Introduction, the first section presents

<sup>1</sup> Western Balkan countries – Eurostat classification- <http://ec.europa.eu/trade/policy/countries-and-regions/regions/western-balkans/>)

<sup>2</sup> New Member States further in paper are analyzed in two groups: Czech Republic, Hungary, Poland, Slovak Republic and Slovenia as NMS2004, and Romania and Bulgaria NMS2007.

<sup>3</sup> Baltic countries (Estonia, Lithuania, Latvia)

<sup>4</sup> EU-14 includes EU-15 without Greece

the theoretical basis of income convergence. The second part outlines the facts and trends in the real convergence of the Western Balkans countries (WBC), measured according to GDP per capita (PPP) and catching up rate. The research methodology is explained in the third section, while the results of the research are presented in the fourth section of the paper. In the next section an additional panel data analysis of determinants of the convergence process are presented. Finally, the conclusions of the research are summarized.

### **Theoretical framework and literature review**

The convergence concept is at the core of growth theories and has been a subject of great importance since the eighteenth century. Convergence is a process describing the progress of a country towards elimination of disparities in the levels of outputs and income. The convergence occurs if relatively poorer countries (or regions) grow faster than relatively richer ones, thereby allowing the former to catch up with the latter ones. As a result, all economies should over time eventually converge in terms of level of income per capita.

The discussion of convergence cannot take place without an outline of the basic theory. The convergence concept has evolved from neoclassical growth theory to the new growth theory. The theoretical insights of the neoclassical growth theory are provided in Solow model (1956) and predict income convergence in the long run. In the transition to steady state, economies far “below” steady state will grow faster. Absolute convergence assumes that if the economies share the same steady state, implying having similar technology and features, the economies with low per capita incomes will grow faster. In the long run, the less developed economies will converge to the same income level and grow at the same rate as the developed one. On the other hand, if economies have different structural variables (population growth, investment in capital and the depreciation rate of capital), less developed economies, with lower initial per capita income and capital level, will grow faster than developed economies after controlling for differences in steady state. In this case, conditional convergence contends and even though their growth rates will eventually converge over time the level of development between these economies will never equalize.

Mankiw, Romer & Weil, (1992) in their paper also examine the implications of the Solow model for convergence in standards of living. The conclusion is that, if population growth and capital accumulation remain constant, then countries converge at about the rate the augmented Solow model predicts. As opposed to the neoclassical model, endogenous growth theories stress the importance of additional variables, besides investments, population growth and depreciation of capital for determining income level and growth and therefore support the hypothesis of conditional convergence rather than absolute.

These theories wish to explain how technology grows within the model by including various processes. Lucas (1988) stress the importance of human capital and R&D for long-run economic growth and conclude that differences in these factors across

economies can explain why some regions experience high growth and others do not. Regions that invest more in human capital and in innovation activities will experience higher growth than regions that do not.

In the first decade of the 21 century with the enlargement wave of EU with the Central and Eastern European countries there is increase in the number of relevant papers dedicated to income convergence of the GDP per capita, that estimate the presence of  $\beta$ - and  $\sigma$ -convergence and confirm the existence of income convergence theorem. In what follows we list only a selected papers in this field. In the work of Matkowski and Próchniak (2004) is empirically tested the income convergence between the transition countries of Central and Eastern Europe (CEE8), as well as between the groups of CEE8 and the EU-15 during the period between 1993 and 2003. The conclusion was that the large gap in development between the countries and the groups of the CEE8 and the EU-15 decreases over time. In the study (Matkowski and Próchniak, 2007), conducted on the same sample, but over a longer period, the authors provide evidence for both types of convergence between the the „old” EU and the eight CEE countries that joined in 2004, whereby the catching up appears to have been more intense in the late 1990s and early 2000s. Later studies (Próchniak, 2008; Vojinovic and Oplotnik, 2008; Vojinovic, Acharya and Próchniak 2009, Vojinovic, Oplotnik, and Prochniak 2010) confirm that the patterns of the economic growth of the new member states CEE8 and EU-15 in the 1990s and the first decade of the 21st century were in accordance with the income convergence theory and the results only differ in the estimated speed of this convergence. After adding Bulgaria and Romania to the sample there is significant evidence of absolute convergence of the region and additionally strengths the conditional convergence of the entire CEE, shows the paper of Szeles and Marinescu (2010).

The work of Rapacki and Prochniak (2009) is the most comprehensive in terms of its sample of 27 transition economies and extended time frame (1990-2005). However, the authors find evidence of strong and significant  $\beta$ - and  $\sigma$ -convergence only for subsamples (e.g., the eight Central European countries) in certain subperiods 2000-2005. Vamvakidis (2009) and Cavenaile and Dubois (2011) in their works examined the process of income convergence and results showed large differences in the speed of catching up with the average income of the EU developed countries. Stanisic (2016) confirms the existence of the income convergence of the CEE10 and the EU-15 countries in the pre-crises period, but emphasizes that the global economic crisis has negative impact and interrupted this process. An undeniable reduction in the gap at the level of development between the „new” and the „old” member states was confirmed in a study by Gligorić (2014). Mexi and Xahja (2017) after calculating the sigma and beta in their paper point out that WB have higher growth, but the New member states have higher convergence. Also, they have broadened their analysis with close up examination of the sectoral convergence and conclude that there is productivity lag behind EU in agricultural sector. Krstevska (2018) concludes that the convergence of WB is still rather slow relative to the EU, emphasizing that WB convergence is mostly comparable to the latest, less developed New Member States. The author gives an overview of the nominal and real convergence processes complemented by the convergence of the main

macroeconomic indicators in the WB countries. Regardless of the numerous studies on the income convergence in the case of the Baltic countries and New Member States, researches on this topic for the Balkan countries' economies are rare. In particular the majority of the research do not include all of the Western Balkan countries and the authors used samples as a represents from the full Balkan group (Bjorksten (2000), Sarajevs (2001), Amplatz C. (2004), Fidrmuc and Korhonen (2006), Kutun and Yigit (2004,2005 & 2009), El Ouardighi and Somun-Kapetanovic (2007 and 2009), Bonetto et al.(2009), Del Bo et al. (2010), Sideris (2010), Tsanana et al. (2013), Nenovsky and Tochkov (2014). Ancona (2007) in her study included Mediterranean countries in an attempt to estimate the convergence of income per capita and concluded that the Balkan countries aspiring EU accession have higher growth rate than the EU average during 2000-2004.

### Real convergence or divergence of the Western Balkans – stylized fact

In this section, a brief analysis of the trends in the real convergence of the Western Balkans countries (WBC) is made, measured according to the two most used indicators of real convergence: annual changes of GDP per capita calculated according to the purchasing power parity (PPP) (1) and catching up rate (2).

$$\Delta GDP_{i,t}^{pc} = \frac{y_{i,t}}{y_t^*} - \frac{y_{i,t-1}}{y_{t-1}^*} \tag{1}$$

where is *GDP per capita* measured by purchasing power standard of a country *i* in year *t*, and is the average of EU-14 in year *t*.

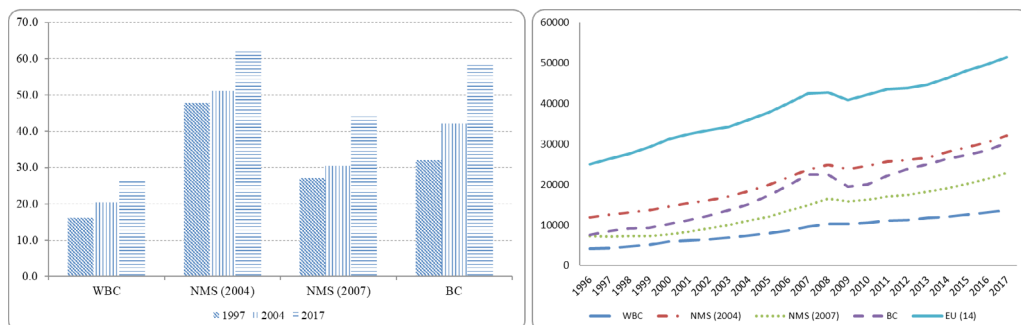
$$R_{catch-up} = 100 * \frac{y_{it} - y_t^*}{(y_{it-1} - y_{t-1}^*)} \tag{2}$$

where is *GDP per capita* by PPS of a country *i* in year *t*;  $y_t^*$  is the average *GDP per capita* by PPS of EU-28 in year *t*;  $\Delta$ - is difference between *t* and *t-1*.

**Figure 1.** GDP per capita (in current prices, PPP)

(EU-14=100, in s%)

(GDP per capita PPP in international l dollars)



Source: IMF, EUROSTAT, authors' calculation

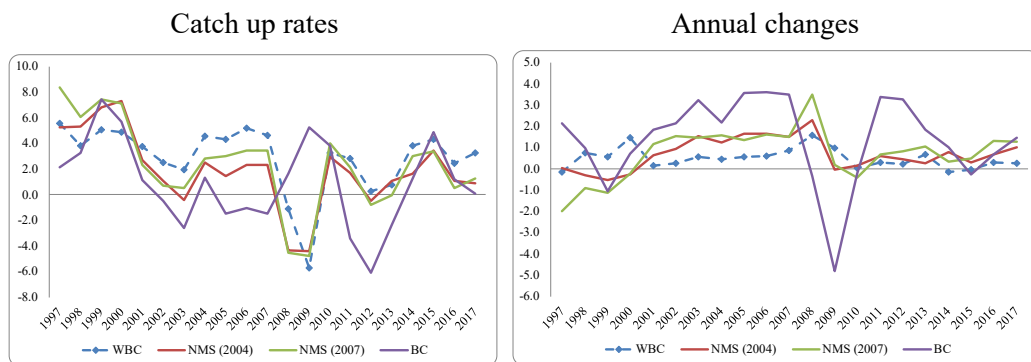
The values and trends of these indicators for the WBC are compared with those of the two groups of new EU Member States (NMS2004, NMS2007) and the Baltics countries (BC), in order to see if the process of joining to EU contributed to accelerating the real convergence.

From Figure 1 one can conclude that the WBC in the past 20 years did not realize significant rate of real convergence. Namely, GDP per capita registered a modest increase from 16% in 1997 to 26% in 2017 of the average EU-14 GDP per capita. This increase of 10 percentage points is significantly lower compared to the other groups of countries NMS2004, NMS2007 and BC, with the dynamics of real convergence being the highest in the BC (increase of 27 percentage points). In this comparison, the initial level of convergence should be taken into account: in 1997 the GDP per capita in NMS2004 was 48%, in NMS2007 was 27%, and in BC was 32% of the average in the EU-14, that is a higher starting base than WBC 16%. This is important because according to the neoclassical growth theory, economies with lower initial level of income tend to grow faster in comparison with economies with higher initial level of income. However, this obviously cannot be confirmed by this analysis.

Analyzing the individual periods, the most significant dynamics of real convergence in NMS2004, NMS2007 and BC was achieved in the period before and after the EU membership, (the difference in dynamics in relation to the WBC was particularly increased in the period after 2004). In the case of WBC, in the last 5 years, the dynamics of real convergence has stagnated which is not the case with other groups of countries that are subject to this analysis. This clearly indicates the positive effects of the EU membership process on the dynamics of real convergence.

The calculation and analysis of catching up rates gives similar conclusions. This rate basically confirms (1) the existence of differences in GDP per capita growth (which is a necessary but not sufficient condition for convergence); and (2) the need for less developed economies to realize positive differences in growth over a long period of time. Such movements are sustainable in the long run only if less developed countries realize not only higher economic growth rates but also rapid rates of improvement of productivity factors and production efficiency. Given that the rate is generally calculated on the basis of historical growth rates, it serves as a framework for ex-post analysis of convergence dynamics. In case of negative catch-up rates, disparity between countries concerned and the EU-14 is decreased and vice versa.

As it is shown on Figure 2 WBC realized positive catch up rates almost in the whole period, which means that the disparity between WBC and EU-14 has permanently increased. Compared with the other groups of countries, the WBC realized the highest positive rate on average, i.e. the divergence is greatest in this group of countries. This is particularly noticeable in the period after 2000, when NMS2004, NMS2007 and BC have significantly reduced the dynamics of divergence in relation to EU-14. It corresponds with the period before and after the EU membership. Only in the years during the crisis (2008 and 2009) WBC, as well as NMS2004 and NMS2007, realized negative rates, i.e. there was a tendency of decreasing the disparity with respect to EU-14. This is due to the fact that these countries were less affected by the crisis than the more developed EU countries.

**Figure 2.** Convergence rates to EU-14 (GDP per capita, PPP, current prices)

Source: IMF, EUROSTAT, Author's calculation

Still, it has to be noted that catch-up rate observes absolute rather than relative disparity. Positive catch-up rates mean that the disparity between all groups of countries and the EU-14 increases on average, although the difference of GDP per capita with regard to the EU-14 actually decreases. In order to explain the relative disparity the best solution is to observe the difference of GDP per capita in two subsequent years (right Figure 2). Opposite to catch-up rate, the disparity between the observed groups and the EU-14 is diminished in case of positive difference of GDP per capita.

As shown on Figure 2 (right), average annual changes of GDP per capita of all groups of countries show the decrease of disparity in relative amounts with regard to the EU-14 average almost in the whole period. In general, WBC recorded relatively lower positive rates, indicating a lag in real convergence compared to NMS2004, NMS2007 and BC. This is particularly pronounced in the period 2001-2008, i.e. in the pre-accession period and in the years of formal membership, which points to the positive effects of the EU membership.

## Methodology and Results

In the literature, there are two basic concepts to approach the process of real convergence, known as  $\sigma$ -convergence and  $\beta$ -convergence (Barro and Sala-i-Martin, 1992). The paper will empirically test the existence of both types of income convergence from 1996 to 2017. As the measure of income *per capita*, the GDP *per capita* was used, adjusted by the purchasing power parity of the currency.

The sigma indicator shows the tendency of reducing the differences in the level of income per capita between different countries over time (Barro and Sala-i-Martin 2003, Barro et al. 1991). The two most common methods for calculating sigma are the standard deviation and the coefficient of variation of per capita income. If the dispersion, or spread, of per capita incomes among countries is decreasing, the countries incomes level is converging. The following equation is used to calculate the coefficient of variation of the real GDP *per capita* (PPP):

$$CV (GDPpc) = \frac{\text{the standard deviation } (GDPpc)}{\text{the arithmetic mean } (GDPpc)} \quad (3)$$

The beta income convergence shows the tendency of poorer countries to approach the level of development of richer countries (the usual tendency of poorer countries to grow faster than more developed countries), i.e. when there is a negative correlation between the initial level of income *per capita* and the rates of economic growth in a period of time. The realization of this convergence depends on internal economic policies and other country specific factors, and fundamentally shows how long the convergence process will last. In order to prove the *beta* convergence, the following panel regression equation was tested on a sample of the Western Balkan countries, the New Member States and on the sample of the Baltic countries:

$$growth_{i,t} = \beta_0 + \beta_1 dist_{i,t-1} + \beta_2 dist_{i,t-1} \times WBC + \beta_3 WBC + u_{it} \quad (4)$$

In the equation  $growth_{i,t}$  represents the growth rate of the real GDP *per capita* (PPP) of a country in the period  $t$ ;  $dist_{i,t-1}$  the gap in the real GDP *per capita* between a country and the EU-14 average in the previous period, and the  $WBC$  is a dummy variable taking the value of 1 for the countries belonging to the Western Balkans region, and 0 for the countries belonging to the NMS or BC. New independent variable presenting the product of  $dist_{i,t-1}$  and the dummy variable  $WBC$  – is included in this model. This additional variable examines whether and to what extent the eventual convergence of the  $WBC$  group is different in the speed compared to the convergence of the NMS and BC group, i.e. whether belonging to the  $WBC$  group modifies the impact the income gap has on the rate of the economic growth of the GDP *per capita*.

The descriptive statistics of the *growth* and the *distance* variables for  $WBC$  and NMS are presented in Table 1. All of the observed variables have a normal distribution (tested with the Shapiro-Wilk test). The post-estimation testing showed that there were no problems of multicollinearity ( $VIF < 10$ ) and autocorrelation (Durbin-Watson test).

**Table 1.** Descriptive statistics of variables for  $WBC$

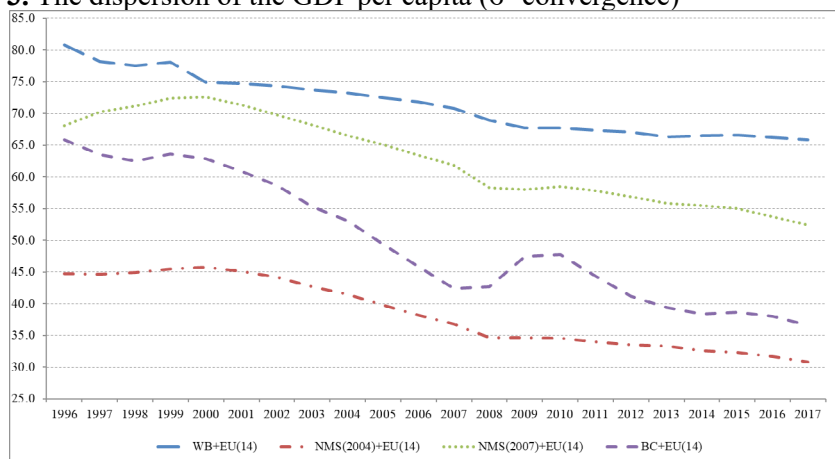
Descriptive statistics					
	Num observations	Mean	Standard Deviation	Minimum	Maximum
<b>Growth</b>	273	0.053	0.038	-0.088	0.213
<b>Dist</b>	273	-0.638	0.162	-0.888	-0.299

Source: IMF, Author's calculation

In the Figure 3 are shown the results using the  $\sigma$ -convergence approach measured by the coefficient of variation. The first thing to be pointed out is that the group of Baltic countries noted biggest decrease in the differences in the level of income per capita relative to EU-14, in their pre-accessioned period, and this process was interrupted with the beginning of the crisis.



**Figure 3.** The dispersion of the GDP per capita ( $\sigma$ -convergence)



Source: IMF, Author’s calculation

If analyzed the overall results Figure 3 shows that there is moderate decrease in the differences in the level of income per capita between the chosen groups and this decrease is the smallest in the WBC + EU-14. Even though Western Balkans were almost on the same level as the NMS2007 their income growth is the slowest, in particular in the period before and in the first period after the accession of NMS2007 in EU. It is evident in case of NMS that the dispersion was mainly decreased also during the period between 2000-2008, which corresponds with the period of pre and post - accession in the EU. The overall results of  $\sigma$  - convergence once again lead us to the conclusion that the EU membership process has positive effect on the dynamics of real convergence.

The testing of the  $\beta$ -convergence was concluded with panel regression equation with fixed effects and it was tested out for the three sub-periods: 1997-2000 (Model 1), 2001-2008 (Model 2) and 2009-2017 (Model 3), as well as for the entire observed period (Model 4). The results of the tested regression for WBC and NMS and WBC and BC are shown in Table 2.

**Table 2.** Results of regression analysis ( $\beta$ -convergence)

	Results of regression WBC and NMS							
	1997-2000		2001-2008		2009-2017		1997-2017	
	Coef	P value	Coef	P value	Coef	P value	Coef	P value
Dist	0.055	0.431	-0.078	0.013	-0.051	0.136	-0.081	0.001
Dummy	-0.494	0.003	0.110	0.171	-0.027	0.658	-0.166	0.001
Dumm*dist	-0.659	0.002	0.171	0.099	-0.018	0.829	-0.192	0.003
N	52		104		117		273	
R <sup>2</sup>	0.262		0.081		0.027		0.108	
Probability	0.001		0.024		0.390		3.47E-08	

	Results of regression WBC and BC							
	1997-2000		2001-2008		2009-2017		1997-2017	
	Coef	P value	Coef	P value	Coef	P value	Coef	P value
Dist	-0.199	0.549	-0.189	0.044	-0.054	0.721	-0.237	0.000
Dummy	-0.366	0.212	0.151	0.197	-0.029	0.797	-0.096	0.144
Dumm*dist	-0.406	0.311	0.283	0.077	-0.016	0.933	-0.035	0.706
N	36		72		81		189	
R <sup>2</sup>	0.203		0.215		0.007		0.168	
Probability	0.05		0.000		0.949		0.000	

Source: IMF, Author’s calculation

When using the F-test for the overall significance if the value of  $R^2$ , as a measure of the proportion of variance of a predicted outcome, has value  $p < 0.05$  the coefficient of determination is statistically significant. From the observed data, the existence of beta convergence in this sub-period cannot be confirmed in Model 3 (2009-2017), due to the outbreak of the global economic crisis in both cases. One can find this conclusion in the paper of Stanisic (2016), who also concludes that the global crises outbreak interrupted the convergence process of WB. In the case of WBC and NMS the value of the coefficient for  $disti, t-1$  is positive only in Model 1, however the value of this coefficient is statistically insignificant. The value is statistically significant ( $p < 0.05$ ) only in Model 2 and Model 4 and in both models' coefficient value has negative sign i.e. the smaller gap in development between the countries (WBC and NMS) and the EU-14 average is associated with higher growth rates of the GDP *per capita*. This is important because according to the neoclassical growth theory the convergence would be proven if  $\beta_1$  has positive value. These results obviously do not confirm this theory. Analyzing the case of WBC and BC the coefficient for  $disti, t-1$  shows similar results and leads us to same conclusions.

The coefficient for the variable determining a country's belonging to the WBC region is statistically significant in the Model 1 and Model 4 in the case of WBC and NMS and it has negative value which indicates that at the same income gap level, the growth rate of the GDP *per capita* (PPP) was higher for the countries of the NMS group than for the Western Balkan countries. In other words, catching up with the average GDP *per capita* achieved in the EU-14 was faster in the case of the NMS than in the case of Western Balkan. On the other hand, this variable is not statistically significant in any period in the case of WBC and BC.

The third coefficient for the variable  $disti_{t-1} \times WBC$  shows the extent to which a country's belonging to the WBC region moderates, i.e. changes the strength of the relationship existing between the income gap and the achieved growth rates of the GDP *per capita*. In the case of WBC and NMS this variable is statistically significant in Model 1, Model 4 (with significance level of  $p < 0.05$ ) and in Model 2 (with significance level of  $p < 0.1$ ). The coefficient has positive value only in Model 2, which indicates that the growth of the countries of the WBC, at the same income gap level, was faster than in the NMS group only in the period before the global crises. In Model 1 and Model 4 the coefficient has negative value which means that growth was faster in the NMS countries. In the case of WBC and BC this variable is not statistically significant.

### Determinants of the Income gap between Western Balkans to EU-14 Level

In addition to the analysed  $\beta$  and  $\sigma$  convergence this paper includes assessment of the possible factors contributing to the income distance of the Western Balkan countries relative to the average level of EU-14. To do this the following regression equation is used:

$$Y_{i,t} = \alpha_i + \beta' X_{i,t} + \varepsilon \quad (5)$$

Where: Y is the dependent variable, X is a k-dimensional vector of independent variables,

$i$  and  $t$  are the country and time subscripts,  $\alpha$  and  $\beta'$  are the constant and the vector of parameters of the explanatory variables, respectively,  $\varepsilon$  are the residuals.

The dependent variable in the equation is the percentage gap in the real convergence measured through GDP per capita relative to EU-14 average, while the chosen explanatory variables are: trade openness, unemployment, capital formation, loans, and agriculture. These are common variables which are used in most of the publications analyzing this topic.

In the panel data model six Western Balkan countries are included and the data in this paper is acquired from the World Bank and IMF databases for the period 2000–2017. The analysed period was chosen due to the available and consistent data series. In the model the observed variables have normal distribution (Jarque-Bera test), there is not autocorrelation (Durbin-Watson test) and there were no problems with determining presence of multicollinearity ( $VIF < 5$ ).

**Table 3.** Descriptive statistics of variables in the panel data model

	<b>Num observation</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Maximum</b>	<b>Minimum</b>
<b>Trade openness</b>	108	85,402	18,681	132,340	24,170
<b>Unemployment</b>	108	3,183	0,383	4,045	2,534
<b>Gross Fixed capital formation</b>	108	25,465	6,372	41,450	10,548
<b>Loans</b>	108	35,383	17,102	86,448	0,900
<b>Agriculture</b>	108	2,378	0,390	3,199	1,725

Source: World Bank, IMF, Author's calculation in E views 10

We analysed the data by means of fixed effects model, especially when the cross sections are not sampled randomly. This is proved after the implemented Hausman-test, which rejects the null hypothesis and the premise that the regressors and disturbances are not correlated. In order to differentiate between OLS and fixed effects model in panel data Wald test was applied. This test also point out that the fixed effects model is suitable for this analysis. Due to heteroscedasticity and evidence of separate factors being important, the countries had diversified performance of their economies and made different progress towards the EU convergence. The preference of the fixed effects model is supported by the results obtained from F- statistics in the fixed effects model, which are highly statistically significant.

**Table 4.** Result of the fixed effects model on the possible Explanatory Factors for the Period 2000–2017

<b>Variable</b>	<b>Beta-coefficient (fixed effects)</b>
Trade openness	0.04**
Unemployment	0.74

<b>Variable</b>	<b>Beta-coefficient (fixed effects)</b>
Fixed Capital formation	-0.14***
Loans	0.12***
Agriculture	-3.82***
number of observations	108
R <sup>2</sup>	0.917
Probability	0.0000

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

Source: Authors' estimations in E views 10

Greater trade openness of a country is associated with higher economic growth. Various studies that focus specifically on the transition process concludes that institutional quality and market liberalization policies to promote private sector growth have a positive impact on economic growth, despite their initially disruptive effect (Campos and Coricelli 2002). The regression analysis confirmed that the trade openness of a country is significant and contributes to lowering the gap, but the coefficient is small. The region has gradually moved toward greater openness and the main export market of WB economies has traditionally been the EU.

In the fixed model, regression unemployment is statistically insignificant variable. There are many reasons to be counted, such as that, the WB region was unable to generate significant employment numbers during the good years and registered large job losses during the transition period and global crisis. Also, low labour productivity, low flexibility and efficiency of the labour market, high youth unemployment and the brain drain situation that WB confronts are contributing to the insignificance of the variable for the convergence process. This issue requires a comprehensive set of reforms to address the region's persistently high unemployment.

Empirical evidence suggests that in lower-middle-income countries, priorities should be reforming banking and agricultural sectors (Dabla-Norris et al 2015). These two variables are most significant in the fixed effects model. In the advanced economies agriculture has already reached the low levels. The result in the regression strongly supports this premise. The regression coefficient has a negative sign and its magnitude is -3.8, implying a very strong effect on the convergence process. This implies that the convergence process is reducing the significance of the agriculture for the account of the service sector. Additionally, income convergence is strongly associated with the transformation and development of the economic structure of the Western Balkan countries. The banking sector determinate turns out to be highly statistically significant, and the regression coefficient has a positive sign. This means that convergence process of the WB countries goes hand in hand with increased financial intermediation and credit support for the economic entities.

High investment rates appear to be essential to foster convergence of WB countries towards the higher-income EU economies. In the presented results from the regression, there is only one odd result – the negative sign of the coefficient in the fixed capital

formation, which is statistically significant variable. This is a complex issue calling for further comprehensive analysis, but one of the possible explanations is that parts of the investments made in these countries are unproductive.

## Conclusion

Having the same level of income standard of the developed EU economies is the main aim and expectation of 18 million people living in Western Balkans. The experience of the Baltic countries has confirmed that best route to prosperity for small countries is to integrate within the global economy. The results of this study outline that Western Balkan countries have the slowest convergence. The second conclusion is that the EU membership process has the biggest positive effect on the dynamics of real convergence in the analyzed countries.

The testing of the sigma concept of income convergence points to the slowest existence of income convergence in the WBC compared to NMS2004, NMS2007 and BC with the EU-14. In addition, it is evident that the dispersion was decreased in Baltic countries and New Member States and in both cases it was mostly achieved in the period before and after their EU membership. Even though Western Balkans were almost on the same level as the NMS2007 their income growth is the slowest and lagging behind NMS2007 especially in the period before and in the first period after the accession of NMS2007 in EU. It should be expected that the membership of the Western Balkans in EU would contribute to faster growth and income convergence of this region.

The results of the conducted regression analysis or the beta income convergence approach shows that the neoclassical growth theory cannot be confirmed. In contrary, in the case of WBC and NMS the smaller gap in development between the countries and the EU-14 average is associated with higher GDP growth rates. In addition, the regression results confirm that catching up with the average GDP *per capita* achieved in the EU-14 was faster in the case of the NMS than in the case of WBC.

Regarding the determinants of the real convergence process, based on panel data for six WB countries during 200-2017, estimated by the fixed-effects model, we find that agriculture is strongly negatively associated with real convergence, which means the need of reducing the importance of agriculture in the future. In addition, the banking loans are highly positively associated with real convergence, implying that financial intermediation and credit support have significant effect on the convergence process of the WB countries. The only one odd result of the regression is the negative association between real convergence and the fixed capital formation, which calls for further research.

With these finding the paper suggests inevitable reform process for deeper structural transformation of less developed countries in order to speed the catch-up, improve productivity factors, private enterprise climate and production efficiency. This is the only path to restart and accelerate the income convergence between Western Balkans and most developed EU countries.

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