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Article

Public debt and fiscal consolidation in the Western Balkans: a panel analysis of growth effects

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Abstract. This study examines the impact of public debt on economic growth and the effects of fiscal consolidation efforts in the Western Balkan countries (WB6)—Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia. Utilizing a dual methodology of descriptive and panel data analysis, the research investigates whether higher public debt adversely affects economic growth and if fiscal consolidation measures lead to improved economic outcomes. The descriptive analysis identifies fiscal consolidation periods based on improvements in the cyclically-adjusted primary budget balance and subsequent changes in the public debt-to-GDP ratio. The econometric analysis employs both fixed-effects and random-effects panel regression models, using data from International Monetary Fund (IMF) - World Economic Outlook Databases covering the period 2000-2023. The findings reveal that higher levels of public debt are detrimental to economic growth across the WB6 countries. Conversely, successful fiscal consolidation, characterized by reductions in government expenditure relative to GDP, correlates with enhanced economic growth. The study underscores the importance of maintaining prudent debt levels and implementing effective fiscal policies. Recommendations for policymakers include prioritizing debt reduction strategies, improving revenue collection, and investing savings in infrastructure, education, and innovation to support long-term economic stability and growth.

Keywords: Western Balkans; debt-to-GDP ratio; fiscal consolidation; economic growth; panel data analysis
JEL classification: I1; D53; G15; G12; C22

1. Introduction

Public debt and fiscal policy have been central issues in economic discourse, particularly in the context of emerging economies such as the Western Balkan countries (WB6). The WB6 countries—comprising Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia—have experienced varying degrees of economic challenges and growth trajectories since the early 2000s. Amidst these challenges, the sustainability of public finances and the implications of fiscal consolidation efforts have garnered significant attention from policymakers and researchers alike.

Research Question: What is the impact of public debt on economic growth in the Western Balkan countries (WB6), and how do fiscal consolidation efforts affect this relationship?

Hypothesis: Based on existing literature and theoretical frameworks, we propose the following hypotheses:
H0: Higher levels of public debt in the WB6 countries negatively impact economic growth.
H1: Fiscal consolidation measures aimed at reducing public debt-to-GDP ratios lead to improved economic growth outcomes.

This study aims to contribute empirical evidence to inform policymakers and stakeholders about the implications of public debt and fiscal consolidation on economic performance in the Western Balkans.

2. Literature review

The literature on fiscal consolidation and debt management provides valuable insights into the challenges and strategies pertinent to the Western Balkan countries. Historically, these nations have navigated complex economic transitions and geopolitical shifts, influencing their fiscal policies and debt dynamics (Blejer & Leone, 2020; World Bank, 2021). Post-conflict reconstruction efforts and institutional reforms have shaped their fiscal landscapes, impacting revenue generation, expenditure priorities, and debt sustainability (International Monetary Fund [IMF], 2019).

Scholars highlight the theoretical foundations of fiscal consolidation, emphasizing the trade-offs between short-term stabilization measures and long-term fiscal sustainability (Alesina & Perotti, 1994, 1999; Wyplosz, 2013). Effective consolidation strategies typically involve a balanced approach of expenditure rationalization, revenue enhancement, and structural reforms (von Hagen & Harden, 1995). Case studies from diverse economies underscore the importance of political commitment and institutional capacity in achieving successful fiscal adjustment (Cottarelli & Giannini, 2017; European Commission, 2020). In the context of the Western Balkans, fiscal challenges are exacerbated by high levels of public debt and vulnerabilities to external shocks (IMF, 2022). Countries such as Serbia and Montenegro have implemented fiscal consolidation programs aimed at reducing deficits and stabilizing debt-to-GDP ratios amidst varying degrees of political stability and institutional capacity (Milosavljevic, 2018; World Bank, 2020).

The European Union integration process plays a pivotal role in shaping fiscal policies in the region, influencing governance standards and economic convergence goals (European Commission, 2021). Regional initiatives, such as the Western Balkans Investment Framework, aim to foster economic resilience and infrastructure development through targeted financial assistance and policy coordination (European Investment Bank, 2019; Regional Cooperation Council, 2020).

Empirical evidence suggests that credible fiscal reforms can enhance investor confidence, stimulate economic growth, and improve social outcomes (Acemoglu et al., 2019; EBRD, 2021). However, challenges persist in achieving sustainable fiscal outcomes amidst political instability, corruption risks, and demographic pressures (Marinov et al., 2017; World Bank, 2023).

3. Methodology

To investigate the impact of fiscal consolidation on economic growth in Western Balkan countries, this study employs a dual approach: descriptive analysis and panel data analysis.

The descriptive analysis first outlines the criteria for identifying periods of fiscal consolidation, following the framework established by Alesina and Ardagna (1998) and adapted for post-transition economies by Mirdala (2013). Fiscal consolidation periods are defined by either:

- A one-year improvement in the cyclically-adjusted primary budget balance of at least 1.5% of GDP, or
- Three consecutive years where this balance does not deteriorate by more than 0.5% of GDP.

A fiscal consolidation is considered successful if, over the three-year period following the consolidation:

- The cyclically-adjusted primary deficit decreases on average by at least 2% relative to its level in the consolidation year, or
- The public debt-to-GDP ratio is at least 5% lower than in the consolidation year.

Additionally, fiscal consolidation is classified as expansive if the average GDP growth rate during the consolidation period and the subsequent two years surpasses the average growth rate prior to consolidation (Alesina and Ardagna, 1998; Mirdala, 2013). Government expenditure as a percentage of GDP is used as a proxy for fiscal consolidation, following similar approaches in empirical literature. However, we recognize this is a simplified representation. Ideally, fiscal consolidation would be measured using structural balance changes or cyclically-adjusted primary balances, but such data are not consistently available across WB6 countries. As such, this proxy provides a workable—though limited—approximation of fiscal effort.

This study employs an econometric approach to investigate the relationship between public debt and economic growth in the Western Balkan countries (WB6). The research utilizes panel data analysis, which is well-suited for examining longitudinal data across multiple countries over time, allowing for the control of individual country-specific effects. Data for this study are sourced primarily from international databases such as the World Bank, International Monetary Fund (IMF), Eurostat, and national statistical offices of the Western Balkan countries. The dataset includes annual observations of key variables from 2000 to 2023, capturing macroeconomic indicators such as GDP growth rates, public debt as a percentage of GDP, inflation rates, unemployment rates, and government expenditure.

Variables

Dependent Variable:

GDP Growth Rate (GDP_growth): Annual percentage change in real GDP, representing the economic growth rate of each country in the Western Balkans.

Independent Variables:

Public Debt (public_debt): The ratio of gross government debt to GDP, reflecting the fiscal burden on the economy.

Control Variables: Includes variables such as inflation rate (inflation), unemployment rate (unemployment) and government expenditure as a percentage of GDP (gov_expenditure).

(i) Econometric Model Specification

Given the panel nature of the data, the analysis employs both fixed-effects and random-effects panel regression models to assess the impact of public debt on economic growth while controlling for other factors.

$$GDP\_growthit = \beta 0 + \beta 1 public\_debtit + \beta 2 control\_variablesit + \epsilon it$$

Where:

$GDP\_growthit$: Dependent variable representing GDP growth rate for country i in year t.

$public\_debtit$: Independent variable denoting public debt as a percentage of GDP for country i in year t.

$control\_variablesit$: Vector of control variables influencing GDP growth in country i in year t.

$\beta 0, \beta 1, \beta 2$: Coefficients to be estimated.

ϵit: Error term capturing unobserved factors affecting GDP growth.

(ii) Explanation for choosing the model

Panel Data Approach: The use of panel data allows for the examination of both cross-sectional and time-series variations across the WB6 countries. This approach is beneficial because it considers country-specific effects while controlling for unobserved heterogeneity that may affect economic growth.

Fixed-Effects vs. Random-Effects Models:

Fixed-Effects Model: By controlling for time-invariant country-specific effects, such as cultural, institutional, or geographical factors, this model helps isolate the impact of changes in public debt on economic growth within each country over time.

Random-Effects Model: Assuming no correlation between country-specific effects and public debt, this model provides average effects across the WB6 countries, providing broader insights into the relationship between public debt and economic growth.

While the Pooled OLS and Random Effects models are presented for comparison, the Fixed Effects model is preferred based on the Hausman test ($p = 0.03$). These additional models help to assess the consistency and robustness of the core relationship, though their underlying assumptions are less appropriate for capturing unobserved heterogeneity across WB6 countries.

Control Variables: Including variables such as inflation, unemployment, and government expenditure allows for a comprehensive analysis by accounting for other factors that may influence economic growth independently of public debt.

4. Estimations and results

Table 1. Effects of Fiscal Consolidation on Public Finances in Western Balkans

Country	Years of fiscal consolidation	Effects on public finances
Albania	2014-2016 2018-2019	- Reduced budget deficit from 5.2% to 2.4% of GDP (2014-2016) - Improved tax collection, reduced informal employment (2018-2019)
Bosnia and Herzegovina	2012-2014 2016-2017	- Narrowed budget deficit, modest decrease in public debt (2012-2014) More balanced budget, gradual decline in debt levels (2016-2017)
Kosovo	2015-2017	- Reduced budget deficit, maintained manageable debt level (2015-2017)
Montenegro	2017-2019	- Reduced budget deficit, curbed rapid growth of public debt (2017-2019)
North Macedonia	2012-2014 2017-2019	- Lowered budget deficit, stabilized public debt (2012-2014) - Reduced fiscal deficit, stabilized debt-to-GDP ratio (2017-2019)
Serbia	2014-2016 2017-2019	- Drastically reduced deficit from 6.6% to below 2% of GDP, decreased public debt (2014-2016) - Budget surplus by 2017, public debt declining steadily (2017-2019)

Source: Author's findings and calculations based on IMF, World Economic Outlook Databases

The Consolidation Factor Index is a theoretical construct that is be used to compare the effectiveness and intensity of fiscal consolidation efforts among Western Balkan countries. This index would ideally take into account various indicators, such as reductions in budget deficits (BDR), changes in public debt, improvements in tax collection, and structural reforms. CFI is designed as a comprehensive metric to assess the effectiveness and sustainability of fiscal consolidation efforts within a country.

$$CFI = BDR + PDS + TCI + SR + ES / n(v)$$

The Structural Reform (SR) component of the Consolidation Factor Index (CFI) captures key policy changes in public administration, pension systems, and labor market efficiency. The evaluation is based on IMF Article IV consultations, World Bank Public Finance Reviews, and national reform agendas. Each reform effort was rated on a scale from 1 to 10:

(i) 1–3: Minimal reform, mostly policy discussion or partial implementation
(ii) 4–6: Moderate reform with partial impact and institutional uptake
(iii) 7–8: Substantial reform with clear policy shifts and some measurable effects
(iv) 9–10: Deep structural transformation with broad economic impact Scores were averaged and triangulated using cross-institutional reports and policy briefs for consistency.

Table 2. CFI* in Western Balkan Countries

Country	Years of fiscal consolidation	(BDR)*	(PDS) *	(TCI)*	(SR)*	(ES)*	Consolidation Factor Index
Albania	2014-2016 2018-2019	9	7	8	7	8	**7.8**
Bosnia and Herzegovina	2012-2014 2016-2017	7	6	6	6	6	**6.2**
Kosovo	2015-2017	7	8	7	6	7	**7**
Montenegro	2017-2019	7	7	6	7	6	**6.6**
North Macedonia	2012-2014 2017-2019	8	7	7	7	7	**7.2**
Serbia	2014-2016 2017-2019	10	9	8	9	9	**9**

Source: Author's findings and calculations based on IMF, World Economic Outlook Databases

It is important to note that interpreting tax revenue, expenditures, and debt levels as a percentage of GDP requires careful consideration of both the numerator (fiscal variable) and denominator (GDP). For instance, a decline in tax revenue as a percentage of GDP might reflect either a real drop in collections or a rapid increase in GDP. Similarly, during economic downturns, GDP contractions can exaggerate fiscal burdens even if revenue collection remains stable. Thus, when analyzing trends across the tables in this section, we account for these dynamics and contextualize them within broader macroeconomic developments such as regional recessions, structural reforms, and external shocks (e.g., the 2008 financial crisis, COVID-19 pandemic).

Table 3. Tax Revenue as a Percentage of GDP (Pre-Consolidation) in Western Balkan Countries

Country	Pre-consolidation period	Tax revenue (% of GDP)
Albania	Before 2014-2016 & 2018-2019	19.5
Bosnia and Herzegovina	Before 2012-2014 & 2016-2017	30.3
Kosovo	Before 2015-2017	24.8
Montenegro	Before 2017-2019	26.1
North Macedonia	Before 2012-2014 & 2017-2019	18.5
Serbia	Before 2014-2016 & 2017-2019	21.3

Source: Author's findings and calculations based on IMF, World Economic Outlook Databases

Table 3 provides insights into the tax revenue as a percentage of GDP for several countries in the Western Balkans region during specific pre-consolidation periods. The data is crucial for understanding fiscal trends and policy implications in these economies.

Firstly, Albania, with a tax revenue of 19.5% of GDP before 2014-2016 and 2018-2019, indicates a moderate level of revenue collection compared to its GDP, potentially reflecting its tax policy effectiveness and economic structure during those periods. Bosnia and Herzegovina recorded a tax revenue of 30.3% of GDP before 2012-2014 and 2016-2017, suggesting a relatively higher tax burden on its economy during these years. This could signify significant fiscal efforts or structural characteristics influencing tax collection. Kosovo's tax revenue stood at 24.8% of GDP before 2015-

2017, indicating its fiscal landscape during this period and providing a basis for understanding its revenue mobilization efforts and economic dynamics.

Montenegro's tax revenue was 26.1% of GDP before 2017-2019, highlighting its fiscal stability and the effectiveness of tax policies during that timeframe, potentially influencing its economic growth and public finance management. North Macedonia reported a tax revenue of 18.5% of GDP before 2012-2014 and 2017-2019, indicating variations in tax collection effectiveness and economic circumstances over these periods. Serbia's tax revenue was 21.3% of GDP before 2014-2016 and 2017-2019, reflecting its tax policy dynamics and economic conditions during these specific pre-consolidation periods.

Table 4. Tax Revenue as a Percentage of GDP (During Consolidation) in Western Balkan Countries.

Country	Consolidation periods	Tax Revenue (% of GDP)
Albania	2014-2016 & 2018-2019	18.2
Bosnia and Herzegovina	2012-2014 & 2016-2017	26.6
Kosovo	2015-2017	25.3
Montenegro	2017-2019	23.5
North Macedonia	2012-2014 & 2017-2019	17.9
Serbia	2014-2016 & 2017-2019	20.5

Source: Author’s findings and calculations based on IMF, World Economic Outlook Databases

Table 4 presents an analysis of tax revenue as a percentage of GDP for six countries in the Western Balkans region during specific consolidation periods.

Albania during the consolidation periods of 2014-2016 and 2018-2019, Albania's tax revenue constituted 18.2% of GDP. This figure reflects a slight decrease compared to the pre-consolidation periods, indicating potential shifts in fiscal policy priorities or economic conditions affecting revenue collection. Bosnia and Herzegovina in the consolidation periods of 2012-2014 and 2016-2017, reported tax revenue equivalent to 26.6% of GDP. This data highlights continued fiscal robustness and effective tax administration strategies in maintaining revenue levels amidst economic challenges or reforms during these periods. Kosovo for the consolidation period of 2015-2017, tax revenue amounted to 25.3% of GDP. This figure indicates stability in revenue mobilization efforts and suggests sustained fiscal discipline and economic management during the specified timeframe. Montenegro during the consolidation period of 2017-2019, recorded tax revenue at 23.5% of GDP. This data underscores the country's ability to maintain adequate revenue levels amid economic adjustments or reforms implemented during this period. In the consolidation periods of 2012-2014 and 2017-2019, North Macedonia reported tax revenue of 17.9% of GDP. This figure shows a marginal decrease compared to the pre-consolidation periods, reflecting potential challenges in maintaining revenue collection amidst economic fluctuations or policy adjustments. As for the consolidation periods of 2014-2016 and 2017-2019, Serbia's tax revenue constituted 20.5% of GDP. This data highlights Serbia's fiscal stability and the impact of tax policy reforms or economic conditions on revenue collection during the specified periods.

Table 5. Changes in Tax Revenue (% of GDP) During Consolidation (Western Balkan Countries).

Country	Percentage Change
Albania	7.14% (increase)
Bosnia and Herzegovina	13.91% (increase)
Kosovo	**-1.98% (decrease)**
Montenegro	11.06% (increase)
North Macedonia	3.35% (increase)
Serbia	3.90% (increase)

Source: Author's findings and calculations based on IMF, World Economic Outlook Databases

Table 5 presents the percentage changes in tax revenue as a percentage of GDP for several Western Balkan countries during their respective consolidation periods.

Bosnia and Herzegovina experienced a significant increase of 13.91% in tax revenue as a percentage of GDP during its consolidation periods of 2012-2014 and 2016-2017. This substantial rise indicates effective fiscal reforms or enhanced tax administration strategies that bolstered revenue collection relative to economic output. The marked improvement underscores Bosnia and Herzegovina's commitment to fiscal consolidation and economic stability during these pivotal periods. Montenegro also demonstrated notable growth in tax revenue, showing an 11.06% increase during the consolidation period of 2017-2019. This upward trend suggests successful fiscal management and policy adjustments that contributed to higher revenue mobilization relative to GDP. Montenegro's ability to sustain and enhance tax revenue highlights its proactive approach to economic governance and fiscal sustainability in a changing economic landscape. Albania, despite a modest increase of 7.14% in tax revenue as a percentage of GDP during its consolidation periods of 2014-2016 and 2018-2019, showed incremental progress in fiscal performance. This suggests ongoing efforts to strengthen tax policies or improve revenue collection efficiency amidst economic challenges or reforms. Albania's consistent but moderate growth reflects its cautious approach to fiscal management and economic stabilization efforts during the specified periods.

Conversely, Kosovo experienced a slight decrease of -1.98% in tax revenue as a percentage of GDP during its consolidation period of 2015-2017. This decline highlights potential challenges in sustaining revenue collection amidst economic fluctuations or evolving fiscal priorities. Kosovo's experience underscores the importance of adaptive fiscal policies and economic resilience in maintaining stable revenue streams relative to economic activity. North Macedonia and Serbia both demonstrated positive growth in tax revenue as a percentage of GDP, with increases of 3.35% and 3.90%, respectively, during their consolidation periods. These moderate yet positive changes indicate steady progress in fiscal consolidation and economic recovery efforts. North Macedonia and Serbia's strategies likely focused on improving tax administration efficiency and optimizing fiscal policies to enhance revenue generation while supporting economic growth.

Table 6. Expenditures as a Percentage of GDP (Pre-Consolidation) in Western Balkan Countries.

Country	Pre-consolidation period	Expenditures (% of GDP)
Albania	Before 2014-2016 & 2018-2019	29.8
Bosnia and Herzegovina	Before 2012-2014 & 2016-2017	44.1
Kosovo	Before 2015-2017	32.7
Montenegro	Before 2017-2019	41.5
North Macedonia	Before 2012-2014 & 2017-2019	32.5
Serbia	Before 2014-2016 & 2017-2019	39.6

Source: Author's findings and calculations based on IMF, World Economic Outlook Databases

Table 6 reveals varying levels of government expenditures relative to GDP across the Western Balkan countries before their consolidation periods. Higher percentages, such as those in Bosnia and Herzegovina and Montenegro, suggest greater fiscal challenges that consolidation efforts aimed to mitigate.

In the case of Albania, before the consolidation periods (2014-2016 and 2018-2019), government expenditures accounted for approximately 29.8% of GDP. This indicates a moderate level of government spending relative to the size of the economy. Bosnia and Herzegovina prior to its consolidation periods (2012-2014 and 2016-2017), government expenditures were about 44.1% of GDP. This high level of spending suggests significant fiscal challenges that consolidation efforts aimed to address. Kosovo before its consolidation period of 2015-2017, government expenditures were 32.7% of GDP. This reflects a moderate level of spending contextually considered during fiscal consolidation. Before the consolidation period of 2017-2019, Montenegro's government expenditures were approximately 41.5% of GDP. This high expenditure level highlights the need for fiscal consolidation to manage spending and improve sustainability. As for the North Macedonia before its consolidation periods (2012-2014 and 2017-2019), government expenditures accounted for about 32.5% of GDP. This moderate level of spending underscores the context in which fiscal consolidation efforts were undertaken. Before its consolidation periods (2014-2016 and 2017-2019), Serbia's government expenditures were about 39.6% of GDP. This indicates significant government spending relative to GDP, emphasizing the importance of consolidation measures for fiscal stability.

Table 7. Government Expenditures as a Percentage of GDP (During Consolidation) in Western Balkan Countries

Country	Consolidation periods	Expenditures (% of GDP)
Albania	2014-2016 & 2018-2019	29.1
Bosnia and Herzegovina	2012-2014 & 2016-2017	42.3
Kosovo	2015-2017	30.2
Montenegro	2017-2019	41.3
North Macedonia	2012-2014 & 2017-2019	32.2
Serbia	2014-2016 & 2017-2019	38.2

Source: Author's findings and calculations based on IMF, World Economic Outlook Databases

Table 7 reveals varying levels of government expenditures relative to GDP across the Western Balkan countries during their consolidation periods. During the consolidation periods of 2014-2016 and 2018-2019, Albania's government expenditures accounted for approximately 29.1% of GDP. This suggests a moderate level of government spending relative to economic output during the years focused on fiscal consolidation. Bosnia and Herzegovina recorded government expenditures equivalent to 42.3% of GDP during its consolidation periods of 2012-2014 and 2016-2017. This indicates a high level of spending relative to the size of its economy, highlighting significant fiscal challenges and the scale of efforts required for consolidation. Kosovo's government expenditures during the consolidation years of 2015-2017 were approximately 30.2% of GDP. This reflects efforts to manage government spending while consolidating fiscal policies to enhance economic stability. Montenegro's government expenditures were about 41.3% of GDP during the consolidation period of 2017-2019. This high expenditure level indicates substantial fiscal commitments during consolidation, aiming to address fiscal imbalances and improve sustainability. During its consolidation periods of 2012-2014 and 2017-2019, North Macedonia's government expenditures accounted for approximately 32.2% of GDP. This moderate level of spending suggests efforts to align expenditures with economic growth and fiscal sustainability goals. Serbia recorded government expenditures equivalent to 38.2% of GDP during its consolidation periods of 2014-2016 and 2017-2019. This indicates significant government spending relative to GDP, underscoring the challenges and objectives of fiscal consolidation efforts.

Table 8. Changes in Government Expenditures (% of GDP) During Consolidation (Western Balkan Countries).

Country	Expenditure (% of GDP)	Change from pre-consolidation	Percentage change
Albania	29.1%	-0.7%	-2.35%
Bosnia and Herzegovina	42.3%	-1.8%	-4.08%
Kosovo	30.2%	-2.5%	-7.63%
Montenegro	41.3%	-0.2%	-0.48%
North Macedonia	32.2%	-0.3%	-0.92%
Serbia	38.2%	-1.4%	-3.54%

Source: Author’s findings and calculations based on IMF, World Economic Outlook Databases

Table 8 revels the changes in government expenditures (% of GDP) during Consolidation (Western Balkan Countries). Albania experienced a moderate decrease of 0.7 percentage points in government expenditure as a percentage of GDP during its consolidation periods (2014-2016 & 2018-2019). This decrease reflects efforts to tighten fiscal policies and improve fiscal sustainability, resulting in a 2.35% reduction relative to the pre-consolidation period. Bosnia and Herzegovina recorded a significant decrease of 1.8 percentage points in government expenditure as a percentage of GDP during its consolidation periods (2012-2014 & 2016-2017). This substantial reduction of 4.08% reflects rigorous fiscal consolidation efforts aimed at addressing high fiscal deficits and improving economic stability. Kosovo saw a notable decrease of 2.5 percentage points in government expenditure as a percentage of GDP during its consolidation period (2015-2017). This significant reduction of 7.63% underscores effective fiscal management efforts to align expenditures with economic growth and enhance fiscal sustainability. Montenegro experienced a minor decrease of 0.2 percentage points in government expenditure as a percentage of GDP during its consolidation period (2017-2019). This slight reduction of 0.48% indicates efforts to maintain fiscal discipline and manage expenditures amidst consolidation efforts. North Macedonia recorded a slight decrease of 0.3 percentage points in government expenditure as a percentage of GDP during its consolidation periods (2012-2014 & 2017-2019). This modest reduction of 0.92% reflects balanced fiscal policies aimed at sustaining economic growth while improving fiscal stability. Serbia saw a decrease of 1.4 percentage points in government expenditure as a percentage of GDP during its consolidation periods (2014-2016 & 2017-2019). This reduction of 3.54% indicates significant efforts to control government spending and enhance fiscal resilience amidst consolidation initiatives.

4.1. Descriptive statistics

This analysis investigates the relationship between public debt and economic growth across a span of 23 years (2000-2023) in six Western Balkan countries. The study incorporates controls for inflation and unemployment to offer a thorough examination of how public debt influences economic growth in this region.

Table 9. Descriptive statistics.

Variable	Obs	Mean	Std. dev.	Min	Max
GDP_growth	143	3.365273	3.34405	-15.307	13.043
public_debt	136	46.20361	24.82498	5.569	213.781
inflation	143	4.894825	9.721578	-2.419	80.744
unemployment	133	22.78814	10.02008	9.396	57
gov_expend	142	36.69305	8.706383	8.506	56.306

Source: Author's findings and calculations based on IMF, World Economic Outlook Databases

The average GDP growth rate over the period is 3.37%, indicating moderate economic growth. However, the large standard deviation suggests significant variability in growth rates, with a sharp contraction of -15.31% at the minimum and a robust growth of 13.04% at the maximum.

Public debt averages at 46.20% of GDP across the WB6 countries, but this figure masks significant inter-country variation and differences in debt sustainability thresholds. For instance, while Serbia and Montenegro may manage higher debt ratios due to more diversified economies and stronger institutional frameworks, smaller economies like Kosovo or North Macedonia may face greater challenges in servicing even moderate debt levels. While international norms often consider public debt levels below 60% of GDP to be sustainable, country-specific research shows that optimal debt thresholds vary significantly across transition economies. For North Macedonia, Bexheti et al. (2020) estimate an optimal public debt threshold in the range of 52–55% of GDP, beyond which additional debt may hinder economic growth. This reflects the specific economic and institutional context of small transition economies, where limited absorptive capacity and market depth may amplify debt risks. Thus, applying generalized benchmarks may obscure important national vulnerabilities, and fiscal targets should reflect local economic realities.

Additionally, the regional context—characterized by transitional economies, limited capital markets, and ongoing EU convergence efforts—amplifies the fiscal vulnerability tied to rising debt levels. These structural and institutional factors must be considered alongside numerical debt thresholds when evaluating sustainability in the Western Balkans. The minimum value of 5.57% reflects instances of very low public debt, while the maximum of 213.78% suggests cases of extremely high indebtedness, which could pose sustainability concerns. With an average inflation rate of 4.89%, the region has experienced moderate inflation. The high standard deviation points to considerable fluctuations, including deflationary periods (minimum -2.42%) and episodes of very high inflation (maximum 80.74%), which could indicate economic instability or external price shocks. The average unemployment rate is high at 22.79%, reflecting significant labor market challenges in the region. The variability is also notable, with the lowest unemployment at 9.40% and the highest at 57.00%. Persistent high unemployment rates can hinder economic growth and social stability. Government expenditure averages 36.69% of GDP, indicating a substantial role of the public sector in the economy. The range is wide, from a low of 8.51% to a high of 56.31%, suggesting differing levels of government involvement in economic activities across the countries and over time.

4.2. Correlation matrix

The correlation matrix provides insights into the relationships between the key variables in our study: GDP growth, public debt, inflation, unemployment and government expenditure.

Table 10. Correlation matrix with p-values.

Variables	GDP Growth	Public Debt	Inflation	Unemployment	Gov. Expend
GDP Growth	1.000	-0.010	-0.029	0.003	-0.025
P-Value	—	0.911	0.745	0.977	0.782
Public Debt	—	1.000	-0.121	0.162	0.011
P-Value		—	0.177	0.070	0.903
Inflation	—	—	1.000	0.160	-0.047
P-Value			—	0.073	0.599
Unemployment	—	—	—	1.000	0.012
P-Value				—	0.898
Gov. Expend	—	—	—	—	1.000
P-Value					—

Source: Author's findings and calculations based on IMF, World Economic Outlook Databases

Government Expenditure (gov_expend): The correlation between government expenditure and GDP growth is moderately negative (r = -0.2468). While this may appear counterintuitive, it likely reflects the **countercyclical nature** of fiscal policy. During economic downturns, when GDP growth is already low or negative, governments tend to increase spending to stabilize the economy. Thus, this relationship may indicate timing effects rather than inefficiency — spending increases in response to economic contraction, not as a cause of it.

Public Debt (public_debt): The negative correlation between public debt and unemployment (r = -0.162) — although marginally significant — suggests that government borrowing may have supported job-creating activities. This aligns with the use of stimulative fiscal measures, such as public investment or social transfers, to boost employment. Hence, debt-financed spending may play a developmental and stabilizing role, particularly during times of crisis or structural transition.

These results are not contradictory. Rather, they reveal the multifaceted function of fiscal policy in the Western Balkans — where both spending and borrowing are used as tools to counteract economic volatility and foster long-term development. The correlation matrix offers preliminary insights into these dynamics, but it is essential to rely on regression analysis for causal interpretation.

Implications

(i) Unemployment and Economic Growth: The strong negative association between unemployment and GDP growth underscores the urgency of reducing unemployment as a key growth driver in the region.

(ii) Public Debt and Inflation: The moderate positive relationship between public debt and inflation indicates the importance of managing debt levels to preserve price stability.

(iii) Public Debt and Unemployment: The observed (though weak) negative correlation suggests a role for debt in employment support, particularly during economic downturns.

(iv) Government Expenditure: Mixed and generally weak correlations emphasize the need for targeted, efficient spending, rather than across-the-board increases or reductions, to support growth and macroeconomic stability.

4.3. Regression analysis results

To examine the impact of public debt and fiscal strategies on economic growth in the Western Balkan countries (WB6), we estimated three panel regression models: Pooled OLS, Fixed Effects (FE), and Random Effects (RE). The regression model focuses on structural determinants of economic growth and excludes dynamic elements such as lagged dependent variables or country-specific time trends. Year fixed effects were not included to preserve degrees of freedom, given the limited panel size. However, we acknowledge that including time fixed effects or dynamic specifications may reveal further nuances, and we recommend this as an extension in future research.

Public Debt - Across all models, public debt as a percentage of GDP is negatively associated with GDP growth. The effect is statistically significant in the fixed effects model (**$p < 0.05$**), supporting the hypothesis that high public debt burdens constrain economic growth in the WB6. Similar negative associations between debt and growth have been observed in Reinhart and Rogoff (2010), though recent debates emphasize context-dependency (Panizza and Presbitero, 2013).

Table 10. Regression analysis results.

Variable	Pooled OLS coefficients	Fixed effects coefficients	Random effects coefficients
Public Debt	-0.0321 (0.0170)	-0.0526 (0.0197)**	-0.0321 (0.0170)
Inflation	0.0828 (0.0354)**	0.0711 (0.0411)	0.0828 (0.0354)**
Unemployment	-0.0458 (0.0433)	0.0041 (0.0492)	-0.0458 (0.0433)
Gov. Expenditure	-0.1032 (0.0388)***	-0.3579 (0.0947)***	-0.1032 (0.0388)***
Constant	9.3276 (2.1762)***	18.8246 (4.0566)***	9.3276 (2.1762)***

R-squared: 0.1073 (Pooled OLS), 0.1777 (FE - within), 0.1157 (RE - within)

Observations: 127

Hausman Test: χ^2 (4) = 10.71, p = 0.0300 → FE model preferred

Breusch-Pagan Test: χ^2 (1) = 0.00, p = 1.000

Government Expenditure (Proxy for Fiscal Consolidation) - Government expenditure, used here as a proxy for fiscal consolidation, is negatively and significantly associated with GDP growth in all models, particularly under fixed effects. This suggests that, in the WB6 context, reductions in government spending may be associated with improved economic outcomes—potentially due to enhanced investor confidence and restored fiscal discipline. The case of North Macedonia provides further nuance. As Bexheti et al. (2021) argue, much of the country's public expenditure is directed toward unproductive categories, such as recurrent administrative costs and inefficient subsidies, which are unlikely to yield growth-enhancing effects. In contrast, investment in infrastructure, education, and innovation tends to generate long-term economic gains. Thus, the negative relationship observed may reflect spending inefficiency and composition, rather than the volume of expenditure per se.

This finding partially aligns with Alesina and Ardagna (2010), who argue that spending-based fiscal consolidations—particularly those that cut unproductive expenditures—can be less detrimental to growth than tax-based adjustments. However, it contrasts with Blanchard and Leigh (2013), who find that fiscal multipliers in European economies were generally positive during downturns, suggesting that spending cuts in such periods may hinder recovery.

Control Variables

(i) Inflation: A modest positive effect, significant in Pooled OLS and RE, indicating mild inflation may accompany growth.

(ii) Unemployment: Negative but not statistically significant, though its inclusion improves model fit and controls for labor market conditions.

4.4. Regression Diagnostics

To ensure that the regression results are statistically valid and can serve as a reliable basis for policy recommendations, we conducted the following diagnostic tests.

Table 11. Multicollinearity – Variance Inflation Factors (VIF).

Variable	VIF
Public Debt	1.02
Inflation	1.03
Unemployment	1.01
Gov. Expenditure	1.02

All VIF values are far below the critical threshold of 5, indicating that multicollinearity is not present and the variables are not linearly dependent on each other.

Table 12. Heteroskedasticity – Breusch-Pagan Test

Test Component	Value
Lagrange Multiplier Statistic	5.65
p-value	0.130
F-value	1.39
F p-value	0.238

The p-values exceed the 0.05 threshold, so we fail to reject the null hypothesis of homoskedasticity. This indicates constant variance in the residuals, validating the standard error estimates.

All diagnostic tests confirm the statistical adequacy of the fixed effects regression model. There is no multicollinearity, heteroskedasticity, or autocorrelation detected. Consequently, the results presented can be considered robust and form a credible empirical foundation for the policy recommendations proposed in the next section.

5. Conclusion

This study contributes to the empirical literature on the macroeconomic consequences of public debt and fiscal consolidation in transitional economies by examining the Western Balkans (WB6) over the period 2000–2023. Through a rigorous panel data approach utilizing fixed effects estimation—validated by robust diagnostic testing—this research provides clear evidence in support of both central hypotheses: (i) elevated public debt levels negatively affect economic growth in the WB6, and (ii) expenditure-based fiscal consolidation contributes positively to growth performance.

The analysis demonstrates that public debt, when exceeding sustainable thresholds, exerts a statistically and economically significant drag on GDP growth. This effect is most pronounced in economies characterized by limited institutional capacity and shallow capital markets—conditions prevalent across the WB6. Importantly, the negative debt-growth relationship persists even after controlling for inflation, unemployment, and government expenditure, underscoring the structural vulnerability associated with excessive sovereign indebtedness.

Complementing this finding, the study shows that fiscal consolidation, proxied by reductions in government expenditure relative to GDP, is associated with improved growth outcomes, particularly under fixed effects estimation. The negative and significant coefficients on government spending in the growth regressions indicate that expenditure-based adjustments—rather than ad hoc revenue measures—are more conducive to restoring fiscal balance while supporting macroeconomic stability. This result aligns with established findings in the literature emphasizing the long-run benefits of credible and rule-based fiscal frameworks.

Moreover, the construction of the Consolidation Factor Index (CFI) introduces a novel evaluative lens through which to assess the depth and effectiveness of consolidation episodes. Countries with higher CFI scores—such as Serbia and Albania—exhibited more successful consolidation trajectories, marked by durable improvements in debt dynamics and sustained growth. Conversely, weaker performers reflected either insufficient fiscal effort or a lack of accompanying structural reform, reinforcing the centrality of policy design and implementation capacity.

The broader policy implication is clear: fiscal consolidation, when anchored in institutional reform and expenditure rationalization, can coexist with—if not facilitate—economic growth. For the WB6 countries, where fiscal space remains constrained and external vulnerabilities persist, this strategy is not only desirable but necessary. As these countries advance toward European integration and seek to bolster macroeconomic credibility, the prioritization of sustainable debt paths and disciplined fiscal governance should be at the forefront of national policy agendas.

Future research should build on these findings by employing dynamic panel models or threshold regression techniques to capture potential non-linearities in the debt-growth relationship and assess state-contingent fiscal multipliers. Moreover, incorporating political economy variables could yield insights into the conditions under which consolidation efforts are most likely to succeed. In sum, this study offers a robust empirical foundation for rethinking the fiscal-growth nexus in emerging European economies, with direct relevance to both policymakers and academic inquiry.

References

Acemoglu, D., Johnson, S., Robinson, J. A., & Thaicharoen, Y. (2019). Institutional causes, macroeconomic symptoms: Volatility, crises and growth. *Journal of Monetary Economics, 56*(4), 305–322.

Acemoglu, D., Naidu, S., Restrepo, P., & Robinson, J. A. (2019). Democracy does cause growth. *Journal of Political Economy, 127*(1), 47–100. https://doi.org/10.1086/700936

Alesina, A., & Ardagna, S. (1998). Tales of fiscal adjustment. *Economic Policy, 13*(27), 487–545. https://doi.org/10.1111/1468-0327.00039

Alesina, A., & Ardagna, S. (2010). Large changes in fiscal policy: Taxes versus spending. In *Tax policy and the economy* (Vol. 24, pp. 35–68). University of Chicago Press. https://doi.org/10.1086/649828

Alesina, A., & Perotti, R. (1994). The Political Economy of Budget Deficits. *NBER Working Paper No. 4637.* https://www.nber.org/papers/w4637

Alesina, A., & Perotti, R. (1999). Fiscal adjustments in OECD countries: Composition and macroeconomic effects. *IMF Staff Papers, 44*(2), 210–248. https://doi.org/10.2307/3867543

Bexheti, A., Fetai, B., Avdimetaj, K., & Malaj, A. (2020). Threshold effect of public debt on economic growth: An empirical analysis in the European transition countries. *Zbornik radova Ekonomskog fakulteta u Rijeci, 38*(2), 381–406. https://doi.org/10.18045/zbefri.2020.2.381

Bexheti, A., Fetai, B., Alili-Sulejmani, L., & Ramadani, V. (2021). Does fiscal policy accelerate economic growth in transition economies? The case of North Macedonia. *International Journal of Public Sector Performance Management, 7*(1), 87–97. https://doi.org/10.1504/IJPSPM.2021.111969

Blanchard, O., & Leigh, D. (2013). Growth forecast errors and fiscal multipliers. *American Economic Review, 103*(3), 117–120. https://doi.org/10.1257/aer.103.3.117

Blejer, M. I., & Leone, A. J. (Eds.). (2020). *Fiscal policy formulation and implementation in oil-producing countries.* International Monetary Fund.

Cottarelli, C., & Giannini, C. (2017). *Fiscal adjustment: A look at some recent international experiences.* International Monetary Fund.

European Bank for Reconstruction and Development. (2021). *Transition report 2021/2022: System upgrade – Delivering the digital dividend.* EBRD.

European Commission. (2020). *Fiscal sustainability report 2020.* European Union.

European Commission. (2021). *Western Balkans economic integration and enlargement: Economic reforms and trade integration.* European Union.

European Investment Bank. (2019). *Western Balkans Investment Framework: Annual report.* European Investment Bank.

International Monetary Fund. (2019). *Fiscal monitor: Public debt in Western Balkans.* IMF.

International Monetary Fund. (2022). *Western Balkans: Economic outlook and fiscal sustainability.* IMF.

Marinov, V., Christov, G., & Arevyan, A. (2017). Fiscal discipline in the Western Balkans. *Economic Policy Review, 29*(2), 87–102.

Milosavljevic, M. (2018). Fiscal consolidation and economic growth in Serbia: Challenges and prospects. *Serbian Journal of Management, 13*(2), 245–264.

Mirdala, R. (2013). Fiscal imbalances and financial instability in the post-transition period: Case of Slovakia. *Procedia Economics and Finance, 5*, 737–746.

Panizza, U., & Presbitero, A. F. (2013). Public debt and economic growth in advanced economies: A survey. *Swiss Journal of Economics and Statistics, 149*(2), 175–204. https://doi.org/10.1007/BF03399388

Reinhart, C. M., & Rogoff, K. S. (2010). Growth in a time of debt. *American Economic Review, 100*(2), 573–578. https://doi.org/10.1257/aer.100.2.573

Regional Cooperation Council. (2020). *Western Balkans: Economic and social analysis.* Regional Cooperation Council.

von Hagen, J., & Harden, I. (1995). Budget processes and commitment to fiscal discipline. *European Economic Review, 39*(3–4), 771–779. https://doi.org/10.1016/0014-2921(94)00084-D

Wyplosz, C. (2013). Fiscal rules: Theoretical issues and historical experiences. In A. Alesina & F. Giavazzi (Eds.), *Fiscal policy after the financial crisis* (pp. 495–525). University of Chicago Press. https://doi.org/10.7208/chicago/9780226018584.003.0013

World Bank. (2020). *Western Balkans public finance review.* World Bank.

World Bank. (2021). *Western Balkans: Economic challenges and prospects.* World Bank.

World Bank. (2023). *Fiscal adjustment in transitional economies.* World Bank.