

The impact of inflation on Sierra Leone’s current account balance

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DOI: 10.22437/ppd.v13i6.43075	Received: 15.04.2025	Revised: 04.07.2025	Accepted: 23.10.2025	Published: 28.02.2026
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Abstract

This study examines the dynamic relationship between inflation and the current account balance (CAB) in Sierra Leone from 1980 to 2024, with a particular focus on both short-run and long-run effects. The objective is to determine the directional impact of inflation and other macroeconomic indicators on current account performance and to provide actionable insights for economic stabilization. Using the Autoregressive Distributed Lag (ARDL) bounds testing approach and Granger causality analysis, the study assesses both equilibrium and predictive relationships among inflation, the real exchange rate, foreign direct investment (FDI), GDP growth, real interest rates, and trade openness. The results indicate that, in the long run, the CAB improves by approximately 0.0867 percentage points for every one-percentage-point increase in inflation, consistent with the intertemporal current account framework. The findings also suggest feedback effects between inflation and the current account, though statistical significance varies across directions. Trade openness and FDI are found to exert negative long-run effects on the current account, while their lagged effects show positive adjustments. Exchange rate dynamics and interest rates are volatile, whereas economic growth contributes positively to the external balance. Furthermore, the results reveal that inflation Granger-causes GDP growth, real interest rates, and FDI, underscoring its broader macroeconomic influence. Overall, the findings highlight the importance of coordinated fiscal, monetary, and trade policies in maintaining external stability and macroeconomic balance in Sierra Leone.

Keywords: *ARDL model; Current account balance; Inflation; Macroeconomic stability*

JEL Classification: C32, E31, F32

INTRODUCTION

The Balance of Payments (BoP) is a crucial macroeconomic indicator for developing countries, as it reflects a country’s international financial position and overall economic health. A stable BoP enhances investor confidence, and several studies suggest that foreign direct investment (FDI) contributes positively to economic growth (Adegbite & Ayadi, 2010). Conversely, Duramany-Lakkoh et al. (2022) find that FDI does not significantly affect economic growth in Sierra Leone, challenging the conventional view that FDI invariably benefits national economies. In Sierra Leone, a weak industrial base and high import dependence contribute to economic instability, potentially leading to exchange rate crises, inflation, currency depreciation, and the accumulation of foreign

debt. By contrast, a favourable BoP promotes export growth and enhances competitiveness (Fakiyesi, 1996). Despite its resource potential, Sierra Leone faces severe macroeconomic vulnerabilities, including persistent trade deficits, high inflation, exchange rate depreciation, and declining external reserves (Tarawalie & Jalloh, 2021).

This deterioration, coupled with unfavourable exchange rates and ongoing fiscal deficits, has resulted in significant imbalances in the country's external position. Because Sierra Leone imports more goods and services than it exports, the resulting trade deficit has reached critical levels, contributing to inflationary pressures and weakening the national currency (Conteh, 2024). The African Development Bank (ADB) Country Focus Report (2024) projects that inflation in Sierra Leone will decline from 30.6% in 2024 to 20.2% in 2025, suggesting potential stabilization as external shocks subside.

Nevertheless, the country continues to grapple with macroeconomic challenges—such as inflation, trade deficits, and exchange rate depreciation—that adversely affect its current account balance (CAB) and generate economic uncertainty (A. B. Tarawalie & Kpana, 2022). Despite policy efforts to stabilize prices and exchange rates, rising inflation has exacerbated trade imbalances, increased import costs, and depleted foreign exchange reserves (Khan & Senhadji, 2024). Over time, these pressures have led to a marked decline in international reserves, with gross reserves falling from \$677 million in 2020 to \$468 million in 2023, and net reserves declining sharply from \$159 million to just \$1 million (Government of Sierra Leone, 2018).

Given that the government's ability to control inflation is essential for improving GDP and achieving sustainable growth, inflation has significant implications for Sierra Leone's CAB, export competitiveness, trade deficits, investment decisions, and overall economic performance (Tarawalie et al., 2012). Evidence indicates that GDP growth in Sierra Leone has been highly volatile due to macroeconomic challenges, including inflation, exchange rate depreciation, and trade deficits (Sesay et al., 2021). Although growth is projected to improve to 4.7% in 2024 and 5.2% in 2025, suggesting potential stabilization, the predominantly agro-based economy—where agriculture accounts for 57% of GDP and employs 60% of the labour force—remains particularly vulnerable to inflationary pressures.

A growing body of literature has examined the relationship between inflation and the BoP. According to the purchasing power parity (PPP) theory, high inflation leads to currency depreciation, which may increase exports and strengthen the BoP. In contrast, the monetary approach to the balance of payments (MABP) holds that excessive monetary expansion leads to inflation, capital flight, and BoP deficits (Fakiyesi, 1996). Braima & Korsu (2013) find that Sierra Leone's balance of payments is largely a monetary phenomenon, driven by changes in domestic credit, the price level, the exchange rate, and interest rates. Empirical findings on the inflation–BoP nexus remain mixed. Some studies contend that inflation worsens the BoP by raising import costs and reducing export competitiveness (Imoughele & Ismaila, 2015). In contrast, others suggest that moderate inflation can stimulate growth and improve trade balances (Usman et al., 2024).

These inconsistencies—particularly in developing, import-dependent economies such as Sierra Leone—underscore the need for further empirical investigation using models capable of distinguishing between short- and long-run effects. Moreover, many existing studies rely on OLS or VAR methodologies, which may not adequately capture both short- and long-term dynamics. For example, Tiruneh (2008) employs a VAR model to examine the effects of currency depreciation on Ethiopia's trade balance between 1960–1961 and 2008–2009, finding a significant positive relationship with real exchange

rates. Ghosh & Phillips (1998), by contrast, document a strong inverse relationship between inflation and growth, emphasizing the detrimental effects of high inflation on short-term economic performance.

Few studies have employed the Autoregressive Distributed Lag (ARDL) methodology to investigate the causal relationship and long-run adjustment between inflation and the CAB in Sierra Leone. Braima & Korsu (2013) assess whether Sierra Leone's balance of payments is a monetary phenomenon and conclude that prices, interest rates, and domestic credit significantly influence external balance dynamics. Kamara (2023) examines the relationship between exchange rates and inflation and demonstrates that both variables significantly affect the trade balance. However, recent studies in Sierra Leone have not applied ARDL bounds testing to analyze inflation–current account dynamics, with most focusing primarily on the trade balance or neglecting the broader external sector framework. Similarly, few studies in West Africa jointly examine inflation and the balance of payments within a structured dynamic-causal framework (Kemoe, 2024).

Overall, the literature on Sierra Leone and West Africa predominantly relies on OLS, VAR, or monetary approaches, with limited application of dynamic ARDL modelling. Furthermore, most studies focus on trade balances or aggregate BoP measures, without isolating current account dynamics or distinguishing between short- and long-run effects. Few integrate inflation with key external sector variables—such as FDI, trade openness, and GDP growth—within a unified dynamic framework.

Although the broader theoretical discussion refers to the Balance of Payments (BoP), this study empirically focuses on the current account balance (CAB), which captures the trade and income components of the external sector.

In light of these gaps, this study examines the impact of inflation on Sierra Leone's CAB using annual data from 1980 to 2024 and applying the Autoregressive Distributed Lag (ARDL) methodology. It addresses the structural challenges faced by small, open economies and provides context-specific insights for Sierra Leone. The primary objectives are to evaluate the short- and long-run effects of inflation, determine whether inflation Granger-causes movements in the CAB, and assess how other macroeconomic variables—such as FDI, exchange rates, interest rates, GDP growth, and trade openness—interact with inflation. The study hypothesizes that higher inflation rates deteriorate Sierra Leone's CAB by reducing export competitiveness and increasing import costs, consistent with the predictions of the MABP and elasticity approaches (Musa et al., 2022).

The study also examines potential feedback effects between inflation and the CAB, underscoring the importance of prudent macroeconomic management. In doing so, it contributes to the literature in three principal ways. First, it applies the ARDL bounds testing approach to examine both short- and long-run effects of inflation on Sierra Leone's current account balance. Second, it integrates key macroeconomic variables—including FDI, the exchange rate, GDP growth, interest rates, and trade openness—within a unified dynamic framework. Third, it provides policy-relevant insights for small, import-dependent economies facing persistent external vulnerabilities.

METHODS

This study employs the Autoregressive Distributed Lag (ARDL) modelling approach to examine the effect of inflation on Sierra Leone's balance of payments. The ARDL framework, developed by Pesaran et al. (2001), accommodates variables integrated of mixed orders—either $I(0)$ or $I(1)$ —without requiring that all variables be

stationary at the same level. It provides a robust method for testing for a long-run relationship via bounds testing. It allows estimation of both short-run dynamics and long-run equilibrium relationships within a single reduced-form equation. The ARDL approach is particularly suitable for small sample sizes and incorporates lagged variables to capture the time-dependent effects of inflation on the current account balance (CAB) (Ukangwa et al., 2022).

As specified in the model, the functional relationship is expressed as:

$$CAB = f(INF, RER, FDI, GDPGR, RIR, TO) \dots\dots\dots (1)$$

Where: CAB denotes the current account balance (as a percentage of GDP), which serves as the dependent variable measuring external sector performance. INF represents the rate of inflation (Consumer Price Index, annual %). RER refers to the real exchange rate. FDI denotes foreign direct investment net inflows (as a percentage of GDP). GDPGR represents economic growth (GDP growth rate, %). RIR is the real interest rate, and TO denotes trade openness.

Model specifications

The functional relationship was transformed into an estimable econometric model to achieve the study's primary objective. Accordingly, Model 2.1 is specified as follows:

$$CAB_t = \alpha_0 + \alpha_1 INF_t + \alpha_2 RER_t + \alpha_3 FDI_t + \alpha_4 GDPGR_t + \alpha_5 RIR_t + \alpha_6 TO_t + \mu_t \dots\dots\dots(2)$$

The current account balance (CAB), measured as a percentage of GDP, serves as the dependent variable and captures overall external sector performance, including trade flows and external adjustments.

Inflation (INF), defined as the annual percentage change in the Consumer Price Index, influences trade competitiveness, capital flows, and reserve dynamics, consistent with the Purchasing Power Parity (PPP) theory and the Monetary Approach to the Balance of Payments (MABP). The real exchange rate (RER), adjusted for inflation differentials, affects export competitiveness and trade balance dynamics, as emphasized by the PPP framework and the Elasticity Approach (Ho & McCauley, 2003).

Foreign direct investment (FDI), measured as net inflows relative to GDP, reflects capital flow dynamics and external balance adjustments. At the same time, economic growth (GDPGR) captures domestic productive capacity and trade performance in line with income and multiplier approaches. The real interest rate (RIR), defined as the nominal rate adjusted for inflation, influences capital mobility and investment decisions (Olayungbo & Quadri, 2019). Trade openness (TO), measured as the ratio of exports and imports to GDP, represents integration into the global economy and may increase exposure to inflationary and exchange rate shocks, particularly in import-dependent economies such as Sierra Leone (Calderón, 2004).

Inflation may also indirectly affect the current account through its impact on FDI and economic growth, thereby influencing macroeconomic stability (Coulibaly & Gnimassoun, 2022). By grounding the empirical specification in established frameworks—including PPP, MABP, the Income Approach (IA), and the Elasticity Approach (EA)—the model provides a theoretically consistent basis for examining both short-run and long-run dynamics within the structural context of Sierra Leone.

Table 1 summarises the definitions, theoretical foundations, and contextual relevance of the variables included in the model.

Table 1. Justification and theoretical linkages of variables

Variable	Definition	Theoretical Framework	Relevance to Sierra Leone
CAB (Dependent Variable)	Current account balance as a percentage of GDP	N/A	Proxy for external balance; captures trade flows, primary and secondary income, and reserve-related adjustments.
Inflation (INF)	Annual percentage change in CPI	Purchasing Power Parity (PPP) and Monetary Approach to BoP (MABP)	High inflation depreciates the currency, affects trade competitiveness, and increases import costs.
Real Exchange Rate (RER)	Inflation-adjusted nominal exchange rate	PPP and Elasticity Approach (EA)	Currency instability affects export pricing and the current account balance.
Foreign Direct Investment (FDI)	Net inflows as a percentage of GDP	Capital flow theory	FDI strengthens reserves and supports the CAB; Sierra Leone actively seeks FDI to stimulate growth.
GDP Growth Rate (GDPGR)	Annual percentage change in real GDP	Income/Multiplier approach	Higher growth enhances export capacity, reserve accumulation, and trade performance.
Real Interest Rate (RIR)	Lending rate adjusted for inflation	IS–LM model and MABP	Influences capital flows and investment; inflation distorts real interest rate effects.
Trade Openness (TO)	(Exports + Imports) / GDP	Globalization and external sector theory	High import dependence increases vulnerability to inflation and exchange rate shocks.

ARDL model and justification

To examine the impact of inflation on Sierra Leone’s current account balance (CAB), this study employs the ARDL bounds testing approach. This method captures both short-run dynamics and long-run equilibrium relationships through an unrestricted error correction representation. To operationalize Equation (2), the ARDL–Unrestricted Error Correction Model (UECM) is specified as follows:

$$\Delta CAB_t = \alpha_1 + \vartheta_1 CAB_{t-1} + \vartheta_2 INF_{t-1} + \vartheta_3 RER_{t-1} + \vartheta_4 FDI_{t-1} + \vartheta_5 GDPGR_{t-1} + \vartheta_6 RIR_{t-1} + \vartheta_7 TO_{t-1} + \sum_{i=1}^k \theta_{1i} \Delta BOP_{t-i} + \sum_{j=0}^k \theta_{2j} \Delta INF_{t-j} + \sum_{j=0}^k \theta_{3j} \Delta RER_{t-j} + \sum_{j=0}^k \theta_{4j} \Delta FDI_{t-j} + \sum_{j=0}^k \theta_{5j} \Delta GDPGR_{t-j} + \sum_{j=0}^k \theta_{6j} \Delta RIR_{t-j} + \sum_{j=0}^k \theta_{7j} \Delta TO_{t-j} + \varepsilon_{1t} \dots \dots \dots (3)$$

In this specification, θ_{ij} represent short-run coefficients, while ϑ_1 to ϑ_7 denote the long-run parameters associated with lagged level variables. The operator Δ indicates first differencing, and k denotes the optimal lag length selected using the Schwarz Information Criterion (SIC). The error term ε_t is assumed to be white noise.

Conventional co-integration techniques, such as the Johansen–Juselius maximum likelihood approach and the Engle–Granger residual-based method, require all variables to be integrated of order I(1) (Narayan, 2004). In contrast, the ARDL bounds testing framework developed by Pesaran et al. (2001) accommodates variables integrated of order I(0) or I(1), making it particularly suitable for small samples and models with mixed integration orders. This approach allows the simultaneous estimation of short-run adjustments and long-run relationships while providing efficient and unbiased estimates in small-sample contexts.

Estimation procedure

The estimation procedure proceeds in several stages. First, the equations are estimated using OLS and ARDL, which require testing for unit roots to determine the integration order of each variable. The Augmented Dickey–Fuller (ADF) test is employed to assess stationarity and to ensure that none of the variables is integrated of order I(2), as this would violate the assumptions of the ARDL framework.

Second, the optimal lag length for the ARDL model is determined using the Akaike Information Criterion (AIC) and the Schwarz Information Criterion (SIC).

Third, the ARDL bounds testing approach is applied to examine the existence of a long-run relationship among the variables. The computed F-statistic is compared with the critical bounds provided by Pesaran et al. (2001). The null hypothesis of no co-integration ($H_0: \pi_1 = \pi_2 = \pi_3 = \pi_4 = \pi_5 = 0$) is tested against the alternative hypothesis of co-integration (H_1 : at least one $\pi_i \neq 0$). If the F-statistic exceeds the upper critical bound (UCB), co-integration is confirmed; if it falls below the lower critical bound (LCB), co-integration is rejected.

Once co-integration is established, the long-run coefficients are estimated using the ARDL long-run specification:

$$CAB_t = \alpha_0 + \sum_{i=1}^n \psi_i CAB_{t-i} + \sum_{i=0}^m \delta_i INF_{t-i} + \sum_{i=0}^p \eta_i RER_{t-i} + \sum_{i=0}^q \zeta_i FDI_{t-i} + \sum_{i=0}^r \gamma_i GDPGR_{t-i} + \sum_{i=0}^s \rho_i RIR_{t-i} + \sum_{i=0}^t \sigma_i TO_{t-i} + \omega_t \dots\dots\dots (4)$$

In the final stage, short-run dynamic adjustments are estimated using an error correction model (ECM) derived from the confirmed long-run relationship:

$$\Delta CAB_t = \theta_0 + \sum_{i=1}^n \theta_1 \Delta CAB_{t-i} + \sum_{i=0}^n \theta_2 \Delta INF_{t-i} + \sum_{i=0}^n \theta_3 \Delta RER_{t-i} + \sum_{i=0}^n \theta_4 \Delta FDI_{t-i} + \sum_{i=0}^n \theta_5 \Delta GDPGR_{t-i} + \sum_{i=0}^n \theta_6 \Delta RIR_{t-i} + \sum_{i=0}^n \theta_7 \Delta TO_{t-i} + \lambda ECM_{t-i} + \mu_t \dots\dots\dots(5)$$

In this specification, θ_1 to θ_7 represent the short-run dynamic coefficients. The term ECM_{t-1} is derived from the established long-run relationship and captures the speed of adjustment toward equilibrium. The coefficient λ measures the rate at which deviations from the long-run equilibrium are corrected following a short-run shock.

Following estimation, the models are subjected to a series of diagnostic tests to ensure robustness. These include the Breusch–Godfrey LM test for serial correlation, heteroskedasticity tests, and the CUSUM and CUSUMSQ tests to assess model stability. Additionally, Granger causality tests are conducted to determine the direction of causality, particularly whether inflation leads to deterioration in the current account balance.

RESULTS AND DISCUSSION

Preliminary and co-integration results

The stationarity of the variables is examined using the Augmented Dickey–Fuller (ADF) test, with the results presented in Table 2. The findings indicate that CAB, RER, FDI, GDPGR, and RIR are stationary at the level, while INF and TO become stationary after first differencing. Importantly, none of the variables is integrated of order two.

Table 2. Augment Dickey-Fuller unit root test results

Variables	ADF t-stat at level	crit.value at 5%	Prob.	ADF t-stat at first difference	crit.value at 5%	Prob.	Order of Integration
CAB	-4.4754	-3.5155	0.0046	-	-	-	I (0)
INF	-2.3548	-3.5207	0.3968	-5.2890	-3.5484	0.0007	I (1)
RER	-7.3429	-3.5155	0.0000	-	-	-	I (0)
FDI	-5.9608	-3.5155	0.0001	-	-	-	I (0)
GDPGR	-6.3038	-3.5155	0.0000	-	-	-	I (0)
RIR	-5.4822	-3.5155	0.0003	-	-	-	I (0)
TO	-3.1831	-3.5155	0.1010	-6.9585	-3.5180	0.0000	I (1)

To account for possible structural breaks, the Zivot–Andrews test is applied (Table 3). The results suggest that CAB becomes stationary after first differencing when structural breaks are incorporated, with a break identified around 1993. This contrasts with the conventional ADF result and reflects the sensitivity of standard unit root tests to structural disruptions. Nevertheless, the mixed order of integration (I(0) and I(1)) remains consistent with the assumptions of the ARDL framework.

Table 3. Zivot-Andrew unit root test result

Variables	Zivot-Andrews t-stat at the level	crit.value at 5%	Prob.	Break Point Dates	Zivot-Andrews t-stat at first difference	crit.value at 5%	Prob.	Break Point Dates	Order of Integration
CAB	-4.8182	-4.93	0.2792	1993	-9.1167	-4.42	0.0089	1989	I(1)
INF	-5.8161	-4.93	0.0000	1993	-	-	-	-	I(0)
RER	-7.9875	-4.93	0.0034	1998	-	-	-	-	I(0)
FDI	-6.271	-4.58	0.0645	2015	-	-	-	-	I(0)
GDPGR	-7.8251	-4.93	0.0039	2002	-	-	-	-	I(0)
RIR	-6.9952	-4.93	0.0000	1993	-	-	-	-	I(0)
TO	-4.6007	-4.93	0.0106	1997	-	-	-	-	I(0)

The optimal lag length is determined using information criteria (Table 4). The majority of the criteria support lag 1, which is therefore selected for the ARDL estimation.

Table 4. Test result for lag length

Lag	LogL	LR	FPE	AIC	SIC	HQ
0	-1336.915	NA	3.31E+18	62.50768	62.79438*	62.61340
1	-1255.856	131.19561*	7.68e+17*	61.01657*	63.31023	61.86240*
2	-1216.035	51.86066	1.41E+18	61.44348	65.74408	63.02941

The ARDL bounds test results (Table 5) show that the calculated F-statistic (5.205654) exceeds the upper bound critical value at the 1% significance level. This confirms the existence of a long-run equilibrium relationship between CAB and the explanatory variables. Having established co-integration, the next section presents and interprets the model's long-run dynamics. Therefore, the ARDL long-run estimation can be meaningfully conducted.

Table 5. Summary of ARDL-bound co-integration test result

Test-statistic	Value	Significant	Bound Critical Values	
			I (0)	I (1)
F-statistics	5.205654	10%	2.12	3.23
		5%	2.45	3.61
K	6	1%	3.15	4.43

Long-run dynamics

In this model specification, the current account balance (CAB) is treated as the dependent variable. Inflation (INF) serves as the primary explanatory variable. In contrast, the control variables include the real exchange rate (RER), foreign direct investment (FDI), GDP growth rate (GDPGR), real interest rate (RIR), and trade openness (TO). Based on the Schwarz Information Criterion (SIC), the optimal specification selected is ARDL (1,0,0,1,0,0,1).

The reported coefficients reflect long-run dynamic relationships derived from the ARDL specification (Table 6). The positive and statistically significant coefficient of the lagged dependent variable (CAB(-1)) indicates partial persistence in the current account balance. The magnitude of the coefficient (0.4767) suggests that approximately 47% of the previous period’s external position is carried forward, reflecting moderate persistence in current account dynamics.

Table 6. Result of long-term model regression

Variables	Coefficient	Std. Error	t-statistics	Prob.
CAB (-1)	0.476692	0.136232	3.499120	0.0013
INF	0.086747	0.031754	2.731857	0.0099
RER	0.000298	0.000384	0.775439	0.4434
FDI	-1.205518	0.102667	-11.74207	0.0000
FDI (-1)	0.758224	0.202217	3.749565	0.0007
GDPGR	0.220696	0.081207	2.717689	0.0103
RIR	0.030338	0.051614	0.587789	0.5606
TO	-0.198646	0.062660	-3.170248	0.0032
TO (-1)	0.120484	0.063609	1.894118	0.0667
C	-2.925091	2.156414	-1.356461	0.1839
R-squared	0.868306			
F-statistics	24.90815			
Prob (F-Statistic)	0.0000000			
Durbin-Watson stat	2.362854			

Inflation (INF) has a positive, statistically significant long-run effect on the CAB at the 1% level of significance. Specifically, a one-percentage-point increase in inflation is associated with a 0.0867 percentage-point improvement in the current account balance. This finding is consistent with the intertemporal current account framework, which suggests that inflation may be accompanied by real exchange rate adjustments and structural transformations that gradually enhance competitiveness.

Although standard open-economy theory posits that inflation typically deteriorates the current account by eroding external competitiveness, structuralist and balance-of-payments–constrained growth perspectives argue that, in developing economies, moderate inflation—when associated with demand compression, relative price adjustments, or export-oriented structural shifts—may improve the external position in the long run. Empirical support for this interpretation is provided by Fosu (2024), who reports a positive long-run relationship between inflation and the current account balance in a panel ARDL study of 28 African countries. Similar evidence is found in Ousseini et

al. (2017) for WAEMU countries and Ahmed (2021) for Bangladesh. However, contrasting findings by Aidi et al. (2018) and Manual and San (2019) highlight that inflation may adversely affect external balances in other contexts, suggesting that country-specific structural conditions play a critical role.

The coefficient of the real exchange rate (RER) is positive but statistically insignificant, indicating that exchange rate movements do not exert a strong long-run influence on the CAB during the study period. Moreover, the very small magnitude of the coefficient (0.000298) suggests limited economic relevance of exchange rate fluctuations in the long-run specification.

Foreign direct investment (FDI) exhibits a negative and statistically significant long-run coefficient (-1.2055), implying that a 1% increase in FDI inflows is associated with a 1.2 percentage-point deterioration in the CAB. The relatively large magnitude of this coefficient suggests that capital inflows may be strongly linked to import-intensive investment structures. In Sierra Leone, FDI is concentrated in sectors such as mining and infrastructure, which require substantial capital goods and intermediate imports. Additionally, profit repatriation and primary income outflows may further exert pressure on the current account. While FDI strengthens the financial account through capital inflows, its net long-run effect on the current account may be adverse if it does not generate sufficient export earnings or domestic value addition.

Notably, the lagged FDI coefficient is positive (0.7582) and statistically significant, indicating that part of the adjustment occurs with a delay. This dynamic pattern may reflect gradual export responses, productivity gains, or the progressive integration of foreign investments into domestic productive capacity over time.

Economic growth (GDPGR) is positively and significantly associated with the current account balance. A one-percentage-point increase in GDP growth leads to an estimated 0.22 percentage-point improvement in the CAB. This suggests that economic expansion enhances export capacity, increases foreign exchange earnings, and may stimulate remittance inflows. The result supports Fambon's (2013) findings, which report a positive association between GDP growth and Sierra Leone's current account performance.

By contrast, the real interest rate (RIR) is statistically insignificant. This finding aligns with the IMF (2023), which notes that real interest rates in Sierra Leone may not exert a strong influence on the external balance due to weak financial intermediation, shallow capital markets, and inflation-driven distortions that limit the effectiveness of interest rate adjustments in guiding investment decisions. Similar evidence is reported by Kingia & Muba (2021) for Tanzania.

Trade openness (TO) exhibits a negative, statistically significant coefficient (-0.1986), indicating that a 1-percentage-point increase in openness reduces the CAB by approximately 0.19 percentage points. This suggests that, given Sierra Leone's high import dependence and narrow export base, greater integration into global trade may exacerbate external imbalances. This finding contrasts with arguments that trade integration promotes external balance through diversification and competitiveness (Yeboah, 2023), underscoring the importance of structural conditions once more.

Overall, with an R^2 of 0.8683 and a statistically significant F-statistic, the model explains approximately 86% of the variation in the current account balance, indicating strong explanatory power and a well-specified long-run relationship.

Short-run adjustment and error correction

The study employs the ARDL (1,0,0,0,0,0,0) model selected based on the Schwarz Information Criterion (SIC), with the current account balance (CAB) as the

dependent variable. The short-run results indicate that inflation negatively affects the CAB in Sierra Leone, suggesting that rising prices do not stimulate economic growth or significantly increase short-term foreign direct investment (FDI) inflows (Table 7). Although inflation may be associated with increases in FDI inflows, the impact of such inflows on the balance of payments is not statistically strong

Table 7. Model for short-term error correction

Variables	Coefficient	Std. Error	t-statistics	Prob.
D(CAB (-1))	0.885081	0.614163	1.441117	0.1587
D(INF (-1))	-0.047169	0.075044	-0.628559	0.5338
D(RER (-1))	-0.000551	0.000841	-0.655513	0.5165
D(FDI (-1))	1.558037	0.808117	1.927984	0.0622
D(GDPGR (-1))	-0.247243	0.190659	-1.296782	0.2034
D(RIR (-1))	-0.031664	0.110180	-0.287382	0.7756
D(TO (-1))	0.168534	0.200262	0.841569	0.4059
ECM (-1)	-1.653639	0.781107	-2.117044	0.0417
C	-0.321843	1.530042	-0.210249	0.8347

This finding is consistent with Kamara (2023), who reports that inflation negatively affects Sierra Leone’s balance of payments. The results imply that low and stable inflation is more conducive to sustainable economic growth and external stability. While increased FDI inflows can potentially improve the balance of payments, their effect may be limited if they are not substantial or do not generate sufficient export earnings, as Echcharfi & Fayou (2024) found in a study examining FDI, the current account, and growth. Thus, inflation may influence the economy in both positive and negative ways, depending on the time horizon and structural conditions.

In the short run, exchange rate movements, economic growth, and real interest rates negatively affect the balance of payments, whereas FDI inflows and trade openness positively associate with the CAB. These results highlight the complex interaction among macroeconomic variables in shaping Sierra Leone’s external position. Exchange rate volatility and high borrowing costs may constrain external performance, while FDI and trade openness can enhance productive capacity, attract capital inflows, and expand market access.

Furthermore, Equation (5), which represents the error-correction model (ECM), captures the short-run dynamics and the speed of adjustment toward the long-run equilibrium. The ECM(-1) coefficient is negative and statistically significant (-1.653639), confirming the existence of a stable long-run relationship among the variables. The magnitude of the coefficient, which exceeds unity in absolute value, suggests a rapid adjustment process—greater than 100% within one year—indicating possible overshooting and oscillatory convergence rather than a smooth, gradual return to equilibrium. Such a dynamic adjustment process is plausible in a fragile and shock-prone economy like Sierra Leone, where external imbalances may respond sharply to inflationary pressures and exchange rate fluctuations. These findings are consistent with evidence from developing economies characterized by vulnerable external sectors (Younus & Prince, 2024). However, the magnitude of the adjustment may be magnified by structural weaknesses, including limited foreign reserves, heavy reliance on aid, and a narrow export base.

To contextualize the short-run dynamics and the rapid adjustment process captured by the ECM, Figure 1 presents the historical evolution of Sierra Leone’s balance of payments and inflation over the study period. The graphical evidence helps explain the volatility and structural shocks that may underlie the observed econometric results.

Figure 1 illustrates the historical trends of Sierra Leone’s CAB and inflation from 1980 to 2024. Macroeconomic instability, persistent trade imbalances, currency depreciation, rising external debt, and political crises have significantly influenced the balance of payments. Between 1980 and 1990, the CAB averaged between -2.6% and -8.26% of GDP.

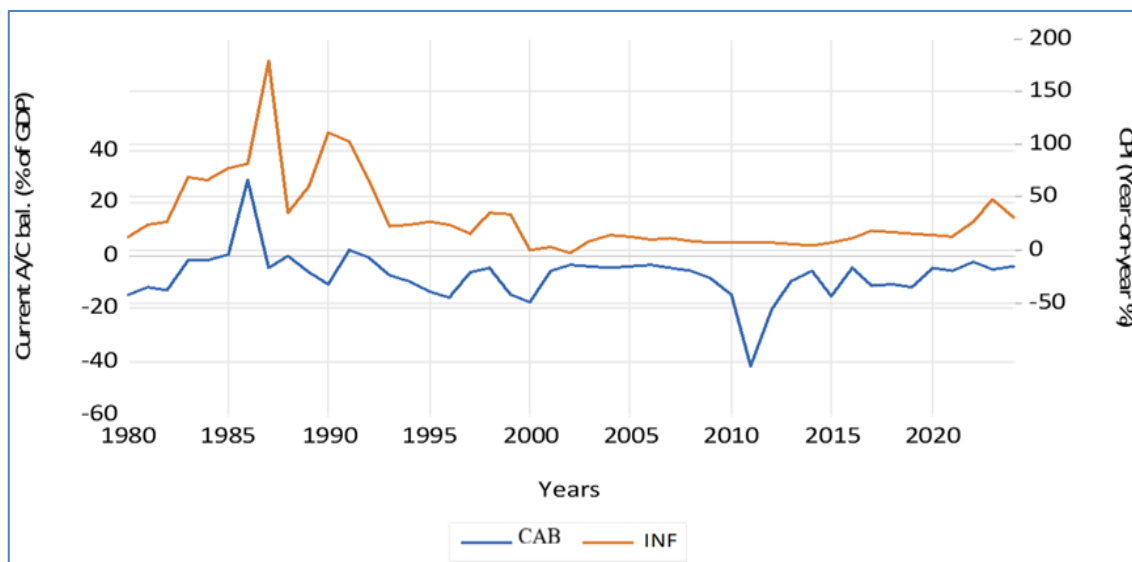


Figure 1. Trend analysis of the Sierra Leone CAB and Inflation

During the civil war period (1991–2002), the economy experienced severe contraction and increased dependence on foreign aid, resulting in a further deterioration of the CAB, with the average declining from -7.99% to -9.09%. The post-war recovery phase (2003–2013) brought temporary improvements, supported by the resumption of diamond and iron ore exports, increased foreign assistance, and IMF-backed stabilization programmes. The CAB-to-GDP ratio improved from -9.09% to -5.2% during this period.

However, the Ebola outbreak (2014–2016) disrupted trade and economic activity, increased debt servicing costs, and widened external deficits. The CAB-to-GDP ratio deteriorated further, averaging -13.12%. Similarly, the COVID-19 pandemic (2020–2022) disrupted global trade, reduced export demand, increased import costs, and contributed to a decline in foreign reserves from \$677 million in 2020 to \$468 million in 2023. These developments, combined with high inflation and declining exports, further weakened the external balance.

Inflation trends over the period display substantial volatility driven by both domestic and international factors, including exchange rate instability, global commodity price fluctuations, and fiscal and monetary policy challenges. Episodes of hyperinflation occurred in 1987 (178.70%), 1990 (110.95%), and 1991 (102.69%), largely due to macroeconomic mismanagement, political instability, fiscal deficits, and external shocks. The transition from a fixed to a floating exchange rate regime in 1986–1987 contributed to currency instability, widened the parallel market premium, and accelerated depreciation of the Leone.

Following the civil war, inflation fluctuated significantly, rising from 7.60% in 2003 to 18.22% in 2017, and reaching 27.0% in 2022, largely due to supply chain disruptions and rising global commodity prices associated with the Russia–Ukraine conflict. Depreciation of the Leone against major currencies intensified imported

inflation, given the country’s heavy reliance on imported goods such as rice, flour, fuel, and machinery.

Causality and macroeconomic interactions

The Granger causality results reported in Table 8 reveal significant predictive linkages among key macroeconomic variables in Sierra Leone, particularly between inflation and the current account balance (CAB). Specifically, causality running from the balance of payments (CAB) to inflation is strongly significant at the 5% level ($p = 0.0009$), suggesting that external imbalances exert a substantial predictive influence on inflation dynamics. In contrast, the reverse causality from inflation to the CAB is only marginally significant at the 10% level ($p = 0.0506$). This implies that although inflation may have some predictive effect on the external balance, the statistical evidence is comparatively weaker. Therefore, the bidirectional relationship should be interpreted with caution, as the strength of causality differs across directions.

Table 8. Outcome of the Granger causality test

		Lag 1	
Null Hypothesis	Obs.	F. stat	Prob.
INF does not Granger-cause CAB	44	3.59483	0.0506*
CAB does not Granger-cause INF		12.8494	0.0009**
FDI does not Granger-cause INF	44	26.2029	8.00E-06
INF does not Granger-cause FDI		4.33181	0.0437**
GDPGR does not Granger-cause INF	44	0.18878	0.6662
INF does not Granger-cause GDPGR		5.67313	0.0219**
RIR does not Granger-cause INF	44	1.11934	0.2963
INF does not Granger-cause RIR		9.39655	0.0038**
GDPGR does not Granger-cause RER	44	2.38749	0.1300
RER does not Granger-cause GDPGR		4.63777	0.0372**
TO does not Granger-cause RER	44	0.25763	0.6145
RER does not Granger-cause TO		5.22566	0.0275**

*Note: **significant at 5% level, *significant at 10% level*

From an economic perspective, a deteriorating balance of payments may contribute to inflationary pressures through exchange rate depreciation and rising import costs, consistent with the Monetary Approach to the Balance of Payments and exchange rate pass-through theory (Aron et al., 2014; Tarawalie & Kpana, 2022). Conversely, inflation may influence the current account through its effects on export competitiveness and import demand, as suggested by the elasticity approach (Ismaila & Lawrence, 2015). However, this channel appears less robust statistically in Sierra Leone.

The results further indicate bidirectional causality between inflation and FDI, as well as unidirectional causality from inflation to GDP growth and real interest rates. The causal relationship between inflation and FDI is consistent with capital flow theory, which posits that macroeconomic instability discourages foreign investment (Ukangwa et al., 2022). Similarly, the significant causal relationship between inflation and GDP growth supports the argument that inflation distorts price signals and undermines economic performance (Ghosh & Phillips, 1998; Jackson et al., 2023).

Additionally, the real exchange rate is found to Granger-cause both GDP growth and trade openness, underscoring the importance of exchange rate dynamics in shaping real sector performance and external integration (Ho & McCauley, 2003).

Overall, the findings reveal interconnected macroeconomic linkages in Sierra Leone, where inflation and external imbalances interact, albeit asymmetrically. From a

policy perspective, stabilizing the external sector may help mitigate inflationary pressures, while effective inflation management remains essential for macroeconomic stability. Nevertheless, given the marginal significance of the inflation-to-CAB causality, policy implications should be drawn with appropriate caution.

Model robustness and stability

Diagnostic tests are conducted to ensure the reliability of the estimated ARDL model. Table 9 reports the results of the Breusch–Godfrey LM test for serial correlation and the Breusch–Pagan–Godfrey test for heteroscedasticity.

Table 9. Findings of the diagnostic test

Model	Test	F-statistic	Prob. Value	Percentage	Conclusion
CAB	Serial Correlation (Breusch–Godfrey LM test Statistic)	4.4191	0.4033	40.3	No serial correlation
CAB	Heteroscedasticity Test (Breusch–Pagan–Godfrey)	0.568737	0.8128	81.2	No heteroscedasticity

As reported in Table 9, the Breusch–Godfrey LM test yields a p-value of 0.4033, which exceeds the 5% significance level. Therefore, the null hypothesis of no serial correlation cannot be rejected, indicating that the residuals are independently distributed. This confirms that the model does not suffer from autocorrelation, thereby enhancing the reliability of the estimated coefficients and standard errors.

Similarly, the Breusch–Pagan–Godfrey test for heteroscedasticity produces a p-value of 0.8128, which is also greater than the 5% significance level. Since the null hypothesis in this test assumes homoscedasticity, the result implies that the error variance is constant. Consequently, the model satisfies the homoscedasticity assumption, and the estimated standard errors remain unbiased and efficient.

Overall, the diagnostic test results confirm that the model is free from serial correlation and heteroscedasticity, thereby supporting the robustness and validity of the econometric estimates.

Beyond residual diagnostics, the model's structural stability is also examined. Figures 2 and 3 present the results of the CUSUM and CUSUM of Squares (CUSUMSQ) stability tests, which assess the structural stability of the estimated ARDL model over the sample period. These tests examine whether the recursive residuals remain within the critical bounds at the 5% significance level. If the plotted statistics remain within the critical bounds, the null hypothesis of parameter stability cannot be rejected.

In both the CUSUM and CUSUMSQ tests (Figures 1 and 2), the plotted statistics remain within the 5% critical bounds throughout the sample period, indicating parameter stability and the absence of structural breaks.

Overall, the results of both the CUSUM and CUSUMSQ tests confirm that the ARDL model is structurally stable over the study period. Consequently, the estimated long-run and short-run coefficients are reliable for inference and policy analysis.

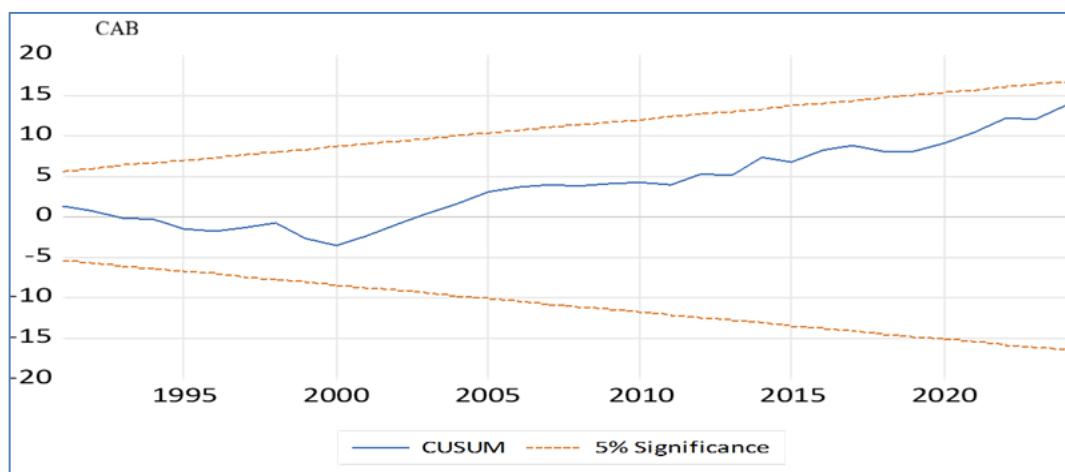


Figure 2. Visual outcome of the CAB CUSUM test

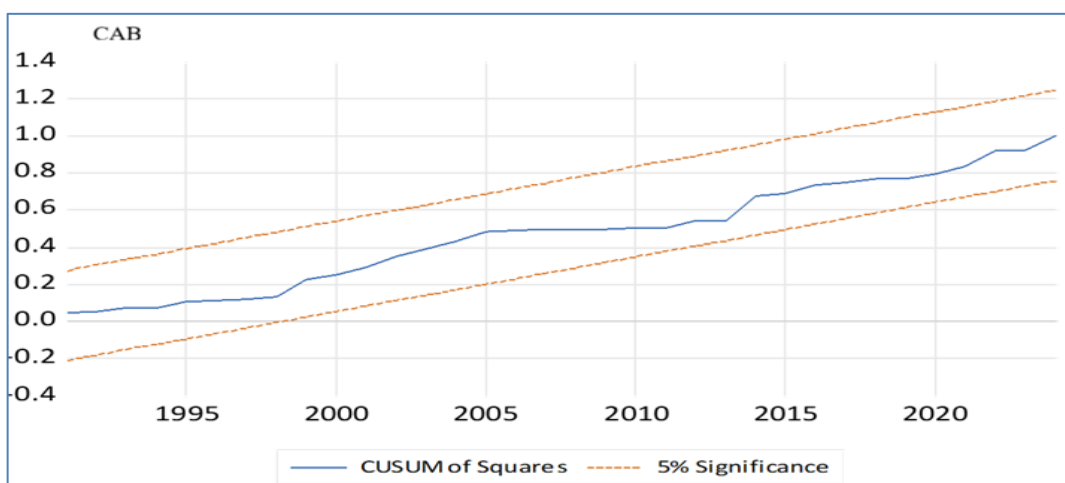


Figure 3. Visual outcome of the CAB CUSUM of Squares test

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examines the relationship between inflation and the current account balance (CAB) in Sierra Leone using annual data from 1980 to 2024. The empirical findings confirm the existence of a long-run equilibrium relationship between inflation and the CAB within the ARDL framework.

In the long run, inflation has a positive, statistically significant effect on the CAB, suggesting that higher inflation is associated with improvements in the external balance. This outcome may reflect exchange rate adjustments and relative price effects that enhance external competitiveness over time. However, in the short run, inflation negatively affects the CAB, indicating that rising prices increase import costs, weaken export competitiveness, and exert pressure on foreign exchange reserves. These findings demonstrate that inflation's role in Sierra Leone's external performance is time-dependent and shaped by structural conditions.

Foreign direct investment (FDI) inflows and trade openness exert negative long-run effects on the CAB, likely due to import-intensive investment patterns and high

dependence on imported goods. In contrast, GDP growth contributes positively to the external balance. The Granger causality results reveal a bidirectional relationship between inflation and the CAB, indicating a feedback mechanism that may amplify macroeconomic instability. The error-correction mechanism suggests rapid adjustment toward long-run equilibrium, with evidence of overshooting and oscillatory convergence, reflecting the economy's fragile, shock-prone nature.

Despite these contributions, several limitations should be acknowledged. Although the study incorporates the Zivot–Andrews test to account for endogenous structural breaks, it does not explicitly model multiple structural breaks or include crisis-specific dummy variables—such as those associated with the civil war, the Ebola outbreak, or the COVID-19 pandemic—within the ARDL framework. Moreover, the findings are derived from Sierra Leone's small, import-dependent economy and may not be directly generalizable to larger or more diversified economies. These limitations suggest caution in interpreting the magnitude and external applicability of the results.

Recommendations

To improve the balance of payments and strengthen external sustainability, several policy recommendations emerge from this study's findings.

First, inflation control should remain a central priority for the government and the Central Bank of Sierra Leone. A credible monetary policy framework, supported by prudent fiscal discipline and effective liquidity management, is essential to anchor inflation expectations and stabilize the macroeconomic environment. Exchange rate policy should aim to maintain competitiveness without causing excessive inflationary pass-through.

Second, policies aimed at attracting foreign direct investment should prioritize export-oriented and productivity-enhancing sectors that generate domestic value addition. Strengthening institutional quality, ensuring regulatory transparency, and improving infrastructure would enhance investor confidence while reducing reliance on import-intensive projects.

Third, structural reforms should promote economic diversification, regional trade integration, and financial sector development. Expanding private sector credit, deepening capital markets, and improving monetary transmission mechanisms would strengthen the effectiveness of macroeconomic policy and reduce external vulnerabilities.

Given the feedback relationship between inflation and the CAB, coordinated macroeconomic management is essential. Regional cooperation through institutions such as ECOWAS may support monetary coordination and external sector resilience among similarly structured economies.

Future research may extend this analysis by incorporating multiple structural break techniques, crisis-specific dummy variables, or alternative econometric approaches such as nonlinear ARDL or structural VAR models to capture potential asymmetries and regime shifts. Panel data analysis across West African economies could also provide broader insights into the dynamics of inflation–external balance in import-dependent countries.

AUTHOR CONTRIBUTIONS

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Software: Ishmael Kamara

Resources: Fajar Hirawan, Indra Gunawan

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Writing – Original Draft: Ishmael Kamara

Writing – Review & Editing: Indra Gunawan, Fajar Hirawan

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest regarding the research.

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