

Abstract

Twin deficits hypothesis (TDH), supported by the Keynesian approach, implies that an increase in a government's budget deficit will deteriorate the country's current account deficit. Numerous empirical studies have investigated this approach for individual country case studies as well as for groups of countries in panel data analyses. Therefore, it is the purpose of this study to investigate the twin deficits hypothesis of Albania, a small developing economy in Eastern Europe. An econometric analysis with quarterly data for the period 2008–2022 investigates this relationship, revealing political implications for fiscal policy and country trade imbalances. Empirical results show a unidirectional Granger cause between the budget balance and the current account balance. The vector error correction model finds evidence of the Keynesian twin hypothesis in the context of the Albanian economy. There is a long-run positive relationship between the budget deficit and the current account deficit, whereas the results do not hold in the short run. The short-term dynamics reveal a complex interplay where fiscal improvements deteriorate the current account. However, the adjustment factor error correction term stabilizes the short-run dynamics toward the long-run relationship, emphasizing the role of persistent coordination among fiscal disciplines and sustained trade imbalances.

Keywords: budget deficit, current account deficit, economic growth, VECM.

TWIN DEFICITS: APPARITION OR REALITY FOR ALBANIA

Nevila MEHMETAJ

Ermira KALAJ

Ritvana RRUKAJ

Nevila MEHMETAJ (corresponding author)

Associate Professor, Business Administration Department,
Economic Faculty,
University of Shkodra 'Luigj Gurakuqi', Shkodër, Albania
CERGE – EI Teaching Fellows, Prague, The Czech Republic
E-mail: nevila.mehmetaj@unishk.edu.al
ORCID ID: 0000-0002-0575-0834

Ermira KALAJ

Professor, Finance Department, Economic Faculty,
University of Shkodra 'Luigj Gurakuqi', Shkodër, Albania
CERGE – EI Teaching Fellows, Prague, The Czech Republic
E-mail: ermira.kalaj@unishk.edu.al
ORCID ID: 0000-0003-4692-6055

Ritvana RRUKAJ

Lecturer, Ph.D., School of Economics and Business,
Norwegian University of Life Sciences, Ås, Norway
E-mail: ritvana.rrukaj@nmbu.no.

1. Introduction

The relationship between the current account deficit and the dynamics of government budget deficit has been a topic of discussion in economic debates and academic research. The theoretical connection between current account deficit and budget deficit, commonly referred to as the Keynesian twin deficits hypothesis (TDH), implies that the current account balance in an economy is influenced by its government budget balance dynamics. Numerous empirical studies have been written on this purpose, and the study of their relationships shows a great empirical significance for fiscal policy reasons.

Countries' fiscal imbalances, after-effects of the 2008 global financial crisis, and the Covid-19 pandemic have renewed the literature on the twin-deficits hypothesis, more specifically, whether fiscal deficits cause countries' external deficits. This has been an emerging issue, especially in the case of developed and developing countries, where both fiscal and current account imbalances have been quite severe over the last two decades. Albania, a small developing country in Eastern Europe, has been experiencing an extended transition since the fall of the socialist political system at the beginning of the 1990s. Since then, the country's public finances have been associated with instability and continuous negative balances; fiscal deficits up to 6.7% of gross domestic product (GDP) have contributed to the increase in the country's public debt over the last few decades. On the other hand, Albania's current account balance has been driven by high imports of energy, machinery, etc., as well as weak exports of mostly textiles, minerals, etc. The fluctuations in the country's internal and external negative balances deteriorated during the global financial crisis of 2008–2009, as the country's dependence on migration remittances decreased during that period. The country recorded a current account deficit up to 15.63% of its GDP during the financial crisis in 2008 (IMF, 2023). The country's macroeconomics balances aggravated further in 2018, after the earthquake disasters that involved Albania. The Covid-19 pandemic period was associated with further deterioration of the public finances. The pandemic restrictive measures in the economy during 2020, as the country's

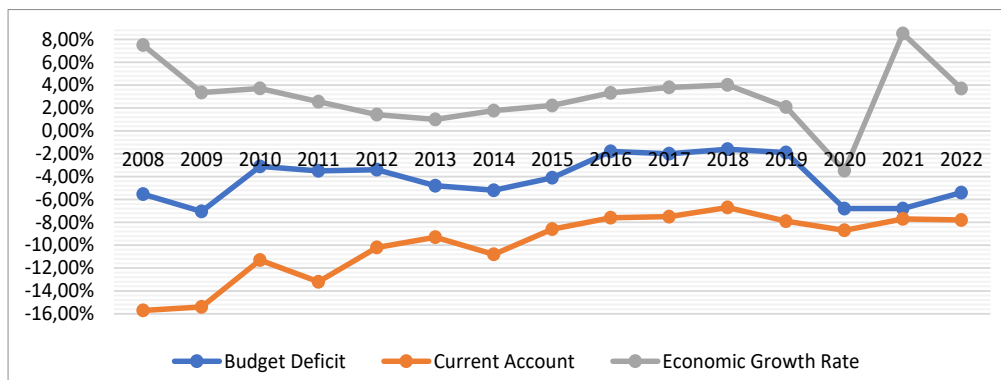


Figure 1: Budget balance, current account balance, and economic growth rate of Albania 2008-2022 (% of GDP)

Source: Authors' visualization based on World Bank Data Indicators, Albania, 2023

lockdown for safety measures, and the economic transfers to the population, had massive effects on the country's budget deficit, which increased up to 7.9% of the GDP (World Bank, 2023). Meanwhile, the economic growth rate of the country in the last decades has been moderately high, reaching up to 8.0% (INSTAT, 2023).

The analysis aims to establish a generalized relationship between fiscal and external imbalances while providing empirical evidence specific to Albania's economic context. Addressing these imbalances is crucial for policymakers due to the country's external vulnerability and public debt pressure. Investigation of the twin hypothesis might be a starting point for policymakers in Albania to address critical insights into how fiscal adjustments might alleviate trade external vulnerabilities.

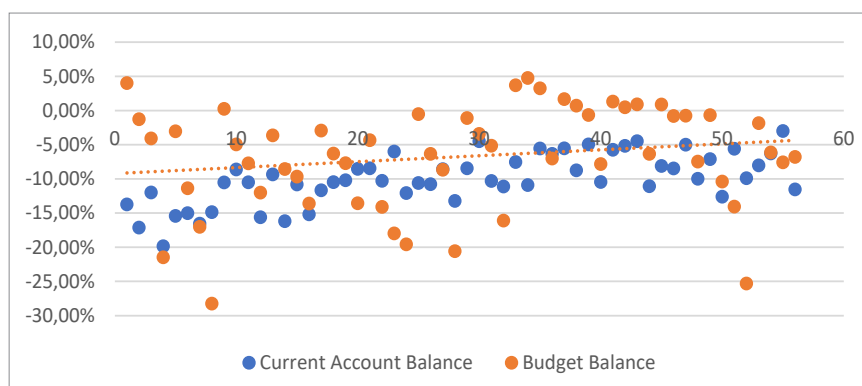


Figure 2: Budget Balance and current account balance of Albania 2008-2022 (% of GDP)

Source: Authors' visualization based on World Bank Data Indicators, Albania, 2023

This paper attempts to examine the strength of the relationship between the budget and the current account deficits in Albania. For this purpose, quarterly data of the government budget balance, current account balance (in percent of GDP), and real economic growth rate, for the period 2008–2022, are applied in a set of econometric methods. The vector error correction (VEC) model investigates the twin deficit hypothesis in the Albanian case study, both in the short run and long run. The Granger causality test is used to explore the direction of the relationship among the variables, and post-estimation tests check the robustness of the model's results. The rest of the paper is organized as follows: the literature review is presented in section 2. The methodology used in this study is described in section 3, the use of the VEC model, which consists of the VAR model (short-term dynamics) and the cointegration (long-term co-movement) among the variables, indicates the characteristics of long-run association. The econometric model results are presented and discussed in section 4, and the conclusion and policy implications are presented in section 5.

2. Theoretical framework

According to Keynesian, New Keynesian, and Post-Keynesian theoretical disciplines, contractionary fiscal policies during economic boom periods, and expansionary fiscal policies during economic recession periods are needed to fix the long-run economic equilibrium. To stimulate economic growth, fiscal expansion should be performed, which is followed by government revenue shortages and debt increases, the payment of which is associated with extra interest rates, decreasing the future budget balances consequently. In these situations, governments typically explore debt funds from foreign sources instead of domestic financial loans (Dornbusch, 1984; Fischer and Easterly, 1990). This results in a disadvantageous consequence on the overall current account balance of the economy.

As per the national macroeconomic accounting methodology, the balance of payments and current account balance are determined by subtracting private investment from national savings. When the budget deficit increases, it leads to a reduction in public savings, consequently causing a decline in national savings. The impact of a government budget deficit on the current account balance depends on the actions of the private sector and households. It can either offset or amplify the effect of fiscal expansion on the current account balance. The national account identity outlines the connection between the current account balance and the budget deficit balance in the following manner:

$$Y = C + I + G + CA \quad (2.1)$$

where: Y = Gross Domestic Product, C = Household Consumption, I = Investment, G = Government Spending; and CA = Current Account Balance ($X - M$), where: X = Total Exports and M = Total Imports of Goods and Services.

Referring to the national income identity, the national savings can be written as:

$$Y - C - G = I - (X - M) \quad (2.2)$$

$$\text{or } S = I - CA \quad (2.3)$$

where: $CA = (X - M)$ and $S = Y - C - G$, which stands for national saving.

Furthermore, the national savings can be divided into public savings of the government (S_g), and private savings of households and business firms (S_p):

$$S = S_g + S_p \quad (2.4)$$

$$S_g = T - G \quad (2.5)$$

$$S_p = Y - T - C \quad (2.6)$$

The fiscal (or budget) deficit of the government (2.5) is the difference between income from taxes (T) and other revenues and its spending. Rearranging the equations:

$$CA = S_p + S_g - I \quad (2.7)$$

According to (2.7), the current account balance is the sum of private savings and public savings minus private investment spending in the economy. It evaluates the relationship

between the current account balance and the budget balance of the government to public savings ($S_g = T - G$), thereby examining the viability of the Keynesian TDH.

The synchronized deterioration of the budget account balance and the current account balance, referred to as the Keynesian TDH is based on the suggestion that an increase in the government budget deficit balance is likely to stimulate a decrease in the current account balance as well (Abell, 1990). There are two major methodologies that support the subsistence of the TDH: the Keynesian income-expenditure methodology and the Mundell-Fleming version (Fleming, 1962; Mundell, 1963). The Keynesian approach to income and expenditure assumes that an increase in the fiscal deficit balance will affect the existence of a greater disposable income, leading to a higher domestic aggregate demand and, consequently, a rise in import growth, leading to a decline in the current account balance. According to the Mundell-Fleming model framework, an increase in the budget deficit balance would put increasing pressure on the domestic interest rate beyond the world rate, which would trigger capital inflows and affect the local currency exchange rate appreciation. The appreciation of the domestic currency affects the exports, making them less competitive in foreign markets, whereas foreign products or imports would score cheaper (Hatemi and Shukur, 2002). Consequently, the net export deterioration would affect the current account balance in the same direction.

The opposing approach of TDH, the Ricardian Equivalence Hypothesis (REH), in contrast to the Keynesian discipline and the Mundell-Fleming model, assumes that the current account balance will not be affected by the expansion of fiscal policies. According to the REH approach, higher disposable incomes (after increasing government budget deficit) will not lead to an expansion of aggregate domestic demand. Because reasonable households in the current period will have expectations that higher taxes will be imposed soon (Barro, 1989). Consequently, households not perceiving themselves as being wealthier will save additional temporary incomes to pay their increased tax liabilities in the future. This will cause private savings to increase at an equivalent rate to the reduction of public savings, and the demand for both domestic goods and foreign goods will not improve to the extent that the current account will deteriorate (Abbas *et al.*, 2010; Corsetti and Müller, 2006).

2.1. Literature review

Since the emergence of Keynesian economics, the fiscal deficit has become very significant for its effects on the economy. However, alternative conventional theories, such as the neo-classical theory, contrary to the view of the government deficit financing, induced opposing effects on the economy. The cause-effect relationship is presented by many studies using different econometrics approaches, and their empirical results are based on different period-span time series data.

Government fiscal deficit & current account balance: Studying the twin deficits validity has been an increasing research issue of wide interest since the 1980s in many countries in the world. The twin deficit analyses initiated in the United States from the synchronized

decline of the current account deficit and the budget deficit in the 1980s. The theory was first thought to be applicable from the perspective of the high-income economies category (Hutchison and Pigott, 1984; Hutchison and Throop, 1985; Fountas and Tsoukis, 2004). However, further research studies showed empirically that the twin deficit hypotheses were prevalent as well within less developed economies (Fidrmuc, 2003; Baharumshah, Lau and Ahmed, 2006). Continuing fiscal imbalances were shown as a popular feature of developed and developing economies around the globe (Klitgaard, 1989). Khalid and Guan (1999) showed that the correlation between the fiscal and trade deficits was more probable to be present in the less developing countries than in the developed ones. This is attributed to the changes in the composition of the economies and the different economic dynamics regulating the two deficits (Khalid and Guan, 1999).

The theoretical approaches on the twin deficits relationship have guided several research studies, which were performed with different investigative techniques. Also, many research studies investigated the hypothesis in different countries, with empirical data spanning different periods of time. However, the research results had various findings within a country and across countries, due to the variation in methodologies, sample sizes, data used, and different time span periods included in the econometric analysis. The first twin deficits hypothesis' empirical results were mostly centered in the United States, where this issue was identified. Most of these studies confirmed that in the United States, government budget deficits contribute to current account deficits (Barro, 1989; Dibooglu, 1997; Hatemi and Shukur, 2002). Along the same line, many other studies, using various estimation methods, analyzed the hypothesis in other high-income countries (see Ahmed and Ansari, 1994; Aslan *et al.*, 2014; Bluedorn and Leigh, 2011; Forte and Magazzino, 2013). The results of the analysis proved the significance of the twin deficits hypothesis. Research on specific European economies such as Greece, Germany, Portugal, Ireland, Italy, and Spain, also validates the twin deficits occurrence in these analyses (Kalou and Paleologou, 2012; Trachanas and Katrakilidis, 2013).

The twin deficits hypothesis has been investigated similarly in low and middle-income countries, focusing on cross-country study analysis. Some of the research examples include cross-country analysis as Central and Eastern European countries (Aristovnik, 2008), Baltic countries (Šulíková, Siničáková and Horvath, 2014), Asian countries (Anoruo and Ramchander, 1998), Southeast Asian countries (Kinza and Kashif, 2016), African countries (Ahmad, Aworinde and Martin, 2015), ASEAN countries (Baharumshah, Lau and Khalid, 2006), and SEACEN countries (Lau and Baharumshah, 2006). Most of these empirical investigations in cross-country analysis reconfirmed the twin deficit hypothesis. In specific country analyses, as Türkiye, China, Pakistan, and Nigeria, the research results also confirmed the validation of the twin deficit (Idil, 2010; Banday and Aneja, 2019; Mukhtar, Zakaria and Ahmad, 2007; Dayo, 2012). However, some research outcomes show different, inconsistent empirical findings that reveal the rejection of the twin deficit hypothesis in other countries' analysis (Algieri, 2013). In

economies such as Egypt and Peru, empirical results failed to support the twin deficits hypothesis (Helmy and Zaki, 2015; Sobrino, 2013).

A brief review of the twin deficits empirical literature is presented below (see Table 1).

Table 1: Brief literature review

Author(s)	Country (ies)	Period	Method	Findings
Dibooglu, 1997	USA	1970–1993	VAR, VEC	Support of the twin hypothesis.
Anoruo and Ramchander, 1998	Developing Economies of Asia	Countries' time span 1957–1993	Granger causality, VAR	Trade deficit causes a fiscal deficit.
Aristovnik, 2008	Eastern Europe and the former Soviet Union	1992–2003	Parks-Kmenta, PCSE	Validity of the twin deficit in the region.
Bluedorn and Leigh, 2011	17 OECD European countries	1978–2009	OLS Regression Delta, IR	1% of fiscal consolidation increases the current account balance to 0.6%/GDP ratio, supporting the twin deficits hypothesis.
Forte and Magazzino, 2013	33 European countries	1970–2010	GLS, FE	1% decrease in the budget deficit deteriorates the current account/GDP ratio of 0.37%.
Šulíková, Siničáková and Horvath, 2014	Baltic countries	1992–2011	VECM	Significant long-run positive relations in most countries.
Ahmad, Aworinde and Martin, 2015	African countries	1980–2009	VECM	Support of twin deficit in six out of the nine countries examined.
Kinza and Kashif, 2016	South Asian Countries	1981–2014	Granger causality, VAR ARDL	No evidence of the twin deficit hypothesis in the long run.
Magazzino, 2017	APEC countries	1980–2013	Panel VAR	Two-direction causality between the two deficits.
Afonso <i>et al.</i> , 2022	65 countries	1985–2015	GMM Panel	Twin-deficits hypothesis confirmed.

Source: Authors' descriptions

The twin deficit hypothesis has been extensively studied globally, with most studies focused on developed economies, large emerging economies such as India, Türkiye, or groups of cross-country analysis. While there is a lack of econometric research studies on small countries such as Albania, where the twin deficit hypothesis shows a lack of rigorous econometric results, contributing to several unresolved economic debates and fiscal policy gaps. Most fiscal analyses in this field are shown in the form of descriptive analysis (International Monetary Fund and World Bank reports) or Granger causal analysis with small size sample data. Granger causality test results showed that there is unidirectional causality from the government budget deficit to the current account deficit, with nominal data ranging from 1991 through 2014 (Kalaj and Mema, 2015).

3. Methodology

The focus of this study is to examine the relationship between public spending (fiscal budget deficit) and economic growth rate, and the country's trade current account balance, in the short and long-run periods. A set of econometric techniques, such as the stationarity test, Johansen test, vector error correction model (VECM), Granger causality, and impulse response functions (IRF), are implemented. Although the Granger causality is included in the analysis, it might exhibit limitations in a small sample size (56 quarters) and might not be efficient when using three or more variables (Engle and Granger, 1987). In multivariate econometric analysis, more than one cointegration vectors are assumed (Enders, 2014). Time series variables are used in unit root and cointegration tests, which determine the use of the VEC model as the most appropriate econometric method to use. The VEC model provides a measure of the short-run correlations and long-run equilibrium relationships between the variables. In the end, diagnostic tests check the sustainability of the VEC model's robustness.

The Augmented Dickey-Fuller unit root test (ADF) is applied to the time series variables. This is to avoid the use of the wrong regression model or including nonstationary variables in the model in their level forms (A.1, Appendix). Cointegration tests suggest one or more long-run equilibriums or stationary relationships between non-stationary series. When the variables are nonstationary, it is common that a cointegration test must be performed before being used to prevent a spurious regression. The co-integration test checks if there is a stable long-run equilibrium relation between the variables over time. If the variables are cointegrated, then they could be employed in the level forms of the regression model. Johansen cointegration test is used for the cointegration of time series variables, in this study. Causality tests show that there might be independence between the variables, a unidirectional causality relationship, or a bidirectional relation running from one variable to the other. Although the regression model simply reveals the statistical relationships among the endogenous variable of interest and other exogenous variables, it does not imply the direction of the relationship and its causal relationship. The Granger causality test investigates the direction of the causal relationship between the included variables (A.2, Appendix).

The vector error correction (VEC) model is used when time series variables are non-stationary and have at least one positive cointegration. VEC consists of a vector autoregressive model (VAR) and an error correction equation, and is used when long-term equilibrium relationships exist (A.3, A.4, A.5, Appendix). Since the data results consist of non-stationarity and co-integration, the VEC model is a suitable approach to be used in the vector analysis in the long term. In the VAR model, the lag length (p) is selected by using the information criteria as AIC, HQ, SC, and FPE. In these criteria, the lowest value is chosen since they penalize models that use additional parameters. The VECM model consists of the VAR model (short-term dynamics) and cointegration (long-term co-movement). The long-run model cointegration equation presented in this study:

$$CAB_t = \beta_0 + \beta_1 BB_t + \beta_2 EGR_t + \epsilon_t \quad (4.1)$$

where β_i 's are the regression coefficients that estimate the long-run relationship between the budget balance (BB- government expenditure minus revenue, in percentage of the GDP) and economic growth rate (EGR- the percentage change in the value of all of the goods and services produced during a year) to the current account balance (CAB- the value of goods, services and investments imported in comparison with exports, in percentage of the GDP).

In the short-run model, the variables need to be in difference forms, and the model error correction term (ECT) is incorporated in the model, which are the residuals of the long-run regression, but lagged one period ($\beta_3 \epsilon_{t-1}$). In other words, they may be interpreted as a deviation from the long-run relation. The equation is presented:

$$\Delta CAB_t = \beta_0 + \beta_1 \Delta BB_t + \beta_2 \Delta EGR_t + \beta_3 \epsilon_{t-1} + v_t \quad (4.2)$$

where β_1 and β_2 are the estimated coefficients that estimate the short-run relationship among the variables. Note that the Δ 's measure changes on a quarterly basis. β_3 is an estimate of the fraction of the misadjustment (relative to the long-run equilibrium) in the previous quarter that is 'corrected' in the current quarter. Therefore, β_3 demonstrates the speed of adjustment toward the long-run equilibrium. To be of significance, it should be negative and between zero and one. The deviations from the long-run equilibrium are corrected gradually by the error correction term (ECT) through a series of partial short-run adjustments. The following four steps are applied to the variables' quarterly time series data: testing for non-stationarity; testing for cointegration (r); estimation of VECM model (if $r > 0$); testing the VEC stability test; and testing the Granger causality direction.

4. Empirical results

To investigate the relationship between the government budget balance, current account balance, and economic growth rate (in percent of GDP), quarterly time series data spanning from 2008 to 2022 are used in a set of econometric models. Time series data are retrieved from the World Bank database, the Institute of Statistics, and the Ministry of Finance (2023). R software is used for econometric analyses.

The stationarity of the time-series variables is tested through the Augmented Dickey-Fuller Test (ADF) unit root analysis. The results show that both the budget balance and the current account balance series data are non-stationary at the levels, but stationary in their first differences (Table 2, at a 5% significance level).

In the Johansen cointegration test, the optimum lag length is chosen from Akaike's information criterion (in cases of small samples, 60 observations and below), as it reduces the chances of underestimation while increasing the chances of recuperating the accurate lag length (Liew, 2004). This selection procedure has led to a lag of three. There are two variants of the Johansen tests: the trace statistics approach and the maximum eigenvalue approach. This analysis uses the trace statistic approach as the most common approach.

Table 2: Augmented Dickey-Fuller (ADF)

	ADF t-Statistic (level)	Prob.	ADF t-Statistic (first differences)	Prob.
Budget balance	-1.5403	0.6653	-2.0853	0.02635
Current account balance	-2.2164	0.3038	-4.3297	0.01035
Economic growth rate	-3.557	0.0719	-1.8623	0.04301

Source: Authors' calculations

The result of $r > 1$ shows that there is at least one cointegrating relationship between the variables in the long run (Table 3). If the series are cointegrated, they exhibit a long-run relationship among them. This implies that the series are related and can be combined in a linear form. Alternatively, if there are shocks in the short run, which may affect the movement in the individual series, they converge with time in the long run.

Table 3: The Johansen test of cointegration

	Test statistic	Critical values		
		10%	5%	1%
$r \leq 2$	2.44	7.52	9.24	12.97
$r \leq 1$	16.37	17.85	19.96	24.6
$r = 0$	35.31	32.85	34.96	41.60

Source: Authors' calculations

The above results of non-stationary data at levels and at least one cointegrating relationship among the variables compose the two critical conditions for applying the VEC model approach rather than the VAR model. The VEC model results confirm that fiscal deficits correlate with current account deficits in long-run (coefficient signs should be reversed in the steadied cointegrating Johansen equation 4.1). In the long run, an increase in the budget deficit by 1% improves the current account balance by 0.4702%, *ceteris paribus* (negative sign confirms mean reversion toward equilibrium). The result is consistent with the twin deficits hypothesis, which implies a positive relationship between the two variables. While the economic growth rate has a negative effect on the current account: 1% increase in economic growth is associated with a 1.7662% decrease in the current account balance.

$$CAB = -0.4702 BB + 1.7662 EGR + 0.0123 \quad (4.1)$$

In the short-run dynamics, all three lags of budget balances have a significant negative effect on current account variations (Table 4). There is a short-run negative effect from the three previous quarters' budget balance on the current account balance, which contradicts the twin deficit hypothesis in the short run. A 1% increase in the fiscal balance (e.g., moving toward surplus) in the previous quarter is associated with a 0.2108% decrease in the current account balance (toward deficit) in the present quarter. CAB worsens by 0.21% (first lag), 0.15% (second lag), and 0.22% (3rd lag) of GDP over the three quarters. This

Table 4: Vector error correction model (VECM)

ECT		
Equation current account	-0.6236 (0.2189) **	
	Budget Balance -1	Economic Growth Rate -1
Equation current account	-0.2108 (0.8859) *	0.7415 (0.4076) *
Equation budget balance	-0.6717 (1.9315) **	
	Budget Balance -2	Economic Growth Rate -2
Equation current account	-0.1523 (0.0762) *	1.2032 (0.4091) **
Equation budget balance	-0.7193 (0.1587) ***	
	Budget Balance -3	Economic Growth Rate -3
Equation current account	-0.2182 (0.0506) ***	0.1694 (0.4162)
Equation budget balance	-0.6827 (0.1258) ***	

Note: *** $p < 0.00$, ** $p < 0.01$, * $p < 0.05$

Source: Authors' calculations

shows temporary versus permanent effects: fiscal austerity of budget balance increase may temporarily deteriorate the current account balance but improve it in the long run. The error correction term (-0.6236) implies a persistent but gradual correction of imbalances. The adjustment coefficient meets the two required conditions: it is significant ($p < 0.05$), confirming the long-term adjustment, and negative, implying the current account balance corrects 0.6236% of its disequilibrium each quarter. In other words, every deviation of the current account from the long-term steadiness is adjusted at a rate of 0.6236 % in the present quarter.

Economic growth in the short run influences the country's external trade balance. A 1% increase in economic growth in the previous quarter leads to a 0.7415% increase in the current account balance in the present quarter. This finding is important because it supports the assumption that if the country experiences economic growth, then this is more likely to affect the category of the exporting industries in the country, or the business companies that are more likely to be in the production of domestic goods that substitute the imported goods.

The results of the unit root test show that the time series is an integrated process of first order, leading to the performance of the Granger causality test. The Granger causality test indicates a unidirectional positive causal relationship: budget balance Granger causes current account balance, while there is no reverse causality. The result is in synchronization with the twin deficits hypothesis. While there are no Granger causalities or instantaneous causalities between the other variables (Table 5).

The stability of the VEC model is evaluated using diagnostics tests, such as the Portmanteau Test for serial correlation, ARCH (multivariate), and normality of residuals (JB-Test). To perform the tests, the VECM model is transformed into the VAR model. The results of the Portmanteau test show that there is no serial correlation among the

Table 5: Pairwise Granger causality test results

Null Hypothesis	F-Test	Prob.	Type of Causation
CAB does not Granger cause BB	1.6785	0.1514	no causation
BB does Granger cause CAB	2.2749	0.0459	causation
BB does not Granger cause EGR	1.3098	0.2682	no causation
EGR does not Granger cause BB	1.4671	0.2090	
CAB does not Granger cause EGR	0.9785	0.4325	no causation
EGR does not Granger cause CAB	2.0676	0.0787	

Source: Authors' calculations

variables (at a 5% significance level). The ARCH (multivariate) test result, with $p = 1$, shows that there is no ARCH effect, or there is no clustered volatility in the model, and the residuals are normally distributed. In Ljung-Box p-values, there is no significant autocorrelation in residuals ($p > 0.05$), validating model assumptions. Considering the diagnostic tests, it can be concluded on the robustness of the model's results (Table 6).

Table 6: Diagnostic Tests

	Chi-squared	df	p-value
Portmanteau Test (asymptotic)	36.924	21	0.0572
ARCH (multivariate)	222	540	1
Normality of Residuals JB-Test	130	6	0.573
Skewness only (multivariate)	21.927	3	0.352
Kurtosis only (multivariate)	108.174	3	0.667
Ljung-Box p-values: [0.541, 0.623, 0.487, 0.602]			

Source: Authors' calculations

This study's empirical findings of the Albania case study are in synchronization with other studies that validate the twin deficit hypothesis. Furthermore, in the short run, the results show a positive effect of the current account balance on the country's economic growth rate. This is vital for the economy as the benefits of the export growth or import reductions are interpreted into economic growth in Albania. To this extent, government policies might be focused on the perspective of the export industries.

5. Conclusions

In this study, the relationship between budget deficit and current account deficit is investigated with an emphasis on the impact of macro-variables shocks on the current account balance and budget deficit in the Albanian economy. Addressing this issue is crucial for the country's policy relevance, as well as for the research implications, in reconciliation with similar empirical literature. The results are based on the VEC model approach for the

short-run and long-run analysis. Granger causality tests are applied to determine the direction of causation between the variables. The findings present a unidirectional causality, fiscal deficits Granger-cause current account deficits, but not vice versa. This highlights the dominant role of fiscal policy in shaping the country's external balances.

Also, the results reveal long-run cointegration, and a stable equilibrium relationship exists between Albania's budget balance and current account balance. A 1% increase in the budget balance (reduced fiscal deficit by 1% of GDP) leads to a 0.47% increase in the current account balance (smaller external deficit), in the long run. This aligns with the Keynesian approach of the twin deficit hypothesis that implies a positive causal relationship between the fiscal balance and the current account balance, while the economic growth rate has a negative effect on the current account (worsening toward a deficit). This is consistent with the 'growth-driven import' effect: higher domestic growth increases demand for imports, worsening the current account.

Short-term dynamics show a negative relation of the previous periods of budget deficits to the present period of current account balance (in contradiction with the twin deficit hypothesis). The short-term relationship suggests fiscal consolidation alone may not resolve external imbalances quickly. The positive sign coefficients of the economic growth rate indicate that past economic growth improves Albania's current account balance in the short term. Albania's economic growth might be fueled by export-led industries, such as agriculture, tourism, etc., that boost exports, or reduced import response as a result of increased domestic production. The error correction mechanism explains that short-term deviations do not negate the long-term trend (0.6236% of the adjustment of disequilibrium is corrected quarterly). It means the system corrects quickly, so policies should consider both short and long-term effects. The findings of the study might be valuable for policymakers and future empirical models, which attempt to further highlight the transmission mechanism.

5.1. Policy implications

The study results carry important policy implications for Albania's fiscal and trade governance. First, strengthening fiscal coordination requires sustainable budget management, including more efficient tax collection and improved public expenditure planning. These measures would help reduce persistent deficits and limit the accumulation of public debt. Second, debt management should be guided by a cautious approach that balances the need for countercyclical fiscal measures with long-term debt sustainability, ensuring that borrowing does not create additional external vulnerabilities. Third, trade policy should be aligned with administrative strategies to stimulate export-oriented sectors such as tourism, agriculture, and manufacturing, while simultaneously promoting import substitution through support for domestic industries. Finally, closer institutional coordination among ministries of finance, economy, and trade is essential for translating fiscal and external balance objectives into coherent governance strategies. By linking econometric findings to administrative practice, the study underlines that effective policy implementation depends not only on fiscal discipline but also on strong governance frameworks and institutional capacity.

5.2. Study limitations

This study faces some limitations. First, the dataset covers 56 quarterly observations, which, while sufficient for cointegration and VECM estimation, remains relatively small and may reduce the statistical power of the tests. Second, the Albanian economy experienced structural breaks during the analyzed period. The 2008–2009 financial crisis reduced remittances and widened external deficits, the 2019 earthquake increased fiscal pressures through reconstruction costs, and the COVID-19 pandemic generated both larger fiscal deficits and trade disruptions. These shocks may have influenced the fiscal-external balance relationship beyond what the model fully captures. Future studies could apply structural break tests and extended datasets to account for such disruptions.

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Appendix

The Augmented Dickey-Fuller unit root test (ADF) is used in the methodology, which is shown:

$$\Delta Y_t = \alpha + \beta t + \rho Y_{t-1} + \sum_{j=0}^p \delta_j \Delta Y_{t-j} + \varepsilon_t \quad (\text{A.1})$$

where Y_t is the variable of interest, t represents the time indicator, j the lag number, p the maximum number of lags, and ε_t the error term. The α , β , ρ , and δ are the estimated coefficients. The first difference of the variable of interest is regressed on a constant term and linear trend to the first lag and other lags.

The insight following Granger causality tests can be shown as:

$$Y_t = c_1 + \sum_{i=0}^p \alpha_{1,i} Y_{t-i} + \rho Y_{t-j} + \sum_{i=0}^p \beta_{1,i} X_{t-i} + \varepsilon_{X,t} \quad (\text{A.2})$$

(X) is said to be Granger-cause (Y), and are independent of each other, if both β s and α s is irrelevant. A feedback causal relationship exists between (Y) and (X) if both β s and α s are significant, or (X) granger causes (Y), and vice versa.

In principle, in the framework of vector time series modeling, there are three basic pairs of models. Given a vector of endogenous variables $X_t = (X_1, X_2, \dots, X_t)$: First, a VAR with stationary level variables (X_t) is used when all variables are stationary in level (X_t):

$$X_t = c + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \dots + \varepsilon_t \quad (\text{A.3})$$

Second, a VAR with stationary growth variables (ΔX_t) is used when all variables are stationary in level (X_t):

$$\Delta X_t = c + \beta_1 \Delta X_{t-1} + \beta_2 \Delta X_{t-2} + \dots + \varepsilon_t \quad (\text{A.4})$$

Third, a VEC model is used when all variables are non-stationary in level (X_t) and show cointegrations in level (ΠX_t) (Johansen and Juselius, 1990). The VEC model involves a VAR regression model (ΔX_t) and error-correcting equations with non-stationary level variables (X_t).

$$\Delta X_t = \beta_0 + \beta_1 \Delta X_{t-1} + \beta_2 \Delta X_{t-2} + \dots + \Pi X_{t-1} + \varepsilon_t \quad (\text{A.5})$$

where ΠX_{t-1} is the first lag of linear groupings of non-stationary variables in level or error correction term and represents long-term relations among non-stationary level variables.