Empirical Observations on Economic Convergence across the Western Balkans – How Long Will EU-Catch up Take?

ERMELA KRIPA, KLODIAN MUCO, EMILJAN KARMA
Department of Economics and Business,
Faculty of Economic, Political and Social Sciences,
Catholic University Our Lady of Good Counsel,
Adress: Rr. Dritan Hoxha, Tiranë,
ALBANIA

Abstract: - This paper investigates income convergence between the Western Balkans and the European Union over the period 2000–2023, focusing on the role of structural and institutional factors. Using panel data, we estimate a conditional β-convergence model to examine the speed of convergence and the contribution of selected determinants of economic growth. The results provide evidence of income convergence, although the estimated convergence speed points to a prolonged adjustment process. At the estimated rate, halving the income gap would require slightly more than fifteen years. Among the explanatory variables, gross fixed capital formation is the only statistically significant determinant across all specifications, while foreign direct investment exhibits marginal statistical significance. Institutional variables show weak and inconsistent statistical significance across specifications. The findings highlight the role of capital formation in the convergence process and suggest that income disparities between the Western Balkans and the European Union are likely to persist under the estimated convergence dynamics.

Key-Words: - β-convergence, Western Balkans, Institutions, Economic growth, FDI, Gross Fixed Capital For mation (GFCF), Economic convergence.

Received: August 23, 2026. Revised: September 13, 2026. Accepted: September 24, 2026. Published: November 11, 2026.

1 Introduction

The Balkan countries (WBCs) have been in the process of economically converging with the European Union (EU) for some years now. This process is mainly driven by the need for increased political and economic stability, but also by a common ambition to build stronger institutions that promote long-run sustainable and inclusive growth [1], [2], [3]. However, Western Balkan countries, Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia, have experienced unstable political and economic transformations since the breakup of the former Yugoslavia, resulting in weak institutions and persistent economic challenges [4], [5], [6], [7]. Still, despite being considered vulnerable countries, reforms across a wide range of economic and institutional dimensions have been implemented since the early 2000s to gradually align with European Union standards and requirements [8], [9], [10], [11]. The idea of economic convergence has triggered considerable academic debate, especially concerning the β-convergence and σ-convergence models introduced by [12]. While empirical studies show some encouraging signs, the rate of progress is still too slow to eliminate disparities within a reasonable timeframe. OECD (2023), which uses GDP per capita measured by Purchasing Power Parity (PPP), estimates that it would take the Western Balkan countries about fifty years to reach the EU average, which uses GDP measured by Purchasing Power Parity (PPP), estimates that it would take the WBCs about fifty years to reach the EU average [13]. According to our β-model estimates, the Balkan countries could reduce the current gap with the EU average GDP per capita by half in about 15 years. Full convergence without major acceleration would take about 100 years. These projections underline the urgent need for effective policies and stronger institutions to shorten this timeline. Although the region's economic growth has benefited from European Pre-Accession funds (IPA) and public investments, the impacts of Foreign Direct Investment (FDI) and institutional quality in our empirical model are still limited or statistically insignificant.

New studies highlight the importance of internal factors, such as governance, political stability, administrative efficiency, and corruption reduction, along with structural elements like productivity,

human capital development, and infrastructural growth [14], [15]. In this context, the primary purpose of this analysis is twofold: first, to empirically measure the level of convergence of the Balkan countries relative to the European Union average; and second, to quantify the time necessary to achieve this convergence, identifying the variables that most significantly condition its speed. To this end, the present study adopts an integrated approach, combining annual descriptive statistical analysis with a β-regression model to investigate the temporal evolution of the GDP per capita gap. The results will allow for the highlighting of differences among the various countries and a deeper understanding of the weight of institutional components on growth, consistent with recent literature [16], [17]. Bartlett discusses the enduring labour-market and social-welfare challenges of transition in the Western Balkans, providing context for the structural barriers to faster catch-up [18].

2 The Economic Convergence of the Western Balkans: A Review of the Literature

The process of Economic Convergence of the Western Balkans (WBs) with the European Union (EU) is recognized as one of the most significant and complex ongoing processes of European integration. EU accession is still very important for these countries. They see it as the way to achieve economic and political stability. Joining Europe helps with growth, modernization, and making democratic institutions stronger (based on studies [7], [14], [19]). Belloni examines how the European Union has shaped political transitions in the Western Balkans, drawing attention to the interaction between external integration incentives and domestic institutional change [20].

Getting integrated with Europe is also expected to bring in Foreign Direct Investment (FDI). Baldwin and Wyplosz provide a framework for examining the trade, market-integration, and monetary channels through which European integration affects economic outcomes [21].

This can help with technology transfer, better management, and access to markets, which in turn can help these countries catch up with others [19], [22], [23], [24].

However, evidence from the Western Balkans is mixed.

Some studies by Bevan & Estrin show that FDI often targets sectors, which limit its benefits [25].

On the other hand, [26] say that human skills and location are important for progress. When looking at all the studies, it seems that the effect of FDI on progress depends on factors. These include where investments are made within a country, how well investments are connected to businesses, and how well a country can use new investments.

So just getting FDI does not immediately lead to clear productivity gains.

In general, research shows that the relationship between FDI and progress is not simple [2], [7], [16].

To provide a clearer analytical foundation for the empirical model, the literature is organized around four complementary strands: 1. convergence theory and its measurable implications; 2. the investment and capital - accumulation channel; 3. the role of FDI and why its impact may be heterogeneous; and 4. institutions and structural constraints that condition the convergence process in the Western Balkans.

The concept of economic convergence describes the tendency for less-developed economies to grow at a faster rate than advanced economies, consequently narrowing disparities in income and development [27], [28], [29], [30], [31], [32], [33]. Authors define two main types of convergence [12]: (i) beta (β)-convergence, whereby poorer economies grow faster; and (ii) sigma (σ)-convergence, whereby income dispersion declines. In a barrier-free economic context, less-developed economies should achieve faster growth primarily due to higher marginal returns to capital, allowing poorer nations to gradually approach the income levels of advanced economies [12], [34], [35], [36]. Wage differentials may also support catch-up, particularly in labor-intensive sectors [19], [37], [38]. However, as emphasized in [39], convergence outcomes depend on intervening factors such as policy effectiveness, demographic dynamics, and an economy's capacity to adapt to external shocks and structural change. This insight shifts attention from convergence "in principle" to the concrete mechanisms that determine its speed in the WB context. Gashi and Avdulaj identify long-run convergence towards the EU among Balkan economies during 2000–2019, while emphasizing variation across countries and the persistence of a considerable income gap [40].

Theory highlights investment as a central mechanism. Domestic capital formation can accelerate convergence when it relaxes binding constraints and raises productivity, whereas weak project selection, misallocation, or governance failures may reduce the growth impact of investment. Accordingly, several studies argue that convergence requires macroeconomic stability [41], digital transformation and productivity gains [42],

institutional stability, and effective structural reforms [10], supported by both domestic and external anchors [15], [43]. This motivates the inclusion of gross fixed capital formation as a key explanatory variable in our conditional convergence model.

EU accession remains a crucial goal for these states, viewed as the primary path to achieving both economic and political stability. European integration is often considered a catalyst for growth, modernization, and the strengthening of democratic institutions [7], [14], [19]. Besim finds that structural reforms and progress towards EU integration can reinforce economic convergence, although the benefits of individual reforms differ over time [44].

Integration is also expected to increase Foreign Direct Investment, which can support countries through the sharing of technology, management skills, and access to new markets [19], [22], [23], [24]. If we look at the evidence from the World Bank, the picture is not so clear. For example, Bevan and Estrin found that Foreign Direct Investment has often been focused on areas, which can limit the benefits for the rest of the economy [25]. Similarly, [26] point out that the quality of the workforce and the location of a country can affect how well it can catch up with others.

When we consider all the research, it seems that the relationship between Foreign Direct Investment and convergence is not straightforward. The impact of Foreign Direct Investment depends on the types of industries involved, how well local businesses are connected, and the ability of a country to absorb knowledge, so it is possible that a large amount of Foreign Direct Investment may not necessarily lead to significant productivity gains in the short term. Velić and Cvečić show that monetary integration and macroeconomic stability are associated with foreign direct investment flows in newer EU member states, indicating that the wider policy environment may condition investment incentives [45].

Overall, the research suggests that the relationship between FDI and convergence is not straightforward. The impact of FDI depends on where it is invested, how well it connects with the local economy, and a country's ability to absorb and use new knowledge. As a result, higher FDI inflows do not always lead to immediate or noticeable productivity gains. This uncertainty is what motivates our empirical analysis, especially since our results later point to a relatively limited statistical role for FDI.

Institutional quality is another crucial element. Robust, strong, transparent, and effective economic institutions play a central role in supporting growth and promoting inclusive, sustainable development [46]. [47] emphasize, institutions are also critical for the successful implementation of public policies. In the Western Balkans, however, institutional weaknesses, persistent corruption, and inefficiencies in public administration continue to impede progress toward convergence. [7], [10]. These challenges are compounded by structural constraints such as high youth unemployment [48], mismatches between skills and labour market needs [17], and ongoing youth emigration [12], all of which make the catch-up process more difficult. Technological progress and digital infrastructure are also emphasized as drivers of productivity and competitiveness [48], [49]. Muço and Balliu report a very weak positive empirical association between corruption and real GDP per capita growth in the Balkan countries, underscoring the difficulty of identifying uniform short-run institutional effects [50].

Overall, these contributions imply that institutions and structural conditions primarily operate as "enablers" that shape the returns to investment and the capacity to absorb technology—hence their inclusion as conditioning variables in a convergence model. Rodrik, Subramanian, and Trebbi emphasize the primacy of institutional quality in explaining cross-country income differences relative to geography or trade integration [51].

In this context, the European Union plays a key role in supporting convergence by providing funding and technical assistance, particularly through the Instrument for Pre-accession Assistance (IPA) [52]. However, moving toward full integration still depends on continued progress in strengthening governance, improving transparency, and building the capacity to implement reforms effectively.

Based on convergence theory and WB-specific evidence, we test three core hypotheses:

H1: The coefficient on lagged relative income is negative, indicating conditional β-convergence toward the EU average.

H2: Gross fixed capital formation is positively associated with relative GDP per capita growth.

H3: The growth impact of Foreign Direct Investment (FDI) is conditional on the environment that allows it to happen. The quality of institutions and the ability to absorb it. So, the average effect of all the FDI that comes into a country may be weak or not statistically significant when there are structural problems that limit the benefits that come from it.

3 Methodology

This paper explores how GDP per capita in the Western Balkans (WB) has been converging toward

the EU average over the period 2000–2023. The analysis is based on an unbalanced panel dataset covering six countries over 23 years (N = 6, T = 23). Given the relatively short time span and small number of countries, choosing an appropriate estimation method is essential to ensure reliable results.

At the outset, we considered using the Arellano–Bond dynamic panel estimator (GMM), which is commonly applied in settings where past GDP growth influences current outcomes.

This method is particularly effective in panels characterized by many cross-sectional units (N) and a moderate time dimension (T).

However, due to the limited number of countries in our dataset, the potential efficiency gains of the dynamic GMM approach were minimal. Furthermore, the risk of instrument proliferation—a common issue in small samples—could compromise the reliability of the estimates [53], [54].

Consequently, we opted for a static panel data estimation approach using Stata. To empirically assess the β-convergence process of the Western Balkan countries toward the average EU GDP per capita, the following panel data regression model is specified:

$$\Delta \ln\left(\frac{GDP_{pc,it}}{GDP_{pc,t}^{EU}}\right) = \alpha + \beta \ln\left(\frac{GDP_{pc,i,t-1}}{GDP_{pc,t-1}^{EU}}\right) + \gamma_1 GFCF_{it} + \gamma_2 FDI_{it} + \gamma_3 PS_{it} + \gamma_4 GE_{it} + \gamma_5 CC_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

where:

- $\Delta\, ln\,(\frac{GDP_{pc_{it}}}{GDP_{pc_t}^{EU}})$ = growth rate of GDP per capita relative to the EU average
- $\Delta\, ln\left(\frac{GDP_{pc_{it-1}}}{GDP_{pc_{t-1}}^{EU}}\right)$ = lagged level of the relative GDP
- α = constant term
- μ_i = unobserved country – specific effects (fixed effects)
- γ'= the set of coefficients on all the control variables
- ε_{it}= error term
- $GFCF_{it}$: Gross Fixed Capital Formation
- FDI_{it}: Foreign Direct Investment inflows
- PS_{it}: Political Stability
- GE_{it}: Government Effectiveness
- CC_{it}: Control of Corruption

Growth relative to the EU average" is measured using GDP per capita relative to the EU average, relying on officially computed series published on Eurostat's database. The dependent variable captures the annual change in a country's GDP per capita position relative to the EU benchmark, and the "initial income" term is the lagged level of this relative GDP per capita measure, consistent with standard convergence regressions. GDP per capita is measured in PPP terms and constant prices, ensuring comparability across countries and over time. The institutional variables and their measurement: Political Stability, Government Effectiveness, and Control of Corruption are taken from the World Bank's Worldwide Governance Indicators (WGI), reported in their standard units, and we state explicitly whether they enter the regressions in levels (baseline) or in standardized form (robustness checks). This construction is consistent with widely used approaches in the convergence literature and is also aligned with the methodological discussion in an OECD (2023) study on economic convergence [13].

The model specification allows us to estimate conditional β-convergence, where the speed of convergence is measured by the coefficient β. A negative and statistically significant β confirms that countries with lower initial relative GDP per capita grow faster than their richer counterparts, after controlling for structural factors X_{it}.

To determine the appropriate estimation strategy, the Hausman test is usually conducted.

The resulting p-value (< 0.05) indicated that the Fixed Effects (FE) estimator is consistent and preferred over the Random Effects (RE) alternative, due to correlation between the regressors and the unobserved heterogeneity.

We used the Hausman test also to evaluate if a fixed or random effects model was better. The returned p-value was < 0.05, showing that the fixed effects estimator is consistent and preferred over the random effects alternative due to correlation between the regressors and the unobserved heterogeneity. Despite the adoption of fixed effects, diagnostic tests revealed the presence of serial correlation, heteroskedasticity, and cross-sectional dependence

This is because the variables we are looking at are connected to the factors that vary across different groups.

These issues violate the classical OLS assumptions and, if unaddressed, make standard errors biased and inconsistent. To correct these issues and enhance inference reliability, we considered two robust estimators: Driscoll-Kraay standard errors and Panel-Corrected Standard Errors (PCSE). Given our panel structure (small N, large T), the PCSE approach was ultimately selected. PCSE is particularly well suited for panels with few cross-sectional units and relatively long time periods, and it explicitly models the panel-specific error structure,

correcting for both cross-sectional dependence and heteroskedasticity [55], [56], [57].

The estimated coefficient on the lagged GDP per capita is negative and statistically significant, confirming the presence of conditional β-convergence among the Western Balkan countries (Table 2, Appendix).

While the reported R^2 is modest, this is not unexpected in time-series cross-sectional analyses and does not undermine the validity of the results. The use of Panel-Corrected Standard Errors (PCSE) means that coefficient estimates are identical to pooled OLS, with adjustments applied only to the variance - covariance matrix. Therefore, $R^2$is not an appropriate benchmark for model adequacy in this context. Instead, the focus is on obtaining unbiased and reliable standard errors, which allow more credible inference about both the statistical significance and theoretical consistency of the estimated relationships. While the use of panel-corrected standard errors (PCSE) is justified by the presence of heteroskedasticity and cross-sectional dependence, we acknowledge that further robustness checks are necessary given the small sample (six countries, 2000–2023).

In the revised analysis, we therefore complement the baseline results with alternative panel estimators, including fixed effects with Driscoll–Kraay standard errors and feasible generalized least squares (FGLS). We also conduct sensitivity analyses using different lag structures and by sequentially excluding regressors to test the stability of the results. The main findings - particularly the evidence of conditional convergence and the role of investment variables - remain qualitatively unchanged across specifications.

To evaluate the reliability of the baseline results, we re-estimated the model using alternative methods designed to address common econometric issues in panel data. We applied panel-corrected standard errors (PCSE), Driscoll–Kraay standard errors, and feasible generalized least squares (FGLS). These approaches differ in how they handle heteroskedasticity, serial correlation, and cross-sectional dependence, providing a more comprehensive assessment of the reliability of the findings. The main finding of conditional convergence is highly robust across all specifications. The coefficient on the lagged level of GDP per capita remains negative and statistically significant at conventional levels in the PCSE, Driscoll–Kraay, and FGLS models. The coefficient on the lagged relative GDP differs in magnitude across estimators: -0.0466 under PCSE and -0.1593 under Driscoll-Kraay. While both are negative and statistically significant, the Driscoll-Kraay estimate is larger in absolute value, reflecting the method's adjustment for both cross-sectional and serial correlation. This suggests that when accounting for dynamic interdependence among Western Balkan countries, the speed of convergence toward the EU average appears faster. Although both PCSE and Driscoll-Kraay robust standard errors confirm conditional β-convergence, we rely on the PCSE estimates as the main specification. The PCSE method is specifically recommended for panels with a small number of cross-sectional units (N=6) and relatively long time periods, as in our dataset. Its pairwise correction of panel covariances produces conservative and reliable estimates, reducing the risk of overstatement due to small-N bias in Driscoll-Kraay standard errors. Table 3 (Appendix) reports the comparative results of the PCSE, Driscoll–Kraay, and FGLS estimators.

Similarly, gross fixed capital formation (GFCF) exhibits a positive and statistically significant effect on economic growth across all three estimation techniques. While the coefficient's magnitude varies slightly and its significance is somewhat reduced under the Driscoll–Kraay correction, the variable remains significant. This indic*ates that* investment is a stable determinant of economic growth in the sample, consistent with standard growth theory.

By contrast, foreign direct investment (FDI), political stability, and corruption do not show consistent effects across the different model specifications. In all cases, their coefficients remain statistically insignificant, even when using FGLS, which tends to produce smaller standard errors and can sometimes overstate significance in small samples. Their lack of significance even under FGLS suggests that their impact on growth is weak or highly context-dependent within the sample analysed.

Overall, the robustness analysis confirms that the key result - namely, conditional convergence - is not sensitive to the choice of estimator. At the same time, the lack of robustness for institutional and external variables suggests caution in drawing strong conclusions about their role in driving economic growth in this framework.

The results provide strong evidence of conditional β-convergence among the countries in the sample. The lagged relative GDP per capita coefficient is negative and highly significant, indicating that economies with lower initial relative income grow faster, adjusting toward their country-specific steady states.

In addition, when we look at time trends for each country, we see patterns. The PCSE regression

specification including country and time effects is reported in Table 4 (Appendix).

Some countries like Albania, Bosnia and Herzegovina, Kosovo, and Serbia show a trend. This means they have been doing better over time. On the other hand, North Macedonia has a negative trend.

This suggests that its growth has been slowing down. Montenegro's growth is stable, with no change over time.

These countries have growth stories.

Albania, Bosnia and Herzegovina, Kosovo, and Serbia are improving.

North Macedonia's growth is getting worse.

Montenegro's growth remains the same. The autocorrelation parameter is very close to zero, it is 0.0044. This shows that the Prais–Winsten correction works well to deal with autocorrelation. It also shows that the model is good at showing what happens over time. These results together show that countries are getting closer to each other in terms of growth. They are doing it at different speeds and in different ways. This means it is important to consider the differences between countries and how things change over time when we look at how economies grow. The Prais–Winsten correction and the model are important for understanding growth, and growth is different across countries.

When the first lag of relative GDP per capita is replaced with the second lag, the coefficient remains negative but decreases in magnitude and becomes only weakly significant. This suggests that convergence is driven more by short-term dynamics than by longer-term persistence. The comparison between the one-period and two-period lag specifications is presented in Table 5 (Appendix).

Removing the corruption variable does not significantly alter the results. The convergence effect remains strong and statistically significant, while the investment coefficient becomes more precisely estimated. This indicates that corruption does not exert an independent effect within this specification. Similarly, excluding political stability does not alter the main findings. In fact, the coefficient on lagged income becomes slightly larger and more significant, suggesting that political stability adds limited explanatory power in this model. The sensitivity analysis to the exclusion of institutional variables is reported in Table 6 (Appendix).

Based on the estimated convergence speed, the implied half-life of income convergence is approximately fifteen years. In practical terms, this means it takes about fifteen years to close half of the income gap relative to the European Union average. At this pace, full convergence would take roughly ninety to a hundred years (Figure 1).

The detailed PCSE regression output is provided in Figure 2 and Table 2 (Appendix). The baseline coefficient on lagged relative GDP per capita is −0.0466 (p = 0.003), implying an annual adjustment rate of approximately 0.0477 and a convergence half-life of about 14.5 years. Table 1 illustrates the associated reduction in a normalized income gap, initially set at 100.

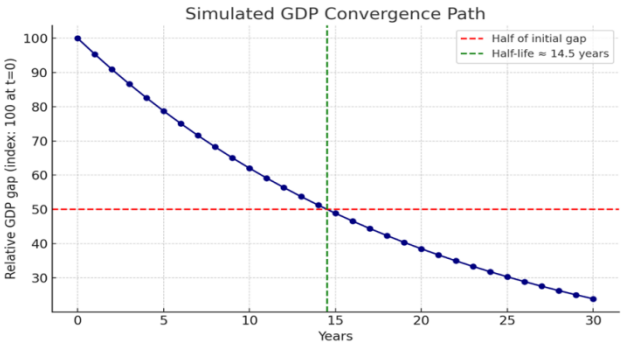


Fig. 1: Simulated GDP Convergence Path in the Western Balkans
Source: created by the authors

Table 1. Illustrative Convergence Path Under the Baseline PCSE Estimate

Year	**Relative gap (y t, starting from 100)**
0	100.0
5	$100 \times \exp(-0.0477 \times 5) \approx 78.8$
10	$100 \times \exp(-0.0477 \times 10) \approx 62.1$
15	$100 \times \exp(-0.0477 \times 15) \approx 48.9$
20	$100 \times \exp(-0.0477 \times 20) \approx 38.5$
25	$100 \times \exp(-0.0477 \times 25) \approx 30.3$
30	$100 \times \exp(-0.0477 \times 30) \approx 23.9$

Source: created by the authors.

Under an unchanged adjustment rate, the remaining gap would fall to roughly 1% of its initial size after about 97 years. This long-run extrapolation is illustrative rather than a forecast of the exact date of income parity.

Among the control variables, Gross Fixed Capital Formation appears as the only statistically significant determinant of growth in GDP per capita. In contrast, FDI inflows and political or institutional quality indicators (such as governance or stability scores) do not show statistically significant effects in the baseline specification, suggesting a limited short-term impact of these variables on convergence in the current regional context.

4 Conclusion

The results of the analysis highlight that the economic convergence of the Western Balkan countries towards the European Union average is an ongoing process but remains far from completion. The presence of conditional β-convergence suggests that countries with a lower GDP per capita are, on average, growing faster. In relative terms, this is consistent with the convergence framework where poorer economies tend to catch up, other things equal. Although there is evidence of convergence, the pace is too slow to close the income gap within a reasonable period. Based on the estimates, it would take roughly fifteen years to reduce half of the gap with the European Union, while full convergence would likely take more than ninety years if current trends continue. This highlights that a negative β is necessary but not sufficient for "fast" convergence: the economic relevance depends on the magnitude of β and on whether the underlying growth drivers persist over time. A notable result of the analysis is the weak and statistically insignificant role of foreign direct investment (FDI) and institutional quality—factors that are often seen as key drivers of development. In the Western Balkan context, this finding indicates that these variables may not yet have a strong enough structural impact to drive growth. However, this null result should be interpreted cautiously and does not imply that FDI or institutions are unimportant for long-run convergence. This limited impact can be partly explained by the way FDI is used. In many cases, it is directed toward sectors such as construction for speculative activities or tied to the privatization of public services, with only modest effects on job creation or overall productivity. More broadly, the effect of FDI on growth depends on where the investment is directed and how well the local economy can absorb it, through factors such as skills, infrastructure, and connections with domestic firms. As a result, higher overall FDI inflows do not necessarily lead to immediate or measurable productivity gains. Similarly, institutional quality may influence growth through longer lags and indirect channels (e.g., investment efficiency, resource allocation, innovation) and may involve non-linear or threshold effects that are difficult to detect in a parsimonious panel model. Finally, the small number of countries, limited changes in governance over time, and shared regional shocks make it harder to detect these effects statistically. In contrast, Gross Fixed Capital Formation (GFCF) is the only variable clearly linked to higher GDP per capita, highlighting the key role of domestic investment, both public and private, in driving economic growth. Importantly, this does not mean institutions do not matter; rather, it suggests that the most immediate and detectable channel in our specification is domestic investment, while institutions may work by shaping the productivity and allocation of that investment over time. Considering this evidence, we can see that there is a need for stronger public policies to help development. These policies should create an environment for growth. It is crucial to work on areas at the same time:

-improving how institutions work, stopping corruption, ensuring political stability, and increasing productivity through digitalization, developing human skills, and technological innovation. In this sense, accelerating convergence requires not only increasing investment volumes but also

-improving the conditions that raise the efficiency and productivity of capital accumulation. Furthermore, European integration must be accompanied by a more strategic use of pre-accession funds (IPA) and a strengthening of coordination between national policies and EU priorities. In conclusion, it is asserted that while positive signs exist, the current pace of convergence is insufficient to ensure rapid alignment with European economic levels. The findings therefore point to a slow but ongoing catch-up process, where shortening the implied convergence horizon depends on strengthening investment dynamics alongside institutional and structural reforms whose effects may be gradual but are critical for sustained long-run growth. Only through a concerted, multilevel action focused on institutional and economic sustainability can the Western Balkan countries genuinely shorten the timeframe for their integration and achieve a level of development comparable to that of the European Union.

Declaration of Generative AI and AI-assisted Technologies in the Writing Process

During the preparation of this work, the author(s) utilized artificial intelligence (AI) technologies solely for the purpose of linguistic refinement and grammatical correction. Following the application of these tools, the author(s) comprehensively reviewed, verified, and edited the resulting text. The author(s) maintain full accountability and responsibility for the accuracy, integrity, and final content of the publication.

References:

[1] Estrin, S., & Uvalic, M. (2013). *Foreign direct investment into transition economies: Are the Balkans* LSE "Europe in Question" Discussion Paper Series, European Institute, London

School of Economics and Political Science, London. *different?* (LEQS Paper No. 64).

[2] Topi, K., & Xhepa, S. (2023). Quality of institutions, foreign direct investments and economic growth: Empirical evidence from Balkan economies. Economicus, 22(1), 43–52. https://doi.org/10.58944/suvu3944.

[3] González-Álvarez, M. A., Montañés, A., Ruiz, E., & Uku, S. (2025). Economic convergence of Balkan regions towards EU. *Journal of Applied Economics, 28*(1), 2460149. https://doi.org/10.1080/15140326.2025.2460149.

[4] Petrakos, G., & Totev, S. (2000). Economic structure and change in the Balkan region: Implications for integration, transition and economic cooperation. *International Journal of Urban and Regional Research, 24*(1), 95–113.

[5] Lorena, Š. (2010). Transition process in the Western Balkans: How much successful is this story? *Intelligent Information Management, 2*, 243–252. Issue 4. https://doi.org/10.4236/iim.2010.23029.

[6] *(text in Italian)* Muco, K. (2015). An analysis of the Albanian development model in the post-communist period: Economic change and specialization (*L'analisi del modello di sviluppo albanese nel periodo post-comunismo: Il cambiamento economico e la specializzazione). (Doctoral dissertation, Università degli Studi dell'Insubria).*

[7] Lucarelli, S., Muço, K., & Valentini, E. (2024). Short run and long run effects of corruption on economic growth: Evidence from Balkan countries. *Economies, 12*(4), 86. https://doi.org/10.3390/economies12040086.

[8] Besimi, F., & Monastiriotis, V. (2019). *The role of EU integration in accelerating structural reforms in the Western Balkans: Evidence, theory and policy* (LEQS Paper No. 140/2019). LSE "Europe in Question" Discussion Paper Series, European Institute, London School of Economics and Political Science, London, [Online]. https://www.lse.ac.uk/european-institute/Assets/Documents/LEQS-Discussion-Papers/LEQSPaper140.pdf (Accessed Date: January 15, 2026).

[9] Mirel, P. (2018). *The Western Balkans: Between stabilization and integration in the European Union*. Fondation Robert Schuman, [Online]. https://www.robert-schuman.eu/en/european-issues/459-the-western-balkans-between-stabilisation-and-integration-in-the-european-union (Accessed Date: January 25, 2026).

[10] Kadia, A. (2020). Corruption and economic growth in the Balkan countries. European Journal of Economics and Business Studies, 6(3), 88–97. https://doi.org/10.26417/228vne34n.

[11] Muco, K., Karra, B., Karma, E. (2024). Economic and institutional convergence of Western Balkans on European Union. *Spațiul schengen. De ambele părți ale granițelor*, 91-108. Published in Polis, Vol. XII, No. 2(44), pp. 91–108.

[12] Barro, R. J., Mankiw, N. G., & Sala-i-Martin, X. (1992). *Capital mobility in neoclassical models of growth* (No. w4206). National Bureau of Economic Research. https://ssrn.com/abstract=227071.

[13] OECD. (2023). Economic Convergence Scoreboard for the Western Balkans 2023 (No. 2023/01). OECD Publishing. https://doi.org/10.1787/2f4b0366-en.

[14] Majocchi, A., & Strange, R. (2007). The FDI location decision: Does liberalisation matter? Transnational Corporations, 16(2), 1–40.

[15] Murati, G., Shala, S., & Hoti, A. (2024). The internal and external factors: EU contestation in Kosovo as a peripheral country. *Krytyka Prawa*, 100, https://doi.org/10.7206/kp.2080-1084.661.

[16] Nedić, V., Despotović, D., Cvetanović, S., Djukić, T., & Petrović, D. (2020). Institutional reforms for economic growth in the Western Balkan countries. Journal of Policy Modeling, 42(5), 933–952. https://doi.org/10.1016/j.jpolmod.2020.04.002.

[17] Beckers, A., Micklitz, H. W., Vallejo, R., & Letto-Vanamo, P. (Eds.). (2024). *The foundations of European transnational private law*. Hart Publishing. doi: 10.5040/9781509962952. Oxford: Hart Publishing, 424 pp. ISBN: 978-1-5099-6292-1.

[18] Bartlett, W. (2008). *Europe's troubled region: Economic development, institutional reform and social welfare in the Western Balkans*. Routledge. ISBN: 9780415748490.

[19] Smolo, E. (2021). The FDI and economic growth in the Western Balkans: The role of institutions. Journal of Economic Cooperation and Development, 42(4), 147–170. https://doi.org/10.5281/zenodo.17054519.

[20] Belloni, R. (2019). Western Balkans transitions and the role of the European Union. In *The Rise and Fall of Peacebuilding in the Balkans* (pp. 135–169). Springer International

Publishing. https://doi.org/10.1007/978-3-030-14424-1.

[21] Baldwin, R. E., & Wyplosz, C. (2004). *The economics of European integration*. McGraw-Hill. 458 pp. ISBN: 13 978-0-07-710394-1.

[22] Daviddi, R., & Uvalić, M. (2024). Does external finance facilitate economic convergence? A comparison between the Western Balkans and Central and Eastern Europe. Robert Schuman Centre for Advanced Studies Research Paper No. 2024/51, European University Institute. https://doi.org/10.2139/ssrn.5019646.

[23] Valmeki, D., Jindra, B., & Marek, P. (2016). FDI, human capital and income convergence: Evidence for European regions. *Economic Systems, 40*(2), 288–307. do: 10.1016/j.ecosys.2015.11.001.

[24] Maličká, L. (2024). Convergence of EU countries according to economic complexity. *Journal of Infrastructure, Policy and Development, 8*(3), 3123. doi:10.24294/jipd. v8i3.3123.

[25] Bevan, A. A., & Estrin, S. (2004). The determinants of foreign direct investment into European transition economies. *Journal of Comparative Economics, 32*(4), 775–787. https://doi.org/10.1016/j.jce.2004.08.006.

[26] Tondl, G., & Vuksic, G. (2003). *What makes regions in Eastern Europe catching up? The role of foreign investment, human resources, and geography* (ZEI Working Paper No. B 12-2003). Zentrum für Europäische Integrationsforschung (ZEI), Rheinische Friedrich-Wilhelms-Universität Bonn.

[27] Sala-i-Martin, X. (1996). Regional cohesion: Evidence and theories of regional growth and convergence. *European Economic Review, 40*(6), 1325–1352. https://doi.org/10.1016/0014-2921(95)00029-1.

[28] Corrado, C., Hulten, C., & Sichel, D. (2005). Measuring capital and technology: An expanded framework. In *Measuring capital in the new economy* (pp. 11–46). University of Chicago Press.

[29] Ezcurra, R., Iraizoz, B., & Pascual, P. (2009). Total factor productivity, efficiency, and technological change in the European regions: A nonparametric approach. *Environment and Planning A: Economy and Space, 41*(5), 1152–1170. doi: 10.1068/a40362.

[30] Tselios, V., Rodríguez-Pose, A., Pike, A., Tomaney, J., & Torrisi, G. (2012). Income inequality, decentralisation, and regional development in Western Europe. *Environment and Planning A: Economy and Space, 44*(6), 1278–1301. doi: 10.1068/a44334.

[31] Degl'Innocenti, M., Matousek, R., & Tzeremes, N. G. (2017). Financial centres' competitiveness and economic convergence: Evidence from the European Union regions. *Environment and Planning A: Economy and Space, 50*(1), 133–156. doi: 10.1177/0308518X17740894.

[32] (text in Spanish) Stezano, F. (2021). Approaches, definitions, and estimates of poverty and inequality in Latin America and the Caribbean: a critical analysis of the literature (Enfoques, definiciones y estimaciones de pobreza y desigualdad en América Latina y el Caribe: Un análisis crítico de la literatura), 7, LC/MEX/TS.2020/38/Rev.1.

[33] Duro, E., Kokaveshi, E., & Muço, K. (2023). Testing pair-wise convergence of Western Balkan and European Union countries. *European Journal of Sustainable Development, 12*(4), 455. doi: 10.14207/ejsd. 2023.v12n4p455.

[34] Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *The Quarterly Journal of Economics, 107*, 407–437.

[35] Sala-i-Martin, X. X., & Barro, R. J. (1997). *Technological diffusion, convergence, and growth* (No. 735). Center discussion paper. Yale University, Economic Growth Center, New Haven, CT. https://doi.org/10.1023/A:1009746629269.

[36] Sachs, J. D., & Warner, A. M. (1995). Natural resource abundance and economic growth (NBER Working Paper No. 5398). doi: 10.3386/w5398.

[37] Vintrová, R. (2005). What the GDP indicator does not reveal in economic analyses (in English). *Czech Journal of Economics and Finance, 55*(11–12), 578–594.

[38] Evans, J., & Mathur, A. (2005). The value of online surveys. *Internet Research, 15*, 195–219. doi: 10.1108/10662240510590360.

[39] Stavytskyy, A. V., & Kozub, M. B. (2020). Modeling of economic convergence processes in Eastern European countries. *Ekonomika, 99*(2), 6–19. doi: 10.15388/Ekon.2020.2.1.

[40] Gashi, S., & Avdulaj, J. (2024). Economic convergence of the Balkan countries towards the European Union (Special issue). *Journal of Governance & Regulation, 13*(1), 471–479. doi: 10.22495/jgrv13i1siart19.

[41] Lungu, A., Roman, M. D., & Stanculescu, D. M. (2024). EU convergence: A pathway to economic stability. *Eastern European Journal for Regional Studies (EEJRS)*, Vol. 10, Issue 1, 2024, pp.6–30. ISSN: 1857-436X, ISSN: 2537-6179.

[42] Parežanin, M. (2024). *Bridging progress: Digital transformation in the Western Balkans* (pp. 34–41). Aspen Institute Germany. https://rfos.fon.bg.ac.rs/handle/123456789/2837. ISSN: 2940-4169.

[43] Radosavljević, M., Rogelja, T., Masiero, M., Čomić, D., Glavonjić, B., & Pette-nella, D. (2024). Institutional and actor-oriented factors influencing timber legality in selected Western Balkan countries: Multiple case study of Croatia, Montenegro, Serbia, Slovenia, and the Republic of Srpska (Bosnia and Herzegovina). *Forest Policy and Economics*, *166*, 103261. https://doi.org/10.1016/j.forpol.2024.103261.

[44] Besim, F. (2017). How structural reforms and European integration can help aid the convergence of Western Balkan states with the EU. *LSE European Politics and Policy (EUROPP) Blog*, [Online]. https://blogs.lse.ac.uk/europpblog/2017/07/07/western-balkans-eu-convergence-structural-reforms/ (Accessed Date: February 20, 2026).

[45] Velić, I., & Cvečić, I. (2024). Monetary integration effects foreign direct investments in new EU member states. *The Journal of Economic Integration*, *39*(1), 55–85. doi: 10.11130/jei.2024008.

[46] Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation. *American Economic Review, 91*(5), 1369–1401. https://doi.org/10.1257/aer.91.5.1369.

[47] Zhelyazkova, A., Thomann, E., Ruffing, E., & Princen, S. (2024). Differentiated policy implementation in the European Union. West European Politics, 47(3), 439–465. https://doi.org/10.1080/01402382.2023.2257963.

[48] Mashamba, T., Magweva, R., & Gani, S. (2023). Bank profitability and economic growth in the emerging markets: The mediating role of stability (Special issue). *Corporate & Business Strategy Review, 4*(2), 386–401. doi: 10.22495/cbsrv4i2siart18.

[49] Nguyen Anh Tu. (2024). Innovation and foreign direct investment attraction in developing countries. *Cogent Economics & Finance*, *12*(1), 2312386. doi: 10.1080/23322039.2024.2312386.

[50] Muco, K., & Balliu, G. (2018). Crescita economica e corruzione: Quale impatto nei paesi balcanici? *Moneta e Credito, 71*(284), 297–309.

[51] Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions rule: The primacy of institutions over geography and integration in economic development. *Journal of Economic Growth*, *9*, 131–165.

[52] Bartlett, R., Morse, A., Stanton, R., & Wallace, N. (2022). Consumer-lending discrimination in the FinTech Era. *Journal of Financial Economics, 143*(1), 30–56. https://doi.org/10.1016/j.jfineco.2021.05.047.

[53] Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies, 58*(2), 277–297. https://doi.org/10.2307/2297968.

[54] Bond, S, A Hoeffler and J Temple (2001), 'DP3048 GMM Estimation of Empirical Growth Models', CEPR Discussion Paper No. 3048. CEPR Press, Paris & London. https://cepr.org/publications/dp3048.

[55] Beck, N., & Katz, J. N. (1995). What to do (and not to do) with time-series cross-section data. *The American Political Science Review, 89*(3), 634–647. doi: 10.2307/2082979.

[56] Plümper, T., & Troeger, V. E. (2007). Efficient estimation of time-invariant and rarely changing variables in finite sample panel analyses with unit fixed effects. *Political Analysis, 15*(2), 124–139.

[57] Reed, W. R., & Webb, R. (2010). The PCSE estimator is good—Just not as good as you think. *Journal of Time Series Econometrics, 2*(1), 1–26. https://doi.org/10.2202/1941-1928.1032.

Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

The authors equally contributed in the present research, at all stages from the formulation of the problem to the final findings and solution.

Sources of Funding for Research Presented in a Scientific Article or Scientific Article Itself

The authors declare that this research received no external funding.

Conflict of Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

Creative Commons Attribution License 4.0 (Attribution 4.0 International, CC BY 4.0)

This article is published under the terms of the Creative Commons Attribution License 4.0
https://creativecommons.org/licenses/by/4.0/deed.en_US

APPENDIX

```
Prais-Winsten regression, correlated panels corrected standard errors (PCSEs)

Group variable:    country                      Number of obs      =       115
Time variable:     year                         Number of groups   =         6
Panels:            correlated (unbalanced)      Obs per group:
Autocorrelation:   panel-specific AR(1)                       min =        15
Sigma computed by pairwise selection                          avg =  19.166667
                                                              max =        22
Estimated covariances      =        21          R-squared          =    0.1397
Estimated autocorrelations =         6          Wald chi2(5)       =     12.29
Estimated coefficients     =         7          Prob > chi2        =    0.0310

                             Panel-corrected
dlrel_gdppc |  Coefficient  std. err.      z    P>|z|     [95% conf. interval]
------------+----------------------------------------------------------------
lrel_gdppc  |
        L1. |  -.0466308   .0159643    -2.92   0.003    -.0779203   -.0153414
            |
        FDI |   .0013586   .0010647     1.28   0.202    -.0007281    .0034454
  Stability |  -.0001758   .0002649    -0.66   0.507     -.000695    .0003434
 Investment |   3.08e-12   1.18e-12     2.62   0.009     7.72e-13    5.38e-12
  GovEffect |  -.0001454   .0002066    -0.70   0.482    -.0005504    .0002595
 Corruption |   .0003295    .000282     1.17   0.243    -.0002231    .0008821
      _cons |  -.0876328   .0460294    -1.90   0.057    -.1778488    .0025832
------------+----------------------------------------------------------------
       rhos =  .0990517  -.0896178  -.5357428  -.3613969  -.0967698   .2037247
```

Fig. 2: PCSE Regression Output for Conditional β-Convergence
Source: created by the authors

Table 2. Panel Regression Results for Conditional β-Convergence

Group variable: country		**Number of obs = 115**
Time variable: year		Number of groups = 6
Panels: correlated (unbalanced)		min = 15
Autocorrelation: panel-specific AR (1)		avg = 19.166667
Sigma computed by pairwise selection		max = 22
Estimated covariances = 21		R-squared = 0,1397
Estimated autocorrelations = 6		Wlad chi2(5) = 12.29
Estimated coefficients = 7		Prob > chi2 = 0,0310
Growth	***Coefficient***	***P >| z |***
Lrel_gdppc L1.	-0,0466	0,003
FDI	0,00135	0,202
Stability	-0,0001	0,507
Gross Fixed Cap. Form.	3,08e-12	0,009
Corruption	0,00033	0,243
Constant	-0,0876	0,057

Source: created by the authors.

Table 3. Comparative Results of the PCSE, DK, and FGLS Models

Variable	***PCSE Model***	***DK Model***	***FGLS Model***

Variable	***PCSE Model***		***DK Model***		***FGLS Model***	
	Coef	P>|z|	*Coef*	P>|z|	*Coef*	P>|z|
Lrel_gdppc L1.	*-0,0466*	0,003	*-0,1593*	0,009	*-0,05*	0,006
FDI	*0,00135*	0,202	*0,00069*	0,508	*0,00138*	0,059
Stability	*-0,0001*	0,507	*-0,0004*	0,850	*-0,00019*	0,506
GFCF	*3.08e-12*	0,009	*1,58e-11*	0,000	*2.85e-12*	0,032
GovEffect	-0,00015	0,482	0,00018	0,773	-0,00009	0,753
Corruption	*0,00033*	0,243	*0,00038*	0,277	*0,00026*	0,545
Constant	*-0,0876*	0,057	*-0,355*	0,013	*-0,093*	0,082

Source: created by the authors

Table 4. PCSE Regression Results with Country and Time Effects

dlrel_gdppc	Panel-corrected Coefficient	std. err.	z	P>|z|	[95% conf.	interval]
lrel_gdppc						
L1.	-.5558726	.1078671	-5.15	0.000	-.7672882	-.3444569
FDI	.0014328	.0013467	1.06	0.287	-.0012068	.0040723
Investment	2.92e-11	4.28e-12	6.81	0.000	2.08e-11	3.75e-11
Stability	-.0000137	.0004126	-0.03	0.974	-.0008223	.0007949
Corruption	.0009152	.0004461	2.05	0.040	.0000408	.0017895
GovEffect	.0002745	.0005167	0.53	0.595	-.0007383	.0012873
country						
2	-2.693992	2.681032	-1.00	0.315	-7.948718	2.560734
3	-2.709933	3.090368	-0.88	0.381	-8.766943	3.347077
4	12.19283	6.962769	1.75	0.080	-1.453941	25.83961
5	7.111402	2.006349	3.54	0.000	3.17903	11.04377
6	27.73673	5.168935	5.37	0.000	17.60581	37.86766
country#c.year						
1	.0074248	.0023884	3.11	0.002	.0027435	.012106
2	.0088031	.0022025	4.00	0.000	.0044862	.01312
3	.0087528	.0031099	2.81	0.005	.0026575	.0148481
4	.0015272	.0028264	0.54	0.589	-.0040125	.0070669
5	.0039729	.001786	2.22	0.026	.0004724	.0074734
6	-.0063052	.0018481	-3.41	0.001	-.0099274	-.002683
_cons	-16.20828	4.988135	-3.25	0.001	-25.98485	-6.431717
rho	.0044466					

Source: created by the authors

Table 5. Comparison of the PCSE Model with One-Period and Two-Period Lags

Variable	**Lag 1 Coef**	**Lag 2 Coef**
Lrel_gdppc	-0.0466***	-0.0310*
Significance	0.003	0.087

Source: created by the authors

Table 6. Sensitivity Analysis to the Exclusion of Institutional Variables

Variable	***Stability***		***Corruption***		***GovEffect***	
	With P>|z|	Without P>|z|	*With* P>|z|	Without P>|z|	With	Without
Lrel_gdppc L1.	0,003	0,002	0,003	0,001	0,003	0,003
FDI	0,202	0,259	0,202	0.13	0,202	0,243
Stability	0,507		0,507	0.42	0,507	0,422
GFCF	0,009	0.008	0,009	0.004	0,009	0,008
GovEffect	0,482	0,456	0,482	0,47	0,482	
Corruption	0,243	0.347	0,243		0,243	0,18
Constant	0,057	0.040	0,057	0,025	0,057	0,043

Source: created by the authors