ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

THE DETERMINANTS OF ETHIOPIA'S BALANCE OF PAYMENT: AN ANALYSIS OF DISEQUILIBRIA AND POLICY IMPLICATIONS

A Thesis Submitted to the Department of Economics of Addis Ababa University in Partial Fulfillment of the Requirements of Degree for Master of Science Degree in Financial Economics

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DECLARATION

I, the undersigned, declare that this thesis titled "THE DETERMINANTS OF ETHIOPIA'S BALANCE OF PAYMENT: AN ANALYSIS OF DISEQUILIBRIA AND POLICY IMPLICATIONS" is the original work of the student Marartu Alemayehu, and it has not been submitted in any form to any other university or institution for the award of any degree or diploma.

All sources of materials and data used in the thesis have been properly acknowledged. The thesis has been carried out under the supervision of the undersigned advisor and is submitted in partial fulfillment of the requirements for the degree of Master of Science in Financial Economics at Addis Ababa University.

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DECLARATION

We, the undersigned, declare that this thesis titled "THE DETERMINANTS OF ETHIOPIA'S BALANCE OF PAYMENT: AN ANALYSIS OF DISEQUILIBRIA AND POLICY IMPLICATIONS" is the original work of the student Marartu Alemayehu, and it has not been submitted in any form to any other university or institution for the award of any degree or diploma.

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LIST OF ACRONYMS

ADF	Augmented Dickey Fuller
ADLI	Agricultural Development Led Industrialization
AGOA	African Growth Opportunity Act
ARDL	Autoregressive Distributed Lag
BOP	Balance of Payment
DW	Durbin Watson
ECM	Error Correction Model
ECOWAS	Economic Community of Western African State
EPRDF	Ethiopian People's Revolutionary Democratic Front
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
HGER	Home Grown Economic Reform
IMF	International Monetary Fund
JB	Jarque Bera
LDCs	Least Developed Countries
NBE	National Bank Ethiopia
OLS	Ordinary Least Square
VIF	Variance Inflation Factor
WB	World Bank

Abstract

Ethiopia has been suffering chronic balance of payments (BOP) disequilibrium for decades, yet few studies have looked at the combined role of structural issues, policy shocks, and governance concerns, above all, political corruption, to explain this imbalance comprehensively. The present study fills the gap by analyzing the principal determinants of Ethiopia's BOP imbalance between 1974 and 2023 with a special focus on economic, structural, and policy-related variables across three political regimes. Using an Autoregressive Distributed Lag (ARDL) specification, the results from the analysis relied on data obtained from the National Bank of Ethiopia, World Bank, Global Economy, and government and research outlets. The long-run findings show that the exchange rate is statistically significant by itself, and hence currency depreciation is helpful in increasing the BOP in the long run. They have powerful impacts in the short term. FDI, external debt, inflation, and exchange rate as well as past BOP levels have powerful short-run impacts. Policy actions and anti-corruption measures also have negative short-run impacts accounting for transitional adjustment costs. The robustness of the model is verified by diagnostic tests. The results stress the pivotal role of exchange rate management to bring about long-run external balance and imply that exchange rate flexibility can be used to strengthen export competitiveness. Added to this, careful management of FDI and external debt can remove short-run external imbalances. Policy and governance reforms are mandated nonetheless, but these need to be sequenced properly in order not to trigger short-run volatility yet achieve long-run BOP sustainability.

Keywords: Balance of Payments, Exchange Rate, Political Corruption, Policy, ARDL

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

At global level, a combination of economic, financial, and structural factors drives BOP disequilibrium. Key economic drivers that influence BOP include disparities between national savings and investment rates, fluctuations in exchange rates, and shifts in global commodity prices that affect trade balances. Financial drivers including capital mobility, foreign direct investment (FDI), and portfolio flows impact the financial account (economies with liberalized capital markets). Structural factors such as governance quality, institutional strength, trade policies, and the level of economic diversification also form a country's external position. Combination of these factors interrelate for the persistent current account imbalances and unstable capital flows, contributing to global BOP disequilibria (Altayligil & Çetrez, 2020).

According to Azeddine & Ziet (2021), many developing economies face persistent BOP deficits. These persistent deficits are a significant and recurring issue demanding deep understanding of their root causes to solicit for more effective actions. Several Middle East and North Africa (MENA) countries also persistently face this challenge.

Ethiopia's BOP is the result of its economic transactions with the rest of the world. These economic transactions include export and import, financial flows, and remittances. Persistent deficits have characterized Ethiopia's BOP. This situation makes it difficult for the country to attain external balance (Serawit, 2017). Obviously, this persistent disequilibrium has placed the country in a difficult position, challenging its macroeconomic stability and development goals.

Guided by the socialist ideology, the Derg regime's economy was centrally planned, characterized by controls over resources and land. The enduring BOP disequilibrium exacerbated by trade imbalances (less export revenues more import expenditures) coupled with recurrent humanitarian crises manifest the inefficiency of the socialist economic model. This period was also marked by a prolonged civil conflict and frequent droughts, which significantly impacted economic performance. During this regime, Ethiopia's balance of payments remained in chronic deficit, driven by low export earnings, high import dependence, and limited foreign exchange

inflows, reflecting the broader inefficiencies of the socialist economic system making economic diversification difficult (Andualem, 2021).

As Andualem (2021) states, starting from 1991 the EPRDF regime's economic strategy was completely different following the agriculture foundation of industrial growth policy which was named Agriculture Development Led Industrialization (ADLI). The ADLI strategy was rooted in the development theories of the 1960s. These theories emphasized the importance of first enhancing smallholder agriculture to generate demand for industrial goods and provide essential inputs for industrial growth (World Bank, 2016). Additional reform measures during this time included the privatization of state-owned enterprises and significant cuts in import tariffs, the average tariff rate fell from 79 percent in 1993 to 20 percent by 1998 (Bigsten, Gebreeyesus, & Söderbom, 2016). Nevertheless, the economy during this phase remained highly unstable, partly due to the 1998–2000 conflict with Eritrea, lingering effects of the prior civil war, and adverse weather conditions. Notable droughts occurred in 1991/92 and 2002/03, contributing to economic disruptions. The average annual growth rate in this period was 4.6 percent, with a relatively high standard deviation of 6.5 . A significant portion of the growth was attributed to the service sector despite the grand government strategy of ADLI. During the PASDEP period (2005/06–2009/10), Ethiopia shifted from an agriculture-led strategy to include industrialization, with increased public investment and FDI incentives. However, the balance of payments remained in deficit due to rising imports and limited export growth. Under GTP I (2010–2015), large-scale infrastructure investment further widened the trade deficit and increased external borrowing, deepening the current account deficit. In GTP II (2015–2020), BOP pressures intensified with growing debt and severe foreign exchange shortages. These imbalances led to a policy shift in 2019 toward macroeconomic stability and debt management (Andualem, 2021).

Under the new Prosperity Party regime (2018 to present), Ethiopia adopted a new reform called Home Grown Economy Reform (HGER) which is aimed to address structural economic challenges and promote sustainable growth. However, Ethiopia's balance of payments remained persistent trade deficits, low export diversification, and high import dependency continued to drive BOP imbalances (Ayele and Cochrane, 2024). External shocks like civil conflict, COVID-19, and climate change further worsened the situation, limiting foreign exchange inflows and complicating efforts to stabilize the external sector. This study tries to explore the

structural problems behind the persistent disequilibria of the BOP under the three subsequent regimes of Ethiopia.

1.2. Problem Statement

Several factors contributed to the imbalances of the BOP in Ethiopia, including insufficient policy actions and long-standing structural issues. The nation's trade gap mainly stems from its heavy reliance on importing critical goods such as food, fuel, and machinery, while its exports remain limited and heavily focused on low-value, primary agricultural products like coffee, oilseeds, and livestock. These exports also face weak demand growth in global markets (AfDB, 2021). Past policy measures under different governments from the Derg's state-led National Revolutionary Development Campaign to the EPRDF's Agricultural Development-Led Industrialization (ADLI) did not manage to broaden the export base or lessen import dependency, resulting in repeated BOP crises.

Heavy dependence on external borrowing, internal conflicts, poor governance, and weak connections within the industrial sector worsened the BOP situation during the military rule (Balema & Tekeste, 2014). Likewise, while ADLI encouraged economic growth, it also increased the demand for imports without significantly raising the export of high-value goods. These trade gaps contributed to ongoing BOP shortfalls, such as the USD 830.9 million deficit seen in 2015/16 (NBE, 2016). Although recent economic reforms under the Home-Grown Economic Reform (HGER) agenda have aimed to ensure macroeconomic stability and push for structural change, external disruptions like the COVID-19 pandemic, regional conflicts, and Ethiopia's suspension from AGOA have continued to pressure the BOP, pushing the deficit to USD 941.6 million in 2018/19 (NBE, 2019) and causing continued instability in the following years.

However, there is limited empirical research that systematically examines the combined effects of structural factors, policy choices, and governance issues on Ethiopia's persistent BOP imbalances. Ayele,G. (2020) examined the determinants of Ethiopia's current account imbalance from 1985 to 2017, differentiating between structural and cyclical determinants. The key issue addressed is why the current account deficit has remained persistent despite economic reforms.

Most existing studies focus on descriptive accounts or specific policy phases, often neglecting the broader context of political corruption and impact of policy measures This study aims at filling the research gaps by making a deep assessment of trends of BOP in Ethiopia with special emphasis on structural and policy-related drivers and the role of corruption under the three last consecutive regimes.

1.3. Objective of the study

The objective of this research is to examine the root causes of disequilibrium in Ethiopia's BOP and propose evidence-based policy recommendations to reduce imbalances. Specifically, the study is aimed to:

- assess the key determinants contributing to Ethiopia's BOP disequilibrium;
- assess and analyze the key economic, political, and structural drivers of BOP disequilibrium in Ethiopia;
- explore the effectiveness of existing policies aimed at addressing BOP challenges.

1.4. Significance of the study

Ethiopia's BOP challenges have significant implications for economic growth, poverty reduction, and global competitiveness. By identifying practical solutions to address these challenges, this study aims to support Ethiopia's efforts to achieve macroeconomic stability and sustainable development. The study recommended policies to improve BOP, reduce the imbalance, and enhance macroeconomic performance. In addition, the findings of this research contributed to the broader literature in BOP dynamics in similar contexts.

1.5. Limitation of the study

This study faced inherent data limitations due to Ethiopia's regime changes and civil conflicts, which disrupted consistent economic reporting. Where official records were incomplete, we carefully employed extrapolation and interpolation methods to bridge gaps, a necessary compromise that, while statistically sound, means some transitional periods may not be fully captured. These constraints remind us that behind the numbers lie untold stories of economic

disruption during turbulent years, when businesses struggled and livelihoods were interrupted. While our methods provide a coherent analytical framework, the findings should be interpreted with awareness of these historical data challenges. Future research combining statistical reconstruction with oral histories could yield richer insights.

1.6. Organization of the Study

This study included five chapters. Chapter one introduced the background of the study, problem of the statement, objectives of the study, significance and limitation of the study. Chapter two represented the literature review including the theoretical review and empirical review. Chapter three states all about the methodology of the study. Chapter four is about the results and discussion with the other findings of the literature. Chapter five concluded the study and recommended some policies for the study.

CHAPTER TWO

LITERATURE REVIEW

2.1. Theoretical Reviews

Theories concerning the balance of payments (BOP) and its impact on economic growth primarily investigate the factors behind BOP results and analyze methods to sustain its equilibrium. Johnson (1972) observed that prior to the 1930s, no unified theory connected BOP with economic expansion. Instead, there was a widely accepted description of how international adjustments functioned under the gold standard, commonly known as the Classical Price-Species-Flow model. This idea proposes that nations with a BOP shortfall (or excess) would experience a decline (or rise) in real money supply, influencing domestic spending. As price levels and real money supplies adjust, countries with deficits would import less, while those with surpluses would import more. Eventually, this adjustment process helps rebalance the BOP. David Hume used this reasoning to dispute the mercantilist view that persistent trade surpluses could be maintained via restrictive policies. However, in reality, neither Hume's model nor mercantilist strategies adequately account for contemporary BOP imbalances, leading to additional studies on their origins and possible solutions.

2.1.1 Types and Causes of BOP Disequilibrium

Mihretu T. (2023) explains that while a country's balance of payments (BOP) is always technically balanced in accounting terms, real-world economic and non-economic factors often disrupt this equilibrium (Melvin, 1992). Economists differentiate between autonomous transactions ("above-the-line items"), which occur independently of the BOP, and accommodating transactions ("below-the-line items"), which are deliberate measures to correct imbalances. A BOP surplus arises when autonomous inflows exceed outflows, while a deficit occurs when outflows surpass inflows. However, Keith Pilbeam (2006) notes that distinguishing between these transactions can be difficult due to the challenge of determining the motives behind them.

One of the primary causes of BOP disequilibrium is a shift in the general price level. These price movements can either be inflationary or deflationary in nature. Deflation often leads to a BOP surplus. While a surplus may not pose immediate challenges for the country experiencing it, it can sometimes result in inefficient spending or poor allocation of resources. On the other hand, inflation tends to produce a BOP deficit. Such a deficit can bring about a range of negative consequences, including growing foreign debt, the depletion of gold or foreign exchange reserves, rising unemployment, internal economic distortions, and broader instability for the country facing the deficit. According to Mundell (1968), the drivers of BOP imbalances whether surpluses or deficits are often rooted in economic factors. He further elaborates that these include: structural transformations within the economy, fluctuations in exchange rates (whether through overvaluation or devaluation), variations in foreign currency reserves, cyclical economic changes, price instability such as inflation or deflation, and capital-intensive public investment. Specifically, developing countries in the early stages of growth often rely heavily on importing large volumes of capital goods from advanced economies, which can contribute to BOP pressures.

i) Fundamental Disequilibrium:

Inflation influences the relative cost of a nation's imports and exports. If exchange rates stay fixed, inflation makes domestic goods more expensive, boosting import demand while reducing export competitiveness. The rise in imports depends on how responsive domestic buyers are to price changes, whereas the decline in exports hinges on foreign consumers' sensitivity to price shifts. When these demand responses are significant, the imbalance between imports and exports can worsen rapidly, creating a balance of payments (BOP) deficit. If inflation continues unchecked, this deficit may become persistent. A severe and long-lasting BOP imbalance is termed a fundamental disequilibrium (Mihretu T., 2023).

ii) Cyclical Disequilibrium:

During economic cycles, price fluctuations often lead to simultaneous downturns and inflation across multiple countries. However, due to differences in economic size, the extent of their import demand varies, causing trade deficits or surpluses to range from moderate to severe. A nation with a high propensity to import more as incomes grow will face larger trade deficits

during inflationary periods, while potentially stabilizing to a moderate deficit or even a surplus during recessions. These cyclical trade imbalances are tied to business cycle patterns. Yet, accurately measuring a country's tendency to increase imports with rising income remains difficult (Mihretu T., 2023).

iii) Structural Disequilibrium:

Structural changes in an economy, whether from depleted resources, technological advances, shifting industries, or evolving consumer preferences, can destabilize a nation's balance of payments (BOP). Export-reliant countries may struggle if rising production costs or declining global demand erode their competitiveness. Heavy trade dependence magnifies these structural imbalances, worsening BOP instability. Conversely, discovering new resources may draw foreign investment, but excessive capital outflows can also lead to deficits (Mihretu T., 2023).

Pratima Chhetri (2020) argues that one of the most important goals for a country's overall economic health is achieving and keeping its BOP stable. Sadly, imbalances in the BOP have become a major concern worldwide, especially in the ECOWAS region. Researchers have been looking into different methods that could help fix these imbalances.

2.1.2. Adjustment Mechanisms for BOP Disequilibrium

Countries can address balance of payments (BOP) imbalances through two primary methods, automatic market adjustments or deliberate government policies, as Johnson (1977) observed. Automatic corrections occur without direct intervention, relying instead on market forces like supply, demand, price fluctuations, interest rates, income levels, and capital flows to restore equilibrium over time. While this self-adjusting mechanism can stabilize the BOP under fixed or flexible exchange rate systems, it doesn't always function smoothly in practice and may hinder economic growth. In contrast, governments can actively implement corrective measures. Johnson (1977) outlined three key policy approaches, later expanded by Mihretu (2023) with a fourth strategy: Absorption Approach, Monetary Approach, Elasticity Approach and Multiplier Approach.

The Monetary Approach to the BOP (MABP) stands out because it addresses the overall BOP, whereas the other two approaches concentrate on the current account and often disregard capital flows (Coppin, 1994).

i) Elasticity Approach

Robinson's (1937) elasticity approach examines how currency exchange rate fluctuations influence a nation's trade balance by affecting export and import volumes, though it largely overlooks income effects. This theory connects to the Marshall-Lerner condition - which Fleermuys (2005) explains requires that the sum of import and export demand elasticities (in absolute terms) must exceed one for currency devaluation to effectively improve the balance of payments. However, this framework has limitations, particularly its failure to account for capital movement effects stemming from trade imbalances, which play a crucial role in shaping the current account position.

ii) Absorption Approach

Alexander's (1952) absorption approach centers on how income fluctuations drive economic adjustments, particularly examining currency devaluation's dual impact on nominal values and real purchasing power. This framework demonstrates that while devaluation may initially boost trade competitiveness, subsequent price inflation often negates these benefits unless countered by either reduced aggregate demand, income redistribution, or monetary depreciation (Fleermuys, 2005). The approach primarily analyzes current account dynamics through the lens of real income changes, assuming constant price levels.

At its core, the theory interprets current account imbalances as gaps between national output and domestic expenditure (absorption), where absorption comprises consumption, investment and government spending (A=C+I+G). This stems from fundamental national income accounting principles, positioning the absorption approach as a real income-based theory of balance of payments adjustment. This is based on the basic equation of national income:

$$Y = C + I + G + X - M$$

Absorption: $A = C + I + G$

National Income: $Y = C + I + G + (X - M)$

Current Account: $CA = X - M \Rightarrow CA = Y - A$. Thus, $dCA = dY - dA$

This relationship shows that whether a devaluation improves the current account depends on how it affects total income and domestic spending. The model essentially views from a real income perspective (Mihretu, 2023).

iii) Monetary Approach to the Balance of Payments (MABP)

The monetary approach interprets balance of payments (BOP) imbalances fundamentally as monetary phenomena, linking them directly to key financial variables including currency exchange rates, interest levels, and money supply dynamics. As Obi (2021) demonstrates, these imbalances critically influence exchange rate stability where surpluses provide economic resilience against external shocks, while deficits create vulnerability, often necessitating foreign borrowing to address payment gaps.

Scholars including Frenkel (1971), Mundell (1971), Johnson (1972) and Dornbusch (1973) theoretically, demonstrate that BOP positions basically consider monetary supply-demand relationships (Umer et al., 2010). The approach maintains that when domestic money supply outstrips demand, BOP deficits emerge, whereas surplus conditions occur when money demand exceeds available supply (Howard & Mamingi, 2002). Essentially, this perspective treats BOP fluctuations as manifestations of underlying monetary market disequilibria. The monetary approach to the BOP is expressed through mathematical equations:

$$M^{d} = F(P, Y, I), \qquad (1)$$

$$M^{s} = (R + DC), \qquad (2)$$

$$M^{d} = M^{s} = M \qquad (3)$$

In Eqs. (1), (2) and (3), M^{d} indicates money demand, M^{s} is money supply, R is the foreign reserves,DC is the domestic credit, Y is the real domestic income, P is the price level, I is the nominal interest rate and M is the money market equilibrium.

On the one hand, examining the related literature shows that money demand and income $\frac{M^{d}}{Y} > 0$ are positively related, and this positive relationship reflects the transaction demand for money. As people's income rises, they engage in more economic activities buying goods, paying bills, etc. which increases their need for liquidity to carry out these daily transactions. This part of money demand is directly proportional to income. Money demand and price level $\frac{M^{d}}{P} > 0$ are positively related, a higher price level means more money is needed to buy the same quantity of goods and services. So, even if real income stays constant, people demand more nominal money balances just to maintain their purchasing power. This also links to the transaction motive. On the other hand, money holding and interest rate $\frac{M^{d}}{I} > 0$ exhibit a negative relation with each other, and this negative relationship is tied to the speculative demand for money. When interest rates are high, people prefer to hold bonds (which earn returns) rather than hold cash (which earns nothing). Conversely, when interest rates are low, people expect rates to rise (and bond prices to fall), so they hold more cash instead of risking losses in bond markets.. The low interest rate, particularly, results in an increase in money demand that is used in investments. Equations (1), (2) are combined in Eq. 3 to obtain the following reserve flow equation with variables expressed through percentage change:

$$\Delta R = \Delta[F(Y, P, I)] - \Delta DC \qquad (4)$$

The Monetary Approach to Balance of Payments (MABP) lies in Equation (4), which establishes a fundamental relationship between foreign reserves and monetary factors. This equation demonstrates that a nation's balance of payments position, reflected in its reserve levels, is determined by the differential between money demand growth and domestic credit expansion - provided the money market remains stable. A key insight reveals an inverse correlation: increases in domestic credit systematically reduce international reserves. Within this framework,

domestic credit changes (ΔD) function as an offsetting variable, bearing a negative coefficient in accordance with MABP theory (Dhliwayo, 1996).

a) MABP under Fixed Exchange Rates

In a fixed exchange rate regime, a pair of active interventions in currency markets are necessary for the central bank to ensure parity. Mihretu (2023) explains that interventions comprise two important operations: (1) purchasing the domestic currency when there is surplus supply threatening devaluation, and hence decreasing foreign reserve assets; and (2) selling the domestic currency when scarcity creates risk of revaluation, and hence accumulating foreign reserves. Counter-cyclical interventions stabilize the exchange rate through central bank foreign exchange reserve transactions.

b) MABP under Floating Exchange Rates:

The theory of money sees independent processes of BOP adjustment under different exchange rate regimes. Under floating rate regimes, movement of the exchange rate automatically eliminates BOP disequilibria so that there is no requirement for intervention by the central bank. Monetary expansion under such regimes generates currency depreciation and inflation in domestic prices, with money market equilibrium is re-established by price and exchange rate flexibility. This provides policymakers with discretionary control over money supply.

Conversely, fixed rate systems preclude independent monetary policy, as Mihretu (2023) demonstrates. The exchange rate peg compels central banks to surrender control over domestic money supply, as monetary adjustments must align with maintaining the fixed parity. Unlike floating regimes, monetary authorities cannot arbitrarily expand currency in circulation without jeopardizing the exchange rate commitment.

iv) Multiplier Approach

The multiplier approach builds upon and extends traditional elasticity analysis, operating under specific economic assumptions. This framework, particularly relevant for fixed exchange rate regimes, posits that balance of payments adjustments occur exclusively through national income variations rather than price mechanisms. Mihretu T. (2023) outlines the model's foundational premises: (1) existence of idle productive capacity, (2) price rigidity, (3) absence of international

capital flows, and (4) current production serving as the sole source of exports. Under these conditions, income changes become the primary driver for correcting payments imbalances when exchange rates remain pegged.

National Income: $Y = C + I + G + (X - M)$

$$C + C_0 + cY,\ I = I_0,\ G = G_0,\ X = X_0,\ M = M_0 + mY$$

Thus: $Y = \frac{1}{1-c+m}(C_0 + I_0 + G_0 + (X_0 - M_0))$

In this model, national income can increase through expansionary fiscal policy (higher government spending), expansionary monetary policy (lower interest rates boosting investment), or a rise in exports.

$$\frac{dY}{dG_0} = \frac{dY}{dI_0} = \frac{dY}{dX_0} = \frac{1}{1-c+m} > 0$$

Conversely, lower government expenditure, more stringent monetary policy, or weakening exports can decrease national income. Fiscal or monetary stimulus can destabilize the current account and therefore the BOP, though.

$$\frac{dCA}{dX_0} = \frac{1-c}{1-c+m} > 0$$

In summary, less-than-full capacity economies possess a set of policy instruments to counteract balance-of-payments (BOP) deficits. Deficits may be cured via fiscal mechanisms (expenditure and taxation), monetary restraint, as well as trade intervention. Nonetheless, fiscal and monetary contraction that enhances the BOP by sacrificing contracting output. In contrast, export-promotion policy has twin advantages - it enhances the payments position in line with rising national income by boosting external demand.

While traditional theories of balance of payments adjustment, such as the elasticity approach, absorption approach, and monetary approach, are largely static in nature, dynamic models provide a more realistic and time-sensitive framework to understand how economies adjust to external imbalances over time. These models consider expectations, lag effects, and policy adjustments, making them highly relevant for developing economies like Ethiopia.

One of the earliest dynamic frameworks is the Mundell-Fleming model, which extends the IS-LM framework to an open economy by incorporating the BOP through the BP curve. Though originally static, it can be adapted dynamically to show how fiscal and monetary policy affect the BOP under different exchange rate regimes and capital mobility conditions over time (Mundell, 1962; Fleming, 1962).

The Autoregressive Distributed Lag (ARDL) model, popularized by Pesaran and Shin (1999), is particularly suited to small-sample time series data. It captures both short-run dynamics and long-run relationships, allowing researchers to assess the speed and direction of BOP adjustment in response to changes in economic fundamentals.

2.2. Empirical Reviews

Dakhil et al (2019) investigated the effects of Foreign Direct Investment (FDI) on supply chain management and balance of payment in the Iraqi market environment between 2005 and 2017. Applying Johansen-Juselius cointegration method, the research analyzed the long-run relationship between the most important variables FDI, current account balance (CAB), and gross domestic product (GDP). To further examine both the short-run and long-run behavior, a Vector Error Correction Model (VECM) is utilized. The results confirmed that FDI, CAB, and GDP are co-integrated and have strong long-run connections. That is, FDI was found to have a positive and significant effect on the current account balance in the long and short run. These findings indicated that foreign direct investment is beneficial to the external balance of Iraq, particularly to improve supply chain and trade. The research points out that export-led development policy supplemented by FDI flows can improve the balance of payments. Therefore, the research advised policymakers to incorporate FDI variables in general economic and supply chain improvement policies to improve external economic stability.

Abakaliki, et al (2015) examined the effect of inflation on Nigeria's balance of payments using annual data covering 1981-2012, which were collected from the Central Bank of Nigeria (CBN) statistical bulletin. The Ordinary Least Squares (OLS) regression analysis method was employed in the research, with estimation being performed using E-Views software. Empirical findings indicated that inflation had a statistically insignificant adverse effect on the balance of payments.

Similarly, unemployment positively but insignificantly influenced the balance of payments. The findings in the above therefore suggest that inflation and unemployment were not the key determinants in influencing Nigeria's external balance during the study period. Based on these findings, the study recommended that the government adopt effective expenditure-switching mechanisms, like currency devaluation, to improve foreign exchange earnings from exports competitiveness and reduce the import level. Some other policy recommendations include tightening direct controls, better management of capital inflows, and imposing very tight controls for preventing inflationary pressures to the long-term external stability.

S. Priyadharshini (2017) tested the effect of exchange rate on Sri Lanka's balance of payments based on annual data covering the sample period 1978-2016. Utilizing the Johansen cointegration test, the paper determined two cointegrating relations, which suggested that the long-run equilibrium relationship between the variables is stable. Error Correction Model (ECM) was used to successfully test both the short-run and long-run relations. Results indicated a statistically significant and positive long-run relationship between the balance of payments and exchange rate. The ECM coefficient for the exchange rate (0.003) helped confirm that 0.3% of the imbalance is adjusted every year after external shocks, identifying a persistent though gradual adjustment towards long-run equilibrium. Besides, lending interest rate and balance of payments also moved in the favourable direction towards the long-run equilibrium, whereas no significant adjustment happened in other macroeconomic variables. According to these results, the study concluded that exchange rate management in the form of devaluation during fixed exchange rate or permitting depreciation during flexible exchange rate can be used as a short-run and long-run policy instrument to balance the balance of payments imbalance in Sri Lanka.

Ochieng, Nyongesa, & Nelson (2020) studied a simplified version of the trade balance model, suggesting that the trade balance depends on FDI, inflation, the real exchange rate, and transfer payments. Their study also revealed the factors affecting Kenya's trade balance including trade in services, inflation, and transfer payments. These factors are aimed at determining the nature and strength of their relationships with the trade deficit. They used an ex post facto correlational research design to assess the relationships between these variables, using time-series data from the World Bank spanning from 1978 to 2014. They employed descriptive statistics, cointegration, the Vector Error Correction Model, Granger causality tests, impulse response function tests, and

other diagnostic tests. Their study concluded that in the long run, only inflation and transfer payments have significant effects on both the trade deficit and foreign direct investment, with positive and negative impacts, respectively, although there was no corresponding causality. They also found that the trade deficit has a positive significant short-run effect on transfer payments, while the real exchange rate has a positive significant short-run effect on inflation, but again, there was no corresponding causality. They found that any shocks need to be addressed quickly, as the impulse response functions indicated adverse effects within the first few years, with effects only beginning to fade after the fourth year. The study concluded that a trade deficit is not necessarily detrimental for Kenya, as measures to reduce it can actually reduce foreign direct investments, which are crucial for a growing economy like Kenya.

Muasya, Sharon, and Muturi, Willy (2023) researched the impact of the international trade balance on the economic growth of the East African region, considering the existing trade imbalances. They used a panel regression analysis methodology to achieve their research objectives. Their findings revealed a long-term relationship among all the variables studied. Moreover, all the variables considered were found to have significant long-term impacts on economic growth in the East African region. They tested the time series properties, such as the presence of unit roots and cointegration of the variables, to ensure that the results were reliable and not misleading. Apart from the log of GDP, which was stable at its original level, all the other variables were not stable at their original level but became stable after taking their first difference, meaning they were integrated of order one. The study concluded that the contribution of trade to the economic growth of East African countries is mainly determined by the balance of trade in merchandise, the service trade balance, and international financial transactions. For an outward-oriented strategy to have a greater impact on economic growth, the region should change the composition of its trade by shifting from exporting raw materials and semi-manufactured goods to high value-added goods. Furthermore, trade policy should promote investments in capital-intensive sectors and develop human capital that can absorb technologies from advanced countries.

Gebremariam, Batu, and Sisay (2018) investigated the relationship between the real effective exchange rate and the BOP in Ethiopia using annual data from 1976 to 2015. Their analysis was based on a cointegrated vector autoregressive approach. The methodology of their study began

with Augmented Dickey-Fuller stationarity tests to ensure the data was stable, and the Johansen cointegration rank test revealed that the current account, real gross domestic product, real effective exchange rate, budget deficit, interest rate, and inflation rate were cointegrated, sharing a long-run equilibrium relationship. The empirical results suggested that real effective exchange rates play a significant role in determining the short- and long-term behavior of Ethiopia's current account. This strongly indicates that the Marshall-Lerner condition holds in Ethiopia, as the current account improved in the long run in response to a depreciation of the real effective exchange rate. The results of the long-run relationship from the vector error correction model, along with the impulse response function, showed that following a devaluation in the real effective exchange rate, the current account initially worsens before improving later, exhibiting the J-curve pattern. Accordingly, the major policy implication of this study is that Ethiopia should depreciate its real effective exchange rate while considering the macroeconomic realities of the country and advocating for export promotion and import substitution strategies.

Usman, Adil, and Majid (2018) investigated the determinants of Pakistan's balance of payments for the period 1981-2016 by employing the bounds testing Autoregressive Distributed Lag (ARDL) approach. The ARDL method was used in investigating both the long-run and short-run relationships between balance of payments and the most compelling macroeconomic determinants such as the exchange rate, foreign direct investment (FDI), inflation, and gross domestic product (GDP). Empirical results revealed that exchange rate, FDI, inflation, and GDP have a statistically significant and negative impact on the balance of payments in the long run. Consequences are macroeconomic instability and structural flaws behind persistent external imbalances. According to these results, studies suggested that the government of Pakistan should undertake coordinated fiscal and monetary policies and structural reforms in order to increase private investment inflows, stabilize inflation, and increase trade to mitigate balance of payments instability and gain long-run external stability.

Mostafa (2020) examined the causality connection between foreign debt, balance of payments, and foreign direct investment (FDI) for Bangladesh from 1980 to 2017. Johansen Cointegration test was used to examine long-run equilibrium connections, Vector Error Correction Model (VECM) to determine short-run dynamics and long-run correction, and Granger causality to examine directional causality between the variables. The Johansen cointegration tests proved that

a long-run relationship existed among FDI (dependent variable) and independent variables, external debt and balance of payments. To be specific, external debt significantly and negatively affected FDI in the long run, although its statistical impact was insignificant during the short run. Meanwhile, the balance of payments had a strong positive impact on FDI, both in the short run and the long run. Granger causality tests also established the existence of bidirectional causality between the balance of payments and FDI in the short run, indicating mutual causation. There was no short-run unidirectional or bidirectional causality between FDI and external debt. These observations indicated that bettering the balance of payments could most probably attract FDI inflows, while excessive external debt could deter the attraction of long-term investment.

Yaya Keho (2021) investigated the factors that determine the trade balance in the West African Economic and Monetary Union (WAEMU) from 1975 to 2017. He used the Mean Group (MG) estimator, along with grouped mean versions of Dynamic OLS (DOLS) and Fully Modified OLS (FMOLS), to address both endogeneity and cross-country differences. The results revealed that the trade balance is negatively related to domestic and foreign income, while real effective exchange rate depreciation improved the trade balance in the long run. However, the results did not confirm the short-run worsening of the trade balance suggested by the J-curve effect. In the short run, the trade balance was sensitive only to foreign real income, but not to domestic income or the real exchange rate. The country-level estimates showed that the response of the trade balance to the real exchange rate, domestic income, and foreign income varied across countries. Overall, the findings of this study suggested that policies aimed at improving the trade balance should focus on domestic production of imported goods, rather than devaluation.

Kingia, Magreth, and Muba, Seif (2021) evaluated the factors influencing the BOP in Tanzania. Their quantitative study collected secondary time-series data covering thirty-one years, from 1990 to 2020. They performed descriptive statistics and diagnostic tests, including a normality test, a unit root test for stationarity, and Pearson's Correlation matrix, to check for multicollinearity. The diagnostic tests indicated that the data would yield reliable results, so they performed ordinary least squares regression. They found that foreign direct investment and the inflation rate have a negative and significant impact on the BOP, while the exchange rate has a positive but insignificant influence, and the interest rate has an insignificant negative influence. In conclusion, they recommended that Tanzania implement policies regarding the relative prices

of imports to improve FDI inflows, leading to a more favorable BOP. They also suggested that Tanzania's central bank should be cautious in its monetary policy and take beneficial steps to regulate the money supply and maintain low interest rates to attract new domestic investors.

Abdul Hadi Sultani and Dr. U. Faisal (2022) examined the management of the BOP in developing countries and Least Developed Countries (LDCs). Recognizing that a significant amount of research has explored the impact of various factors on the BOP in different countries, but often in a fragmented and contradictory manner, this study aimed to create a comprehensive index of the main determinants of BOP and to summarize the dimensions of BOP problems for developing countries and LDCs. They introduced a new typology classifying BOP indicators into direct and indirect categories, discussed the importance and application of each, and compared the impact of identified determinants of BOP on developing countries and LDCs. The main findings indicated that exports and imports, fiscal policy, money supply, and structural changes similarly impact the BOP of both developing countries and LDCs. However, factors like liberalization, terms of trade, FDI, exchange rates, loss of investor confidence, stage of development, and quality of infrastructure differently impact their BOPs.

Abu and Khalil (2022) investigated the effect of monetary policy and exchange rate fluctuations on the trade balance in Sierra Leone using the autoregressive distributed lag (ARDL) bound testing framework with annual time-series data covering the period 1980 to 2020. The money supply, real effective exchange rate, and real GDP are the main determinants of the trade balance in Sierra Leone in long-term. The money supply and real effective exchange rate have a negative impact on the trade balance, while a positive relationship exists between real GDP and the trade balance. In addition, the study based on the beta coefficients confirmed that real GDP has the greatest effect on the trade balance in the long run, followed by the real effective exchange rate. It was also revealed that in the short-run real GDP, government expenditure, and foreign direct investment are the main determinants of the trade balance. Approximately 85 percent of the variation in the trade balance is explained by the independent variables, as shown by the R-squared value of 0.85. The CUSUM and CUSUMSQ tests indicated that the model is stable.

Nepal, Khanal & Dhakal (2024) studied the major drivers of Nepal's Balance of Payments (BOP) by analyzing the impacts of exports, imports, foreign direct investment (FDI), and remittances

during 2006-2019. Adopting a quantitative research approach, analysis utilized the application of the Autoregressive Distributed Lag (ARDL) model to analyze short-run as well as long-run association between the variables. The model was tested stringently with the use of diagnostic tests, which vindicated the non-serial correlation, heteroscedasticity, and non-normality of residuals, thus securing the reliability of the conclusions. Empirical evidence lended support to the fact that imports have a statistically significant negative impact on the BOP in that an increase in imports by 1% lowers the BOP by 0.72%. Remittances have a positive impact such that an increase by 1% raises the BOP by 1.06%. Despite both exports and FDI having a positive relationship with BOP, their impact is statistically insignificant, indicating inherent structural limitations in the investment environment and competitiveness of Nepalese exports. Accordingly, the study suggested that policymakers focus on managing high import levels, smoothing remittance flows, exporting diversification and improving competitiveness, and establishing an attractive climate for foreign investment. These policies, based on sound econometric analysis, are required in order to ensure long-term balance of payments stability and sustainable economic growth.

Benedict et al. (2022), explored the effect of political risk on Zimbabwean foreign exchange demand, a nation that has not been free from political turbulence in the long term. In contrast to existing literature that has worked with political risk and its effects on stock markets or macroeconomic variables, this study explores its effects on foreign currency demand specifically. Applying secondary data from the World Bank World Development Indicators (WDI), International Country Risk Guide (ICRG), and Reserve Bank of Zimbabwe (RBZ), the estimation applies regression analysis to estimate short-run and long-run effects. Empirical results validate that there is a statistically significant negative correlation between political risk and foreign exchange reserves, that is, greater demand for foreign currency when political risk is present. In the spirit of robustness of findings, the paper further employs another proxy for foreign exchange demand, with findings duplicating themselves and lending credibility to the main results. From the findings, the paper suggests that policymakers and financial regulators within the Zimbabwean government incorporate policies of minimizing political uncertainty since political risk is a decisive factor that affects currency demand and, by extension, the stability of the external sector.

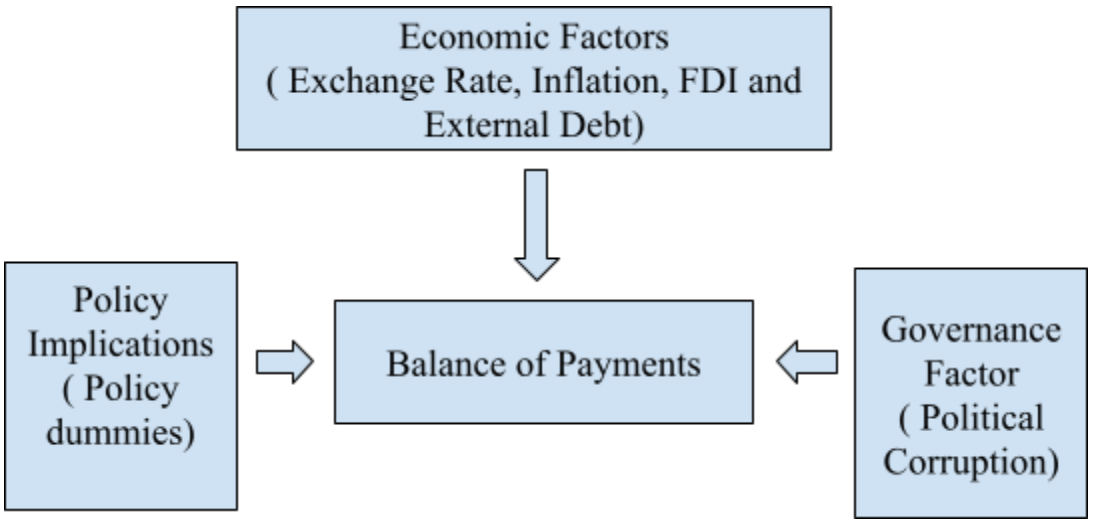
Bahmani-Oskooee and Goswami (2005) examined the impact of institutional factors, corruption, in this case, on the foreign exchange black market premium in developing economies. Noting that most developing countries restrict trade and capital flows, which trigger parallel foreign exchange markets, the study tests cross-section evidence from 60 developing countries between 1982 and 1995. Applying both cross-section and panel data methods, employing multiple regression techniques to determine the correlation between corruption and black market premium, and robustness testing, five alternative corruption measures are employed. The primary findings show a very strong and statistically significant positive correlation: more corrupt countries experience higher black market premiums. The finding is robust to the corruption measure and to the data specification, and it implies that low institutional quality creates excessive volatility of distortions in official foreign exchange markets. The research highlights the significance of institutional reforms as a solution to curbing corruption in foreign currency stabilizing markets and countering the negative impacts of parallel exchange rate systems in developing countries.

Anokwuru, G., & Chidinma (2024) investigated the effect of exchange rate on Nigeria's balance of payments over the period 1981-2022. To this end, balance of payments, exchange rate, trade openness, government capital expenditure, and monetary policy rate data were obtained from the Central Bank of Nigeria statistics bulletin. Autoregressive Distributed Lag (ARDL) bounds test approach was utilized to estimate short-run and long-run relationships between variables. Empirical evidence shows that in the long run, exchange rate, government capital spending, and monetary policy rate are positively and statistically significant with the balance of payments, while trade openness adversely affects it. Exchange rate and government capital spending have a negative and significant effect on balance of payments in the short run. Monetary policy rate and trade openness are, however, very positively correlated. According to these findings, this study concludes the importance of employing a managed floating exchange rate regime to minimize exchange rate volatility. Secondly, it urges the government to increase domestic production levels and diversify the economy in order to boost exports and reduce imports dependence, steps that would improve the external balance of the nation and strengthen the naira.

2.3. Conceptual Frameworks

The conceptual framework of this study is built on the understanding that a country's balance of payments (BOP) reflects the net outcome of all economic transactions between residents and the rest of the world. Persistent BOP disequilibrium in developing countries like Ethiopia is influenced by a complex interaction of economic fundamentals, policy interventions, and governance conditions.

Diagram 1.1. Framework for the study



CHAPTER THREE

METHODOLOGY

3.1. Method of Data Collection

This study adopted a different approach, combining quantitative and qualitative analysis to achieve its objectives. In order to conduct any research activity, data gathered from appropriate sources. The investigation will use secondary data. The study will rely on time series data that evaluates one variable across numerous time periods. The secondary data, quantitative data, will be sourced from the National Bank of Ethiopia, The Global Economy (from its official website), World Bank (from its official website), yearly publications and unpublished materials From 1974 to 2023. This qualitative analysis depends on different literature or reports that explore the structure of the economy, specifically on BOP, from the Derg regime to the present.

3.2. Data Analysis

The collected data analyzed by using descriptive statistics, and the auto regressive distributed lag (ARDL). The auto regressive distributed lag (ARDL) model is a useful method for investigating longitudinal relationships among variables while controlling for other factors (Pesaran, Shin, & Smith, 2001). This method is particularly suitable for small sample sizes and non-stationary time series data. The long run relationship between the dependent and independent variables are examined using the Auto Regressive Distributed Lag Model (ARDL), while controlling for other variables. ARDL is selected since it is efficient and unbiased for small samples available in the data at hand.

3.3. Description of Variables

Balance of Payments (BOP): A Balance of Payments is a balance sheet documenting all the financial inflows and outflows between the country and the rest of the world. It keeps track of the flow of foreign exchange into and out of the economy. If there is more inflow (such as exports or

investments) than outflow, the nation experiences a BOP surplus. Conversely, a deficiency is when there is a greater inflow of money into the nation than out. BOP determines a significant aspect of the condition of the finances of a nation in global trade and depends on trade flow, investment flow, and economic policy in general.

Exchange Rate (Exc): The exchange rate reflects the value of the Ethiopian birr against other currencies in the foreign exchange market. The rate is very vital to international trade. If the birr weakens, the exports of Ethiopia are cheaper for other foreign buyers, and it can increase exports. It increases the price of imports and worsens the external debt burden, all of which can have a bearing on the BOP.

Inflation Rate (Inf): Inflation refers to the pace at which the prices are increasing in the country. Inflation can worsen the balance of payments by making domestic goods less competitive internationally, leading to higher imports and reduced exports..

Foreign Direct Investment (FDI): FDI is foreign investment in enterprises and infrastructure in a nation over the long run. It can promote economic growth by creating employment, bringing new technology, and enhancing infrastructure. More FDI enhances the BOP by bringing in foreign exchange and, possibly, covering trade deficits.

External Debt (ED): External debt is debts a nation owes to foreign lenders. Foreign borrowing can be utilized to finance valuable development projects, but excessive external debt can be beyond the financial capacity of the economy, particularly if the debt servicing cost outweighs the gain derived, on the BOP.

Political Corruption Index (PCI): Political Corruption Index measures the level of corruption which is seen in a nation. Excessive corruption will scare away foreign investors, misplace resources, and dilute the grip of the economy. Such effects will lower the foreign income and even deteriorate the BOP condition.

Policy (Categorical Dummy Variable): This is a dummy variable to capture varying economic policy regimes in the history of Ethiopia. It will be equal to 1 whenever there is a change in policy and 0 otherwise. Having this allows one to trace how alterations in the direction of policy have influenced the BOP over time.

- **Derg Phase 1 (Derg_P1) (1974–1989):** Characterized by the nationalization of key sectors, socialist economic planning, and strong state control over trade and finance (usually called central command economic policy).
- **Derg Phase 2 (Derg_P2) (1989–1991):** Marked by economic reform attempts, including limited liberalization under pressure from external lenders like the IMF and World Bank. The policy was announced but not pronounced well in research studies as it was a very short-lived policy. The policy was called mixed economic policy meant to partly introduce privatization while the government continued to play the leading role in the economy.
- **EPRDF Phase (Eprdf_P) (1991–2021)**: Introduced structural adjustment programs, market reforms, and policies that encouraged privatization and FDI. The Agricultural Development Led Industrialization (ADLI) remained the guiding economic policy until the EPRDF/ TPLF regime collapsed in 2018.
- **Prosperity Party Phase (Pp_P) (2021–present)**: A new phase of economic reform called Home Grown Economic Reform focusing on privatization, digital transformation, and opening up key sectors such as telecom and finance.

3.4. Model Specification

A multiple regression model is formulated to examine the study's hypotheses. The dependent variable in the model is the BOP. The independent variables included the economic variables that are related to BOP (Exchange Rates, Inflation, Foreign Direct Investment, and External Debt), policy changes during the Derg regime to the present regime by using a categorical dummy variable and the political corruption index. Therefore, to assess the factors BOP, the researcher developed a multiple linear regression model with these variables.

Many economic studies assume a linear or log-linear relationship between macroeconomic variables and the balance of payments (BOP). Linear models are widely used due to their simplicity and interpretability. Gudina. T (2021) used a linear regression model to analyze the empirical study of FDI, environmental quality and economic growth in Ethiopia. They justified the linear specification based on economic theory and prior empirical work.

$ln\_BOP = \beta_0 + \beta_1 ln\_Exc + \beta_2 Inf + \beta_3 ln\_FDI + \beta_4 ln\_ED + \beta_5 PI + \beta_6 ln\_PCI + U_i$

BOP = Balance of Payment,

Exc = Exchange Rate,

Inf = Inflation Rate,

FDI =Foreign Direct Investment,

ED = External Debt,

PI = Policy Implications of the regimes (if policy is changed 1 and if not 0),

PCI = Political Corruption Index.

U_i = Error term (i = 1974 - 2023),

β_0 = constant for each dependent variable.

3.3.1. The Autoregressive Distributed Lag (ARDL) Model

The ARDL (Autoregressive Distributed Lag) model is an econometric model used to analyze the relationship between variables in a time series framework. It allows for the inclusion of lagged variables to capture short-term dynamics and also considers the long-run equilibrium relationship between the variables.

3.3.1.1. Stationarity Test or Unit Root Test

Augmented Dickey-Fuller (ADF) Test

Time series data are typically not stationary by nature, meaning they often contain a unit root. This implies that their statistical properties such as the mean and variance change over time rather than remaining constant (Studenmund, 2014). When this happens, applying regression techniques to such data can lead to misleading results. Even though the R-squared values and t-statistics might seem valid, the model itself could be producing false or spurious findings. In other words, the results might look statistically strong but are actually unreliable.

Non-stationary time series typically consist of stochastic trends, which go against the fundamental assumptions of the Ordinary Least Squares (OLS) regression technique (Stock and Watson, 2012). This is the reason why making a time series stationary is crucial. A stationary series conducts itself as anticipated after the passage of time, and this makes it much simpler and more reliable to analyze and predict. However, a non-stationary series could have trends or seasonal effects that vary, thus complicating the interpretation and prediction of information.

Tests carried out on a time series to check if it is stationary or not involve the Augmented Dickey-Fuller test, among others referred to as the KPSS test. These tests will determine the existence of trends and other variations in the data. The ADF test is one of the most frequent tests employed. Its null hypothesis for the sake of this test considers that the series contains a unit root and therefore are non-stationary. If the test statistic is more negative than the critical value, then the null is rejected indicating that the series is stationary. Otherwise, we cannot reject the null, indicating non-stationarity.

The hypotheses for ADF test are:

- H_0: The series has a unit root (non-stationary)
- H_1: The series is stationary (no unit root)

Order of integration is terminology used to describe how often a series must be differenced in order to achieve stationarity. For instance, if the data becomes stationary after one differencing, it is said to be integrated of order one, written as I(1). If it needs to be differenced *d* times, it is I(d). If the series is already stationary, it is called I(0). However, differencing too much can distort the long-term relationships between variables (Gujarati, 2004).

3.3.1.2. Bound Cointegration Test

The second vital step in time series analysis is the determination of whether there is long-run relationship between the variables or not, referred to as cointegration. In the present research study, the Bounds Test is applied for this purpose. Pesaran et al. (2001) developed the method, which has also been referred to as the ARDL bounds testing technique. The procedure proceeds

with comparing the calculated F-statistic with some cutoff values. The result is evaluated as follows:

- If the F-statistic is below the lower bound, we reject the null hypothesis, indicating no cointegration.
- If it is above the upper bound, we reject the null, indicating cointegration.
- If it falls between the two bounds, the test is still inconclusive, and hence it cannot be unambiguously said whether or not there is a long-run relationship.

3.3.1.3. ARDL Model Long Run Representation

If the long run relationship between the variable under consideration is exist, the ARDL model long run representation will have the following form:

$$BOP_t = \beta_0 + \sum_{i=1}^{p} \beta_1 Exc_{t-i} + \sum_{i=1}^{p} \beta_2 Inf_{t-i} + \sum_{i=1}^{p} \beta_3 FDI_{t-i} + \sum_{i=1}^{p} \beta_4 ED_{t-i} + \sum_{i=1}^{p} \beta_5 PI_{t-i} + \sum_{i=1}^{p} \beta_6 PCI_{t-i} + \varepsilon_t \ldots$$

… … … (3.1)

3.3.1.4. ARDL Model Short Run Representation

The ARDL short run dynamics model is specified as below:

$$\Delta BOP_t = \alpha_{0i} + \sum_{i=1}^{q} \alpha_{1i\Delta} BOP_{t-i} + \sum_{i=1}^{p} \alpha_{2i\,\Delta} Exc_{t-i} + \sum_{i=1}^{p} \alpha_{3i\,\Delta} Inf_{t-i} + \sum_{i=1}^{p} \alpha_{4i\,\Delta} FDI_{t-i} + \sum_{i=1}^{p} \alpha_{5i\,\Delta} ED_{t-i} +$$

$$\sum_{i=1}^{p} \alpha_{6i\,\Delta} PI_{t-i} + \sum_{i=1}^{p} \alpha_{7i\,\Delta} PCI_{t-i} + \phi ECT_{t-i} + \varepsilon_t \ldots \ldots \ldots \ldots (3.2)$$

3.3.1.5. Error Correction Model

The Error Correction Model (ECM) is a popular method of non-stationary time series data analysis. It is particularly valuable when evidence of cointegration, or the long-run connection, exists between two or more non-stationary variables. Although individual constituent time series can be non-stationary, their combination could move together in a constant direction over time.

As Brooks (2014) describes, the ECM accounts for both short-run adjustment and long-run equilibrium between variables. It does this by accounting for both the first differences (which account for short-run adjustment) and an error correction term (which accounts for the path of long-run equilibrium). This error correction term is the deviation from the long-run relationship and allows the model to adjust or "correct" towards the equilibrium in each period.

ECMs are usually estimated with approaches like Ordinary Least Squares (OLS) or Maximum Likelihood Estimation. Another benefit of ECMs is that they can estimate complex economic relations by capturing short-run dynamics as well as long-run stability in one framework. ECMs also have the tendency to assume the long-run relationship between the variables is linear and constant over time, which does not hold with real data.

Finally, the ECM is a useful tool in macroeconomic modeling, specifically when dealing with variables like exchange rates, inflation, or balance of payments. It allows economists to identify both short-run reactions and long-run changes in economic relationships (Brooks, 2014).

3.3.1.6. Diagnostics Tests for ARDL Model

Diagnostic tests perform a very critical role in confirming whether assumptions of the ARDL model are valid. They are used to confirm for possible issues like autocorrelation, Ramsey RESET, heteroskedasticity, or model instability issues which can make the results useless. Some of the most popular diagnostic tests in econometrics are:

The Ramsey RESET test The Ramsey Regression Equation Specification Error Test (RESET) is used to check whether the functional form of the model is correctly specified. Essentially, it tests if any important variables are missing or if the chosen model structure is flawed.

- Null Hypothesis (H_0): The model is correctly specified.
- Alternative Hypothesis (H_1): The model is misspecified.

If the p-value is less than the significance level (usually 0.05), the null hypothesis is rejected, indicating potential model misspecification (Ramsey, 1969).

The Breusch-Godfrey test detects whether the residuals from a regression model are autocorrelated (i.e., whether current errors are related to past errors). The presence of autocorrelation violates OLS assumptions (Breusch and Godfrey, 1978).

- Null Hypothesis (H_0): No autocorrelation in residuals.
- Alternative Hypothesis (H_1): Residuals are autocorrelated.

If the p-value is less than 0.05, we reject the null, suggesting autocorrelation in the model.

White's test identifies whether the variance of the residuals is constant (homoskedasticity) or varies (heteroskedasticity). Heteroskedasticity can lead to inefficient estimates and invalid standard errors (White, 1980).

- Null Hypothesis (H_0): Residuals have constant variance (homoskedastic).
- Alternative Hypothesis (H_1): Residuals have changing variance (heteroskedastic).

A significant p-value suggests the presence of heteroskedasticity, requiring adjustments such as using robust standard errors.

The Durbin-Watson (DW) test is another tool used to detect autocorrelation, particularly first-order autocorrelation in the residuals.

- A DW statistic close to 2 suggests no autocorrelation.
- A value significantly less than 2 indicates positive autocorrelation, while a value above 2 points to negative autocorrelation (Durbin & Watson, 1950).

This test is easy to interpret and widely used in time series analysis.

The Jarque-Bera (JB) test checks whether the residuals of a regression model follow a normal distribution. Normality is an important assumption for many hypothesis tests and confidence intervals.

- Null Hypothesis (H_0): Residuals are normally distributed.
- Alternative Hypothesis (H_1): Residuals are not normally distributed (Jarque and Bera, 1987).

The test considers both skewness and kurtosis of the residuals. A low p-value (below 0.05) leads to rejection of the null hypothesis, indicating non-normality.

The CUSUM (cumulative sum) stability test: is a statistical tool used to detect changes in the parameters of a model over time (long-run). It is a non-parametric test that is based on the cumulative sum of the recursive residuals of the model. The test determines whether the cumulative sum of the residuals exceeds a critical value, which indicates that the model has become unstable. The graphical test for the CUSUM stability test involves plotting the cumulative sum of the recursive residuals against time. The decision rule for interpreting the test graphically is to draw a horizontal line at the critical value of the test and reject the null hypothesis of model stability if the plotted curve intersects the horizontal line.

CHAPTER FOUR

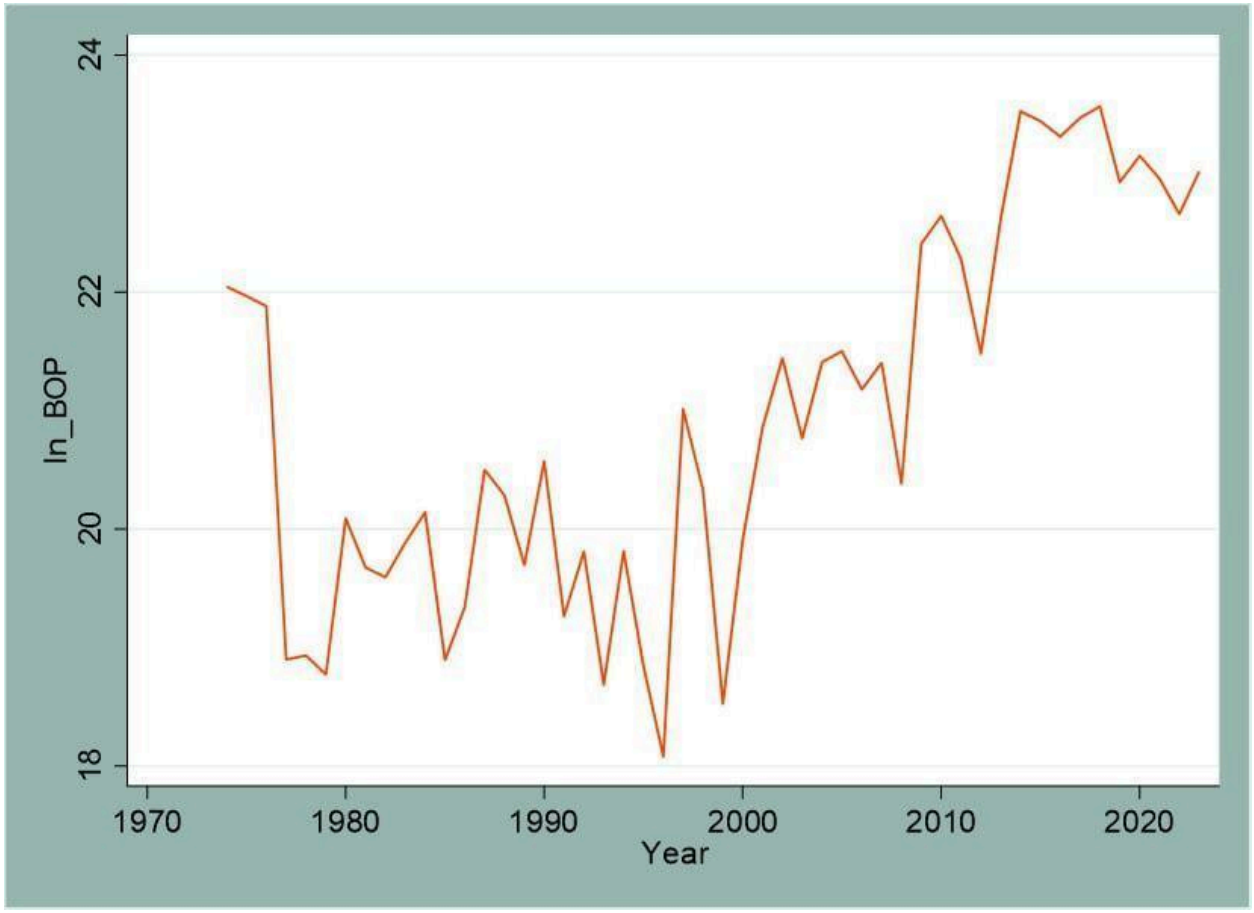
RESULTS AND ANALYSIS

This chapter examines the analysis of disequilibria and policy implications approaching the BOP in Ethiopia using annual time series data covering all variables for time period. After presenting the organized data, a significant stationary test and ARDL regression results were reviewed. Descriptive statistics were selected for the data, considering bound tests for cointegration, diagnostic tests, error correction model, and normality analysis of the variables. The key section, following the time series data ARDL regression model results, provides a detailed explanation of the findings for the study.

4.1. Trends of Balance of Payment in Ethiopia

The graph of ln_BOP from 1974 to 2023 reveals that Ethiopia experienced its lowest balance of payments level around the year 2000, which coincided with the aftermath of the Ethiopia-Eritrea border war (1998–2000). This conflict severely disrupted trade routes, deterred foreign direct investment, and strained public finances due to increased military spending, contributing to external imbalances (World Bank, 2002). In contrast, the highest ln_BOP levels were observed between 2015 and 2018, during the implementation of Growth and Transformation Plan I (GTP I) and the early phase of GTP II, when Ethiopia pursued aggressive public infrastructure investment financed through external borrowing and attracted growing FDI inflows (NPC, 2010; NPC, 2015). This period also benefited from improved remittance inflows and donor support, which temporarily eased foreign exchange pressures despite underlying trade deficits and import dependency (World Bank, 2016; UNCTAD, 2017).

Figure 1: Trends of average Balance of Payments



Source: Model Output using Stata 17 Software

4.2. Descriptive Statistics

The descriptive statistics of variables included in the model is summarized before formal estimation of the model. The descriptive statistics give a snapshot of the characteristics of the variables used in empirical analysis. The summary statistics of variables included in the model is given in Table 4.1 in a compact way.

Table 4.1. Summary of Statistics Results

Variables	Observation	Mean	Standard Deviation	Min	Max
Balance of Payment	50	-3.22	5.25	-1.72	3.75

Exchange Rate	50	11.88	13.42	2.07	54.6
Inflation Rate	50	11.37	13.29	-11.82	55.24
Foreign Direct Investment	50	7.07	1.37	-1.12	4.26
External Debt	50	1.02	9.62	2.83	3.33
Political Corruption Index	50	0.56	0.04	0.45	0.62
Policy	50	1.46	0.91	0	3

Source: Model Output using Stata 17 Software

The study used 50 observations that range from 1974 - 2023. The result shows the mean value, median, maximum, minimum, standard deviation in the analysis. The descriptive result shows that the mean value of Balance of Payments is -3.22, Exchange rate is 11.88, Inflation rate is 11.37, Foreign Direct Investment is 7.07, External Debt is 1.02, Political Corruption Index is 0.56. The policy implication, which is a categorical dummy variable, the mean is 1.46 for the study period. The result reveals that the standard deviation value of Balance of Payment, Exchange rate, Inflation, Foreign Direct Investment, External Debt, Political Corruption is 5.25, 13.42, 13.29, 1.37, 9.62, 0.04 respectively**.** The maximum value and minimum value for all variables were also presented in the table below.

4.2. Correlation Matrix of the Variables

A correlation matrix shows how strongly different variables in a dataset are connected to each other, and whether their relationships move in the same direction or in opposite directions. It helps to understand patterns and connections within the data. The correlation among the variables included in the study is given in Table 4.2 below.

Table 4.2. Correlation Matrix Result

	ln_BOP	ln_Exc	Inf	ln_FDI	ln_ED	ln_PCI	Policy
ln_BOP	1						
ln_Exc	0.73	1					
Inf	0.18	0.27	1				
ln_FDI	0.64	0.76	0.20	1			
ln_ED	0.41	0.71	0.05	0.34	1		
ln_PCI	0.36	0.48	0.03	0.52	-0.001	1	
Policy	0.42	0.82	0.22	0.76	0.71	0.27	1

Source: Model Output using Stata 17 Software

The result of the correlation coefficients indicates that all independent variables are positively correlated with dependent variables. The correlation coefficients between the independent variables are also positive except between external debt and political corruption which is negative -0.001. This may cause multicollinearity problems in the dataset utilized in this study. However, the mean value of VIF (variance inflation factor) is less than ten (4.55 < 10) showing that there is no high multicollinearity problem in the dataset. That is, variables under the study do not suffer from high problems of multicollinearity.

4.3. Presentation of the Econometrics Findings

4.3.1. Selection of Optimal Lag Length for ARDL

Determining the optimal lag length for each variable is a crucial step in time series analysis, as it ensures the model captures the dynamic relationships among the variables in the following Table 4.3. Khim-Sen Liew (2004) suggests that for small sample sizes (60 observations or less), Akaike's 27 information criterion (AIC) is preferable to other criteria for determining the optimal lag length.

Table 4.3. Optimal lag length selection

Variables	AIC Selection	BIC Selection	HQIC Selection
Balance of Payments	4	4	3
Exchange Rate	1	4	2
Inflation Rate	4	1	0
Foreign Direct Investment	2	2	2
External Debt	4	3	2
Political Corruption Index	4	1	1

Source: Model Output using Stata 17 Software, 2025

Lutkepohl (2006) explains that determining the appropriate number of lags would allow the researcher to appropriately model these relationships. In this study, the lag length was chosen using the BIC, which produced an ARDL (4, 4, 1, 2, 3, 1, 3) model. Following this, the maximum lag order was one for both the unit root tests and ARDL estimation in order to be consistent.

4.3.2. Unit Root Test Results

This research performed unit roots tests to test the stationarity of the time series variables employed in our research. This is due to the fact that employing non-stationary variables in regression analysis could lead to misleading results. The Augmented Dickey-Fuller (ADF) test and Phillips Perron (PP) was applied to each variable, both in level and first-difference forms and the result of the test is given below Table 4.4 and Table 4.5.

Table 4.4. Augmented Dickey-Fuller (ADF) test result at their level, I (0)

Variables	Test	MacKinnon approximate P-Value	T-test Statistics	Critical values			Results at I(0)
				1 %	5 %	10 %	
Balance of Payments	ADF	0.503	-1.56	-3.59	-2.94	-2.60	Non-stationary

Exchange Rate	ADF	0.98	0.34	-3.59	-2.94	-2.60	Non-stationary
Inflation Rate	ADF	0.0015	-3.98	-3.59	-2.94	-2.60	Stationary
Foreign Direct Investment	ADF	0.53	-1.50	-3.59	-2.94	-2.60	Non-stationary
External Debt	ADF	0.25	-2.09	-3.59	-2.94	-2.60	Non-stationary
Political Corruption Index	ADF	0.19	-2.27	-3.59	-2.94	-2.60	Non-stationary

Source: Model Output using Stata 17 Software, 2025

The results revealed that most of the variables, including the natural log of Balance of Payments, Exchange Rate, Foreign Direct Investment, External Debt and Political Corruption Index were non-stationary at levels but became stationary after taking their first differences. This suggests they are integrated of order one, I(1). On the other hand, variables like Inflation were found to be stationary at levels, indicating they are I(0). As for the dummy variables representing different policy regimes, unit root tests were not performed because these variables are categorical and do not vary randomly over time. Instead, they are assumed to be stationary by nature.

Table 4.5. Augmented Dickey-Fuller (ADF) test result at their level, I(1)

Variables	Test	MacKinnon approximate P-Value	T-test Statistics	Critical values			Results at I(1)
				1 %	5 %	10 %	
Balance of Payments	ADF	0.0000	-7.565	-3.600	-2.938	-2.604	Stationary
Exchange Rate	ADF	0.0002	-4.520	-3.600	-2.93	-2.604	Stationary
Inflation Rate	ADF	0.0007	-4.195	-3.600	-2.938	-2.604	Stationary

Foreign Direct Investment	ADF	0.0116	-3.383	-3.600	-2.93	-2.604	Stationary
External Debt	ADF	0.0000	-4.885	-3.600	-2.938	-2.604	Stationary

Source: Model Output using Stata 17 Software, 2025

In Phillips Perron (PP) test variables like Inflation were found to be stationary at levels, indicating they are I(0), similar with the ADF test.

Table 4.6. Phillips Perron (PP) test result at their level, I(0)

Variables	Test	MacKinnon approximate P-Value	T-test Statistics		Critical values			Results at I(0)
			Z(rho)	Z(t)	1 %	5 %	10 %	
Balance of Payments	PP	0.39	-6.43	-1.76	-3.59	-2.94	-2.60	Non-stationary
Exchange Rate	PP	0.99	0.927	0.94	-3.59	-2.94	-2.60	Non-stationary
Inflation Rate	PP	0.00	-42.66	-3.98	-3.59	-2.94	-2.60	Stationary
Foreign Direct Investment	PP	0.59	-3.93	-1.38	-3.59	-2.94	-2.60	Non-stationary
External Debt	PP	0.23	-3.73	-2.13	-3.59	-2.94	-2.60	Non-stationary
Political Corruption Index	PP	0.08	-12.27	-2.69	-3.59	-2.94	-2.60	Non-stationary

In the Philips Perron test results revealed that most of the variables, including the natural log of Balance of Payments, Exchange Rate, Foreign Direct Investment, External Debt and Political

Corruption Index were non-stationary at levels but became stationary after taking their first differences. This suggests they are integrated of order one, I(1).

Table 4.7. Phillips Perron (PP) test result at their level, I(1)

Variables	Test	MacKinnon approximate P-Value	T-test Statistics		Critical values			Results at I(0)
			Z(rho)	Z(t)	1 %	5 %	10 %	
Balance of Payments	PP	0.00	-50.83	-9.75	-3.59	-2.94	-2.60	Stationary
Exchange Rate	PP	0.00	-25.30	-4.19	-3.59	-2.94	-2.60	Stationary
Foreign Direct Investment	PP	0.00	-33.46	-4.99	-3.59	-2.94	-2.60	Stationary
External Debt	PP	0.00	-34.78	-5.05	-3.59	-2.94	-2.60	Stationary
Political Corruption Index	PP	0.00	-43.79	-7.23	-3.59	-2.94	-2.60	Stationary

Overall, the mixed orders of integration, some variables being I(0) and others I(1) support the use of the Autoregressive Distributed Lag (ARDL) model, which is well-suited for such a data structure. The fact that no variable was found to be integrated of order two or higher (I(2) or more) also satisfies a key precondition for ARDL estimation.

4.3.3. ARDL Model Bounds Cointegration Test

The ARDL co-integration method is a useful approach to establishing long-run relationships between variables even in situations where they are integrated of different orders, e.g., a combination of I(0) and I(1) (Pesaran et al., 2001; Pesaran and Shin, 1996). The test is very convenient in handling variables of mixed orders of integration, i.e., I(0) and I(1). The F-statistic calculated by the application of the bounds test was 7.06 and hence compared with Pesaran et al.

(2001) critical value bounds. At the 5 percent significance level, the lower bound critical value and upper bound critical value were 2.45 and 3.61, respectively. As the calculated F-statistic exceeds the upper bound, we have sufficient reason to reject the null hypothesis of no long-run relationship. It indicates that there is a statistically significant long-run equilibrium among the variables of the ARDL model.

Table 4.8. ARDL Bound Test for Cointegration

ARDL Bounds Test		Level of Significance	Bound Critical Value	
			Lower Bound I(0)	Upper Bound I(1)
Observations	50	10 %	2.12	3.23
		5 %	2.45	3.61
F-Statistics	F= 15.69	1 %	3.15	4.43

Source: Model Output using Stata 17 Software, 2025

4.3.4. Long Run ARDL Model

Subsequent to the confirmation of the cointegration, the research also explored the nature of the connection between the variables in the long run coefficients of the model. This estimation informs one how every explanatory factor affects the dependent variable the balance of payments (BOP) through time. The ARDL framework is especially helpful in this regard since it allows for variables of varying levels of integration and both short-run adjustments and long-run equilibrium relationships. The long-run estimates provide us with the insight into potential economic factors that have long-term effects on Ethiopia's BOP performance.

Table 4.9. Estimated result of long-run ARDL Model

ARDL (4, 4, 1, 2, 3, 1, 3) selected based on BIC				
Variables	Coefficients	Std. Error	t-statistics	P-Value
Balance of Payments (-1)	-0.24	0.14	-1.71	0.103

Exchange Rate	3.31	1.36	2.44	0.024
Inflation Rate	-0.1	0.10	-1.40	0.175
Foreign Direct Investment	-0.47	0.41	-1.13	0.269
External Debt	-1.26	0.97	-1.29	0.211
Political Corruption Index	6.40	11.85	0.54	0.594
Policy	7.23	5.72	1.27	0.220
R-squared =	0.9829			
Adjusted R-squared =	0.9634			

Source: Model Output using Stata 17 Software, 2025

In the long-run estimates of the chosen ARDL (4, 4, 1, 2, 3, 1, 3) model on the basis of the Bayesian information criterion (BIC), it is found that only the exchange rate is statistically significant at 5%. The significant and positive coefficient of the exchange rate (3.31, $p = 0.024$) indicates that home currency depreciation helps to aid long-term balance of payments improvement. The finding is in accordance with theoretical expectations because currency depreciation has the potential to lower the price of exports and reduce imports, thereby improving the trade balance and helping to offset external imbalances. This result is consistent with the findings of S. Priyadharshini (2017), who identified a long-run significant and positive relationship between exchange rate and BOP in Sri Lanka, and Gebremariam et al. (2018), who confirmed the validity of the Marshall-Lerner condition in Ethiopia. This is also consistent with Anokwuru and Chidinma (2024), who found that exchange rate depreciation improved Nigeria's BOP in the long run.

All the other variables, such as inflation, foreign direct investment, external debt, political corruption, and policy regime reforms, were insignificant in the long run and hence not explored further. Therefore, the model fits the data reasonably well, with an R-squared value of 0.98, indicating that 98 percent of total variation of the dependent variable is explained by explanatory variables included in the model and the remaining 2 percent is unexplained proportion which

account for other factors not included in the model. This strengthens confidence in the model's explanatory power.

4.3.5. Short run ARDL (Error Correction) Model

After the long-run coefficients of the equation have been determined, the next step is to estimate the short-run error correction model (ECM). The ECM plays a critical role in the model, indicating the rate at which variables adjust to return to their equilibrium state after experiencing shocks. Specifically, the ECM is a one-period-lagged residual that is obtained from the estimated long-run model. The coefficient of the ECM is an important indicator of the speed at which variables converge to their equilibrium values and should be negative and statistically significant, with a P-value of less than 0.05

Table 4.10. Short run ARDL model Test

Variables		Coefficient	Std. Error	t-statistic	P-Value
Balance of Payments	LD	-0.909	0.145	-6.23	0.000
	L2D	-0.705	0.097	-7.22	0.000
	L3D	-0.458	0.791	-5.79	0.000
Exchange Rate	D1	-1.091	0.905	-1.21	0.241
	LD	-3.035	0.768	-3.95	0.001
	L2D	0.519	0.789	0.66	0.517
	L3D	-4.129	0.592	-6.98	0.000
Inflation Rate	D1	0.019	0.006	3.19	0.004
Foreign Direct Investment	D1	0.147	0.029	5.06	0.000
	LD	0.133	0.026	4.95	0.000
External Debt	D1	1.318	0.226	5.83	0.000
	LD	0.853	0.239	3.57	0.002
	L2D	1.102	0.248	4.43	0.000

Political Corruption Index	D1	-5.938	2.802	-2.12	0.046
Policy Implication	D1	-1.828	0.503	-3.63	0.002
	LD	-1.012	0.473	-2.14	0.044
	L2D	-1.259	0.598	-2.11	0.047
_cons		10.806	3.056	3.54	0.002
ECM (-1)	L1	-0.237	0.139	-1.71	0.103

Source: Model Output using Stata 17 Software, 2025

Exchange Rate (ln_Exc): Exchange rate movements have the first lag (LD) and third lag (L3D) are both significant and negative. This suggests that devaluations in the past exchange rates lead to worsening balances of payments in the short run due to higher import prices and sluggish export response. This result is consistent with the findings of Anokwuru, G., & Chidinma (2024).

Inflation Rate (Inf): Inflation is positive and significant in the short run, i.e., a rise in inflation is associated with an improvement in the balance of payments. This may be because of lower imports as domestic prices increase compared to foreign prices, or because price adjustments enhance trade competitiveness. However, this finding contradicts most of the existing evidence (e.g., Abakaliki et al., 2015; Usman et al., 2018; Kingia et al., 2021),

Foreign Direct Investment (ln_FDI): Foreign direct investment (FDI) is positively and significantly influencing in the short run both at its level (D1) and at its lagged value (LD). This suggests that higher FDI flows serve to ease balance of payments pressures by creating foreign exchange and funding investment domestically. This result accords with that of Dakhil et al. (2019), who demonstrated that FDI has a positive impact on Iraq's current account balance both in the short run and in the long run, as well as with Mostafa (2020), who found high positive correlation between FDI and BOP for Bangladesh.

External Debt (ln_ED): External debt has positive and significant effects at current and two lagged times, which indicates that debt inflows have a positive effect on balance of payments in the short term, perhaps by alleviating foreign exchange tightness. This accords with the findings

of Mostafa (2020) for Bangladesh that there are adverse impacts of external debt on FDI and balance of payments, and Usman et al. (2018) for Pakistan that external debt is responsible for long-run BOP deficits because of structural weaknesses.

Political Corruption Index (ln_PCI): The political corruption index also has considerable short-run effects. As would be expected, the decline in corruption (i.e., rising in the index) makes the BOP worse in the current period. This might capture shocks from transition phases due to anti-corruption reforms whose positive effects are only realized after some time.

Policy Implication (Policy): The policy variable is also highly significant in the current period and its two lags. This would imply that recent policy measures have a short-run adverse effect on the balance of payments.

Lastly, the intercept term is statistically significant and positive, suggesting an optimally balanced surplus in the balance of payments when all the other variables are at zero. Overall, the short-run results support the role of FDI, foreign debt, inflation, and exchange rate behavior while also indicating that policy reforms and the fight against corruption are expensive for short-term external balance in Ethiopia.

4.3.6. Diagnostic Test Result

The selected model is well specified if it passes the diagnostic tests. Hence, prior to estimating the long- and short-run model, the following diagnostic tests were conducted.

Table **4.**11**.** Diagnostic tests of the ARDL model

Tests	Statistics	P-Value
Ramsey RESET test (F-statistic)	1.95	0.1581
Breusch-Godfrey LM test for autocorrelation	0.737	0.3907
White's test	46.00	0.4306
Normality test of the residual-Jarque-Bera test	2.751	0.1002
Durbin Watson d-statistic		2.201063

Source: Model Output using Stata 17 Software

The Ramsey RESET test was used to assess the correctness of the model's functional form. The test yielded an F-statistic of 1.95 with a p-value of 0.1581, which is greater than 0.05, meaning we fail to reject the null hypothesis.. This result suggests that the model is correctly specified and does not suffer from omitted variable bias or incorrect functional form. In other words, the structure of the model fits the data well.

The presence of autocorrelation was tested using the Breusch-Godfrey LM test, which returned a test statistic of 0.737 with a p-value of 0.3907. Since the p-value is well above the conventional 0.05 threshold, the null hypothesis of no serial correlation fails to reject. This indicates that the residuals are not correlated across time, which is essential for unbiased and efficient coefficient estimates.

The Durbin-Watson statistic is 2.20, which is sufficiently close to the ideal value of 2. This suggests that there is no evidence of first order autocorrelation in the residuals of the estimated model. Therefore, the assumption of independent errors appears to hold, supporting the validity of the regression results.

To check for heteroskedasticity, the White's test was employed. The test produced a statistic of 46.00 with a p-value of 0.4306. As the p-value exceeds 0.05, the null hypothesis of homoskedasticity fails to reject, implying that the variance of the residuals remains constant throughout the sample period. This confirms that the model does not suffer from heteroskedasticity, and therefore, the standard errors of the estimates are reliable.

The Jarque-Bera test was conducted to examine whether the residuals are normally distributed, a key assumption for valid inference in regression analysis. The test generated a value of 4.602 with a p-value of 0.1002, indicating no significant deviation from normality. Thus, all the assumptions are satisfied indicating that the models are reliable.

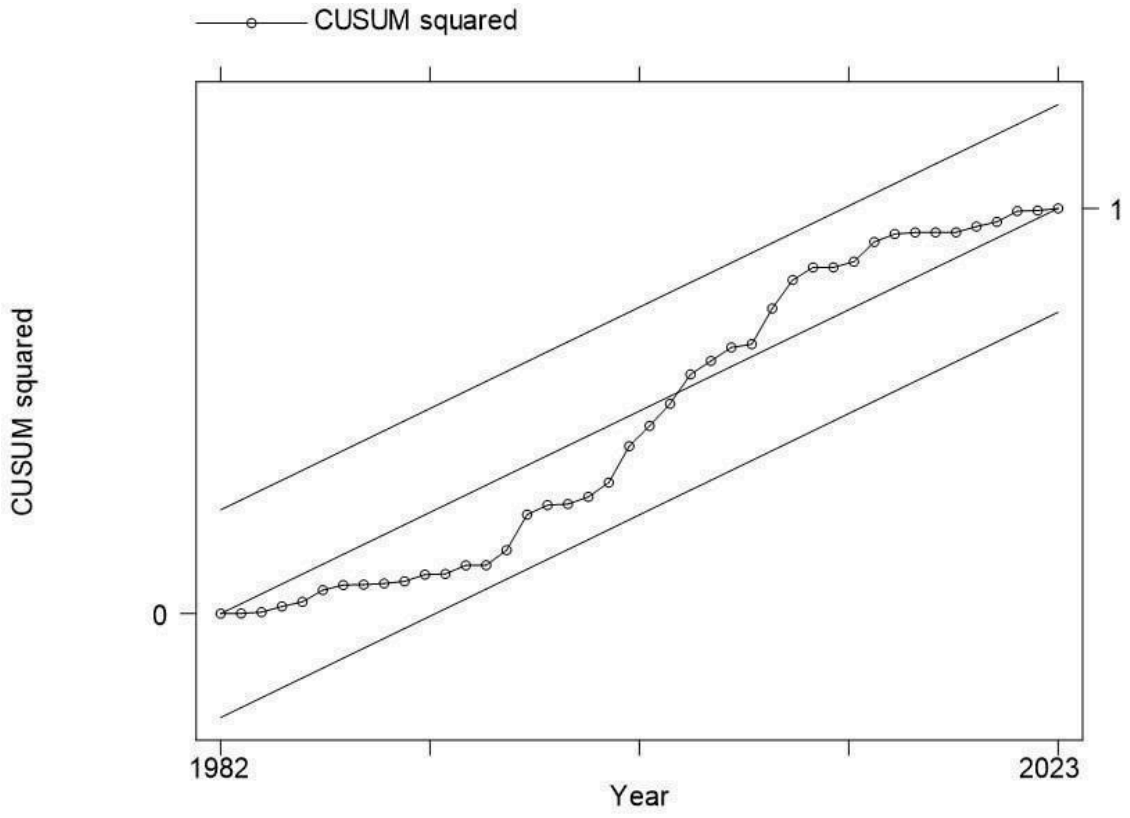
The Variance Inflation Factor (VIF) for this study was found to be 4.49 (see annex) , indicating a moderate degree of multicollinearity. Although this value suggests that the variable is somewhat correlated with other independent variables in the model, it remains below the commonly accepted threshold of 10, beyond which multicollinearity is considered problematic (Gujarati,

2004). Therefore, the level of multicollinearity does not pose a significant threat to the reliability of the coefficient estimates in this model.

4.3.7. Stability Test

According to Pesaran and Shin (1999, 2001), the CUSUM of Squares (CUSUMSQ) test helps check whether the model's structure remains stable over time. It does this by plotting the cumulative sum of the squared residuals along with two critical lines representing the 5 percent significance level. The interpretation is quite straightforward: if the plotted line stays within the critical boundaries or if it briefly crosses the line but then comes back it means the model is likely stable, and we have no strong reason to doubt its specification. However, if the line clearly goes beyond these boundaries and stays outside, it signals a potential structural break or a period where the relationship between the variables may have changed, suggesting that some instability exists in the model over time.

Figure 4.2. Cumulative sum (CUSUM) graph at 5 percent significance level



Source: Model Output using Stata17 Software, 2025

CHAPTER FIVE

CONCLUSION AND POLICY RECOMMENDATION

5.1. Conclusion of the study

This research explored the determinants of Ethiopia's balance of payments (BOP) imbalance employing an ARDL model with annual data spanning 1974-2023, under varying regimes, based on economic, structural, and policy considerations. The long-run result showed that only the exchange rate was statistically significant in the context that currency depreciation enhances the BOP in the long run by making exports competitive and diminishing import demand. In the short term, a few variables had significant effects. Foreign exchange-carrying lagged BOP levels were negatively and strongly significant, validating persistent short-run flows towards equilibrium. Both external debt and foreign direct investment were positively significant, indicating their work in hedging foreign exchange shortages and maintaining short-run external equilibrium. Inflation also was short-run significantly positive, possibly illustrating better relative price competitiveness. However, short-run effects of exchange rate depreciation were mixed, with some lagged observations exhibiting negative impacts on the BOP, possibly through increased import prices or sluggish responses of exports. Furthermore, political corruption and policy reform variables have exerted strong negative short-run impacts, which reflect that while reforms are growth enhancing in the long run, they generate transitional instability in the foreign sector. These results stress the pivotal place of exchange rate management, FDI inflows, and judicious use of debt to improve the BOP. They also underscore prudent and phased policy reform to prevent short-run deteriorations in imbalances. Generally, although structural and governance-oriented reform is required for long-term external stability, short-run issues have to be addressed through coordinated macro policies to ensure Ethiopia's stable BOP performance.

5.2. Policy Recommendations

This research was based on 50 years of time series data to better understand the effectiveness of existing policies, structural drivers and key determinants of Ethiopia's BOP. Findings of the study basically emphasizes the need for a full-fledged long term policy approach to address challenges of Ethiopia's persistent balance of payments (BOP). Improvement in BOP requires, among other things, policymakers' prudent decisions to adopt a gradual and managed depreciation strategy in the understanding that exchange rate depreciation positively impacts the BOP in the long run but worsens deficits in the short term. The currency regulating agency, in this case the National Bank of Ethiopia (NBE) should smoothen exchange rate instruments to reduce volatility that allows exporters to make the necessary adjustment in addition to mitigating inflationary pressures on imports.

A key factor for the stability of BOP is to enhance export competitiveness. In this regard, Ethiopia must be able to diversify its export base far beyond primary agricultural commodities such as coffee, khat, sesame, etc. It must strongly invest in value-added sectors such as agro-processing, textiles, light manufacturing and the like. In addition, the country has to introduce various incentives including targeted tax incentives, export subsidies, and infrastructure development that may help promote high-value exports. It should also influence different trade agreements such as the African Continental Free Trade Area (AfCFTA) to expand its market access. In addition, there is a need to restructure Foreign Direct Investment (FDI) policies giving priority for export-oriented industries to ensure the positive contribution of FDI to the BOP.

Ethiopia must improve its debt management practices, direct borrowing toward productive investments in industrialization and infrastructure, and strengthen its monitoring mechanisms to ensure debt sustainability in the context of external debt's short-term benefits and long-term risks. Governance reforms such as enhancing transparency in public financial management and reducing bureaucratic inefficiencies are critically important to fight and reduce corruption-related forex leakages and enhance confidence of investors.

Finally, looking back to decades of experiences, policy coherence and consistency across political transitions (regime changes) is very vital to avoid disruptive shocks. The present Home-Grown Economic Reform (HGER) agenda should reallocate more resources to accelerate industrialization that helps reduce imports, which will help improve the BOP performance. Supporting local manufacturing industries that substitute imports (e.g., pharmaceuticals and food processing) through facilitating access to healthy credit and appropriate technology for small and medium enterprises (SMEs) may further enhance and strengthen domestic production while easing pressures on the forex.

These recommendations provide a comprehensive, evidence-based framework for improving and stabilizing Ethiopia's BOP in the short term. The recommendations also help foster sustainable structural transformation in the long run by addressing objectives of the study, which are analyzing the BOP disequilibrium and suggesting pragmatic policy proposals.

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ANNEXES

```
. summarize
```

Variable	Obs	Mean	Std. dev.	Min	Max
Year	50	1998.5	14.57738	1974	2023
BoP	50	-3.22e+09	5.25e+09	-1.72e+10	3.75e+09
Exc	50	11.87804	13.42377	2.07	54.6
Inf	50	11.37202	13.29538	-11.82323	55.24131
FDI	50	7.07e+08	1.37e+09	-1.12e+09	4.26e+09
ED	50	1.02e+10	9.62e+09	2.83e+08	3.33e+10
PCI	50	.55828	.0365223	.445	.617
Policy	50	1.46	.9082389	0	3

```
. cor ln_BOP ln_Exc Inf ln_FDI ln_ED ln_PCI Policy
(obs=50)
```

	ln_BOP	ln_Exc	Inf	ln_FDI	ln_ED	ln_PCI	Policy
ln_BOP	1.0000						
ln_Exc	0.7284	1.0000					
Inf	0.1848	0.2720	1.0000				
ln_FDI	0.6374	0.7616	0.2047	1.0000			
ln_ED	0.4109	0.7145	0.0486	0.3399	1.0000		
ln_PCI	0.3627	0.4768	0.0319	0.5184	-0.0012	1.0000	
Policy	0.4165	0.8079	0.1601	0.7032	0.7655	0.2141	1.0000

```
. dfuller d_ln_BOP, lag(1)

Augmented Dickey-Fuller test for unit root

Variable: d_ln_BOP                          Number of obs   = 47
                                            Number of lags  =  1

H0: Random walk without drift, d = 0
```

	Test	Dickey-Fuller critical value		
	statistic	1%	5%	10%
Z(t)	-7.239	-3.600	-2.938	-2.604

```
MacKinnon approximate p-value for Z(t) = 0.0000.
```

```
. dfuller d_ln_Exc, lag(1)

Augmented Dickey-Fuller test for unit root

Variable: d_ln_Exc                          Number of obs   =        47
                                            Number of lags  =         1

H0: Random walk without drift, d = 0

                                         Dickey-Fuller
                 Test                 ---------------- critical value ----------------
               statistic                     1%               5%               10%
------------------------------------------------------------------------------------
 Z(t)            -4.520                    -3.600           -2.938           -2.604
------------------------------------------------------------------------------------

MacKinnon approximate p-value for Z(t) = 0.0002.

. dfuller Inf, lags(1)

Augmented Dickey-Fuller test for unit root

Variable: Inf                               Number of obs   =        48
                                            Number of lags  =         1

H0: Random walk without drift, d = 0

                                         Dickey-Fuller
                 Test                 ---------------- critical value ----------------
               statistic                     1%               5%               10%
------------------------------------------------------------------------------------
 Z(t)            -3.977                    -3.594           -2.936           -2.602
------------------------------------------------------------------------------------

MacKinnon approximate p-value for Z(t) = 0.0015.

. dfuller d_ln_FDI, lags (1)

Augmented Dickey-Fuller test for unit root

Variable: d_ln_FDI                          Number of obs   =        47
                                            Number of lags  =         1

H0: Random walk without drift, d = 0

                                         Dickey-Fuller
                 Test                 ---------------- critical value ----------------
               statistic                     1%               5%               10%
------------------------------------------------------------------------------------
 Z(t)            -4.195                    -3.600           -2.938           -2.604
------------------------------------------------------------------------------------

MacKinnon approximate p-value for Z(t) = 0.0007.
```

```
. dfuller d_ln_ED, lags(1)

Augmented Dickey-Fuller test for unit root

Variable: d_ln_ED                           Number of obs   =        47
                                            Number of lags  =         1

H0: Random walk without drift, d = 0

                                         Dickey-Fuller
                 Test                 ---------- critical value ----------
               statistic                 1%           5%           10%
------------------------------------------------------------------------------
 Z(t)            -3.383                -3.600       -2.938       -2.604
------------------------------------------------------------------------------

MacKinnon approximate p-value for Z(t) = 0.0116.

. dfuller d_ln_PCI, lags(1)

Augmented Dickey-Fuller test for unit root

Variable: d_ln_PCI                          Number of obs   =        47
                                            Number of lags  =         1

H0: Random walk without drift, d = 0

                                         Dickey-Fuller
                 Test                 ---------- critical value ----------
               statistic                 1%           5%           10%
------------------------------------------------------------------------------
 Z(t)            -4.885                -3.600       -2.938       -2.604
------------------------------------------------------------------------------

MacKinnon approximate p-value for Z(t) = 0.0000.

. pperron d_ln_BOP

Phillips-Perron test for unit root          Number of obs   =        48
Variable: d_ln_BOP                          Newey-West lags =         3

H0: Random walk without drift, d = 0

                                         Dickey-Fuller
                 Test                 ---------- critical value ----------
               statistic                 1%           5%           10%
------------------------------------------------------------------------------
 Z(rho)         -50.834               -18.764      -13.236      -10.660
 Z(t)            -9.750                -3.594       -2.936       -2.602
------------------------------------------------------------------------------

MacKinnon approximate p-value for Z(t) = 0.0000.
```

```
. pperron d_ln_Exc

Phillips-Perron test for unit root        Number of obs   = 48
Variable: d_ln_Exc                        Newey-West lags =  3

H0: Random walk without drift, d = 0

                                          Dickey-Fuller
                    Test                  critical value
                statistic           1%           5%          10%
------------------------------------------------------------------
 Z(rho)          -25.302       -18.764      -13.236      -10.660
 Z(t)             -4.187        -3.594       -2.936       -2.602
------------------------------------------------------------------

MacKinnon approximate p-value for Z(t) = 0.0007.


. pperron Inf

Phillips-Perron test for unit root        Number of obs   = 49
Variable: Inf                             Newey-West lags =  3

H0: Random walk without drift, d = 0

                                          Dickey-Fuller
                    Test                  critical value
                statistic           1%           5%          10%
------------------------------------------------------------------
 Z(rho)          -42.662       -18.832      -13.268      -10.680
 Z(t)             -5.688        -3.587       -2.933       -2.601
------------------------------------------------------------------

MacKinnon approximate p-value for Z(t) = 0.0000.

. pperron d_ln_FDI

Phillips-Perron test for unit root        Number of obs   = 48
Variable: d_ln_FDI                        Newey-West lags =  3

H0: Random walk without drift, d = 0

                                          Dickey-Fuller
                    Test                  critical value
                statistic           1%           5%          10%
------------------------------------------------------------------
 Z(rho)          -33.463       -18.764      -13.236      -10.660
 Z(t)             -4.996        -3.594       -2.936       -2.602
------------------------------------------------------------------

MacKinnon approximate p-value for Z(t) = 0.0000.
```

```
. pperron d_ln_ED

Phillips-Perron test for unit root        Number of obs   = 48
Variable: d_ln_ED                         Newey-West lags =  3

H0: Random walk without drift, d = 0
```

	Test statistic	Dickey-Fuller critical value 1%	5%	10%
Z(rho)	-34.785	-18.764	-13.236	-10.660
Z(t)	-5.052	-3.594	-2.936	-2.602

MacKinnon approximate *p*-value for Z(t) = 0.0000.

```
. pperron d_ln_PCI

Phillips-Perron test for unit root        Number of obs   = 48
Variable: d_ln_PCI                        Newey-West lags =  3

H0: Random walk without drift, d = 0
```

	Test statistic	Dickey-Fuller critical value 1%	5%	10%
Z(rho)	-43.790	-18.764	-13.236	-10.660
Z(t)	-7.230	-3.594	-2.936	-2.602

MacKinnon approximate *p*-value for Z(t) = 0.0000.

```
. ardl ln_BOP ln_Exc Inf ln_FDI ln_ED ln_PCI Policy,maxlag(4) bic

ARDL(4,4,1,2,3,1,3) regression

Sample:       1978 thru       2023                    Number of obs =     46
                                                      F(24, 21)     =  50.37
                                                      Prob > F      = 0.0000
                                                      R-squared     = 0.9829
                                                      Adj R-squared = 0.9634
Log likelihood = 6.8141759                            Root MSE      = 0.3088
```

ln_BOP	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
ln_BOP						
L1.	-.1465677	.1006699	-1.46	0.160	-.3559222	.0627868
L2.	.2041732	.0995439	2.05	0.053	-.0028396	.411186
L3.	.2467304	.0797936	3.09	0.006	.0807906	.4126702
L4.	.4584162	.0791562	5.79	0.000	.293802	.6230305
ln_Exc						
--.	-.3031902	.879439	-0.34	0.734	-2.132084	1.525703
L1.	-1.943711	1.478833	-1.31	0.203	-5.019111	1.13169
L2.	3.554543	1.382541	2.57	0.018	.6793927	6.429694
L3.	-4.649899	1.121844	-4.14	0.000	-6.982902	-2.316897
L4.	4.1299	.5917192	6.98	0.000	2.899353	5.360448
Inf						
--.	-.014408	.0059185	-2.43	0.024	-.0267162	-.0020998
L1.	-.0194562	.0060973	-3.19	0.004	-.0321362	-.0067761
ln_FDI						
--.	.035323	.0432926	0.82	0.424	-.054709	.1253549
L1.	-.0142016	.0346897	-0.41	0.686	-.0863429	.0579396
L2.	-.1328534	.0268364	-4.95	0.000	-.1886628	-.077044
ln_ED						
--.	1.020175	.2603718	3.92	0.001	.4787027	1.561648
L1.	-.4647888	.3408241	-1.36	0.187	-1.173571	.2439938
L2.	.248886	.3273191	0.76	0.455	-.4318114	.9295834
L3.	-1.102414	.2486432	-4.43	0.000	-1.619496	-.5853322
ln_PCI						
--.	-4.418115	3.029836	-1.46	0.160	-10.719	1.882773
L1.	5.938298	2.802331	2.12	0.046	.1105309	11.76606
Policy						
--.	-.11225	.2581456	-0.43	0.668	-.6490932	.4245932
L1.	.8154569	.3112972	2.62	0.016	.1680789	1.462835
L2.	-.2464636	.5446276	-0.45	0.656	-1.379079	.8861515
L3.	1.259319	.5977954	2.11	0.047	.0161355	2.502503
_cons	10.80609	3.056209	3.54	0.002	4.450351	17.16182

```
. ardl ln_BOP ln_Exc Inf ln_FDI ln_ED ln_PCI Policy,maxlag(4)ec btest bic

ARDL(4,4,1,2,3,1,3) regression

Sample:       1978 thru       2023                    Number of obs =     46
                                                      R-squared     = 0.9465
                                                      Adj R-squared = 0.8853
Log likelihood = 6.8141759                            Root MSE      = 0.3088
```

D.ln_BOP	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
ADJ						
ln_BOP						
L1.	-.2372479	.1390383	-1.71	0.103	-.5263939	.051898
LR						
ln_Exc	3.319916	1.35921	2.44	0.024	.4932847	6.146547
Inf	-.1427374	.1016024	-1.40	0.175	-.3540311	.0685563
ln_FDI	-.4709508	.4149645	-1.13	0.269	-1.333917	.3920151
ln_ED	-1.256666	.9737495	-1.29	0.211	-3.281689	.7683573
ln_PCI	6.407569	11.84661	0.54	0.594	-18.2288	31.04394
Policy	7.233203	5.716191	1.27	0.220	-4.654268	19.12067
SR						
ln_BOP						
LD.	-.9093198	.1459628	-6.23	0.000	-1.212866	-.6057735
L2D.	-.7051466	.0976747	-7.22	0.000	-.9082723	-.5020209
L3D.	-.4584162	.0791562	-5.79	0.000	-.6230305	-.293802
ln_Exc						
D1.	-1.090833	.9048456	-1.21	0.241	-2.972563	.7908961
LD.	-3.034544	.7677445	-3.95	0.001	-4.631156	-1.437932
L2D.	.5199991	.7886715	0.66	0.517	-1.120133	2.160131
L3D.	-4.1299	.5917192	-6.98	0.000	-5.360448	-2.899353
Inf						
D1.	.0194562	.0060973	3.19	0.004	.0067761	.0321362
ln_FDI						
D1.	.147055	.0290481	5.06	0.000	.0866462	.2074639
LD.	.1328534	.0268364	4.95	0.000	.077044	.1886628
ln_ED						
D1.	1.318317	.2260677	5.83	0.000	.8481832	1.78845
LD.	.853528	.2390859	3.57	0.002	.3563217	1.350734
L2D.	1.102414	.2486432	4.43	0.000	.5853322	1.619496
ln_PCI						
D1.	-5.938298	2.802331	-2.12	0.046	-11.76606	-.1105309
Policy						
D1.	-1.828312	.5031592	-3.63	0.002	-2.874689	-.7819355
LD.	-1.012855	.4727835	-2.14	0.044	-1.996063	-.0296484
L2D.	-1.259319	.5977954	-2.11	0.047	-2.502503	-.0161355
_cons	10.80609	3.056209	3.54	0.002	4.450351	17.16182

```
note: estat btest has been superseded by estat ectest
      as the prime procedure to test for a levels relationship.
      (click to run)

Pesaran/Shin/Smith (2001) ARDL Bounds Test
H0: no levels relationship            F =  15.693
                                      t = -1.706

Critical Values (0.1-0.01), F-statistic, Case 3
```

	[I_0] L_1	[I_1] L_1	[I_0] L_05	[I_1] L_05	[I_0] L_025	[I_1] L_025	[I_0] L_01	[I_1] L_01
k_6	2.12	3.23	2.45	3.61	2.75	3.99	3.15	4.43

```
accept if F < critical value for I(0) regressors
reject if F > critical value for I(1) regressors

Critical Values (0.1-0.01), t-statistic, Case 3
```

	[I_0] L_1	[I_1] L_1	[I_0] L_05	[I_1] L_05	[I_0] L_025	[I_1] L_025	[I_0] L_01	[I_1] L_01
k_6	-2.57	-4.04	-2.86	-4.38	-3.13	-4.66	-3.43	-4.99

```
accept if t > critical value for I(0) regressors
reject if t < critical value for I(1) regressors

k: # of non-deterministic regressors in long-run relationship
Critical values from Pesaran/Shin/Smith (2001)
```

```
. ardl ln_BOP ln_Exc Inf ln_FDI ln_ED ln_PCI Policy,maxlag(4)ec bic

ARDL(4,4,1,2,3,1,3) regression

Sample:       1978 thru       2023                    Number of obs =     46
                                                      R-squared     = 0.9465
                                                      Adj R-squared = 0.8853
Log likelihood = 6.8141759                            Root MSE      = 0.3088
```

D.ln_BOP	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
ADJ						
ln_BOP						
L1.	-.2372479	.1390383	-1.71	0.103	-.5263939	.051898
LR						
ln_Exc	3.319916	1.35921	2.44	0.024	.4932847	6.146547
Inf	-.1427374	.1016024	-1.40	0.175	-.3540311	.0685563
ln_FDI	-.4709508	.4149645	-1.13	0.269	-1.333917	.3920151
ln_ED	-1.256666	.9737495	-1.29	0.211	-3.281689	.7683573
ln_PCI	6.407569	11.84661	0.54	0.594	-18.2288	31.04394
Policy	7.233203	5.716191	1.27	0.220	-4.654268	19.12067
SR						
ln_BOP						
LD.	-.9093198	.1459628	-6.23	0.000	-1.212866	-.6057735
L2D.	-.7051466	.0976747	-7.22	0.000	-.9082723	-.5020209
L3D.	-.4584162	.0791562	-5.79	0.000	-.6230305	-.293802
ln_Exc						
D1.	-1.090833	.9048456	-1.21	0.241	-2.972563	.7908961
LD.	-3.034544	.7677445	-3.95	0.001	-4.631156	-1.437932
L2D.	.5199991	.7886715	0.66	0.517	-1.120133	2.160131
L3D.	-4.1299	.5917192	-6.98	0.000	-5.360448	-2.899353
Inf						
D1.	.0194562	.0060973	3.19	0.004	.0067761	.0321362
ln_FDI						
D1.	.147055	.0290481	5.06	0.000	.0866462	.2074639
LD.	.1328534	.0268364	4.95	0.000	.077044	.1886628
ln_ED						
D1.	1.318317	.2260677	5.83	0.000	.8481832	1.78845
LD.	.853528	.2390859	3.57	0.002	.3563217	1.350734
L2D.	1.102414	.2486432	4.43	0.000	.5853322	1.619496
ln_PCI						
D1.	-5.938298	2.802331	-2.12	0.046	-11.76606	-.1105309
Policy						
D1.	-1.828312	.5031592	-3.63	0.002	-2.874689	-.7819355
LD.	-1.012855	.4727835	-2.14	0.044	-1.996063	-.0296484
L2D.	-1.259319	.5977954	-2.11	0.047	-2.502503	-.0161355
_cons	10.80609	3.056209	3.54	0.002	4.450351	17.16182

```
. estat dwatson

Durbin-Watson d-statistic(  25,    46) =  2.201063
```

```
. estat bgodfrey

Breusch–Godfrey LM test for autocorrelation
```

lags(*p*)	chi2	df	Prob > chi2
1	0.737	1	0.3907

H0: no serial correlation

```
. estat imtest, white

White's test
H0: Homoskedasticity
Ha: Unrestricted heteroskedasticity

   chi2(45) =  46.00
Prob > chi2 = 0.4306

Cameron & Trivedi's decomposition of IM-test
```

Source	chi2	df	p
Heteroskedasticity	46.00	45	0.4306
Skewness	24.70	24	0.4224
Kurtosis	1.21	1	0.2716
Total	71.91	70	0.4145

```
. jb resid
Jarque-Bera normality test:  4.602 Chi(2)  .1002
Jarque-Bera test for Ho: normality:


. estat ovtest

Ramsey RESET test for omitted variables
Omitted: Powers of fitted values of D.ln_BOP

H0: Model has no omitted variables

F(3, 18) =   1.95
Prob > F = 0.1581


. vif
```

Variable	VIF	1/VIF
ln_Exc	8.40	0.119060
ln_ED	5.49	0.182105
Policy	5.32	0.188085
ln_FDI	4.37	0.228785
ln_PCI	2.08	0.480515
Inf	1.25	0.797154
Mean VIF	4.49	