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## THE NEXUS OF GROWTH, INFLATION AND UNEMPLOYMENT IN THE WESTERN BALKAN ECONOMIES

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**Abstract:** The economies of the Western Balkan countries have undergone through prolonged economic transition and have been repeatedly exposed to external shocks such as economic crisis, financial crisis, wars and conflicts, and this has also led to macroeconomic crises of this region. In this regard, this study will investigate the nexus of the main macroeconomic indicators, aiming to identify the dynamic interrelationship among real GDP growth, inflation CPI and unemployment. The purpose of the paper is to contribute to empirical literature by providing empirical evidence and by clarifying whether classical macroeconomic trade-offs, such as those implied by Okun's Law and the Phillips Curve hold in small transition economies such as the Western Balkan countries.

The analysis employs annual panel dataset covering six Western Balkan economies (Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia and Serbia), over the period 2000–2023. The empirical approach combines correlation analysis, country-specific ordinary least squares OLS regressions, and panel fixed-effects (FE) estimations. Okun's law is tested through the growth–unemployment relationship, while a reduced form Phillips curve framework is employed to examine the inflation–unemployment trade-off. The findings indicate no strong or systematic evidence that higher GDP growth consistently reduces unemployment across the WB-6, suggesting a weak or absent Okun-type relationship. Inflation and GDP growth are found to co-move positively, supporting the hypothesis of a short-run growth–inflation linkage. And the evidence for a Phillips-type trade-off is mixed, with inflation reducing unemployment only in certain countries or periods, reflecting heterogeneous labor market structures and institutional conditions. The results suggest that in Western Balkan economies, inflation and growth tend to move together in the short run, but economic growth alone does not reliably translate into lower unemployment. The inflation–unemployment relationship appears state-dependent and sensitive to structural and institutional factors especially during crisis.

Policy efforts should focus on growth-enhancing structural reforms, particularly in labor markets, education and productivity, rather than relying on demand-side growth or inflationary pressures for reducing unemployment.

The analysis is based on harmonized secondary data from international recognized sources, including the World Bank, IMF, Eurostat, ensuring comparability and reliability across countries and over time and providing policy-relevant and transparent elasticity estimates for the WB-6 region.

**Keywords:** economic growth, inflation, unemployment, Western Balkans

### 1. INTRODUCTION

The interaction between economic growth, inflation, and unemployment has been a central issue in macroeconomic research, with extensive evidence showing that these relationships are neither stable nor uniform across countries of the Western Balkan region and thus because of transitional economic conditions shaped by wars, civil conflict and external shocks such as global financial crisis and pandemic crisis. Three main theoretical and empirical strands dominate the literature: the inflation–unemployment trade-off, the growth–unemployment nexus, and the inflation–growth relationship.

This study examines the interrelationship among three key macroeconomic indicators: real GDP growth, inflation, and unemployment, in the Western Balkan countries (WB-6) excluding Kosovo, because of missing data. Unemployment is treated as a central structural challenge, as it remains one of the most persistent constraints on economic development in the region.

The objective of the paper is to analyze how real GDP growth, consumer price inflation and unemployment interact in small open economies of the Western Balkans. Specifically, by addressing three questions: whether higher GDP growth reduces unemployment, whether higher inflation is associated with stronger GDP growth, and whether inflation and unemployment exhibit an inverse Phillips-curve relationship. By focusing exclusively on these variables, the analysis provides a transparent and replicable baseline framework.

The inflation–unemployment relationship is traditionally explained by the Phillips curve (Phillips, 1958), later extended by Samuelson and Solow (1960) as a short-run policy trade-off. Empirical evidence for transitioning economies remains mixed. Recent studies for the Western Balkans find weak and country-specific Phillips-type

effects: inflation reduces unemployment in some cases (Balliu & Brodzicki, 2022; Dimovski et al., 2023), while other studies report limited or unstable relationships (Vladi & Hysa, 2019).

The growth–unemployment relationship is commonly analyzed through Okun’s Law (Okun, 1962), which predicts a negative association between output growth and unemployment. While some evidence supports this relationship in Balkan economies (Balliu & Brodzicki, 2022), a growing literature documents “jobless growth,” particularly in post-transition and post-crisis contexts. Ball, Leigh, and Loungani (2017) show that higher growth does not necessarily translate into employment gains. For the Western Balkans, recent evidence of panel and country-level analyzes show that economic growth does not systematically reduce unemployment across WB-6 economies (Tumanoska, 2020; Arifi et al., 2023; Živković, 2022)

The inflation–growth relationship exhibits similarly mixed findings. Early contributions suggest that inflation affects growth through investment and productivity channels (Fischer, 1993; Barro, 2013). Recent studies for the Western Balkans report a positive association between inflation and GDP growth, supporting demand-driven dynamics (Dimovski et al., 2023; Malenković, 2022). IMF analysis shows that inflation in the region since 2022 has been driven by a combination of external price shocks and domestic demand pressures, with measurable effects on output fluctuations (IMF,2023) In contrast, other studies find a negative relationship, particularly in developed economies or at higher inflation levels (Akinsola & Odhiambo, 2017; Gokal & Hanif, 2004).

Overall, the literature indicates that the links between growth, inflation, and unemployment are highly context dependent. For the Western Balkans, recent evidence points to weak Okun-type dynamics, fragile Phillips-curve effects, and a stronger role for inflation in shaping short-term output. This study contributes by providing updated country-level and panel evidence for the WB-6 economies.

## 2. MATERIALS AND METHODS

The study uses annual panel data for Western Balkan countries over the period 2000–2023. The variables include real GDP growth (annual % change), consumer price inflation (CPI, annual %), and total unemployment (% of labor force). All data are obtained from the World Bank. Kosovo is excluded from empirical analysis due to data limitations.

The analysis proceeds in three steps. First, Pearson correlation coefficients are estimated to describe the basic associations among three variables GDP growth, inflation, and unemployment. Correlations provide preliminary evidence on whether GDP growth is associated with unemployment reduction, and whether inflation behaves in line with Phillip’s curve expectations.

Second, country-level OLS regressions are applied to assess the effects of GDP growth and inflation on unemployment. This approach allows us to observe heterogeneity in how each economy’s labor market responds to growth and inflation.

Third, panel fixed-effects models are estimated to capture unobserved country-specific heterogeneity. Two baseline specifications are employed: (i) unemployment as a function of GDP growth and inflation, and (ii) GDP growth as a function of inflation and unemployment. This multi-step approach allows for both country-specific and regional-level inference.

## 3. RESULTS

The correlation analysis results generally a weak and heterogeneous relationships across the Western Balkan economies. In Albania and North Macedonia, economic growth is positively associated with unemployment, contradicting conventional expectations and suggesting that higher growth has not translated into job creation. Bosnia and Herzegovina exhibits an almost negligible association between growth and unemployment. Montenegro shows a marginally negative correlation, close to zero, while inflation is strongly and positively linked to unemployment—an outcome that runs counter to standard macroeconomic theory. Serbia emerges as the only country displaying the anticipated inverse relationship (–0.30), whereby stronger GDP growth is accompanied by declining unemployment. At the same time, inflation in Serbia is positively correlated with growth, pointing to a demand-led expansion dynamic. (see Table1)

**Table 1. Correlations between GDP growth, Inflation, and Unemployment by country (2000–2023)**

Country	GDP–Unemployment	Inflation–Unemployment	GDP–Inflation
<b>Albania</b>	+0.29	-0.23	+0.10
<b>Bosnia &amp; Herzegovina</b>	+0.10	-0.32	+0.28
<b>Montenegro</b>	-0.06	+0.55	+0.07
<b>North Macedonia</b>	+0.27	-0.34	+0.04
<b>Serbia</b>	-0.30	-0.15	+0.37

Source: Authors calculations.

The regression results indicate that economic growth does not systematically reduce unemployment in the Western Balkans. For Albania, no coefficients are statistically significant, and GDP enters with a positive sign. Bosnia and Herzegovina provides weak evidence of a Phillips-type effect, with inflation reducing unemployment at the 10% significance level. In Montenegro, inflation is positively and significantly associated with unemployment. North Macedonia shows weak evidence of a negative inflation–unemployment relationship, while the GDP coefficient remains positive. Serbia is the only country in which GDP growth is negatively related to unemployment, consistent with Okun’s Law, although the coefficient is not statistically significant. Overall, the estimates suggest limited responsiveness of unemployment to growth. (see Table2)

**Table 2. Regression of Unemployment on GDP Growth and Inflation (OLS by country, 2000–2023)**

Country	Inflation (CPI)	GDP Growth	Constant	R <sup>2</sup>
<b>Albania</b>	-0.400 (0.307)	+0.310 (0.198)	14.42***	0.15
<b>Bosnia &amp; Herzegovina</b>	-0.642* (0.360)	+0.444 (0.469)	24.05***	0.14
<b>Montenegro</b>	+0.422*** (0.136)	-0.105 (0.202)	18.81***	0.32
<b>North Macedonia</b>	-0.748* (0.424)	+0.842 (0.582)	27.88***	0.19
<b>Serbia</b>	-0.009 (0.048)	-0.432 (0.336)	17.19***	0.09

Source: Authors calculations.

At the regional level, the panel estimates show no statistically significant effect of either GDP growth or inflation on unemployment. The constant term, at approximately 20.5, indicates a persistently high baseline level of unemployment across the Western Balkans, meaning that growth in the Western Balkans does not translate into job creation, while inflation does not consistently reduce unemployment. (see Table3)

**Table 3. Panel Regression of Unemployment on GDP Growth and Inflation (Fixed Effects, 2000–2023)**

Variable	Coefficient	Std. Error
<b>GDP Growth</b>	+0.056	(0.172)
<b>Inflation (CPI)</b>	-0.015	(0.065)
<b>Constant</b>	20.53***	(0.418)

Source: Authors calculations.

The growth regression reveals a positive and statistically significant effect of inflation on GDP growth. A one-percentage-point increase in inflation is associated with an increase in growth of about 0.055 percentage points. The unemployment coefficient is not statistically significant. This pattern is consistent with demand-driven dynamics, where moderate inflation is associated with higher consumption and investment. The unemployment coefficient remains statistically insignificant, indicating that GDP growth is more closely related to price conditions than to labor market slack in the region. (see Table4)

**Table 4. Panel Regression of GDP Growth on Inflation and Unemployment (Fixed Effects, 2000–2023)**

Variable	Coefficient	Std. Error
<b>Inflation (CPI)</b>	+0.055***	(0.005)
<b>Unemployment</b>	+0.020	(0.055)
<b>Constant</b>	2.51*	(1.15)

Source: Authors calculations.

#### 4. DISCUSSIONS

The empirical results indicate that the relationship between economic growth, inflation, and unemployment in the Western Balkans is weak and heterogeneous. Evidence consistent with Okun's Law is found only for Serbia, where GDP growth is negatively related to unemployment, although the coefficient is not statistically significant. In the remaining countries, the growth–unemployment relationship is either positive or close to zero. At the regional level, the panel fixed-effects model confirms that GDP growth does not have a statistically significant effect on unemployment, while the constant term points to a persistently high baseline level of unemployment.

Inflation exhibits country-specific effects on labor market outcomes. It is negatively associated with unemployment in Bosnia and Herzegovina and North Macedonia, positively and significantly related to unemployment in Montenegro, and statistically insignificant in Albania and Serbia. In the regional panel, inflation does not exert a significant effect on unemployment.

By contrast, inflation plays a significant role in explaining output dynamics. The panel growth regression shows a positive and statistically significant relationship between inflation and GDP growth, with a one-percentage-point increase in CPI associated with an increase of approximately 0.055 percentage points in real GDP growth. Unemployment remains insignificant in the growth equation, indicating that short-term output fluctuations in the region are more closely related to price conditions than to labor market developments.

#### 5. CONCLUSIONS

Western Balkan countries (WB-6) entered the transition period with unfavorable initial conditions, characterized by low-income levels and persistently high unemployment during the 1990s. Against this background, this study examined the relationship between real GDP growth, inflation, and unemployment using annual data from the World Bank covering the period 2000–2023.

The empirical results indicate that inflation plays a significant role in explaining short-run GDP growth, with higher inflation associated with higher output growth, consistent with demand-driven dynamics. In contrast, the relationship between GDP growth and unemployment is weak and unstable across countries, providing limited support for Okun's Law at the regional level. While unemployment is negatively associated with GDP growth in some cases, economic expansion does not systematically translate into job creation in the Western Balkans, reflecting structural labor-market constraints.

Despite prolonged transition, heterogeneous policy frameworks, and repeated economic shocks, WB-6 economies have demonstrated a notable capacity for recovery. However, unemployment, particularly youth unemployment, remains a critical and unresolved challenge. Addressing this issue requires comprehensive structural reforms and coordinated policy interventions aimed at increasing the employment intensity of growth, fostering job creation, and improving labor-market integration. Future research should extend this analysis by incorporating institutional and structural variables to better capture the mechanisms linking growth, inflation, and employment in the region.

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