IMPACTS OF DEVALUATION ON MACROECONOMIC STABILITY OF ETHIOPIA: CASE OF 2017 BIRR DEVALUATION

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CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by The Open University of Tanzania a dissertation titled: "**Impacts of Devaluation on Macroeconomic Stability of Ethiopia: Case of 2017 Birr Devaluation"** In partial fulfilment of the requirements for the award of degree of Master of Science in Economics (MSc. – Econ.).

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DECLARATION

I, **Girum Amaha Diana,** declare that, the work presented in this dissertation is original. It has never been presented to any other University or Institution. Where other people's works have been used, references have been provided. It is in this regard that I declare this work as originally mine. It is hereby presented in partial fulfillment of the requirement for the Degree of Master of Science in Economics (MSc. – Econ.).

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30th Sep. 2023

…….....

Date

DEDICATION

This work is mainly dedicated to Africa, the continent that is home to the two countries that have given me my education far, Ethiopia and Tanzania. I shall forever strive to raise this blessed continent to the glory that it very much deserves.

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ABSTRACT

This study analyzes the Impact of Currency Devaluation on Macroeconomic stability in Ethiopia, with focus on the 2017 devaluation using secondary data between 1992 and 2021. Two Models were used, with Inflation and RGDP as dependent variables acting as proxies for macroeconomic stability in each model, while NEER, External Debt, M2, Government expenditure and a Devaluation dummy Variable were used as independent Variables in both models. ARDL regression was conducted for the Long run estimation of both models, and the short run Error Correction Model (ECM) was estimated for both models. The findings indicate that an official devaluation is deflationary and expansionary to the real economy in the short run, but inflationary and insignificant to real GDP in the long run. The granger causality test also confirmed that Devaluation Granger causes Inflation uni-directionally. Finally, the study recommends that devaluation should not be carried out before Enacting import minimization, export composition switching, debt reliance reduction, rule based monetary policy and fiscal austerity policy measures to mitigate the adverse effects of devaluation on macroeconomic stability.

Keywords: *Macroeconomic Stability, Devaluation, Birr, Ethiopia.*

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LIST OF ABBREVIATIONS AND ACRONYMS

ADF	Augmented Dicky-Fuller (test)
ARDL	Autoregressive Distributed Lag
BOP	Balance Of Payments
CPI	Consumer Price Index
CSA	Central Statistics Authority
ECM	Error Correction Model
EDs	External Debt
EFY	Ethiopian Fiscal Year
EPRDF	Ethiopian Peoples' Revolutionary Democratic Front
EU	European Union
FDI	Foreign Direct Investment
FOREX	Foreign Exchange
G	Government Spending
GDP	Gross Domestic Product
GDP	Gross Domestic Product
GERD	Grand Ethiopian Renaissance Dam
IMF	International Monetary Fund
M2	Broad Money Supply
MoF	Ministry of Finance
NBE	National Bank Of Ethiopia
NEER/NEERI	Nominal Effective Exchange Rate Index
OLS	Ordinary Least Square
USD	United States Dollar

VECM	Vector Error Correction Model
Vs	Verses
WB	World Bank

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Macroeconomic stability is among the several national level objectives placed by every country's government, and promoting it is among the main duties of central banks across the globe, including Ethiopia's Central bank, the National bank of Ethiopia. It is crucial in engaging the private sector in investment, consumption, international trade and saving (National Bank of Ethiopia 2009). It also encourages research and development as well as competitiveness in the Global Market (Romer, 2012; Haghighi et. al., 2012).

However, what constitutes macroeconomic stability does not have a clear cut answer. According to the Reut Institute (2006)[1], The EU and IMF's general criteria for macroeconomic stability are: (1) Low and Stable Inflation, (2) Low Long-Term Interest Rates, (3) Low National debt relative to GDP, (4) Low Deficits and Finally (5) Currency Stability. Thus it is when these conditions are met that one can say that there is macroeconomic stability in a country.

Every nation has its own chosen variable to gauge macroeconomic stability. For instance, in Ethiopia, that chosen variable is price stability or Inflation (National Bank of Ethiopia, 2009). Regardless, it is in the best interest of governments to maintain macroeconomic stability for obvious political reasons. As such, they meticulously monitor their chosen proxy variables for macroeconomic stability, and employ policies at their disposal to stabilize the economy when shocks that deter the

[1] http://reut-institute.org/en/Publication.aspx?PublicationId=1299

economy form its stable state occur.

Governments typically have two broad types of policy at their disposal to ensue macroeconomic stability, and these are Monetary Policy and Fiscal Policy. A government implements monetary policy through the central bank of the country, which may or may not be independent of Government intervention. In contrast, it has direct control over the implementation of fiscal policy. Monetary policy is the means by which a government or a Central Bank uses its control on the money supply to stimulate or cool down the economy, while Fiscal Policy is the means by which a government uses its spending and revenue mobilization, be it taxation or debt, to do the same thing.

As far as macroeconomic stability goes, both monetary and fiscal policy has significant effects since they affect all criteria of Macroeconomic stability in one way or another. Fiscal Policy has direct effects on Government or fiscal deficit and Government debt, since it's spending and borrowing are determining factors for both, while it has indirect effects on Inflation, Interest rate and currency stability depending on the means by which a government may choose to finance its fiscal policy measures.

On the other hand, Monetary policy has direct impacts on Inflation, Interest rate and currency stability, since all three are directly tied to money supply, while it has indirect effects on Government budget deficit and National Debt since money creation is one of the means that the government uses to finance its deficit spending and repay its debts. In the case of Ethiopia, Monetary policy is the one mostly used

to promote macroeconomic stability, and the National Bank of Ethiopia (NBE) is the monetary authority mandated to implement it.

The National Bank of Ethiopia, in its Monetary Policy Framework Document (2009), states that the principal objective of its Monetary Policy is "to maintain price & exchange rate stability and support sustainable economic growth of Ethiopia". Given that the exchange rate is one of the transmission mechanisms for monetary policy, the NBE has an exchange rate policy as well. An exchange rate policy is a Central Bank's stance on how its issued currency is to be exchanged for other nations' currencies. According to the Barth (1992), exchange rate policy or exchange policy boils down to two things: The exchange rate system and the exchange rate. The "system" is dependent on the degree of control that a nation's central bank has on the value of its currency in the world FOREX market, while the "rate" is the conversion ratio between the nation's currency and that of other nations.

The Exchange rate system adapted by the National Bank of Ethiopia since 1992 is a managed floating exchange rate system. In a managed floating exchange rate system, the central bank of a nation engages in buying and selling of the home currency to keep the currency at a range of rates it deems desirable (Mankiw, 2010). As such, the NBE regularly intervenes in the currency exchange market to adjust the value of the birr in relation to the currencies of other countries in line with its goals and objectives. Yet The World Bank, IMF and others have stated that the Birr is overvalued, and denounced the exchange rate system for it. To its credit and blame, the NBE's meddling birr's value has brought with it a mix of positive and negative outcomes.

On the plus side, the fact that the NBE maintains a Partial control over the exchange rate has made the birr's value more stable than it would be if it was allowed to float. Since the adaption of the Managed floating exchange rate regime in 1992, the official exchange rate was depreciating at a more or less predictable rate, annually averaging around 11.1% between 1992 and 2019. The stability of the exchange rate induced by the national bank's involvement has also made the country keep its External Debt, which was 26.5% of the GDP at the end of 2020/2021EFY according to the NBE's annual report (2020/21), from increasing in value at uncontrollable rates with rapid exchange rate depreciation that would have occurred counterfactually.

In addition, the artificial adjustment of the rate has also made it possible for Ethiopia to import much needed Capital goods, Industrial machinery and fuel to aid its industrialization and development efforts, as well as necessities such as medicine and wheat, at reasonable prices from the rest of the world. However, the management of the Exchange rate has also brought some complications as well.

All of the negative consequences of the NBE's management of the birr's value stem from the fact that it is kept at a rate higher than what the market would have valued it at. According to Gebregziabher (2019), the national bank has used the USD as the anchor currency, which has made the birr appreciate in real terms to an extent that it has become overvalued. Overvalued currency has numerous negative implications to an economy. In the Ethiopian context, it has led to a thriving parallel market along with a high spread in the parallel market premium (PMP), capital flight and a currency crunch coupled with currency rationing (Gebregziabher, 2019). Having an

overvalued currency also adversely affects the competitiveness of exports in the global market and that of locally produced import substitution products uncompetitive in the domestic market (Shatz and Tarr, 2020).

When under a managed floating exchange rate regime, there is one exchange rate policy suggested by the IMF that could solve the above mentioned ailments, and it is to make the exchange rate flexible (Kebret and Hussien, 2015). However, many argue that floating the birr would not be a prudent move on the part of the NBE, and would rather lead to macroeconomic instability. According to a UN monthly report (November, 2020), floating the birr under current conditions would lead to disastrous consequences including, but not limited to, high uncertainty hindering long-term investment planning, exchange rate volatility, soaring inflation, widened income inequality and aggravation of capital flight. This may be the reason that the NBE has thus far maintained its stance on the exchange rate system for the past nearly three decades, and rather opted for devaluation to appease the IMF and tackle the adverse effects of the birr's overvaluation.

But devaluation has as much negative consequences as it has positive, and it becomes necessary to examine if the net effect on macroeconomic stability is worth the implementation. Its effects on the economy disseminate deeply, and affect each of the five macroeconomic stability criteria mentioned above. Despite this, The NBE has officially devalued the Birr by significant percentages three times in history, with the most recent one being in October of 2017. Even though the birr has already being devalued three times, the WB and IMF still call on the National Bank of Ethiopia to stop artificially adjusting the Birr's value and allow it to be determined my market

forces. Following their suggestion would change the exchange rate system of Ethiopia, and by consequence, the exchange rate as well. The new government of Ethiopia seems to agree with the WB and IMF, and has issued a 10 year prosperity plan for the country which includes allowing of the birr to be completely determined by market forces as one of the measures to be taken in the coming decade. Yet some speculate that the birr will be devalued again even before that happens.

Before a fourth devaluation takes place, it is important to review the effect of the first three on the Ethiopian economy and the prudence as a policy measure. The overall effects of the 1992 and 2010 devaluations have been sufficiently explored, and the merits and faults of the policy have been assessed and researched by numerous Ethiopian and foreign economists. The consciences is that the 1992 devaluation was justified and garnered mostly positive results, and the accompanying change in the exchange rate system from a fixed to a managed floating as well as the economic liberalization reform following the shift from a command to a mixed economy played a major role to the double digit growth and economic stability that followed for a decade after the move.

However, the same has not been said about the 2010 devaluation, with scholars agreeing that the potential positive effects of the devaluation were quickly undone. Gebregziabher (2019) suggests that the 2010 nominal devaluation led to a an appreciation in the real effective exchange rate, making the birr overvalued, further exacerbating the spread in the parallel market premium, worsening the currency crunch, failing to boost export revenue and leading to the brink of total economic collapse with the country's foreign exchange results reserves being unable to cover 3

months of imports. It was then that the Birr was devalued yet again in 2017.

When a third devaluation took place, it was debated that its long run effects would be as ineffectual, if not outright harmful, as the 2010 devaluation was to the economy. However, its effects have not been as sufficiently assessed as those of its predecessors. This is perhaps because the devaluation was fairly recent and a time series analysis needs enough periodic data to carry out. In addition, its effect on macroeconomic stability has not been explored at all. The events that transpired after the 2017 devaluation have made it increasingly difficult to attribute the changes and movement of macroeconomic variables purely to it.

Since 2017, the Ethiopian economy has been influenced by political, as well as natural incidents. For instance, the regime change within the then incumbent political party, known as the EPRDF, which took place in 2018 as well as the sweeping reforms that followed had positive impacts on the economy. Prior to that economy was in a down turn due to political instability that reigned in late 2016 and early 2017, making Ethiopia a difficult place to do business.

However, the optimistic expectations of Ethiopians abroad, as well as strengthened Bi-lateral alliances with Nations such as the UAE and China that ensued a vote of confidence after the regime change which led to massive inflow of foreign currency in the form of Unilateral Transfers such as Remittance, Grants and Loans as well as Foreign Direct Investment (IMF Country Report No. 18/354). In addition the economic liberalization instituted by the reformed government and the emphasis placed on Public-Private partnerships, Technology Transfer and Innovation

positively influenced economic growth from 2018 to 2020. However, when the COVID-19 pandemic spread to Ethiopia, with the first case being found in late March of 2020, the global measures taken to control the spread such as Lockdowns, Halting International Travel etc. devastated World Economy, and the same measures also slowed down Ethiopia's economic growth from 8.4% in 2019 to 6.1% in 2020 according to data from the African Development Bank Group.

According to Geda (2020), COVID-19 did not hurt the Ethiopian economy as much as it did prosperous nations in the world, which was due to the fact that Full-fledged Lockdowns were impossible to implement at the prevailing poverty in Ethiopia, but nevertheless worked to significantly reduce household Income, redistribute wealth, aggravate poverty and induced a substantial negative shock to the Ethiopian Economy. In addition, Ababulgu and Wana (2022) suggest that Covid-19 had inflationary outcomes due to supply side disruptions, increased unemployment and lowered Job creation due to its effects on the Global Supply-chain, worsened Government Budget Deficit due to increased fiscal spending on Health and COVID-19 Mitigation as well as led to the expansion of broad money supply, with the National Bank of Ethiopia having injected 15 Billion Birr into the economy in order to assist the financial sector to provide debt repayment relief to its customers.

Another Event that has affected the Ethiopian Economy was the Currency change, where the 10, 50 and 100 Birr currency notes were debased and replaced, and a new 200 Birr note was introduced in September of 2020. As part of the currency change protocols, the narrow money in circulation was ordered to be deposited in banks, and then limits on withdrawals and transfers were placed as per the National Bank of

Ethiopia's Directive No. FIS/03/2020 in October of 2020. A month later in November of 2020, the "Tigray War", which was then dubbed as a "law enforcement operation" began and was on-going until a cessation of hostilities agreement was signed in early November of 2022.

In addition, the Russia Ukraine war which started in February of 2022 have also affected the World Economy, with the two countries being the largest suppliers of Oil and Wheat, which are two of the major Imports of Ethiopia. These domestic and foreign wars, as typical to all wars, have taken a massive toll on the economy, with the most adverse macroeconomic impact being on Inflation, trade balance and foreign direct investment. The Ethiopian economy was already weakened by COVID-19, and the domestic and foreign wars have further exacerbated macroeconomic instability.

Due to these above stated reasons, it becomes increasingly difficult to attribute the movement of macroeconomic stability variables in Ethiopia from 2017 onwards to any one Event, including to the 2017 Devaluation. Nevertheless, past experience dictates that inflation has almost always followed the aftermath of devaluation in Ethiopia because imports suddenly become more expensive and Ethiopia is a net importer. Interest rate is usually also adjusted as part of a curbing mechanism after the birr is devalued, which in 2017 was raised from 5% to 7% by the NBE.

Devaluation also leads to increased burden of external debt which is denominated in foreign currency that suddenly takes more local currency to purchase and pay off, which is usually more than half of Ethiopia's national debt at any given point in time

and always on the rise as it is the financing mechanism of choice for most government funded mega projects. These facts beg an inquiry in to the impacts of devaluation as an exchange rate policy, and what the effects of the three historical devaluations, especially the 2017 devaluation, were on macroeconomic stability in Ethiopia, which is what this study had ventured to undertake.

1.2 Statement of the Problem

The National Bank of Ethiopia (NBE) has never shied away from using the policy instruments at its disposal to try and correct the instabilities that occur in the economy from time to time. In line with that, it has devalued the Ethiopian Birr on three historical instances to achieve different objectives and the effects on macroeconomic stability have been different each time. Nevertheless, the government of Ethiopia stands by its decision to devalue the birr in 2017 claiming that its effects on the economy were a net positive, and even plans to float the birr by 2030.

The theoretical view on devaluation is that it is contractionary both to the economy as well as to money supply, while it has the potential to cause inflation and worsen external debt burden which has devastating outcomes to economies. It would be logical to conclude from the theory that devaluation has adverse effects on macroeconomic stability. However, since the 2017 devaluation, Real GDP has grown by 42% and broad money has increased by 135%, while inflation has gone from 7.4% in 2016/17 to 20% in 2020/21 while External Debt to GDP ratio has fallen from 29.2% to 26.5% within the same periods (NBE Annual Report, 2016/17; 2020/21).

Except for inflation, the movement of the other macroeconomic indicators is contrary to what the theory suggests. As such, an empirical examination into the isolated impact of the 2017 devaluation on macroeconomic stability and the relationship between monetary as well as fiscal variables and macroeconomic stability is required to identify how much of the movement in these variables can be attributed to devaluation.

With the 2017 devaluation being fairly recent, there is a shortage of studies on its impact, and virtually none on its impact on macroeconomic stability. As such, this study aims to fill that gap, and since it was conducted in 2022, there is 5 years of time series data available to make accurate inferences.

1.3 Research Objectives

1.3.1 General Objectives of the study

The general objective of the study is to assess the impact of devaluation on macroeconomic stability, with emphasis on the 2017 Ethiopian birr devaluation.

1.3.2 Specific Objectives of the Study

i. To describe the long run and short run impact of monetary variables on Macroeconomic stability
ii. To identify the long run and short run impact of Fiscal Variables on Macroeconomic stability
iii. To analyze the Effect of Ethiopian birr devaluations on Macroeconomic stability in Ethiopia.

1.4 Research Hypothesis

The hypotheses of this study are as follows:

i) Monetary Variables have had no impact on with Macroeconomic stability in Ethiopia between 1990-2022

ii) Fiscal Variables have had no impact on Macroeconomic stability in Ethiopia between 1990-2022

iii) The 1992, 2010 and 2017 Devaluations had no effect on Macroeconomic stability in Ethiopia.

1.4 Significance of the Study

The significance of this study is it provides a deeper understanding into the effects of currency devaluation on the macroeconomic stability of a country following a fixed or a managed floating exchange rate system. When it comes to macroeconomic stability of Ethiopia, devaluation is only justified if it brings bring the desired effects on stability indicators. If devaluation leads to inflation, debt burden, soaring government deficits and overall economic instability, it cannot be deemed a prudent exchange rate policy. With Ethiopia planning to let the birr float by 2030 and speculations being made about a possible devaluation before that, it is crucial to empirically assess the impacts of the recent devaluation and decide if it was prudent or if the NBE should take alternative measures in the future, and this study generates findings that can be significant in that regard.

If the NBE is indeed planning to devalue the birr, this study provides insight on its effect on the macroeconomic stability of the country based on the impact of devaluation on monetary and fiscal variables, as well as on its own, with emphasis

those of the most recent one. In addition, this study is significant in that it adds to the existing empirical literature on the impact of devaluation on inflation, as well as the impacts of Nominal Effective exchange rate, broad money supply, external debt and government spending on both inflation rate and Real GDP in particular and macroeconomic stability in general with wider time series coverage for other researchers.

1.5 Organization of the Study

The remainder of this study is organized as follows: Chapter Two provides definitions for different concepts, the review of relevant Theoretical and Empirical Literature as well as past policies and the gaps therein, along with the theoretical and conceptual frameworks utilized for the undertaking of the study. Chapter Three demonstrates the Methodology used to conduct the study pertaining to the research approach, the variables and how they were measured, the types and sources of data used, as well as the Econometric model and methods employed to conduct the data processing and analysis.

Chapter Four presents the data analysis, both the descriptive analysis on the trends followed by the variables during the observation period and how they related to devaluation, and the econometric analysis, which covers the pre-estimation tests, the results from both the ARDL Regression for long run estimation and the short run ECM estimation results for both models, and the Granger causality test. Chapter five forwards the conclusions reached after conducting the study, and the recommendations for policy and future research.

CHAPTER TWO

LITRATURE REVEIW

2.1 Chapter Overview

This section provides conceptual definitions, reviews theoretical and empirical literature as well as policies and evaluates the gaps therein. It also provides the conceptual framework used to conduct the study.

2.2. Conceptual Definitions

2.2.1 Devaluation

Mishkin (2003) defines devaluation as resetting the par exchange rate at a lower value. It can be understood from this definition that devaluation is a deliberate reduction in the amount of foreign currency it takes to purchase domestic currency. On the other hand, Pugel (2008) defines devaluation as the discrete official reduction in the otherwise fixed par value of a currency. Compared to the first definition, this one places its emphasis on the fact that devaluation, unlike its floating exchange rate counterpart “Depreciation”, is an official policy measure, instigated by intervention rather than market forces.

Both devaluation and depreciation are reductions in a currency’s value as implied by the first two definitions, but while devaluation is an official policy measure initiated by an authority in charge of maintaining the value of the currency, depreciation is a self-contained process that emanates from the fact that the currency is allowed to float on the forces of supply and demand. Alternatively, Salin (2016) defines devaluation as a breach in the previous commitment between the Central Banks of two or more nations to exchange one currency for another without limit at a fixed

exchange rate, such that the devaluing central bank single-handedly decides to offer a smaller quantity of a foreign currency in exchange for its own currency.

For the purpose of this study, we define devaluation as an instance here the central bank of a nation officially increases the amount of domestic currency it takes to purchase foreign currency, thereby lowering the value of its own currency in the exchange rate market and unilaterally breaching its underlying commitment to other central banks. Hence, it is conceptualized is this study as a deliberate reduction in the value of a nation's currency by its central bank as part of an exchange rate policy measure intended to usher selected macroeconomic variables towards desired ends directly or indirectly.

2.2.2 Macroeconomic Stability

Macroeconomic Stability is tricky concept to define. No source, to this researcher's knowledge, gives a textbook definition for it, but rather an idea of what it is. In contrast, it's opposite, macroeconomic instability has been well defined in literature, and can be used to define macroeconomic stability by implication. Azam (2001) defined it as a mess in the macroeconomic conditions of a nation, manifested by high inflation, overvalued currency, real exchange rate instability, balance of payment and fiscal deficit etc. From this, it is implied that macroeconomic stability can be thought of as order in the macroeconomic conditions of a nation, where there is tolerable inflation, correctly valued currency, stability in the Real exchange rate, and so on.

Alternatively, Serven and Montiel (2004) defined macroeconomic instability is a phenomenon that reduces the predictability of the domestic macroeconomic

environment, thereby impeding resource allocation decisions, investment, and growth. By that regard, the opposite, Macroeconomic stability is a phenomenon that makes the domestic macroeconomic environment more predictable, thereby facilitating resource allocation decisions and creating fertile grounds for long term planning, investment and the growth that comes along with it.

For the purpose of this research, given that it is focused on Ethiopia and the National Bank of Ethiopia uses price stability as a proxy for macroeconomic stability (NBE, 2009), we define macroeconomic stability as order in the macroeconomic conditions of a nation where there is more predictability in macroeconomic variables, specifically inflation and Real GDP, allowing for long term planning, investment and economic growth.

2.3 Theoretical Literature Review

As part of the theoretical literature review for this study, it is important to elaborate on the theories behind exchange rate policy, devaluation, macroeconomic stability and the theoretical relationship between devaluation as an exchange rate policy and Macroeconomic stability, embodied by price stability for which inflation is the proxy variable. In addition to Inflation, it is also important to review the theoretical literature on the relationship between devaluation and the other relevant macroeconomic variables such as external debt, broad money supply, real gross domestic product and government spending.

2.3.1 Exchange Rate Policy

Exchange rate policy is part of monetary policy that is concerned with the exchange rate of a country's currency with respect to other currencies. Barth (1992) suggests

that exchange rate policy involves two steps, the first being the selection of an exchange rate system and the second being deciding on the particular rate at which foreign exchange transactions will occur. The second component of exchange rate policy, i.e. the exchange rate, is heavily dependent on the system.

2.3.1.1 Exchange Rate Systems and Determination of Exchange Rate

The Exchange rate system creates a distinction for how the rate will be determined, and thus it is crucial to give some background on the exchange rate systems, or regimes as they may be called, and how the exchange rate will be determined in each one. The exchange rate systems are broadly classified into three as follows:

i. Fixed Exchange Rate System

According to Blanchard and Sheen (2013), a system in which two or more countries maintain a constant exchange rate between their currencies is called a fixed exchange rate regime. Under this regime, the exchange rate is determined based on the discretion of the nation's central bank, and maintained at that particular rate through the use of various mechanisms, the most notable of which is the open market mechanism where the central bank buys and sells its own currency and the foreign currency in its reserves in the global currency exchange market (Krugman & Obstfeld, 2018). Thus the actions of the central bank under this regime are intended to counteract market forces and keep the exchange rate fixed, but if, for whatever reason, the government decides that the exchange rate has to be adjusted, it will do so officially. Blanchard and Sheen (2013) state that under a fixed exchange rate regime, increases in the exchange rate, although not common, are called revaluations instead of appreciations, while decreases in the exchange rate are known as

devaluations, instead of depreciations, since the exchange rate is adjusted as part of official policy by the monetary authority.

ii. Flexible (Floating) exchange rate System

According to Carbaugh (2019), a flexible or floating exchange rate system is one where the currency is allowed to fluctuate according to supply and demand forces typical of a free market system. In this exchange rate system, the rate is determined by market forces and minimal involvement from Central Bank. But this is in theory. According to Dunn and Mutti (2003), The real life implementation of flexible exchange rates is less flexible due to the fact that partial management is possible, and thus central banks reserve the right to intervene in exchange rate markets when the exchange rate becomes volatile or heads in undesirable directions.

iii. Managed Floating exchange rate System

According to Carbaugh (2019), a Managed floating exchange rate system (dirty float) is a hybrid of the floating exchange rate system (clean float) and the fixed exchange rate system (pegged), whereby the best features of both systems are expected to come together and result in a stable exchange rate free from the volatility characteristic to a market determined exchange rate in the short run, yet still ensure that the exchange rate is determined by market forces in the long run. Therefore in this system, the central bank intervenes to direct the movement of the exchange rate in desired directions, but only in the sense that it reduces the speed or magnitude in which market forces cause a change in exchange rate. A very popular managed floating exchange rate system is the crawling peg, which according to Dunn and Mutti (2008) is an arrangement where a fixed exchange rate is explicitly maintained

but parity changes are frequently made in order to correct for the differences in local and foreign inflation rates. This means that the central bank adjusts the exchange rate in accordance with the inflation rates at home and abroad.

As can be understood from above, devaluation as a policy measure is open to nations that follow either a fixed or a managed floating exchange rate system, while nations that follow flexible exchange rate system only have the fact that their currency is freely floating as their exchange rate policy while the rate is exclusively determined by market forces.

2.3.1.2 Foundational Theories on Devaluation as an Exchange Rate Policy Measure

Devaluation as an exchange rate policy measure is advocated by the IMF for countries that have fixed or managed floating exchange rates and have overvalued currencies. Doroodian (1994) suggests that devaluation is a frequent component of macroeconomic stabilization plans offered by the IMF to developing countries. However, devaluation has a lot of problems associated with it since exchange rate is tied to many aspects of the economy. According to Cooper (1971), devaluation should be the measure of last resort when all other possible measures have been tried to no avail.

Most of the theories surrounding devaluation are disproportionately focused on explaining its effect on trade balance. Indeed, the purpose of exchange rates is making international trade possible, and where there is international trade, each nation exports to— and imports from – the rest of the world. In the same light, the

main purpose of devaluation is to improve international trade competitiveness which is reflected in the trade balance. For this reason, popular theories on the effectiveness of devaluation make cases for the conditions under which devaluation will lead to improved trade balance. These theories are encompassed under the elasticity approach and worth highlighting.

The Elasticity approach outlines the conditions necessary for a devaluation to improve trade balance. This condition, which is also known as the Marshall-Lerner condition, states that the effect of a devaluation on trade balance depends on the sum of import and export elasticity, such that if it is greater than unity then trade balance improves; if it is less than unity and trade balance will deteriorate; and if it is zero the trade balance will be unaffected by devaluation (Bahmani et. al., 2013). Umer (2015) suggests that the Marshall-Lerner condition can only be a necessary but not sufficient condition for a devaluation to affect trade balance, as trade balance is not only dependent on exchange rates but also the productive capacity of a nation to boost output for exports in line with the newly devalued exchange rate which improved its competitive stance in the global marketplace. This is where the J-Curve Effect provides some context.

The J-Curve effect is a phenomenon that follows a devaluation where trade balance will initially worsen before improving. According to Bahmani-Oskooee (2008), this is due the fact that the price effect of devaluation is instantaneous, while the volume effect has a substantial lag making the trade balance deteriorate until import volume is lowered in accordance with the newly raised import prices and productive capacity required for output to catch up to the increased export demand is set up.

Although the elasticity approach is worth highlighting in any devaluation themed paper, it cannot be an appropriate approach to analyzing the comprehensive effect of devaluation for this study, which is less concerned with trade balance and more so on the overall macroeconomic stability. Cooper (1971), who is credited for having made substantial contributions to the consolidation of theories on devaluation, suggests that the elasticity approach did not consider the effect of devaluation on the overall economy, but rather individual sectors. For this reason, the approaches most relevant to this study are the absorption approach and the monetary approach as both consider the overall economy rather.

According to Jha (2003), the Absorption approach to analyzing the impact of devaluation was proposed by Sidney Alexander after he forwarded his critique on the elasticity approach for overlooking the income effect of devaluation and only addressing the relative price effects. Alexander defined absorption as the sum of consumption expenditure, investment expenditure and government expenditure and suggested that policies that increase absorption including devaluation itself will often increase income, and can only yield positive results if the addition income is saved and not consumed. These saving could be made by the private sector through reducing consumption and investment spending, or even the government if it taxes the addition income and refrains from rising its spending which, According to Jha (2003), is less likely to happen in developing countries.

The absorption approach suggests that devaluation has inflationary implications that have expenditure changing effects. The first effect, named the Keynes Effect, originates from the drop in the real value of money arising from the increase in

domestic prices, which shrinks aggregate expenditure (Jha, 2003). The second is the real balance effect, where devaluation increases the overall price index and increases money demand forces individuals to cut their expenditure (absorption) and liquidate their assets in order to maintain their real money balances where money stock is rigid (Labata, 2019).

The Third effect, known as the inflationary expectations effect, increases aggregate expenditure unlike the first two, and is caused by individuals increasing expenditure after devaluation, especially on durable goods including imported goods and other stores of value, in anticipation of further loss in the purchasing power of the money in their hands, which further worsens inflation. The remaining effects are the idle resources effect and the terms of trade effect, which according to Jha (2003) work in opposition of each other, with the former raising real income and the latter deteriorating it through the effects of devaluation on terms of trade.

The absorption approach was further developed by Harry Johnson, who according to Jha (2003) proposed a general theory of the balance of payments suggesting that deficit countries facing inflationary pressures should accompany devaluation with a reduction in money growth or reducing the government deficit. Johnson also went on to propose an alternate approach to analyzing the effects of devaluation, which was the Monetary Approach. According to Cooper (1971) the absorption approach is inherently Keynesian, with its emphasis on the effects of devaluation on aggregate output and expenditures, while the monetary approach proposed by Johnson (1977) is monetarist as it places its emphasis on the effect of devaluation on demand and supply of money, making the two approaches complementary. As such, the gaps left

open by the absorption approach are filled by the monetary approach.

According to Johnson (1977), The monetary approach is based on Walras's law which states that there can be no excess demand for goods, securities, and money, which necessitates that if there is indeed excess demand for or supply of money, it has to be matched by an excess supply or demand somewhere else in the market system. As such, Johnson asserted that policy to correct the disequilibrium arising in the firm of surpluses and deficits can only have a catalytic role, as the system will adjust itself even if left alone. Johnson argued that devaluation can be thought of as increasing the nominal amount of money demanded by reducing the real value of existing money stock due to inflation, which has the same effect as contractionary monetary policy at constant exchange rate. For this reason, devaluation can only be effective to the extent that the reduction of real balances that it creates is not offset by expansionary monetary policy in the form of domestic credit creation.

Cooper (1971) also observes that that the monetary approach considers devaluation as akin to a decline in money supply denominated in local currency when measured in terms of foreign currency, or a reduction in the real value of money supply. For this reason, devaluation as an exchange rate policy can be considered a contractionary monetary policy. Krugman and Taylor (1978) also share the same sentiment, suggesting that since devaluation raises prices, it increases the demand for nominal money which is contractionary, and where Broad money supply is held constant by the central bank, results in deflationary outcomes in the short run in both the monetary and absorption models.

2.3.2 Recent Theories on Devaluation as Exchange Rate Policy Measure Stability

Recent theory on Devaluation is mostly derivative of older work by prominent authorities on the matter. Cooper takes credit for having consolidated the otherwise dispersed literature on devaluation, and his 1971 paper summarizing the contributions of devaluation theory to that point, as well as his own contributions to the theoretical literature, is cited several times in this study and was reprinted by Kenen (2019) as part of a 50 years of old yet prominent Princeton Essays that still hold water in International Monetary Theory to this day.

Textbooks on Macroeconomics and International economics elaborate on the old theories, and Empirical research papers published in countries where devaluation is still applicable rehash the old theories to provide background or theoretical foundations for their respective study. But aside from that, Original theoretical literature on devaluation after the 1980's is extremely scarce as devaluation as an exchange rate policy went out of fashion when a majority of the world's nations made the shift from fixed to flexible exchange rates soon after the gold standard was abolished.

Nevertheless, some expansions were made on devaluation theory recently, and they are worth mentioning for the purpose of this study. Salin (2016) expanded on Johnson's Monetary approach, by introducing the effects of devaluation on tradable and non-tradable goods. His take on devaluation is that it is illusory to regard devaluation as a non-monetary phenomenon, as the elasticity approach does, and suggests that devaluation applies to tradable goods and therefore results in a cascade

of real and monetary effects on the economy of a nation.

According to Salin (2016), In the absence of non-tradable goods, these effects manifest in the form of temporary inflation, changes in the distribution of resources (to exports and import substitution goods that will have attractive prices due to devaluation), Monetary Expansion to meet money demand by the public (which will cost nothing but profit commercial banks and the central bank vastly), inflation tax by the government (in the form of reduced real debt as price hikes due to devaluation and the accompanying zero cost money creation campaign), Increased Deficit Spending by the Government (financed by the sale of treasury bills to Commercial and Central Bank who became vastly profitable due to the devaluation), Distortions in price and production structures and massive uncertainty in the public which stems from their inability to forecast the duration and rate of inflation, as well as the duration and value of distortions.

Salin (2016) also suggests that in the presence of non-tradable goods, devaluation will have the same effect as in their absence, but with the added harmful consequence of wastage in resources due to costly transfer of factors of production from non-tradable to tradable due to demand structure distortions that are created by the devaluation. His final verdict is that devaluation is an attempt to create flexibility in an otherwise fixed exchange rate regime, which defeats the purpose of having a fixed exchange rate in the first place. As such, he suggests that all effects of devaluation are transitory at best, and thus not worthwhile, and as such countries who plan to devalue their currency should make the transition towards a flexible exchange rate instead, or stick to the commitments they made to other central banks

when they agreed to exchange their currency for foreign currency at a fixed rate in the first place and refrain from devaluation.

Grekou (2019) suggests that devaluation can only be effective if it translates to a real depreciation, which is conditional on the institutional environment, the exchange rate system, the wage indexation policies as well as stabilization policies. He forwards that literature has misconstrued or outright omitted the key factors that determine the impact of devaluation, and these are the economic environment, the size of the devaluation, and the initial misalignment between the nominal and real exchange rates.

2.3.3 Theories on the Effects of Devaluation on Indicators of Macroeconomic Stability

There are not many theoretical literature sources that have attempted to explain the holistic effects of devaluation on macroeconomic stability. However, some sources have provided insights into the conditions where devaluation will not lead to inflationary or contractionary outcomes. Ratha (2010) suggests that a devaluation carried out by a central bank, which is a nominal devaluation, can only be effective and yield positive results if it leads to a Real Devaluation/depreciation. This means that when the exchange rate, Foreign currency in terms of local currency is reduced, then the goods and services of the devaluing country must become cheaper while foreign goods become more expensive. If prices are allowed to adjust to the new exchange rate, the possible benefits of the devaluation will be undone and the resulting inflation will have contractionary effects on the economy.

Grekou (2019) shares this sentiment as well, and suggests that a sizable disparity between the nominal and real exchange rates is a precondition to justify devaluing a currency, and the devaluation can only be effective and yield positive results if it leads to a Real depreciation. However, he also provides other conditions needed for a devaluation to not be inflationary. He suggest that a devaluation must come as a surprise to prevent economic agents from taking measures beforehand, and must not be weak enough to not require another devaluation in the near future. If these conditions are not met and inflation expectations are close to real inflation, devaluation will not be effective and garner inflationary outcomes.

Ratha (2010) also suggests that the value of the currency must also be overvalued prior to devaluation, such that the devaluation makes the value of the currency realistic. According to Shatz and Tarr (2000), Devaluations carried out by countries with currencies that were overvalued have reaped the benefits of devaluation, such countries as Chile, Turkey, Cameroon and Cote d'Ivoire. On social and economic grounds, devaluations have caused increased inflationary pressures and unemployment, increased balance of payments deficits, distortion in resource allocation and undesirable redistribution of income (Cooper, 1971; Donovan, 1981; Doroodian, 1994).

There are theories that suggest it is inflationary to import dependent countries (Williamson, 1983; Befikadu and Kibre, 1995; Shatz and Tarr, 2000; Ratha, 2010). Libman (2018) suggests that a macroeconomic stabilization program needs to be implemented along with a credible central bank policy based on rule rather than discretion, as expectations of the policy being abandoned once it is in motion will

result in real appreciation of the devalued currency, cause external deficit, cheapen the current consumption of tradables and worsen the trade balance, which will in turn create inflation and instigate macroeconomic instability. As for the debt burdening effect of devaluation, Da-Rocha, et al., (2004) point that devaluation will increase the value and burden of debt denominated in foreign currency which will increase overall debt value in local currency.

2.4. Empirical Literature Review

The empirical literature reviewed for the purpose of this study are those conducted to assess the impact of devaluation, and its relationship with selected macroeconomic variables relevant to this research, namely Inflation, external debt, Government spending, Broad money supply and real gross domestic product. A few related worldwide studies and some Ethiopian ones have been reviewed. Their summaries are presented as follows:

2.4.1 Relevant Studies from Around the World

Borensztein and Gregorio (1999) studied the impact of large devaluations inspired by episodes of currency crisis on inflation, taking data from 49 sampled episodes of currency crisis in 26 countries around the world between the periods of 1970 - 1996. The study employed estimation of reduced form equations through OLS regression to analyze the data and found that the effect of devaluation on inflation is negatively related to the starting inflation rate and the extent of currency overvaluation preceding the devaluation. The study found that there is low pass-through of devaluation when there is overvaluation of currency to begin with, and that the inflationary effect of devaluation in countries with high inflation rates prior to

devaluation is lower than those whose inflation rates are low before devaluation.

Fawaz and Hamaad (2021) estimated the short run and long run impact of exchange rate devaluation on inflation in Iraq using time series data from 2004 to 2018. The study did this through the use of an ARDL model to estimate the cointergration between the independent variable (exchange rate) and the dependent variable (Consumer Price Index). The study found that there is a significant negative short run and long run relationship between exchange rate and inflation, with a 1% decrease in Exchange rate leading to a factor of 10 rises in CPI, concluding that devaluation is inflationary in Iraq.

Okaro (2017) aimed to determine the effect of devaluation on economic growth of Nigeria using time series data from 2000 to 2015. The study utilized the OLS method to run regression analysis on the 3 separate models with Real GDP, External Debt and Private domestic Investments as the dependent variables respectively, while the Exchange rate was the independent variable in all 3 models. The findings of the study indicated that there is a significant positive relationship between currency devaluation and Real GDP of Nigeria and also a significant positive relationship between devaluation and External Debt in Nigeria.

David and Oluseyi (2017) also assessed the Impact of devaluation on the Nigerian economy with a focus on empirically assessing how macroeconomic variables responded to currency devaluation. They did this through analyzing timeseries data from 1986 to 2016 using Johansen Co-integration, Vector Error Correction Model (VECM) and impulse response to do the analysis. The study found that real GDP and

Money supply are significantly and positively related with currency devaluation, while inflation is significantly and negatively related to currency devaluation. For a 1% change in devaluation, the study found that there will be a 0.07% and 0.26% growth in Money supply and real GDP respectively, while inflation will decrease by 0.04%.

2.4.2 Relevant Studies from Ethiopia

Behru (2012) aimed to empirically investigate the pass through of exchange rate to inflation after the 2010 devaluation, examine the effects of an assortment of macroeconomic variables on inflation and analyze the effectiveness of monetary policy on inflation rate. The study employed vector autoregressive model to estimate impulse response functions and variance decompositions from monthly timeseries data from July 2002 to June 2011. The study found that a 1% change in exchange rate will increase CPI by 4.75% during the first year, but the pass through wears off two years after the shock. In addition, the study also found that 24% of the variations in inflation are caused by money supply shocks, but that the causality does not run in the opposite direction, meaning CPI has no effect on Money supply.

Biresaw (2014) set out to investigate the causal relationship between money supply and currency devaluation on inflation in Ethiopia using time series data covering the periods between 1998 and 2010. The study conducted granger causality test between the dependent variable, i.e. CPI and the independent variables, of which the ones relevant to this research are broad money supply and exchange rate. The study found that there is a bi-directional causal relationship between broad money supply and inflation, while there is a unidirectional significant causal relationship between

Exchange rate and inflation.

The granger causality test revealed that change in the broad money supply granger caused inflation at the third lag while inflation granger caused change in the broad money supply in the first two lags, indicating that as time passes, the direction of causality is shifted from inflation leading to an expansion in broad money to expansion in broad money causing inflation. In contrast, the direction of causality is persistent through all three lags when tested for exchange rate and inflation, with increase in the exchange rate expressed in terms of birr/$ granger causing inflation in all 3 lags.

Hunegnaw (2015) aimed to empirically investigate the pass through of exchange rate to consumer prices and assess the short and long run effects of exchange rate shocks like devaluation and the other determinants of CPI in Ethiopia. The study did this through analyzing data from 1981 to 2013 through the ARDL cointegration and found that foreign exchange pass through to consumer prices is statistically insignificant while the contribution of broad money supply, budget deficit and world commodity price index have statistically significant detriment to consumer price index in Ethiopia.

Labata (2019) aimed to assess the empirical relationship between currency devaluation, trade balance, Inflation, External debt servicing, and Economic growth of Ethiopia using data from the second quarter of 1992 to the fourth quarter of 2017. The study employed Johnson co-integration, Vector Error correction model (VECM), Granger causality tests, impulse response function and forecast error

variance decomposition to conduct the econometric analysis, and conducted trend analysis on top of that in order to analyze the short run and long run relationship of the variables. The study found that devaluation leads to inflation and external debt burden, while its effects on trade balance and economic growth are statistically insignificant.

Tafesse (2019) set out to identify the benefits and costs of currency devaluation in Ethiopia, and economic growth with five intervening macroeconomic variables, the one relevant to this study being inflation. The study employed mediation analysis with multiple regressions through the use of time series data encompassing a period of 27 years. The study found that devaluation has a significant relationship with inflation, and that inflation increases by 0.265 for every unit increase in devaluation.

Hunibachew (2021) set out to examine the short and long run effect of monetary policy variables on economic growth (real GDP) and test the causal relationship between monetary policy and economic growth using time series data from 1980 to 2019. The study employed the ARDL model for cointergration and granger causality test to analyze the data. The results of the the longrun ARDL bounds test for cointegration revealed that there is a significant long run relationship between the variables, of which the ones relevant to this research are Real GDP, Money supply, Inflation (CPI) and Exchange rate. In addition, the study also found that inflation had an insignificant effect on Real GDP while exchange rate had negative significant relationship with Real GDP.

Table 2.1. Summary of Findings from Relevant Empirical Literature

Author and Year	Study Objectives	Study Location	Analytical Method	Findings of effect of Exchange rate/devaluation on:					
				Macroeconomic stability Proxies		Monetary variables			Fiscal Variables
				Inflation	RGDP/ Growth	NEER	Money supply	External Debt	Government spending/ Fiscal deficit
Studies from Across the Globe									
Borensztein and Gregorio (1999)	Study impact of devaluation on inflation and currency stability.	26 Countries around the world.	Empirical, estimation of reduced form equations through OLS regression.	Inflationary	-	-	-	-	-
Fawaz and Hamaad (2021)	Assess the short run and long run impact of exchange rate devaluation on inflation in Iraq	Iraq	ARDL model to estimate the cointergration	Inflationary	-	-	-	-	-
Okaro (2017)	determine the effect of devaluation on economic growth of Nigeria	Nigeria	OLS method to run regression analysis on the 3 separate models	Inflationary in short run	Expansionary	-	-	Increased external debt Burden	-
David and Oluseyi (2017)	Investigate Impact of devaluation on the Nigerian economy and assess response of macroeconomic variables to currency devaluation	Nigeria	Johansen Co-integration, Vector Error Correction Model (VECM) and impulse response	Deflationary	Expansionary	-	Expansionary		-
Studies from Ethiopia									
Behru (2012)	Empirically investigate the pass through of exchange rate to inflation after the 2010 devaluation, examine the effects of an assortment of macroeconomic variables on inflation and analyze the effectiveness of monetary policy on inflation rate	Ethiopia	vector autoregressive model to estimate impulse response functions and variance decompositions	Inflationary in the first year only	-	-	Caused inflation	-	-
Biresaw (2014)	assess the causal relationship between money supply and currency devaluation on inflation in Ethiopia	Ethiopia	Granger causality test	Inflationary	-	-	Bi-direction causation with	-	-

Author and Year	Study Objectives	Study Location	Analytical Method	Findings of effect of Exchange rate/devaluation on:					
				Macroeconomic stability Proxies		Monetary variables			Fiscal Variables
				Inflation	RGDP/ Growth	NEER	Money supply	External Debt	Government spending/ Fiscal deficit
							inflation		
Hunegnaw (2015)	Empirically investigate the pass through change in exchange rate to change in CPI in Ethiopia and assess short and long run effects of exchange rate shocks and other factor on CPI	Ethiopia	Trend analysis and ARDL Model time series regression and impulse response	Insignificant	-	-	-	-	Causal relationship on inflation
Labata (2019)	To examine the long run and short run relationship between devaluation and selected macroeconomic variables such as inflation, growth, trade balance and external debt servicing	Ethiopia	Trend analysis along with Econometric analysis through Johnson co-integration, (VECM), Granger causality tests, impulse response function, and forecast error variance decomposition.	Inflationary	-	-	-	Increases external debt burden	-
Tafesse (2019)	To **t**est the relationship between GDP and currency devaluation with the mediating role of inflation rate, FDI, Interest rate, import and export.	Ethiopia	Multiple Time series regression through OLS	Inflationary	Insignificant	-	-	-	-
Hunibachew (2021)	examine the short and long run effect of monetary policy variables on economic growth and test the causal relationship between monetary policy and economic growth	Ethiopia	ARDL model for co-intergration and granger causality test	Insignificant to RGDP	Contractionary	-	-	-	

2.5 Policy Review

As mentioned before, Ethiopia uses a managed floating exchange rate system, which was adapted after the fall of the socialist regime in 1991. Prior to that, the country followed a fixed exchange rate regime since the Imperial era where the Ethiopian birr was pegged to the USD. The birr had never been devalued before that; in fact, the birr was revalued twice, once in December of 1971 and again on February of 1973. Even when the Socialist Regime took power in 1974, it made no changes to the exchange rate system or the rate itself. But after the EPRDF seized power in 1991, managed floating exchange rate system was adopted and the first historical devaluation of the birr by 140% accompanied the move. After that, the birr steadily depreciated until the second devaluation of nearly 20% was carried out in 2010, following which the birr continued to further depreciate until the 2017 devaluation by 15%. Since then, the birr has depreciated on its own by 92.5 % from 27 Birr/USD to nearly 52 Birr/USD as of late June of 2022, and plans of floating exchange rate policy to be adopted by 2030.

2.6 Research Gap

The gap in research observed from the review of empirical literature is that studies have not examined the impact of devaluation as an exchange rate policy on the macroeconomic stability of nations. A majority of the Ethiopian studies such as Eshetu (2017), Hailu and Saliya (2020), Berhe and Gebrehiwot (2020), Chalachew (2019) are exclusively concerned with the impact of devaluation on trade balance and balance of payment. While some like Labata (2019) have taken a comprehensive view of its effects on the entire economy, they did so from an “effectiveness as a

policy measure" standpoint rather than a "macroeconomic stability" perspective. Some of the studies such as Behru (2012), Hunegnaw (2015), Tafesse (2019) and Ali (2019) have also given due attention to inflation, but the studies did so to examine the exchange rate pass through effect where inflation was an end variable in and of itself with CPI as its proxy rather than using inflation as a means to assess the impact of devaluation on macroeconomic stability.

The studies reviewed have examined the effects of devaluation with different approaches, used different sets of endogenous and exogenous variables and generated contradictory findings. Although a majority of the studies concluded that devaluation is inflationary, there were studies that concluded that its effects were deflationary or statistically insignificant. In addition, while although a majority of studies found that it was expansionary, still others have found its effects to be contractionary or statistically insignificant. The fact that the results from different studies are not reconciled indicates the need for further research into the matter.

The biggest gap in research around the effects of devaluation in Ethiopia comes from most studies only being focused on the 1992 and 2010 devaluations of the Birr. For some of the studies, this is due to the fact that the research was conducted prior to 2017, meaning that the third devaluation of the birr had not happened yet. While for the other studies, it was due to the fact that not enough time had passed since the 2017 devaluation for there to be enough time series data to justify including the analysis of the 2017 devaluation in their studies.

Two studies made commendable efforts to assess the impact of birr devaluation on the macroeconomic stability of Ethiopia. One was Labata (2019), which explored its

effect on inflation, Economic growth and external debt servicing, yet even that study was conducted two years after and thus its findings were based on data from 1992 to 2017. The other was Hunibachew (2021) who examined the short and long run effect of monetary policy variables on economic growth (real GDP) and tested the causal relationship between monetary policy and economic growth, but he used data from 1980 to 2019, thus his study only had two years of post-2017 devaluation data to work with, making any inference the study makes about the impact of the 2017 devaluation unreliable.

Thus the fact that there is no study so far which assesses the effects of the 2017 devaluation based on at least 5 years of time series data is a big gap which this study will fill.

2.7 Theoretical and Conceptual Framework

The theoretical framework to be used in this study follows the channel through which the effects of currency devaluation as an exchange rate policy are transmitted towards the indicators of macroeconomic stability. In order to say that devaluation created an effect on macroeconomic stability, the effects of that particular devaluation must be isolated somehow, which makes it necessary to distinguish the regime before and after a particular devaluation is carried out. In any case, devaluation has two direct channels towards macroeconomic stability and these are inflation and Real GDP.

Devaluation, as established in the theoretical literature review, transmits to domestic prices through making imports expensive. This drives the prices of imported final

goods, but also cost pushes the price of final goods that were locally produced with imported inputs for domestic consumption as well as for export upwards as well. This will raise the general price levels and create inflation, which in turn affects macroeconomic stability. In contrast, devaluation also has the potential to boost output, either in the form of exports or import substituting goods, which boosts Real GDP (GDP after the effects of inflation are taken out) as well.

But Devaluation does not only affect macroeconomic stability directly, as it also has indirect effects. The inflationary effect of devaluation branches out to affect two of the determinants of macroeconomic stability, one being the fiscal variable government spending, while the other is the monetary variable broad money supply. The government spends its resources on imported final goods, goods that were domestically produced with imported inputs, as well as imported services. Since devaluation makes all of these more expensive in terms of local currency, the government will have the choice to curtail its spending in order to adjust to the new prices and maintain the value of government spending, or rise its spending in order to maintain the volume of its procured goods and services. The government's decision on how to approach its spending post devaluation will have implications on demand-pull inflation, and in turn affect macroeconomic stability.

As for broad money supply, the fact that devaluation increases the demand for money as per the monetary approach discussed above will lead to one of two outcomes: one being a reduction in aggregate expenditure to acclimate to the reduced real value of money supply while broad money supply is held constant, or an increase in money supply by the central bank to maintain consumption,

investment and government spending at their pre-devaluation states in real terms. The central bank's decision to maintain or increase money supply in response to the increased money demand instigated by the devaluation will have implications on demand-pull inflation, and affect macroeconomic stability.

Meanwhile, devaluation will also increase the amount of local currency it takes to service denominated in foreign currency as well. Unless the government has excess foreign currency reserves, to external debt burden, and the government and private sector borrowers will have to use the newly devalued exchange rate to convert the local currency into the currency of foreign lenders in order to service its debts. Even if we only consider the portion of external debt liable to the government, the external debt burden caused by the devaluation will necessitate two policy measures. One is contractionary fiscal policy in the form of raising taxes and reducing spending in order to service external debt. The other is expansionary monetary policy, where the central bank creates money to service external debt. Regardless, the increased debt burden will affect macroeconomic stability in one way or another.

Thus, monetary and fiscal variables as well as devaluation (dummy variable to years where the birr was officially devalued, i.e. 1992, 2010 and 2017) make devaluation have an effect on macroeconomic variables. Mathematically, this is expressed as follows:

Macroeconomic Stability = *f*(Devaluation) = *f*(Monetary variables, Fiscal variable, Dummy for Devaluation)

MS = *f*(D) = *f*(NEER, M2, EDS, G, R**)……..1**

Where

MS = Macroeconomic stability

D = Devaluation

NEER = Nominal Effective exchange rate

M2 = Broad Money Supply

EDs = External Debt

G = Government spending

Ŕ = Devaluation Dummy Variable

The conceptual framework for the econometric analysis to be conducted through the ARDL model time series regression in this study builds on the theoretical framework, which is illustrated in the figure below.

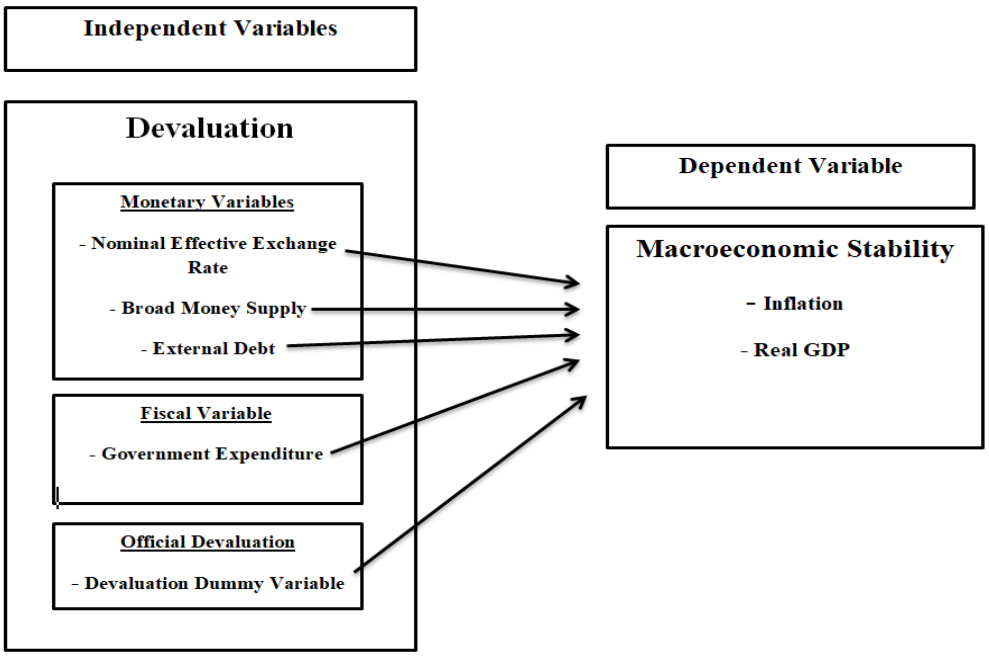

Figure 2.1: Diagram for the Conceptual Framework of the Study

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Overview

This section presents the methodology used to conduct the study pertaining to research approach, data and data source, the variables and how they were measured, approach to data processing and analysis, as well as the specification of the model and diagnostic tests utilized to ensure the model and variables yield reliable results.

3.2 Research Approach

This study is an empirical macroeconomic study on the impacts of devaluation as exchange rate policy, specifically the 2017 birr devaluation, on the macroeconomic stability of Ethiopia and relies on time series data from 1992 to 2021. The study used quantitative methods, both descriptive statistics and time series econometric analysis to analyze the relationship between monetary and fiscal variables and macroeconomic stability, as well as the impacts of devaluation, particularly the 2017 birr devaluation, on the macroeconomic stability of Ethiopia. Descriptive tools of statistics were utilized for deducting trends and an econometric model was employed for inferential analysis.

3.3 Data and Data Source

Data used as input for this study was obtained from the national bank of Ethiopia, and is secondary in nature. The national bank of Ethiopia is a vital resource and keeps better record of data of the nation's macroeconomic variables than any other entity in Ethiopia, which is why it was chosen as a source. Data was obtained on Inflation (end of Ethiopian Fiscal Year), Real GDP at Constant ETB, Broad Money Supply

at current ETB, External Debt in ETB (end of EFY), Government spending in ETB (end of EFY) and NEER Index (Annual) for periods between 1992 and 2021 to conduct both the descriptive analysis and ARDL Model regression. In addition, data of the same period was also obtained from national Bank of Ethiopia was also obtained for REER Index (Annual) and official Exchange rate (Annual Average) for the descriptive analysis, and from the World Bank data website (1992-2020) for calculations for the Descriptive analysis. The data collected for the study is found in the appendices.

3.4 Variables and Measurement Procedures

The variables utilized in the descriptive and econometric analysis of this study are;

3.4.1 Dependent Variable: Macroeconomic Stability

Macroeconomic stability is the dependent variable in this study. This study uses two proxy variables for macroeconomic stability. One of the proxies is inflation, which according to Gerry, et Al., (2008), has been used as a proxy for macroeconomic stability in numerous studies, and according to the NBE Monetary Policy framework (2009), is used by the National Bank of Ethiopia as a proxy for macroeconomic stability as well. Inflation is a decline in the purchasing power of money caused by a rise in the price of goods and services. The Other proxy for Macroeconomic stability used in this study is Real GDP, which is the total value of goods and services produced within the borders of a nation when the effects of inflation are removed. Real GDP allows capturing the relationship between monetary and fiscal variables when the effect of inflation is taken out.

3.4.2 Independent Variables: Monetary, Fiscal and Devaluation

3.4.2.1 Nominal Effective Exchange Rate (NEER)

Nominal effective exchange rate (NEER) is one of the independent monetary

variables of this study and is the unadjusted weighted average exchange rate of a country's currency against a basket of foreign currencies. It is expressed in terms of an index and is expected to be positively related to both inflation and Real GDP.

3.4.2.2 External Debts (EDs)

External Debt is one of the independent monetary variables of this study and is defined as the liabilities of residents of a nation to foreigners. To capture the effect of devaluation on external debt, it is expressed in Ethiopian Birr. External Debt is expected to be positively related to inflation and negatively related to Real GDP.

3.4.2.3 Broad money Supply (M2)

Broad money supply is one of the independent monetary variables of this study and can be defined as the amount of money in circulation in highly liquid and slightly less liquid forms. It is normally expressed in terms of the concerned currency, in this case Birr. Broad Money supply is expected to be positively related to both inflation and Real GDP.

3.4.2.4 Government Spending (G)

Government spending is the independent fiscal variable of this study, and can be defined as money spent by the public sector on the procurement of goods and services for consumption, investment and transfer payments. Government spending is expressed in Birr even through a portion of the government's expenditures are in foreign currency. Government expenditure is expected to have a positive relationship with both inflation and GDP.

3.4.2.5 Devaluation Dummy Variable (R)

The Devaluation dummy variable is a dummy variable employed in this study to

capture the causal impact on the proxies of macroeconomic stability. Being a dummy variable, it has a dichotomous outcome and takes two values. It takes a value of 0 in all the periods where no Birr devaluation took place, (1990 – 2009, 2011 – 2016, 2018 – 2021) and a value of 1 in periods where the Birr was officially Devalued by the National Bank (1992, 2010, 2017).

3.5 Data Processing and Analysis

This study used descriptive methods to analyze the trends in the movement of dependent and independent variables throughout the observation period, with an emphasis on how they trended in periods where the Birr was officially devalued, which are objectives of the research in determining the impact of the policy measure on these indicators of macroeconomic stability. This was done through tabular representations and descriptions of central tendency in the indicators, as well as graphical representations to visualize the trends these variables followed before and after the three devaluations, especially the 2017 devaluation.

The descriptive analysis serves the main objective of this study, which is to analyze the impact of devaluation on macroeconomic stability indicators, which will be personified by Inflation and Real GDP. The descriptive analysis examines the trends followed by both dependent and independent variables of this study in each of the three devaluations to see the general fiscal and monetary policy stance of the government and National Bank, and analyzes if the official reduction in the par value of the birr had in any way affected the movement of said variables. It also examines if the trend followed by the variables is indeed as per the theoretical foundations laid in chapter two. Of course, descriptive analysis cannot be conclusive, which is why

econometric analysis is also applied to analyze the empirical relationship between the variables.

As for the econometric analysis, the study aims at assessing the relationship between devaluation and macroeconomic stability via the proxy variables Inflation and Real GDP, and makes use of an adaptation of a models by Hunegnaw (2015) and Hunibachew (2021) for Inflation and Real GDP respectively, where Macroeconomic Stability is a linear function of monetary variables (Nominal Effective Exchange Rate, External Debt, Broad Money), Fiscal Variables (Government Spending) and the Devaluation Dummy variable (1992 devaluation, 2010 devaluation and 2017 Devaluation).

For the econometric analysis, the ARDL model was utilized to assess the empirical relationship between devaluation and macroeconomic stability. The study employed the use of Stata software Version 13 to conduct the time series regression via the ARDL model, as well as for diagnostic tests of the model and its variables. The Autoregressive Distributed Lag (ARDL) model to conduct the time series regression yet hedge against variables that are not stationary at level, which was to be verified when data is obtained and unit root tests are conducted.

ARDL Model allows for the regression of mixed (some stationary and some non-stationary) as well as non-stationary variables and provides more robust results. The ARDL regression was conducted on two models, with Inflation and Real GDP working as proxies for the dependent variable macroeconomic stability, while monetary and fiscal policy variables as well as a dummy variable for devaluation were used as independent variables in both models.

The Akaike Information Criterion (AIC) was used to select the optimal lag length of each variable for both of the models prior to running the ARDL model regression to estimate the long run relationship between variables. Once the optimal lag lengths were identified, the long run ARDL model was estimated. The ARDL bounds test was then conducted to identify if there is long run relationship, as it becomes necessary to estimate the short run error correction model if such a relationship exists. Finally, a granger causality test was conducted between the devaluation dummy variable and Inflation, as inflation is the chosen proxy variable of the National Bank of Ethiopia to measure macroeconomic stability.

3.5.1 Model Specification

The models use natural log forms of endogenous and exogenous variables (except Inflation since it is always already expressed in terms of percentage and the Devaluation dummy variable since it takes only 0 and 1 values) in order to observe percentage relationships instead of unit change relationships. The models are shown below:

$$\ln INF = \beta_0 + \beta_1 ln NEER_t + \beta_2 ln M2_t + \beta_3 ln EDs_t + \beta_4 ln G_t + \beta_5 R_t + \varepsilon \ldots\ldots\ldots\ldots \textbf{(2)}$$

Where

$lnINF_t$ = Natural log of the Inflation rate at time t

$lnNEER_t$ = Natural log of Nominal effective exchange rate at time t

$lnM2_t$ = Natural log of Broad money supply at time t

$lnEDs_t$ = Natural log of External Debts at time t

lnG_t = Natural log of Government Spending at time t

R_t = Devaluation Dummy variable at time t

β_0 = Intercept or constant

β_1 = Regression coefficient for $\ln NEER_t$

β_2 = Regression coefficient for $lnM2_t$

β_3 = Regression coefficient for $lnEDs_t$

β_4 = Regression coefficient for lnG_t

β_5 = Regression coefficient for R_t

ε = Residual or Error Term

$$lnRGDP = \alpha_0 + \alpha_1 ln NEER_t + \alpha_2 ln M2_t + \alpha_3 ln EDs_t + \alpha_4 ln G_t + \alpha_5 R_t + \mu \text{----------} \textbf{(3)}$$

Where

$lnRGDP_t$ = Natural log of Real GDP at time t

$lnNEER_t$ = Natural log of Nominal effective exchange rate at time t

$lnM2_t$ = Natural log of Broad money supply at time t

$lnEDs_t$ = Natural log of External Debts at time t

lnG_t = Natural log of Government Spending at time t

R_t = Devaluation Dummy variable at time t

α_0 = Intercepts or constants

α_1 = Regression coefficients for $lnNEER_t$

α_2 = Regression coefficients for $lnM2_t$

α_3 = Regression coefficients for $lnEDs_t$

α_4 = Regression coefficient for lnG_t

α_5 = Regression coefficient for R_t

μ = Residuals or Error Terms

The ARDL models as per Pesaran and Shin (2001) versions of the above models are expressed as follows:

$$lnINF = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta lnNEER_{t-i} + \sum_{i=1}^{n} \beta_{2i} \Delta lnM2_{t-i} + \sum_{i=1}^{n} \beta_{3i} \Delta lnEDs_{t-i} + \sum_{i=1}^{n} \beta_{4i} \Delta lnG_{t-i}$$

$$+ \sum_{i=1}^{n} \beta_{5i} \Delta R_{t-i} + \delta_1 lnNEER_{t-i} + \delta_2 lnM2_{t-i} + \delta_3 lnEDs_{t-i} + \delta_4 lnG_{t-i} + \delta_5 R_{t-i} + \varepsilon \quad \text{..... (4)}$$

Where δ1 ,δ2 , δ3, δ4 ,δ5 are the long-run coefficients of the Inflation Model for lnNEER, lnM2, lnEDs, 4lnG and R, respectively at time t-i.

$$lnRGDP = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta lnNEER_{t-i} + \sum_{i=1}^{n} \alpha_{2i} \Delta lnM2_{t-i} + \sum_{i=1}^{n} \alpha_{3i} \Delta lnEDs_{t-i} + \sum_{i=1}^{n} \alpha_{4i}$$

$$\Delta lnG_{t-i} + \sum_{i=1}^{n} \alpha_{5i} \Delta R_{t-i} + \varphi_1 lnNEER_{t-i} + \varphi_2 lnM2_{t-i} + \varphi_3 lnEDs_{t-i} + \varphi_4 lnG_{t-i} + \varphi_5 R_{t-i}$$

$$+ \mu \quad \text{.....(5)}$$

Where φ1 ,φ2 , φ3, φ4 , φ5 are the long-run coefficients of the Real GDP Model for lnNEER, lnM2, lnEDs, 4lnG and R, respectively at time t-i.

The theoretical expected outcomes of the coefficients in equations 2 to 5 are Positive for β_1, β_2, $\beta_3$and β_4, β_5, α_1, α_2 and α_5 while those of α_3 and α_4 is expected to be

negative.

3.5.2 Diagnostic Tests for Estimation

The study intends to use the usual estimation tests applicable for an ARDL Model in several studies such as Hunegnaw (2015, Hunibachew (2021), Fawaz and Hamaad (2021) depicted in the chart below:

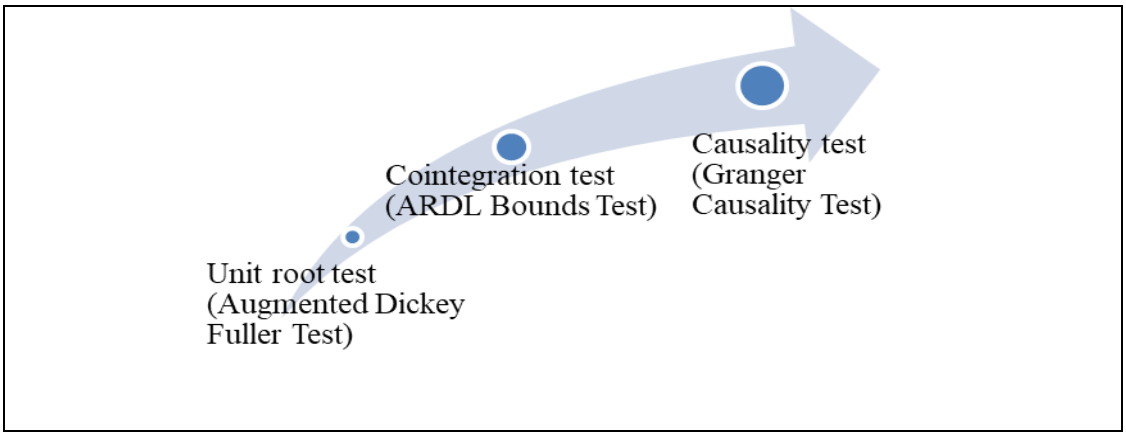

Figure 3.1: Estimation Tests to be used in the Study

The ADF test will seek out the existence of unit roots and reveal if there are time series variables following a stochastic trend. The ARDL Bounds test will test the presence of a long run relationship between time series in different orders of integration. The Granger Causality test will reveal if there is a causal relationship between exogenous and endogenous variables that are stationary, as well as expose the direction of causality.

CHAPTER FOUR

RESEARCH RESULTS

4.1 Chapter Overview

The Chapter presents the results of the descriptive and econometric data analysis. The data analysis was conducted to test the research hypothesis and carry out the three specific objectives of the study presented in chapter one. The descriptive analysis presents a glance at the measures of central tendency, as well as the trends followed by the variables under observation throughout the periods between 1992 and 2021. On the other hand, the econometric analysis empirically assesses the relationship between monetary and fiscal variables with macroeconomic stability, as well as checks for a causal relationship between devaluation and macroeconomic stability.

4.2 Descriptive Analysis of Trends in Model Variables

4.2.1 Trends in the Proxies of Macroeconomic Stability

Since 1992, Ethiopia has seen growing trend in both proxies for Macroeconomic stability, namely inflation and Real GDP. Since Inflation is the official proxy used by the national bank to measure macroeconomic stability in Ethiopia, it would be appropriate to observe its movement throughout the years first, as shown in Fig. 4.1. As can be seen in Figure 4.1, the movement of inflation between the periods of 1992 and 2021 suggests that there is an upward trend, as depicted by the black linear trend line. The inflation rate had reached period highs in 2008 and 2011 at 55.2% and 38% respectively. On the other hand, it had also reached period lows of -9% and -10.8% in 1996 and 2001, respectively, signifying that there was deflation in those two

periods. The mean inflation rate between 1992 and 2021 was 10.59%.

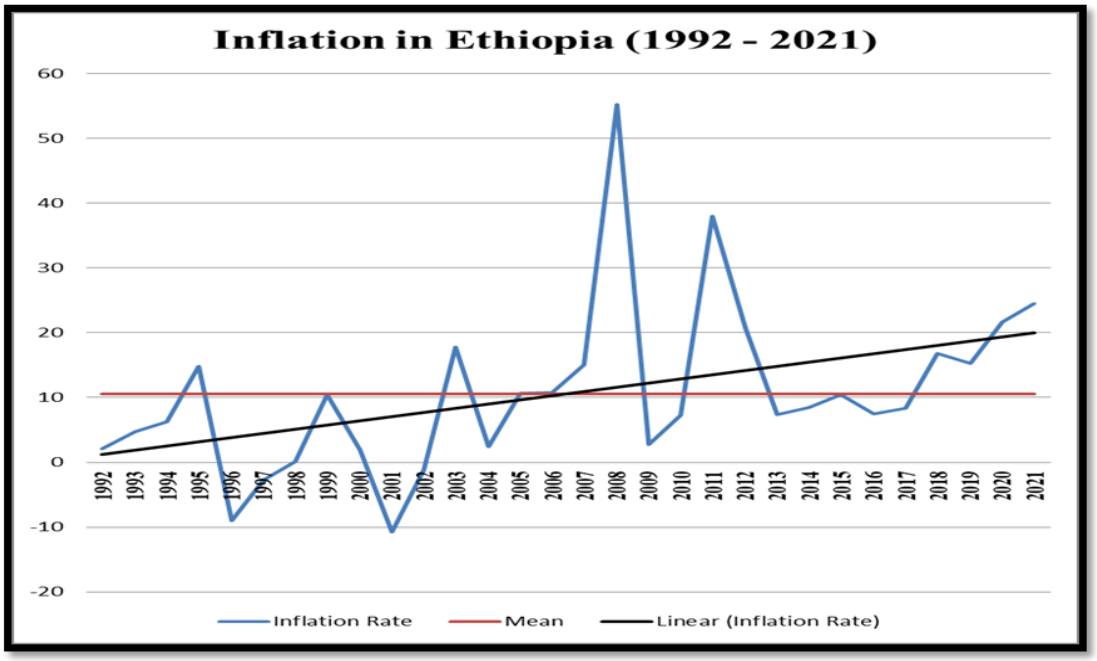

Figure 4.1: Movement of Inflation in Ethiopia between 1992 and 2021

As for what the inflation rate within the observation period says about macroeconomic stability, it would be fair to say that the Reut institute's criterion of "low and stable inflation rate" was not fulfilled, as sharp rises and falls can be seen in the graph during most of the observation period and by a flatter trend line, and because the average inflation rate was double digits. One of inflationary peaks occurred immediately after the 2010 devaluation, where the rate more than doubled from 2.7% in 2009 to 7.3% in 2010 after the devaluation and then rose to 38% in 2011. Another sharp rise in the inflation rate was also observed after the 2017 devaluation, where the inflation rate had actually fallen from 10.59% in 2015 to 7.5% in 2016 by roughly 3%, after which rose to 8.4% in 2017 and then doubled to 16.8% in 2018.

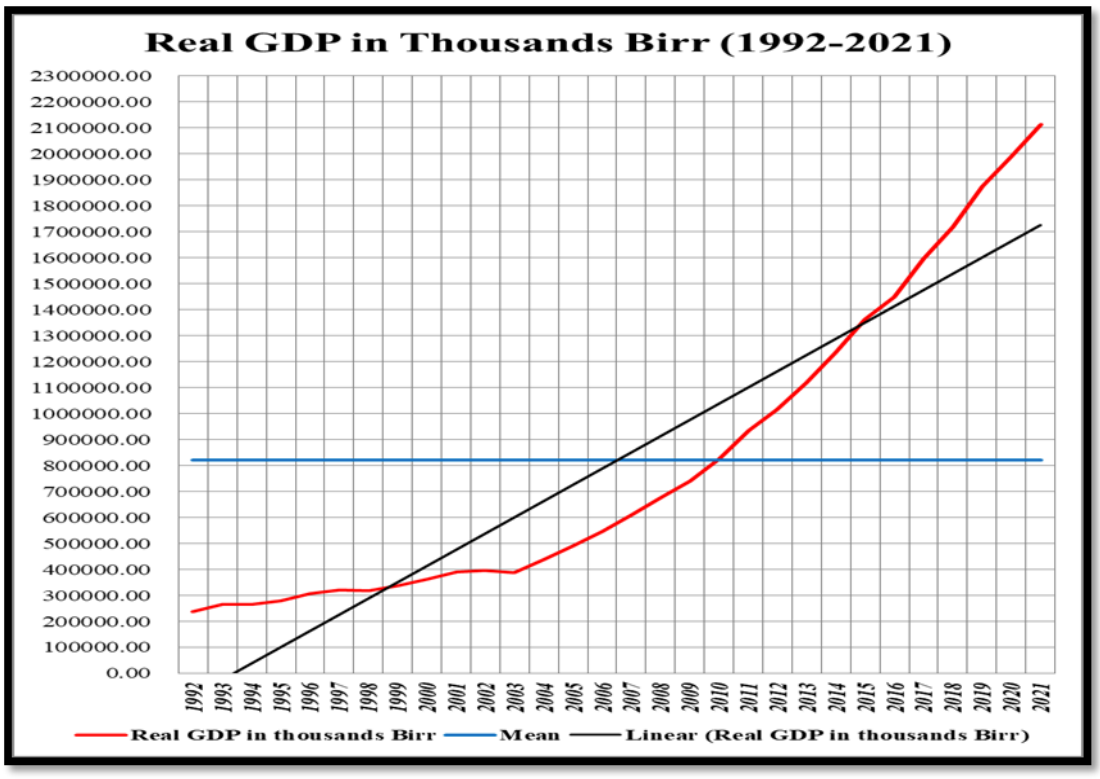

Figure 4.2 Real GDP of Ethiopia between 1992 and 2021

As for Real GDP and its implications on macroeconomic stability in Ethiopia, figure 4.2 depicts it as following an upward Trend as well, and as expected of the Variable under normal conditions. But unlike inflation, its movement is less erratic and without much event driven shocks which is why the trend line is steeper. Real GDP doesn't account for Price, as it is it is measured at constant Birr fixed in the base year (2015/2016 = 100), but rather captures the real economic growth exhibited by the country during the observation period.

The Movement of Real GDP is more or less stable at a glance and has grown by an average rate of 8% through the periods between 1992 and 2021, with the highest growth being in 2011 at 13.2%, and the lowest being in 1994, where the growth rate was a minuscule 0.05%. It is worth noting that in 1993 and 2003, Real GDP actually

fell by 0.8% and 2.1% respectively when compared to the corresponding preceding year. An average growth rate of 8% in Real GDP suggests that there was solid real economic growth in Ethiopia during the observation periods, and the steep trend line showing an absence of erratic shocks provides a positive portrayal of macroeconomic stability that is contrary to what the inflation graph (Figure 4.1) depicts.

A table summarizing the Descriptive statistics results obtained from Stata for the Two Proxies of macroeconomic stability (the dependent variable) can be seen summarized below:

Variable	Obs	Mean	Std. Dev.	Min	Max
Inflation (%)	30	10.59333	13.0621	-10.8	55.2
RGDP (in thousands birr)	30	819,844.4	586,704.8	237,017.9	2,114,163.0

4.2.2 Trends in the Independent Variables with Devaluation

The movement of the Independent variables, i.e. Monetary Policy Variables (Broad money supply, Nominal Effective Exchange rate, External Debt) and the Fiscal Policy Variable (Government expenditure) has been examined against the movement of the official exchange rate for the purpose of conducting descriptive analysis on the trends followed by the variables as well as how they responded to the two recent devaluations.

4.2.2.1 Trend of Government Expenditure with Devaluation

Government expenditure followed an upward trend during the observation period, i.e. 1992 to 2021. This is expected given that Ethiopia is growing nation, and considering that the government has acted as the engine that propels the economy forward thus far, and expansionary fiscal policy is a useful tool in stimulating a

nation's economy where the private sector falls short. The bar chart below visualizes how government expenditure has grown through the years:

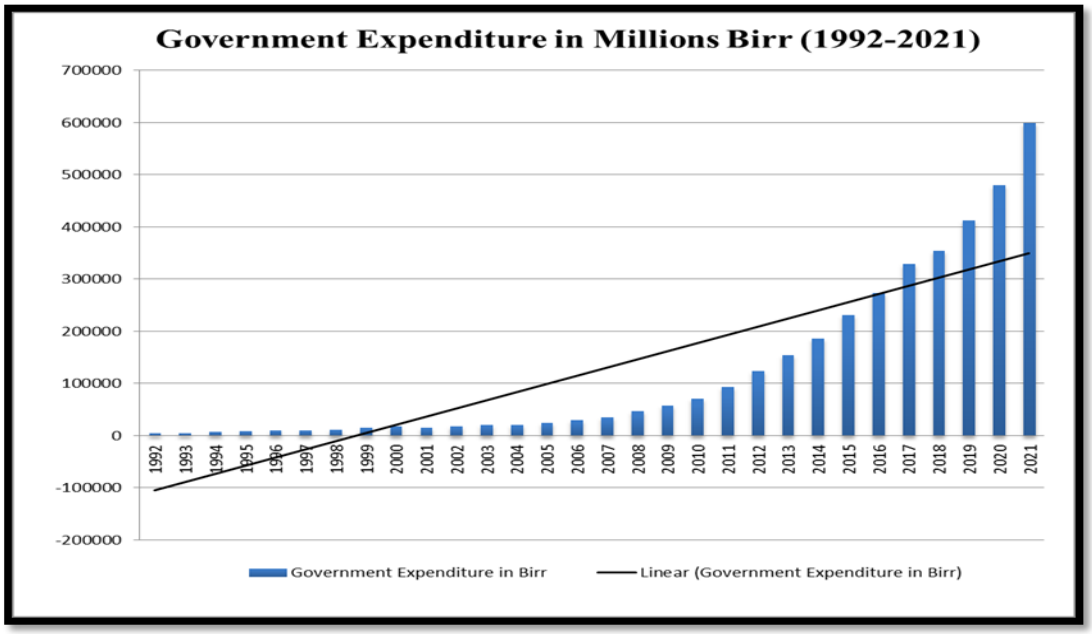

Figure 4.3: Government Expenditure in Ethiopia between 1992 and 2021

As can be seen from the graph above, government spending has been trending upwards during the observation period, with an average of 122 Billion Birr Spending per annum for between 1992 and 2021. It surpassed the 100 Billion Birr mark in 2012, after having increased by 32.6% from the previous year. The rapid rise of Government spending after 2012 becomes more apparent when considering that the average amount during the first decade of the observation period (1992-2001) was nearly 10.4 Billion, for the second decade (2002 – 2011) was nearly 41.8 Billion and for the Third Decade (2012 – 2021) was close to 314. 3 Billion Ethiopian Birr. Contractionary fiscal policy seems to have been employed only in 1992, 1997 and 2001, as those are the only years where growth in government spending was negative, at -13.37%, -1.76% and -10.23% respectively. Aside from that, it looks like the Government was implementing expansionary fiscal policy, and to a much higher

intensity after 2012.

When it comes to identifying the effect of exchange rate policy like devaluation has on government spending, a closer look at the annual growth rate provides a fuller picture. Government spending had been growing at an average rate of 18% during the observation period, which appears to be a healthy rate. But when we consider what the government spends on, i.e. Goods and services, both from the domestic market as well as imports from the global market, the impact that devaluation could potentially have on government expenditure and its growth through the years becomes evident. To illustrate this, the graph below plots the growth rate of government spending in terms of birr and in terms of USD[2], and the annual change in exchange rate (Depreciation/Devaluation rate) along with them.

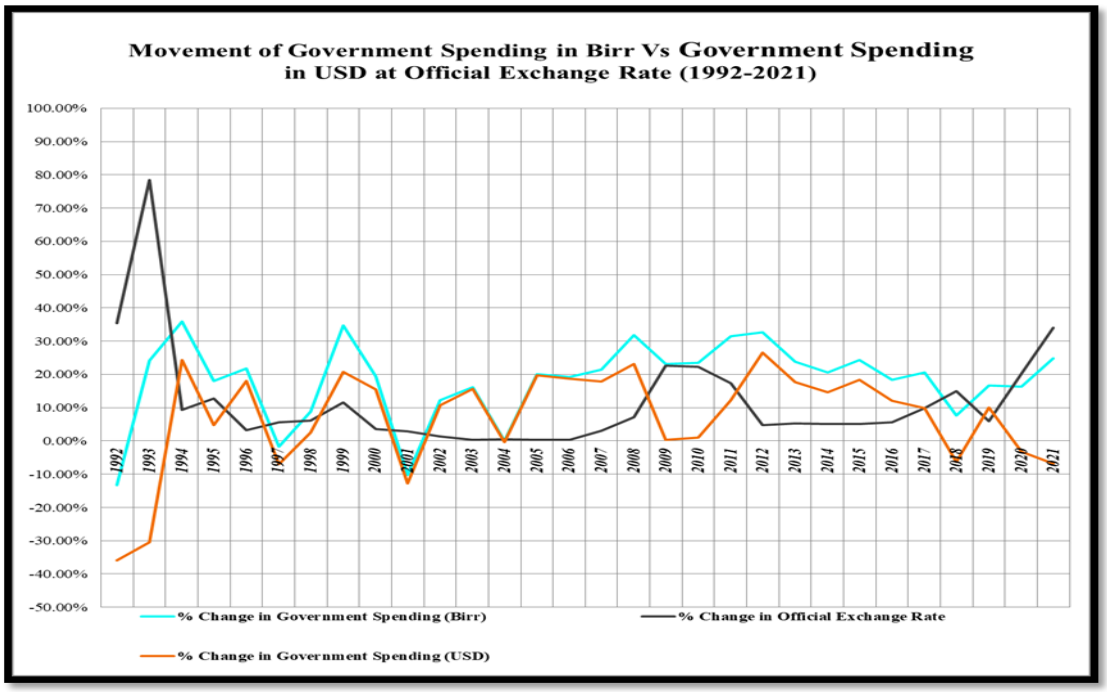

Figure 4.4: Disparity in Government Spending Growth in Birr Vs in USD amounts between 1992 and 2021

[2] Government Expenditure in Terms of USD was calculated by multiplying the Government Expenditure In terms of Birr by the Official Exchange rate of the year, for which data was obtained from the World Bank's Data website (1992-2020) and from the Comercial Bank of Ethiopia Website (2021).

The Figure 4.4 depicts the movement of Government spending throughout the observation period both in terms of birr and in terms of USD, and the disparity between the two. As mentioned before, government spending in terms of birr grew at an average annual rate of 18.05%, but when the growth rate is measured in terms of USD, it only grew by an annual rate of 7.03%. Seeing the graph, the impact of change in exchange rate, be it in the form of devaluation or depreciation, becomes clear. The two graphs for Government expenditure in terms of birr and in terms of dollars only move being adjacent to each other on the years where the depreciation rate is close to zero, while they spread substantially on the years where the depreciation rate is high.

In addition, on the years that the birr was officially devalued, i.e. 1992, 2010 and 2017, there is an obvious gap between the two graphs. The growth rate in government spending for 1992, 2010 and 2017 were -13.37%, 23.47% and 20.65% respectively while the Growth in Government Spending in terms of USD for the same period were 36.01%, 0.92% and 9.86% respectively. This disparity appears to have been caused by the change in exchange rate Devaluations. Another trend that can be seen is that the two graphs move in opposite directions after 2019.

The annual percentage change in Government spending for 2019, 2020 and 2021 in terms of birr were 16.63%, 16.23% and 24.76%, while in terms of dollars it was 10.05%, -3.26% and -6.89% for the same years. It is for this reason that while the growth rate in birr terms was trending up, the growth rate in Dollar terms was going down. This is likely a consequence of the depreciation that followed the COVID-19 pandemic, and not due to the 2017 devaluation.

The three official devaluations of the Birr, and even its market-caused depreciation, appear to have undermined the effectiveness of the expansionary fiscal policy. The reduction in the purchasing power of the birr due to devaluation has made it so that the government's expenditure in terms of birr rises year after year but gets less for the amount it spends, which makes the expansionary fiscal policy ineffective as compared to the counterfactual outcome.

4.2.2.2 Trend of Broad Money Supply with Devaluation

Like Government expenditure, Broad money supply has followed an upward trend during the observation period. This indicates that the national bank had been implementing expansionary monetary policy, which stimulates the economy by encouraging consumption and investment rather than saving and austerity. Expansionary monetary policy is a prudent measure for a developing nation like Ethiopia, given that both consumption and investment are necessary conditions for Economic Growth and Development. The following Graph illustrates the Broad money supply in circulation from 1992 to 2021 and the trend therein:

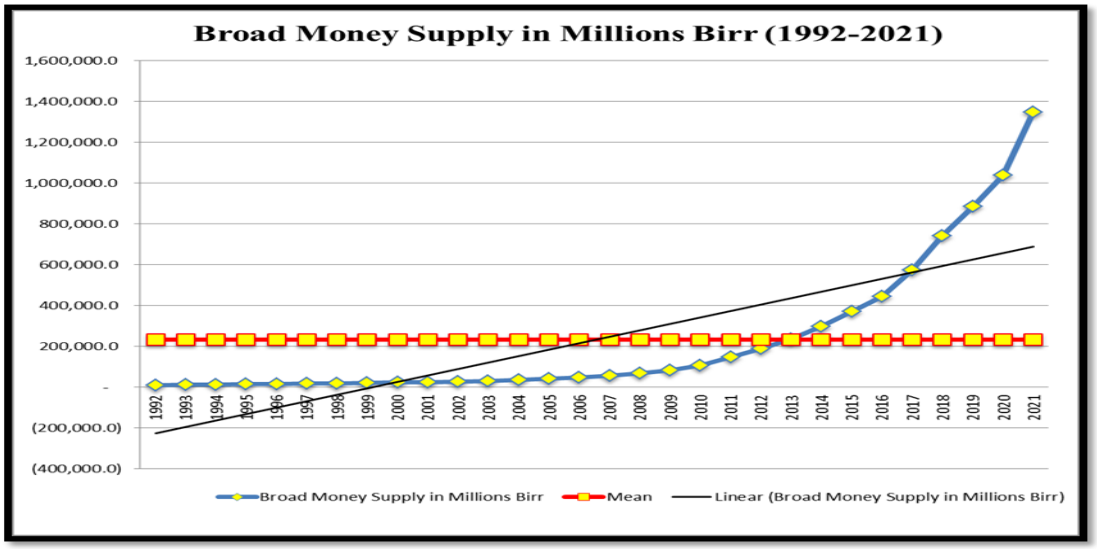

Figure 4.5: Broad Money Supply in Ethiopia between 1992 and 2021

As can be seen in the above graph, Broad money supply has trended upwards during the observation period, with the average amount of broad money in circulation (M2) between 1992 and 2021 being close to 230 Billion Birr. It can also be seen that it is after 2010 that M2 Surpassed the 100 Billion Birr Threshold, and exceeded the 1 trillion Birr mark a decade later in 2020. From this, we can understand that the growth of Broad money supply was rapid after 2010. It also seems like the National Bank of Ethiopia had strictly followed an expansionary monetary policy during the observation period, as the Broad money supply has not fallen in a single instance during the time. However, the degree of monetary expansion has not been the same; growth in Broad money supply was lower in some years while higher in others. The growth in Broad money supply during the observation period can be seen in the graph below:

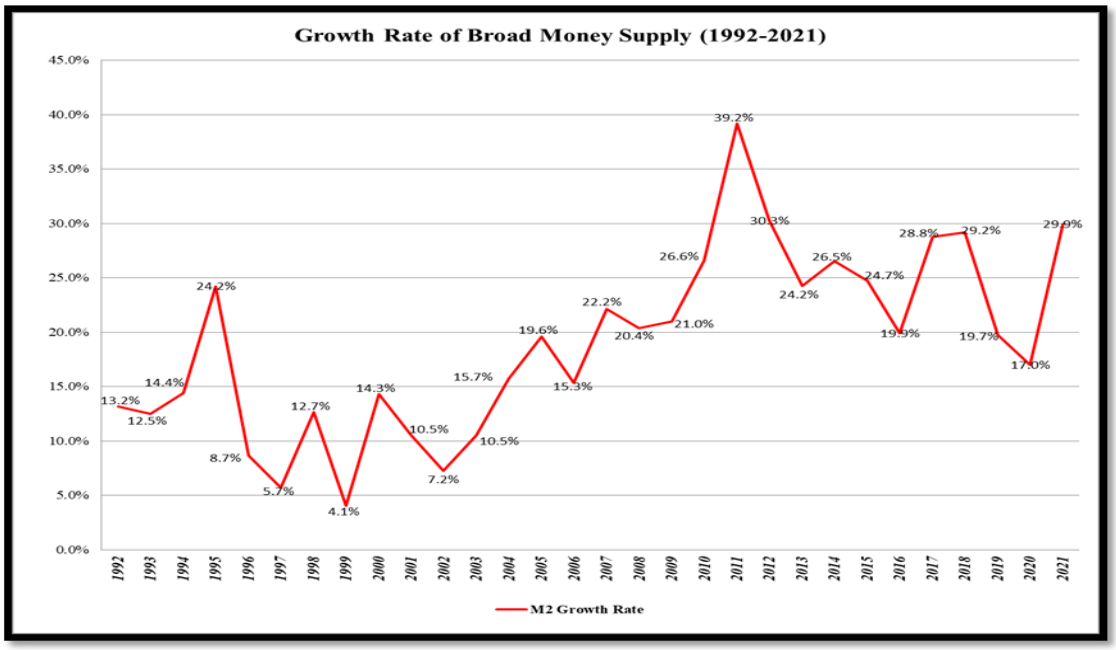

Figure 4.6: Growth of Broad Money Supply in Ethiopia Between 1992 and 2021

As can be seen in the above graph, the lowest growth in broad money supply was by 4.1% in 1999 followed by 5.7% in 1997, while the highest was by 39.2% in 2011

followed by 30.3% in 2012. As for the impact that the three devaluations had on the growth of broad money supply, it is important to take into consideration that logically, devaluation carried out in any year will not enforce monetary expansion in the same year. This is because as expressed in detail in the theoretical framework for this study, and according to the monetarist approach, devaluation's effect is on the demand for money through increasing price of imports, which in turn affects the central bank's decision to whether or not to carry out expansionary monetary policy increase the supply of money, which is likely to be implemented in the year after the devaluation year. The Graph below Plots the Movement of Exchange rate, Money supply and Inflation during the observation Period:

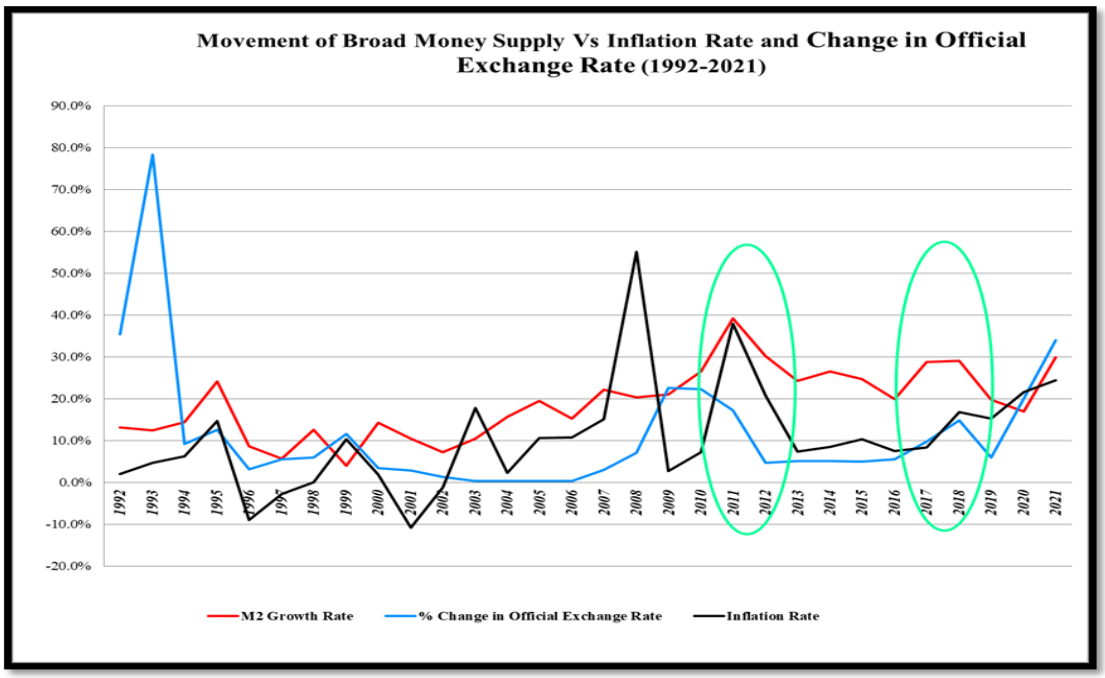

Figure 4.7: Movement of Broad Money Supply, inflation and Depreciation Rate between 1992 and 2021

Looking at the Figure 4.7, the aggressive monetary expansion during 2011 and 2012 of 39.2% and 30.3% respectively could be the National bank's response to the prevailing inflation rate at the time, and to satisfy the accompanying surge in

demand for nominal money, as inflation during 2011 and 2012 was 38% and 20.8% respectively, likely caused by an increase in the price of import goods after the 2010 devaluation. The same can be said in 2018 and 2019, where the growth in money supply was 29.2% and 19.7%, while inflation was 16.8% and 15.3% respectively in response to the hike in import prices after the 2017 devaluation, even though it was not as harsh as that of the 2010 devaluation.

4.2.2.3 Trend of Nominal Effective Exchange Rate with Devaluation

The Nominal Effective Exchange Rate Index has been Trending Downwards in the periods between 1992 and 2021. NEERI is an index that measures the nominal weighted average of the value of a nation's currency against a basket of foreign currencies and is supposed to indicate the external competitiveness of a of a nation, which means that a downward trending NEERI suggest that Ethiopia's external competitiveness has nominally increased throughout the years. The graph below illustrates the movement of NEERI from 1992 to 2021:

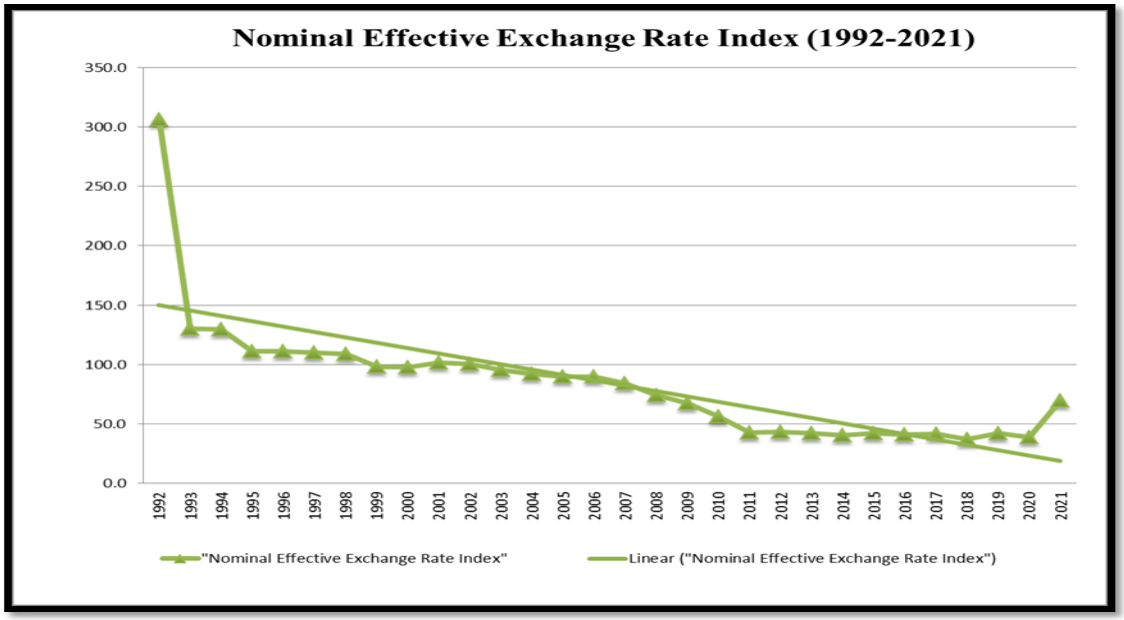

Figure 4.8: Nominal Effective Exchange Rate Index of Ethiopia Between 1992 and 2021

As can be seen in the above graph, Nominal Effective exchange rate has trended downwards through the observation period. Prior to the 1992 devaluation, it was at 306, which fell by 57.41% to 130.3 the following year and continued its downward spiral. The other two devaluations have also caused NEERI to decline further, from 56 in 2010 to 42.9 in 2011 and 41.8 in 2017 to 37.2 in 2018. Looking at the graph, one could conclude that up until 2021, Ethiopia's external competitiveness was increasing nominally throughout the observation period since the average percentage change in NEERI between 1992 and 2021 was -3.04%. But the key word here is "nominally", as NEERI is unadjusted and is influenced by Inflation both within the nation, and within the foreign countries whose currencies are in the basket.

When the adjustment is made, NEERI become Real Effective Exchange Rate Index (REERI). REERI tells the true story of a nation's external competitiveness, but since this study uses Inflation as a proxy for macroeconomic stability, the effects of inflation must be retained. However, it is useful to make the comparison between NEERI and REERI for the descriptive analysis, and to observe how the Birr's value and the value of Ethiopian goods and services have moved relative to currencies as well as goods and services of Ethiopia's trading partners during the observation period. The graph below illustrates the movement of NEERI and REERI and their respective trends for comparison:

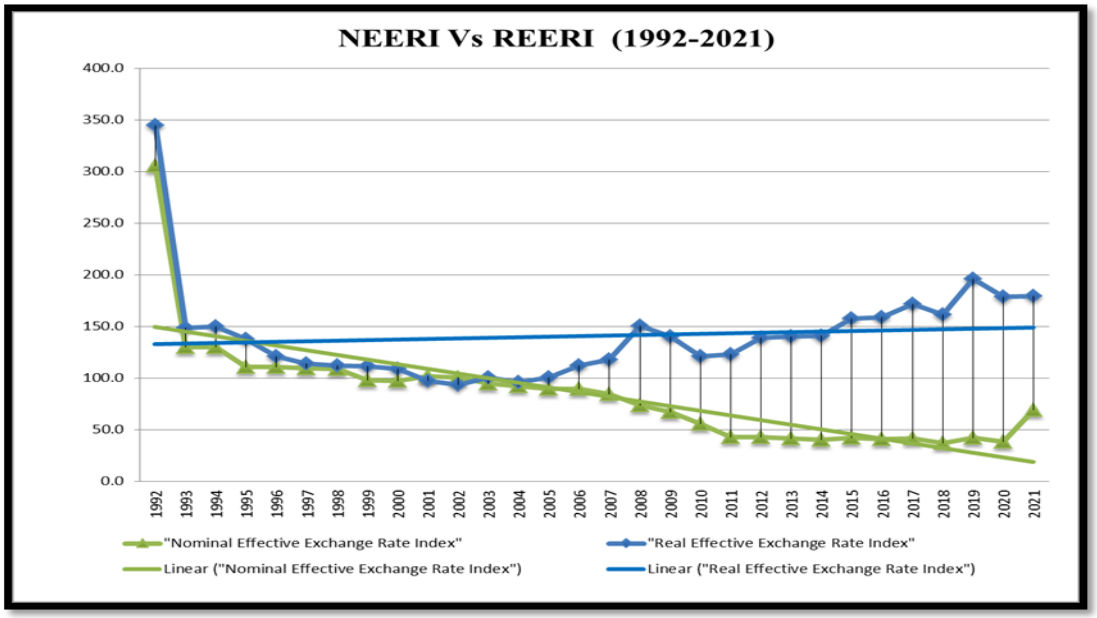

Figure 4.9: Trends of NEERI Vs REERI of Ethiopia Between 1992 and 2021

As can be seen from the above graph, NEERI has a steep downward trend, while REERI has a flat upward trend. From this, we can understand that the birr has been on a steady nominal depreciation between 1992 and 2021, but has appreciated in real terms during the same period. According to the above graph, the 1992 devaluation has been effective, as the Devaluation has led to a real depreciation that lasted until 2002, after which Ethiopia's competitiveness began to decline indicated by the upward movement of the REERI in the years to follow. It is worth mentioning that even though REERI started going up, NEERI kept on going down, which gives off the illusion that the depreciation is actually making Ethiopia competitive in the global market.

In 2007, REERI began to decline, showing that Ethiopia's competitiveness was actually increasing, which deems the 2010 devaluation as unjustified and even harmful as it was followed by a persistent increase in REERI in the years to follow indicating a Real Appreciation of the Birr which adversely affected Ethiopia's trade

competitiveness.

As for the 2017 devaluation, it caused NEERI to fall by 11% from 41.8 in 2017 to 37.2 in 2018. But when looking at the effect of the devaluation to the REERI, the above graph shows that it was not as harmful as the 2010 devaluation to Ethiopia's competitiveness in the global market, as the 2017 Devaluation was followed by a 5.89% decrease in REERI in 2018, but it was counteracted by a 21.84% growth in 2019 which undermines the achievement.

4.2.2.4 Trend of External Debt against Exchange Rate Devaluation

External Debt has followed an upward trend between 1992 and 2021, with a sharp and consistent rise after 2008, following the largest fall seen during the observation period in the prior year by about 60.9%. The upward trend is not surprising given that Ethiopia is heavily reliant on external debt to finance all of its mega projects (except the Grand Ethiopian Renaissance Dam), as well as the countless socioeconomic projects. The Figure 4.10 shows how external debt has moves through the years as follows:

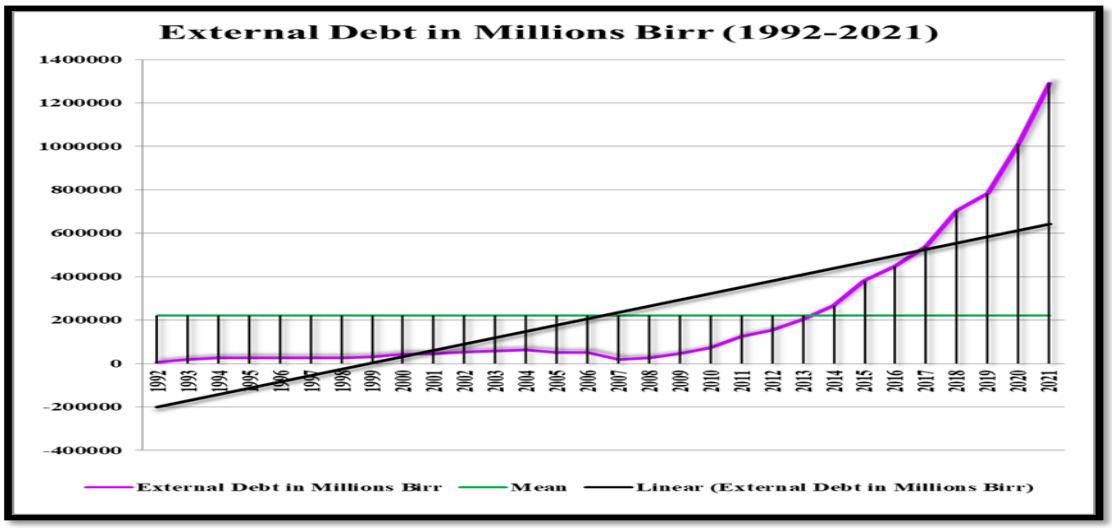

Figure 4.10 External Debt of Ethiopia between 1992 and 2021

As can be seen in the above graph, the amount of money Ethiopia owes the rest of the world in terms of its own currency, the Ethiopian Birr, has been on a growing trend throughout the observation period. On average, Ethiopia owed its foreign creditors 221 Billion Birr between 1992 and 2021, and it is also worth noting that it is after 2011 that its external debt hit the 100 Billion Birr mark after having grown by 73.3% compared to 2010, and crossed the 1 Trillion Birr threshold in 2020 after having grown by 29.1% when compared to 2019. The 2011 Growth could be attributed to the 2010 Birr devaluation, while the 2020 growth is perhaps due to the Covid-19 Pandemic.

External debt is normally denominated in terms of the currency of lenders (usually USD as the United states Dollar is the Vehicle Currency of the World), which tends to leave out the effect that exchange rate has on its actual amount that the nation owes in terms of its own currency. This is the reason why this study, and the graph above, expresses external debt in terms of Ethiopian Birr. But expressing the Birr amount of external debt fails to visualize the disparity caused by change in exchange rate, be it in the form of a market caused depreciation or an official devaluation. To capture these facets, the following graph depicts the year to year growth of External debt in terms of birr plotted along with External debt in terms of USD[3] and the annual percentage change in the official exchange rate[4] (Birr/USD).

[3] The USD figure of external debt is calculated by the in the same manner as that for Government Expenditure.

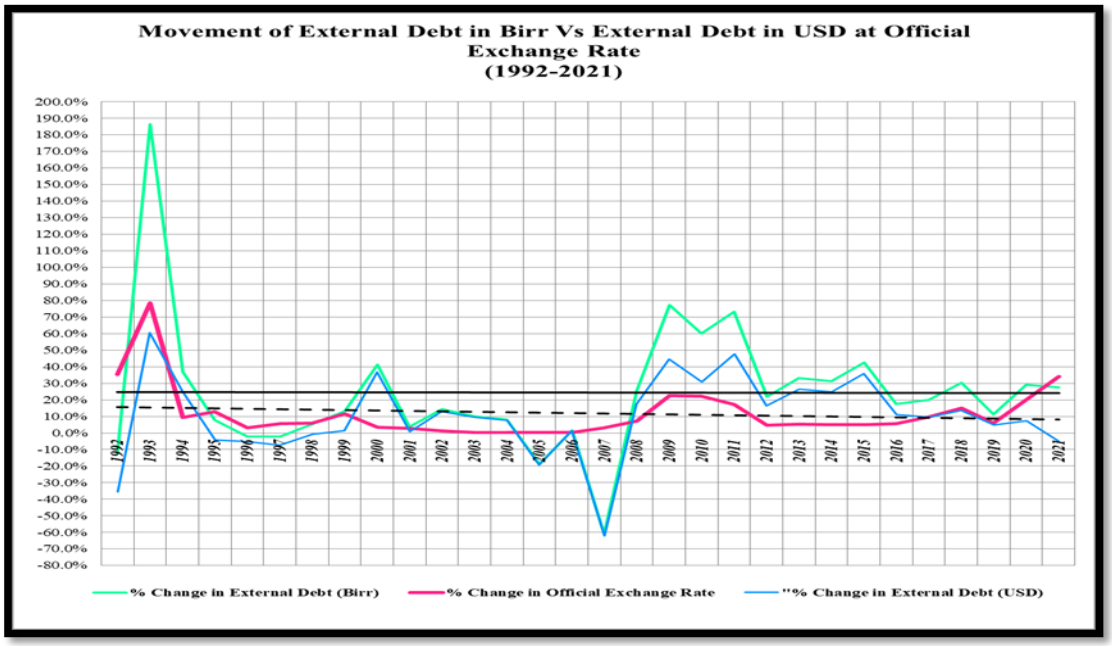

Figure 4.11: Disparity in External Debt Growth in Birr Vs USD amounts between 1992 and 2021

As can be seen in the above graph, there is a clear disparity in External debt caused by change in exchange rate through the observation period, with external debt in terms of USD having only grown at an annual average rate of 10.26% while in Birr terms it was 24.46%, which can be deduced from the fact that the Graph for the growth in USD value (blue) is lower than the one representing the growth in Birr amount (green). It is also visible that the two graphs depicting the growth in External Debt in terms of the two currencies move asymptotically to each other on certain years (2002-2006), which is due to the fact that the exchange rate only depreciated by a cumulative 2.82% during the time from 8.57 Birr/USD in 2002 to 8.70 Birr/USD in 2006. On the remaining periods, it can be seen that the change in exchange rate has caused a disparity.

Given that this paper focuses on official devaluation rather than market caused depreciation, it is important to observe the graphs for the External debt Denominated

in Local and Foreign currency in 1992/93, 2010/11 and 2017/18 when the three large devaluations were implemented. Looking at the above graphs, it is very clear that the Blue graph and the Green Graph diverged during these three devaluations, with the divergence being at its highest in 1992/93 as the devaluation was the highest in magnitude.

Particular to the 2017 devaluation, growth in external debt in terms of birr was at 20.2% and 30.4% in 2017 and 2018 respectively, while the growth in terms of USD was 9.4% and 13.4%, indicating that the rest of the in the growth of external debt was caused as an effect of the devaluation. This same phenomenon was seen after the 2010 devaluation, where growth in external debt in terms of birr was at 60.1% and 73.3% in 2010 and 2011 respectively while the growth in terms of USD was 30.9% and 47.8% respectively for the two years. In both cases, the growth in external debt in terms of birr is almost double the growth in the USD amount in the devaluation year as well as the next year.

4.3 Results of the Econometric Analysis

As per the methodology of this study detailed in chapter three, an ARDL model was adapted for the two models of this study where the two proxies of macroeconomic stability were used as dependent variables, while the independent variables of the study were used in both models. The ARDL model was chosen over other time series econometric models with the expectation that some of the variables would not be stationary, which could only be determined after the data was obtained and tested for unit roots. The following section provides the results of the unit root test using the Augmented Dickey-Fuller test through the use of Stata 13.

4.3.1 Unit Root Test for Stationarity

The Augmented Dickey-Fuller test was run via Stata 13 on the model's Dependent and Independent Variables. For Variables that followed a visible trend or drift, the trend and Drift commands were used respectively. The findings from the Result of the ADF test show that all of the model's variables are either stationary at level or at first difference, making the ARDL model appropriate for the study as expected. Only Inflation, the Devaluation Dummy Variable and LnNEER were stationary at level at 1% critical value, with the latter being stationary at level when drift command is used. As for the remaining variables, some were stationary at level at 5% critical Value, and all were stationary at first difference at 1% critical value either with a drift or trend. The Table Below provides a summary of the Results:

Table 4.1: Summary of Results from ADF Test

Variable	Option	Test statistic for Z(t)	1% Critical Value	5% Critical Value	10% Critical Value	MacKinnon approximate p-value for Z(t)	Remark
INF	None	-4.191	-3.723	-2.989	-2.625	0.0007	Stationary at Level
LnRGDP	Trend	1.447	-3.723	-2.989	-2.625	0.9973	Not Stationary at level
d.LnRGDP	Trend	-4.237	-4.352	-3.588	-3.233	0.0039	Stationary at I(1)
LnGov_Exp	Trend	-1.148	-4.343	-3.584	-3.23	0.9206	Not Stationary at level
d.LnGov_Exp	Trend	-4.118	-4.352	-3.588	-3.233	0.0059	Stationary at I(1)
LnNEER	None	-3.415	-3.723	-2.989	-2.625	0.0105	Weak Stationarity at level
LnNEER	Drift	-3.415	-2.473	-1.703	-1.314	0.001	Stationary at level (Random walk with drift)
d.LnNEER	None	-6.432	-3.73	-2.992	-2.626	0.000	Stationary at I(1)
LnM2	Trend	-0.752	-4.343	-3.584	-3.23	0.9695	Not Stationary at level
d.LnM2	Trend	-3.409	-4.352	-3.588	-3.233	0.0502	Weak Stationary at I(1)
d.LnM2	Drift	-2.258	-2.479	-1.706	-1.315	0.0163	Stationary at I(1) Random Walk with drift
LnExt_Dbt	None	-0.436	-3.723	-2.989	-2.625	0.9038	Not Stationary at level
d.LnExt_Dbt	None	-4.747	-3.73	-2.992	-2.626	0.0001	Stationary at I(1)
Dev_Dummy	None	-6.754	-3.723	-2.989	-2.625	0.0000	Stationary at Level

4.3.2 Optimal Maximum Lag Selection

After ensuring that all of the variables were at least stationary at first difference, the next step was to estimate the ARDL Model. In order to do this, the optimal lags as per the Akaike Information Criterion (AIC) had to first be identified. The AIC criterion was used over the SIC/BIC criterion because according to Stock and Watson (2007), although BIC does indeed pick the more parsimonious model, including more parameters is a small price to pay to avoid omitting significant parameters. However, for both the Inflation model and RGDP Model, the optimal lags chosen by both AIC and BIC criterions were identical. Both Criterions chose max lags of 4 for the inflation model and 3 for the Real GDP Model. The Stata Output from running the VARSOC command to determine optimal max Lags is found in the appendices.

4.3.3 Estimation of the Long Run ARDL Models

After the optimal max lags were identified, the ARDL Models were estimated for Both the Inflation and the Real GDP models to identify the impact of Devaluation, by itself and through the monetary and fiscal variables, on macroeconomic stability as per the objectives of the study. The Results from the Estimation of the ARDL model with the two Proxies of Macroeconomic Stability is found in the following sections.

4.3.3.1 Estimation Results of the Long Run ARDL Model with Inflation as the Proxy for Macroeconomic Stability

The ARDL regression for the Inflation model was conducted with max lags of 4 under the AIC criterion. Accordingly, the optimal lags for Inflation, NEER, External

Debt and the Dummy variable were set to 4 by Stata, while that of Government Expenditure was set to 3 lags. It is important to mention here that including Broad money supply (M2) as one of the independent variables in this model caused problems of multicolliniarity in the Devaluation dummy variable and its lagged versions, and thus it had to be dropped from this model. Despite this late adjustment, the R- Squared and Adjusted R-squared of the model were both above 0.99 (99%) indicating that the variations in Inflation are almost perfectly explained by the Variations in the Independent variables in the long run. In addition, the P Value for the Model (P>F) was 0.0044, indicating that the findings are very reliable with a Significance level less than 1%. The output summery of the ARDL Regression with Inflation as the dependent Variable is summarized in the following Table 4.2.

Table 4.2: Output Summery of Long run Estimation of ARDL Model with Inflation as Dependent Variable

Independent Variables	Coef.	Std. Err	t-statistics	p-value
inf (L4)	-0.4263273	.0550542	-7.74	0.016**
lngov_exp (L3)	127.0836	9.6146	13.22	0.006***
lnneer (L4)	19.98788	6.25567	3.20	0.086*
lnext_dbt (L4)	15.65387	2.707109	5.78	0.029**
Dev_Dummy (L4)	37.62641	2.771115	13.58	0.005***
Constant	-734.6325	69.52215	-10.57	0.009***
The asterisks ***, ** and * denote statistical significance of the coefficients at, 1%, 5% and 10% respectively.				

As can be seen in table 4.2, the results of the long run ARDL estimation indicate that there is a significant and positive long run relationship between Devaluation and Inflation as the proxy for Macroeconomic stability. This outcome is in line with the expected results and the findings suggest that devaluation causes a 37.62% increase in inflation rate in the long run at 1% level of significance.

As for Monetary variables, Both Nominal effective exchange rate index and External debt have a significant positive long run relationship with Inflation as a proxy for

macroeconomic stability albeit under different levels of significance, which is in line with what was expected. The results show that a 1% increase in the Nominal Effective exchange rate index results in a 19.98% increase in Inflation Rate (0.1998 X the prevailing inflation rate) in the long run 10% level of significance. The results also show that a 1% increase in external debt causes a 15.65% increase in Inflation Rate (0.1565 X the prevailing inflation rate) in the long run 5% level of significance. The fiscal variable Government Expenditure was also found to have a statistically significant positive long run relationship with inflation as a proxy for macroeconomic stability as expected, with the results showing that a 1% increase in Government expenditure leads to the Inflation Rate increasing by 127.08% (1.2708 X the prevailing Inflation rate) in the long run at 1% level of significance.

In summery, the ARDL Estimation results for the inflation model show that devaluation by itself, and through the monetary and fiscal variables, leads to inflationary outcomes in Ethiopia in the long run. This is consistent with with the findings of Tafesse (2019), Labata (2019) and Biresaw (2014), as well as the theoretical literature. However, the findings were not consistent with those of Hunegnaw (2015) and Behru (2012), who suggested that devaluation was insignificant to inflation and only inflationary in the first year respectively.

4.3.3.2 Estimation Results of the Long Run ARDL Model with Real GDP as the Proxy for Macroeconomic Stability

The ARDL regression for the Real GDP model was conducted with max lags of 3 under the AIC criterion. Stata set the optimal lag for all of the Variables in this model, including Broad Money Supply (M2), to 3 Lags. The R- Squared and

Adjusted R-squared of the model were both above 0.999 (99.9%), indicating that the variations in Inflation are almost perfectly explained by the Variations in the Independent variables in the long run. In addition, the P Value for the Model (P>F) was 0.0000, signifying that the findings are extremely reliable with a Significance level less than 1%. The output summery of the ARDL Regression with Real GDP as the dependent Variable is summarized in the Table 4.3.

Table 4.3: Output Summery of Long run Estimation of ARDL Model with Real GDP as Dependent Variable

Independent Variables	Coef.	Std. Err	t-statistics	p-value
lnrgdp (L3)	-0.9629957	0.2718956	-3.54	0.038**
lngov_exp (L3)	0.3146025	0.0827781	3.80	0.032**
lnneer (L3)	0.0856974	0.1138471	0.75	0.506
lnM2 (L3)	-0.2970798	0.1463484	-2.03	0.135
lnext_dbt (L3)	-0.0794401	0.025027	-3.17	0.050**
Dev_Dummy (L3)	-0.0318717	0.0215752	-1.48	0.236
Constant	5.981329	1.361208	4.39	0.022**
The asterisks ***, ** and * denote statistical significance of the coefficients at, 1%, 5% and 10% respectively.				

As can be seen in Table 4.3, the results of the long run ARDL estimation indicate that there is a negative yet statistically insignificant long run relationship between Devaluation and Real GDP as the proxy for Macroeconomic stability. The monetary variables Nominal effective exchange rate and Broad money supply also have statistically insignificant positive and negative relationships with Real GDP as a proxy for Macroeconomic stability respectively.

External Debt appears to be the only monetary variable that has a statistically significant relationship with Real GDP as a proxy for Macroeconomic stability in the long run. The relationship is negative as expected, with a 1% rise in external debt leading to a 0.07% fall in real GDP in the long run at 5% level of significance. The fiscal variable Government Expenditure was found to have a statistically significant

positive long run relationship with Real GDP as a proxy for macroeconomic stability, which is contrary to the a priori expectation. The results suggest that a 1% increase in Government spending will lead to a 0.31% rise in Real GDP in the long run at 5% level of significance.

The findings from the Long Run ARDL regression suggest that devaluation doesn't have a statistically significant impact on Real GDP as a proxy for Macroeconomic stability by itself. However, its effects through the monetary variable external debt and the fiscal variable government expenditure are significant, and opposite in polarity. As expected, a rise in external debt shrinks real economic growth, which is in line with what is stipulated in the theory. In addition, the result also suggests that expansionary fiscal policy in the form of a rise in government expenditure stimulates the real economy in line with Keynesian Economic Thought, and contributes positively for macroeconomic stability.

4.3.4 ARDL Bounds Test for Co-integration

The ARDL bounds test was conducted to identify the existence of long term relationship between model variables in the two models. The presence of a long run level relationship in the model variables will necessitate the estimation of a Short Run Error Correction Model. As such, the bounds tests for is conducted to test the following Null Hypothesis for both models.

H_0 = There is No Levels Relationship in the Long run

For the Inflation model, the bounds test was conducted with the optimal lags set for each of the variables same as the ARDL regression. The outcome of the bounds test suggested there is a levels long-run relationship since F > I_1 bound for all Critical

Value Levels in the Inflation Model by a large margin; Therefore we reject the null hypothesis that there is no levels relationship, and an Error Correction Model must be estimated for the Short Run.

When it comes to the Real GDP model, the bounds test was conducted with the optimal lags set for each of the variables as per the ARDL regression and the outcome suggested that there exists a level long-run relationship among variables in this model as well. Even though it was not by a large margin like in the inflation model, this model's F statistic is greater than the I_1 bound for all Critical Value Levels. Therefore we reject the null hypothesis that there is no levels relationship, and an Error Correction Model must be estimated for the Short Run for this model as well. Summary of the results from the Bounds Tests for the Two Models is Summarized in Table 4.4:

Table 4.4: Results of the ARDL Bounds Test for the two models

Model	F - Statistic	[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
Inflation Model	115.365	2.45	3.52	2.86	4.01	3.25	4.49	3.74	5.06
Real GDP Model	7.993	2.26	3.35	2.62	3.79	2.96	4.18	3.41	4.68

4.3.5 Estimation of the Short Run Error Correction Models

The findings from the bounds tests for both the Inflation and Real GDP models (Table 4.4) suggest that there are level long run relationships, the estimation of short run error correction models was found to be necessary. According to Girma (2020), the error correction model measures the speed at which dependent variables adjust to shocks in Independent variables in order to return to their long run equilibriums. The results from the estimation of the Short run error correction models for the Inflation and Real GDP models are found in the following Sections.

4.3.5.1 Estimation Results of the Short Run Error Correction Model with Inflation as the Proxy for Macroeconomic Stability

The Short run error correction term with inflation as the proxy for the dependent variable macroeconomic stability was estimated in a manner similar to the long run ARDL model. The AIC Criterion was used to select the best short run ECM with Stata. Just as the ARDL Long run regression of the inflation model, Broad money supply was omitted again as caused problems of multicolliniarity in the Devaluation dummy variable and its lagged versions in the short run as well. In spite of the omission of M2 from the ECM for the inflation model, the R- Squared and Adjusted R-squared of the model were 0.9998 (99.98%) and 0.9970 (99.7%) respectively, indicating that the variations in Inflation are almost perfectly explained by the Variations in the Independent variables in the short run as well. The output summery of the ARDL Regression to estimate the Short run error correction model with Inflation as the dependent Variable is summarized in table XY.

Table 4.5: Output Summery from Estimation of Short run Error Correction model with Inflation as Dependent Variable

Regressor	Coefficient	P-Value
Δinf (-1)	2.829053	0.007***
Δinf (-2)	1.259257	0.008***
Δinf (-3)	.4263273	0.016**
Δlngov_exp	-42.80728	0.028**
Δlngov_exp (-1)	-129.31	0.005***
Δlngov_exp (-2)	-127.0836	0.006***
Δlnneer	-18.39803	0.029**
Δlnneer (-1)	-360.3154	0.003***
Δlnneer (-2)	-286.1385	0.009***
Δlnneer (-3)	-19.98788	0.086*
Δlnext_dbt	-34.97176	0.004***
Δlnext_dbt (-1)	-6.367091	0.070*
Δlnext_dbt (-2)	-1.340561	0.648
Δlnext_dbt (-3)	-15.65387	0.029**
ΔDev_Dummy	-15.85438	0.008***
ΔDev_Dummy (-1)	11.6966	0.130
ΔDev_Dummy (-2)	-40.69433	0.005***
ΔDev_Dummy (-3)	-37.62641	0.005***
Constant	-734.6326	0.009***
ECM-1	-5.356161	0.004***
The asterisks ***, ** and * denote statistical significance of the coefficients at, 1%, 5% and 10% respectively.		

As can be seen in the above table, the estimated coefficients of almost all of the regressors with the exception of the second year lag of External debt and First year lag of the development dummy variable are statistically significant at 10% and less. It can also be deduced that all the first lag, second lag and third lag changes in inflation are statistically significant at 1%, 1% and 5% respectively, and that a 1 % change in the first lag, second lag and third lag change in inflation are associated with a 2.82% 1.25% and 0.42% increase in current year inflation rate, Ceteris paribus, respectively. The coefficient of the Error Correction adjustment is also highly statistically significant at 1%. ECM-1 coefficient is negative which confirm that a long run relationship does indeed exist, but its magnitude of -5.35 is substantially large, indicating that the disequilibrium being corrected to set it back to its the long run equilibrium path is very large as well.

When it comes to the differenced monetary variables and their lagged versions, the level, first lag, second lag and third lag of change in NEER are statistically significant at 5%, 1%, 1% and 10% respectively. Further, change in NEER appears to have a negative relationship with current year inflation, with a 1% increase in change in NEER at level, first lag, second lag and third lag leading to drop in current year inflation rate by 18.4%, 360.3%, 286.13% and 19.98% respectively, all other variables held constant.

Change in External Debt also appears to have a negative relationship with the current year inflation rate, with a 1% rise in change in external debt at level, first lag and third lag resulting in a drop in the current year inflation rate by 34.97%, 6.36% and 15.65% respectively, Ceteris paribus, at 1%, 10% and 5% level of significance respectively. What can be understood from this is that, all other things held constant, expansionary monetary policy in the form of nominal devaluation and external borrowing are

deflationary in the short run.

The differenced Fiscal Variable government expenditure at level and its lagged versions are also negatively related to inflation rate according to the above table. Change in government expenditure is statistically significant at level and two lags at 5% and 1% respectively. The above table shows that a 1% increase in change in government spending at level, the first lag and the second lag will yield lead to a drop in the inflation rate by 42.80%, 129.31% and 127.08% respectively, all other variables held constant. Thus according to the results, it can be apprehended that expansionary fiscal policy in the form of rising government spending has deflationary outcomes in the short run, Ceteris paribus.

As for devaluation, the above table reveals that the first difference of devaluation is statistically significant and negatively related to the current year inflation rate at level, the second lag and the third lag, all at 1% level of significance. In addition, the results show that devaluation at level, second lag and third lag reduce inflation rate by 15.85%, 40.69% and 37.62% respectively in the short run, Ceteris paribus.

4.3.5.2 Estimation Results of the Short Run Error Correction Model with Real GDP as the Proxy for Macroeconomic Stability

The Short run error correction term with Real GDP as the proxy for the dependent variable macroeconomic stability was estimated with The AIC Criterion set in order to select the best short run ECM with Stata. Just as the ARDL Long run regression of the Real GDP model, the inclusion of Broad money supply did not cause multicolliniarity and thus the variable was included in the model to estimate the short run ECM as well. The R- Squared and Adjusted R-squared of the model were both

above 0.9823 (98.23%) and 0.8465 (84.65%) respectively, indicating that the variations in Real GDP are explained by the Variations in the Independent variables in the short run in an acceptable manner. The output summery of the ARDL Regression to estimate the Short run error correction model with Real GDP as the dependent Variable is summarized in Table 4.6.

Table 4.6: Output Summery from Estimation of Short run Error Correction model with Real GDP as Dependent Variable

Regressor	**Coefficient**	**P-Value**
Δlnrgdp (-1)	1.402073	0.013**
Δlnrgdp (-2)	0.9629957	0.038**
Δlngov_exp	0.0348584	0.725
Δlngov_exp (-1)	-0.5858727	0.021**
Δlngov_exp (-2)	-0.3146025	0.032**
Δlnneer	-0.1817838	0.070*
Δlnneer (-1)	-0.5436673	0.194
Δlnneer (-2)	-0.0856974	0.506
Δlnm2	0.5641301	0.159
Δlnm2 (-1)	0.142064	0.474
Δlnm2 (-2)	0.2970798	0.135
Δlnext_dbt	-0.1273139	0.049**
Δlnext_dbt (-1)	0.1025161	0.045**
Δlnext_dbt (-2)	0.0794401	0.050**
ΔDev_Dummy	-0.0362511	0.138
ΔDev_Dummy (-1)	0.1760057	0.071*
ΔDev_Dummy (-2)	0.0318717	0.236
Constant	5.981329	0.022**
ECM-1	-3.43586	0.007***
The asterisks ***, ** and * denote statistical significance of the coefficients at, 1%, 5% and 10% respectively.		

As can be seen in the above table, the estimated coefficients of most of the regressors in this model are statistically insignificant, with change in NEER and broad money supply being statistically insignificant at level and all lags. In fact, the ECM-1 adjustment is the only one that is significant at 1%, with the rest of the significant regressors being significant at 5% and 10. As such, the above table also shows that both the first lag and

second lags of change in Real GDP are statistically significant at 5% respectively, and that a 1 % change in the first lag and second lag change in RGDP are associated with a 1.4% and 0.9% increase in current year RGDP, respectively, all other things being equal. The coefficient of the Error Correction adjustment is also highly statistically significant at 1 and negative, which confirm that a long run relationship does indeed exist. However, the magnitude of the Error Correction's Coefficient being -3.04 is very substantial for this model as well, indicating that there is a large disequilibrium being adjusted to set it back to its the long run equilibrium here as well.

When we look at the first differenced monetary variables, change in NEER at level and External Debt at level, first lag and second lag are the only ones that are significant, with change in NEER the level being significant at 10%, while change in External Debt is significant at 5% at level and the two lags. Change in NEER at level and Change in External Debt at level seem to be negatively related to current year RGDP, with a 1% increase in the respective variables resulting in a decline in RGDP by 0.18% and 0.12% respectively, Ceteris paribus.

Meanwhile, the first and second lag of change in external debt are positively related to current year RGDP, with a 1% increase in the first lag and second lag of external debt resulting in a growth in RGDP by 0.1% and 0.07% respectively, all other conditions being held constant. What can be understood from this is that, all other things held constant, expansionary monetary policy in the form of nominal devaluation and growth in external borrowing is contractionary to RGDP in the current year, Ceteris paribus. On the other hand, expansionary monetary policy in the form of increased external borrowing instituted in T-1 and T-2 years are expansionary to the real economy in the current year, Ceteris paribus.

The lagged versions of the differenced Fiscal Variable, government expenditure, are also negatively related to RGDP as per the above table. The table suggests that for a 1% increase in change in government spending the first lag and the second lag, RGDP will drop 0.58% and 0.31% respectively, all other variables held constant. From this, it can be concluded can be apprehended that expansionary fiscal policy in the form of rising government spending is contractionary to the real economy in the short run, Ceteris paribus.

As for devaluation, Table 4.6 reveals that only the first lag of the differenced devaluation dummy variable is statistically significant, and is positively related to the current year inflation rate. The results indicate that the first lag of the devaluation dummy variable leading to an expansion in RGDP by 0.17% at 10% level of significance in the short run, Ceteris paribus.

4.3.5 Results from Granger Causality Test

The granger causality test was needed to analyze the causal relationship between devaluation and macroeconomic stability as per the third objective of the study. To test the causal relationship, it was first necessary to ensure that variables are stationary as the granger causality test demands stationarity at level for its results to be reliable. While unit root testing the variables with the Augmented Dicky-Fuller test in section 4.3.1, it was found that of the two proxies for macroeconomic stability, inflation was the only one that proved to be stationary at level, while RGDP was only stationary at first difference. On the other hand, devaluation dummy variable was stationary at level. From this, we can proceed to conduct the granger causality test to determine if a causal relationship between macroeconomic stability and devaluation exists, and if so, what the direction of causality is.

To conduct the granger causality test between inflation and the devaluation dummy variable, a Vector Autoregression was conducted on Stata with 4 lags and inflation and the devaluation dummy variable were set as dependent variables. The Stata output from the Vector Autoregression can be found in the appendices. After that, the granger causality test was conducted and the results are as follows:

Table 4.7. Granger Causality Test Results

Null Hypothesis	Direction of Causality	Prob > chi2
Devaluation does not granger cause Inflation	Dev_dummy →Inf	0.003 ***
Inflation does not granger cause Devaluation	Inf → Dev_dummy	0.661

As can be seen in the above table, we can reject the null hypothesis that Devaluation does not granger cause Inflation at 1% level of significance, but we cannot reject the null hypothesis that inflation granger causes Devaluation. Therefore, the outcomes of the granger causality test suggest that there is indeed a unidirectional relationship between devaluation and macroeconomic stability, such devaluation and its lagged values granger cause inflation, which is a deterioration of macroeconomic stability.

4.3.6 Post Estimation Test Results

ARDL Model Stability Test

The test recommended by Pesaran and Shin (1999, 2001) to test the structural stability of an ARDL model is the cumulative sum of squares recursive residuals, which is applicable on stata through the CUSUM6 command. The rational here is that if the cumulative squared sum of residuals remain within the upper and lower critical bounds in the graph, the null hypothesis of correct model specification can be accepted, and the model is deemed structurally stable. As such, The Test was run on both the inflation and RGDP models to investigate the structural stability of both models.

For the inflation model, the ARDL model stability test (Cusum6) was run on stata and the output graph was obtained. The cumulative squared sum of residuals graph was found to have stayed within the upper and lower critical bounds, which prove that the inflation model is indeed stable. The graph is found in the Appendices. The same was done for the Real GDP Model, where the Cusum6 command was run on stata in the same manner in order to investigate the stability of this model. Findings from the test, again prove, that the model is indeed stable as the cumulative squared sum of residuals graph was found to have stayed within the upper and lower critical bounds. The graph is found in the Appendices.

4.4 Discussion of the Results

The major theoretical foundations used as the analytical framework to conduct the data analysis for this study were laid by Alexander through his Absorption approach and Johnson, through his monetary approach. These theories suggested that the monetary and fiscal policies implemented to control or stabilize the economy after currency devaluation will lead to inflationary outcomes under certain circumstances, which have implications to the macroeconomic stability of the nation in question. In addition, theories by other scholars have also detailed the conditions necessary for devaluation to not cause macroeconomic instability by resulting in inflation were also used in the analytical framework for this study.

The findings suggest that devaluation is deflationary in the short run and inflationary in the long run. In addition, The results of the short run estimation of the ECM for both models suggests that the shock created by devaluation also creates a substantial disequilibrium in the short run that is adjusted for in the long run. However, the

descriptive analysis suggests that the degree to which a particular devaluation has resulted in inflationary or contractionary outcomes depends on which devaluation is being discussed. The emphasis of this study being the 2017 devaluation, the descriptive analysis suggests that inflation responded mildly at first and then was decreasing, until COVID-19 hit in 2020, after which it declined in 2021. On the other hand, while the 2017 devaluation did not result in contractionary outcomes to Real GDP, it had contributed to slowing down the rate at which it grows.

As for how monetary and fiscal policy in the midst of currency devaluation impact macroeconomic stability, it is important to look at a few facts first. Throughout the observation period, it appears that the Government has followed an expansionary fiscal policy, while the national bank was following an expansionary monetary policy. This is not to say that government spending on one hand and broad money supply, external debt and NEERI have never declined, but rather to say that the general trends they followed were very much upward. The policy variables used in the empirical analysis of the study, especially External Debt and Government expenditure, have had significant and persistent effects on macroeconomic stability through both its proxy variables.

According to the theoretical assertions of the absorption approach, devaluation can only yield positive results that contribute to macroeconomic stability in the form of enhanced real income/output under contractionary fiscal policy conditions where government spending is low and taxes are high (Jha, 2003). But Looking at the Ethiopian government's fiscal policy amidst devaluation via its level of spending, it becomes clear that the 1992 devaluation was followed by a contractionary fiscal

policy while the 2010 devaluation and 2017 devaluation were followed by expansionary fiscal policy. It is worth noting, however, that the rise in spending was much higher after the 2010 devaluation than after the 2017 one. In any case, the findings of this study were not consistent with what was asserted by the absorption approach when descriptively analyzed.

The state of Ethiopia's macroeconomic stability responded to fiscal policy in very different ways during the three official devaluations. The Descriptive analysis indicates that fter the 1992 devaluation, which was highest in magnitude compared to the other two and coupled with prudent policies, a mildly expansionary fiscal policy was at play and inflation declined by over 2 percentage points while RGDP increased by 11.2%. After the 2010 devaluation, which was devaluation by a rate that paled in comparison to the depreciation rate that led up to it and a mere desperate attempt at curbing the prevailing currency crunch, the government was implementing aggressive expansionary fiscal policy and inflation rose by alarming levels while RGDP only increased mildly. After the 2017 devaluation, which was shortly followed by favorable political and economic conditions, the government was implementing moderately expansionary fiscal policy and inflation sharply rose first bit then fell up until COVID hit, while RGDP growth rate declined first then rallied until COVID hit.

However, empirically, Government expenditure affects macroeconomic stability proxies in different ways. Through inflation, expansionary fiscal policy improves macroeconomic stability in Ethiopia the short run while worsening it in the long run, while through RGDP, expansionary fiscal policy worsens` Macroeconomic stability

in the short run while improving it in the long run.

When it comes to the effects monetary policy variables such a broad money supply, external debt and NEER have on macroeconomic stability, the findings from this study are eye opening. The empirical results suggest that Broad Money supply is likely influenced by inflation rather than the other way around, as it was found to be correlated with the other independent variables. In addition, its effects on Real GDP were statistically insignificant in both the short run and long run, suggesting that it has no effect on the overall macroeconomic stability of Ethiopia. The descriptive results also support the findings of the empirical ones, but point out the National Bank's tendency to engage in aggressive monetary expansion after devaluation, which is consistent with the theoretical assertions of Salin (2016).

According to Johnson's Monetary approach, devaluation has the same effect as contractionary monetary policy due to the reduction in real money balances, and can only work if this effect is not offset by implementing monetary expansion. Given that The National Bank engaged in Aggressive Monetary Expansion after the 2010 devaluation and 2017 devaluation, perhaps in anticipation of the inflation that would follow after the birr is devalued, the possible benefits of the devaluation were offset as per the theory of Johnson (1971) and became transitory at best, as suggested by Salin (2016), and could explain why the empirical findings deemed the effects of Broad money supply on Macroeconomic stability statistically insignificant.

By contrast, the effects of External debt on macroeconomic stability were found to be quite potent, as it had significant relationships with both inflation and Real GDP,

in both the long run and short run. The effects of external debt on macroeconomic stability through inflation were found to be negative in the Short run but positive in the long run. However, through RGDP, the impact of External debt on macroeconomic stability was found to be positive in the short run and negative in the long run. As such, expansionary monetary policy through external borrowing is deflationary and expansionary to Real Economic growth in the short run, but inflationary and contractionary to economic growth in the long run.

The findings from the descriptive strengthen this point further, as they have revealed that the impact of devaluation on external debt is consistent with the theory of Da-Rocha et.al. (2004). Comparing the trend of External Debt Growth in Ethiopia in terms of Dollars and in terms of Birr shows that there were noticeable disparities in the growth rate of external debt, where the rate at which Ethiopia Borrows from foreign lenders in terms of dollars was significantly less than its value in the local currency. All three devaluations have made it more difficult for Ethiopia to settle its external debt by making the value of that debt in terms of Birr outgrow the actual Dollar amount by the magnitude of the devaluation.

When it comes to the impact of the monetary policy variable Nominal Effective exchange rate (NEER/NEERI) on macroeconomic stability, the findings are from the analysis have proven consistent with the theory. The findings from the empirical analysis indicate that NEER has more of an effect on macroeconomic stability in the short run than in the long run. In the short run, the effect of NEER on both Inflation and Real GDP is negative, although the significance is much higher for the former than for the latter. As mentioned earlier, the monetary approach assumes a nominal

devaluation, or depreciation as they move in the same direction, is akin to a contractionary monetary policy. By that logic, a nominal appreciation is akin to expansionary policy.

However, in the long run, the effect of NEER on inflation is weakly significant yet positive, while on Real GDP it is not statistically significant at all. Since the National Bank uses inflation as its chosen proxy for macroeconomic stability, it can be concluded that expansionary monetary policy in the form of Nominal Currency Appreciation leads to Deflationary outcomes that lead to improved macroeconomic stability as there is no negative consequence to the Real Economy. This is indeed in line with what was asserted by Cooper (1971) as well as Krugman and Taylor (1978).

But looking at the findings from the descriptive analysis, it becomes clear that the Birr was not made to undergo a nominal Appreciation throughout the observation period. The NEER/NEERI graph trends downwards, showing that the birr was undergoing a nominal depreciation under the Supervision of the National Bank. This hints that the national bank's monetary policy was contractionary when dealing with exchange rate policy, allowing the birr to depreciate in a stable and predictable manner throughout the observation period and devaluing it on the three aforementioned occasions.

The other Governing theoretical framework that links NEERI to Macroeconomic stability is by Ratha (2010) and Grekou (2019), who suggest that a nominal devaluation can only be effective if it leads to a real depreciation. Ratha (2010)

asserts that in his theory that a devaluation that does not lead to real depreciation will be inflationary and contractionary to the real economy, which is consistent with the findings of this study. The results from the Descriptive analysis indicate that the only devaluation that led to a real Depreciation was the 1992 devaluation, which was neither inflationary nor contractionary. On the other hand, the 2010 devaluation, which was followed by a persistent appreciation in the Real Effective exchange rate proved to be very inflationary and very contractionary, while the 2017 devaluation was followed by an initial real depreciation followed by a real appreciation, and was not as inflationary or contractionary to the real economy.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

The objective of this study was to empirically and descriptively analyze the impact that devaluation has on macroeconomic stability on its own, and through monetary and fiscal variables. As per the discussion in the previous section, the impact of devaluation on macroeconomic stability was thoroughly analyzed from both a descriptive and empirical angle.

The empirical findings on the impact of devaluation, through the devaluation dummy variable on macroeconomic stability have led to this study concluding that devaluation improves macroeconomic stability in the short run by being deflationary and slightly expansionary, while worsening it in the long run by being only inflationary. In addition, Findings from the granger causality test have led to the conclusion that that devaluation not only granger causes inflation, but also that its effects are significant in both the short run and long run, although opposite in polarity.

The emphasis of this study being the 2017 devaluation, the descriptive analysis indicates that the 2017 devaluation was only mildly inflationary immediately afterwards, but the rate was decreasing until COVID-19 hit in 2020, after which it declined in 2021. From this, we can conclude that the 2017 devaluation did not adversely impact macroeconomic stability to the degree that the 2010 devaluation did, but more so when compared to the 1992 devaluation.

As for the impacts of fiscal policy, and specifically through government expenditure, we can conclude that the assertions of the absorption approach regarding fiscal policy do not hold water for Ethiopia when descriptively analyzed. It can be concluded based on the empirical analysis that the Expansionary Fiscal Policy is deflationary and thus good for macroeconomic stability in the short run, but is inflationary and thus bad for macroeconomic stability in the long run.

With regards to Monetary Variables, this study concludes that Broad money supply is insignificant to macroeconomic stability. However, the empirical results also suggest that expansionary monetary policy in the form of increased external borrowing has long term consequences on the macroeconomic stability of Ethiopia even though it is temporarily beneficial. Findings from this study indicate that devaluation increases debt burden, and external debt worsens macroeconomic stability in the long run by intensifying inflation and stunting real economic growth.

On the other hand, this study concludes that that expansionary monetary policy in the form of Real Currency Appreciation (NBE allows NEER to decline) is Inflationary and expansionary to the real economy in the short run but in in the long run leads to Deflationary outcomes that lead to improved macroeconomic stability as there is no negative consequence to the Real Economy. The conclusion is that the net impact of Appreciation NEER improves macroeconomic stability in Ethiopia while NEER depreciation worsens it. Regarding the 2017 devaluation, findings from the descriptive analysis of this study conclude that the 2017 devaluation was followed by an initial real depreciation which was bad for macroeconomic stability, but was followed by a real appreciation which was good for macroeconomic stability.

Overall, this study concludes that the impact of devaluation on macroeconomic stability is significant and undesirable, and the adverse effects are exacerbated when devaluation is implemented along with expansionary monetary policy in the form of raising external debt, contractionary monetary policy in the form of Real currency depreciation (NEER goes up) and expansionary fiscal policy in the form of rising government expenditure. This study also concludes that impact of the 2017 devaluation on macroeconomic stability is less adverse compared to the 2010 devaluation, but was not as beneficial as the 1992 devaluation.

5.2 Recommendations for Policy and Further Research

This study was conducted with the intention of, among others, extracting effective and prudent policy recommendations that are founded on empirical research and pointing out areas where further research is needed based on limitations faced while conducting the study. As such the following section will summarize the recommendations for policy as well as further research.

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5.3.1 Policy Recommendations

The National Bank of Ethiopia’s chief objective is to ensure macroeconomic stability in the nation. It does this primarily through the implementation of monetary policy

including exchange rate policy. Under the Managed-Floating exchange rate system, it has maintained its control on the value of the birr, and has allowed it to depreciate in a stable and predictable manner. Other factors aside, this has allowed nations that trade with Ethiopia to rest easy, knowing that the birr's value is not volatile. However, The Home Grown Economic Reform Ten Year Plan of Ethiopia (2021 – 2030) includes plans to allow the birr to float by 2030, the switch will surely shake this confidence that trading partners of Ethiopia previously held, but the full extent of what the switch in the exchange rate system will bring is yet to be seen.

However, even while the managed floating exchange rate was in place, the National Bank has devalued the Birr on three historical instances so far, the most recent of which was in 2017. The aftermath of the three devaluations has been sufficiently covered in the previous sections. But looking at the future, recent developments provide some insight into what may be in store. The national bank has issued multiple directives in 2022 to mitigate the shortage of Foreign currency. It had briefly allowed "Fraco Valuta" for Importers to source their own FOREX from elsewhere, then instituted stricter punishments for Parallel Market trading and provided lucrative incentives for citizens that will expose black market traders, and much recently, has outright banned the import of luxury goods. These moves were made to curb the currency crunch that the nation is facing, and from the lack of traction in any of these measures, there is strong speculation that a fourth devaluation is underway soon.

Whether a fourth devaluation will be instituted or not, the birr will, according to the Ten year plan, float by 2030. Thus it becomes important to utilize the findings of this

study to make policy recommendations that will ensure that devaluing the birr, or even making the switch to a floating exchange rate system, will strengthen macroeconomic stability, or at least prevent Macroeconomic instability. The recommendations are detailed as follows.

(i) Import Minimization/Substitution Policy

Dependence on Imports has to be minimized by strengthening existing import substitution firms, funding R&D and technology transfer from abroad and fostering entrepreneurship towards import substitution. The should highly incentivize and give preferential treatment to local importers to make the shift from importing finished goods that are produced abroad to importing the Capital equipment, machinery, training etc. used as inputs to produce the goods and produce them locally. If imports dependence is substantially reduced and import substitution firms are strengthened, devaluation will not be inflationary and might even boost real output and support macroeconomic stability.

(ii) Export Composition Switching Policy

The Composition of Ethiopia's exports has to be changed from Primary goods such Crops, Livestock, Minerals etc. to manufactured goods to allow devaluation to give Ethiopia a competitive advantage in the Global market. Primary Goods are known to be inelastic, which is why nominal devaluation does not lead to real depreciation in Ethiopia. However, if the goods in the export bundle are change to Manufactured goods, which are price elastic, devaluation will lead to real depreciation of the exchange rate which will prevent inflation and boost real output, which contributes to overall macroeconomic stability. For this reason, the government should

incentivize exporters to add value to their exports by providing the necessary duty exemption on importation of industrial equipment, tax holiday period, access to industrial park facilities at preferential rates, facilitate technology transfer opportunities, funding for research and development in the sector etc. as part of the export composition switching policy.

(iii) Reducing External Debt Reliance

Reliance on External Debt to fund public projects has to be minimized by establishing a secondary market for Capital, and removing the regulatory barriers associated with raising debt domestically. External debt is both contractionary to the real economy and inflationary in the long run therefore the government should implement policy that restructures the nation's debt portfolio to be composed of more domestic debt than external debt to ensure macroeconomic stability. Currently, treasury bills are only held by Banks, which is well and good but allowing the general public and organizations to hold this instruments for saving and investment would allow the government to reduce its reliance on external debt. Furthermore, domestically issuing Government Bonds to raise funding for public projects (as was done to construct the GERD) and encouraging Public-Private-Partnerships will go a long way to reduce the nation's reliance on external debt, and minimize the debt burden that could result from a devaluation.

(iv)Monetary policy by Rule

The National Bank should stick to the monetary policy it implements, and should not undo the possible benefits from implementing one form of monetary policy with another form of monetary policy. Devaluation is an exchange rate policy, which is

part of monetary policy. As such, national bank should refrain from engaging in monetary expansion after devaluing the birr as the "Monetary tightening" effect of devaluation will be undone and inflation will be worsened.

(v) Restraint on Government Spending

Government Spending must be reduced by strengthening the private sector to lead the economy and take over the Government's investment activities. Expansionary fiscal policy in the form of increased government spending is inflationary in the long run, and thus the government's expenditure should be directed at goods and services that the private sector cannot provide. Hence, the government should limit its activities to the provision of infrastructure, Public goods, Public services and law enforcement and leave production to the private sector. But before this can be done, the private sector itself will have to be strengthened through fostering entrepreneurship and strengthening institutions to lower transaction costs. If the government reduces its spending to only cover the essentials while empowering the private sector, devaluation will not affect macroeconomic stability negatively.

5.3.2 Recommendations for Further Research

This study set out to analyze the impact of devaluation on the macroeconomic stability of Ethiopia. The variables Inflation and Real GDP were used to capture Macroecnomic Stability as its proxies. The effect of devaluation on its own was captured by a dummy variable that served as one of the Independent variables of the study. In addition, other variables that affect macroeconomic stability, such as the monetary variables NEERI, External debt and Broad money supply, as well as the Fiscal Variable Government expenditure were used as independent variables as well.

While conducting this study, the researcher has found multiple gaps in the empirical literature and faced various limitations.

The Gaps in empirical literature were due to the disproportionate tendency of researchers to study the effect of devaluation on Balance of payments and its components rather than studying its comprehensive effect on the economy. The limitations were due to the absence of monthly and quarterly data for most of the variables that limited the number of observations when conducting the ARDL regression. In addition, only one fiscal variable was used as data for government revenue had missing values for some periods.

These gaps and limitations can be filled by further research into the matter, and thus the following are recommendations for future research:

a) An empirical assessment of the impact of devaluation, or exchange rate in general, on Absorption components such as Gross National Saving, Investment, Consumption and Government Spending will expand the existing literature on the comprehensive impact of exchange rate policy and devaluation and generate findings that can guide policy. It will also fill the research gap in existing literature on devaluation, which is disproportionately focused on the relationship between exchange rate and trade balance.
b) Studying the impact of devaluation on a microeconomic scale, on sampled firms/industries engaged in exports and import substitution could generate useful policy recommendations. It will also provide useful empirical literature that assesses the microeconomic impact of a macroeconomic policy measure such as devaluation.

c) The causal relationship between Inflation rate and Broad money supply needs to be assessed to empirically determine if monetary expansion is the cause of—or a response to—inflation. This would address one of the limitations of this study, and provide an answer as to why Broad Money supply caused problems of multicolliniarity in the inflation model.

d) If at any point in the future monthly data for the variables used in this study becomes available in Ethiopia, replicating this study using monthly data is highly encouraged. One of the limitations of this study was the number of observations for each of the variables being 30, which when 4 lags are set becomes 26, but if monthly or quarterly data is used, more potent results could be generated.

e) Replicating this study in other nations under fixed or managed floating exchange rate system is highly recommended to amass worldwide studies that assess the impact of exchange rate policy such as devaluation on the macroeconomic stability of nations. One of the gaps in literature is that there aren't enough international studies conducted on the impact of devaluation, or even currency deterioration, on the macroeconomic stability of different nations. As such, researchers from all over the world could fill this gap by replicating this study in their own countries.

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APPENDICES

Appendix 1: Stata Outputs

ADF Test for Stationary in Model Variables

```
. dfuller inf

Dickey-Fuller test for unit root                   Number of obs   =        29

                         ------------ Interpolated Dickey-Fuller ------------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic         Value             Value            Value
------------------------------------------------------------------------------
 Z(t)            -4.191           -3.723            -2.989           -2.625
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0007

. dfuller lnrgdp

Dickey-Fuller test for unit root                   Number of obs   =        29

                         ------------ Interpolated Dickey-Fuller ------------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic         Value             Value            Value
------------------------------------------------------------------------------
 Z(t)             1.447           -3.723            -2.989           -2.625
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.9973
. gen dlnrgdp =d.lnrgdp
(1 missing value generated)

. dfuller d.lnrgdp, trend

Dickey-Fuller test for unit root                   Number of obs   =        28

                         ------------ Interpolated Dickey-Fuller ------------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic         Value             Value            Value
------------------------------------------------------------------------------
 Z(t)            -4.237           -4.352            -3.588           -3.233
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0039

. dfuller lnm2, trend

Dickey-Fuller test for unit root                   Number of obs   =        29

                         ------------ Interpolated Dickey-Fuller ------------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic         Value             Value            Value
------------------------------------------------------------------------------
 Z(t)            -0.752           -4.343            -3.584           -3.230
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.9695

. gen dlnm2 = d.lnm2
(1 missing value generated)

. dfuller dlnm2, drift

Dickey-Fuller test for unit root                   Number of obs   =        28

                         ------------ Z(t) has t-distribution ------------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic         Value             Value            Value
------------------------------------------------------------------------------
 Z(t)            -2.258           -2.479            -1.706           -1.315
------------------------------------------------------------------------------
p-value for Z(t) = 0.0163
```

```
. dfuller lnneer

Dickey-Fuller test for unit root                   Number of obs   =        29

                                 ------------ Interpolated Dickey-Fuller ------------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value            Value
------------------------------------------------------------------------------
 Z(t)            -3.415            -3.723            -2.989           -2.625
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0105

. gen dlnneer =d.lnneer
(1 missing value generated)

. dfuller d.lnneer

Dickey-Fuller test for unit root                   Number of obs   =        28

                                 ------------ Interpolated Dickey-Fuller ------------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value            Value
------------------------------------------------------------------------------
 Z(t)            -6.432            -3.730            -2.992           -2.626
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000

. dfuller lnext_dbt

Dickey-Fuller test for unit root                   Number of obs   =        29

                                 ------------ Interpolated Dickey-Fuller ------------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value            Value
------------------------------------------------------------------------------
 Z(t)            -0.436            -3.723            -2.989           -2.625
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.9038

. gen dlnext_dbt =d.lnext_dbt
(1 missing value generated)

. dfuller d.lnext_dbt

Dickey-Fuller test for unit root                   Number of obs   =        28

                                 ------------ Interpolated Dickey-Fuller ------------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value            Value
------------------------------------------------------------------------------
 Z(t)            -4.747            -3.730            -2.992           -2.626
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0001

. dfuller Dev_Dummy

Dickey-Fuller test for unit root                   Number of obs   =        29

                                 ------------ Interpolated Dickey-Fuller ------------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value            Value
------------------------------------------------------------------------------
 Z(t)            -6.754            -3.723            -2.989           -2.625
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000
```

Optimal Lag Selection for the Two Models

```
. varsoc inf lngov_exp lnneer lnm2 lnext_dbt Dev_Dummy

   Selection-order criteria
   Sample:  1996 - 2021                            Number of obs      =        26
```

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-122.402				.000785	9.8771	9.96071	10.1674
1	34.8311	314.47	36	0.000	7.6e-08	.551452	1.13668	2.58376
2	83.9051	98.148	36	0.000	4.6e-08	-.454242	.632617	3.32005
3	151.366	134.92	36	0.000	2.5e-08	-2.87433	-1.28585	2.64194
4	2732.08	5161.4*	36	0.000	3.8e-89*	-198.621*	-196.531*	-191.363*

```
   Endogenous:  inf lngov_exp lnneer lnm2 lnext_dbt Dev_Dummy
    Exogenous:  _cons

. varsoc lnrgdp lngov_exp lnneer lnm2 lnext_dbt Dev_Dummy

   Selection-order criteria
   Sample:  1996 - 2021                            Number of obs      =        26
```

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	33.4931				4.9e-09	-2.11486	-2.03125	-1.82453
1	185.351	303.72	36	0.000	7.1e-13	-11.027	-10.4418	-8.99469
2	229.198	87.695	36	0.000	6.5e-13	-11.6306	-10.5438	-7.85635
3	344.66	230.92*	36	0.000	8.7e-15	-17.7431*	-16.1546*	-12.2268*
4	.	.	36	.	0*	.	.	.

```
   Endogenous:  lnrgdp lngov_exp lnneer lnm2 lnext_dbt Dev_Dummy
    Exogenous:  _cons
```

Long run ARDL Regression for the Inflation Model

```
. ardl inf lngov_exp lnneer lnext_dbt Dev_Dummy , lags (4 3 4 4 4)

ARDL(4,3,4,4,4) regression

Sample:     1996 -     2021                 Number of obs   =         26
                                            F(  23,      2) =     227.46
                                            Prob > F        =     0.0044
                                            R-squared       =     0.9996
                                            Adj R-squared   =     0.9952
Log likelihood = -2.4155409                 Root MSE        =     0.9574
```

inf	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
inf						
L1.	-1.527108	.0994465	-15.36	0.004	-1.954992	-1.099224
L2.	-1.569796	.1349827	-11.63	0.007	-2.15058	-.9890127
L3.	-.83293	.0681134	-12.23	0.007	-1.125998	-.5398616
L4.	-.4263273	.0550542	-7.74	0.016	-.6632066	-.189448
lngov_exp						
--.	-42.8073	7.280159	-5.88	0.028	-74.13129	-11.4833
L1.	-.5631338	5.413743	-0.10	0.927	-23.85659	22.73032
L2.	2.22641	5.150025	0.43	0.708	-19.93236	24.38518
L3.	127.0836	9.6146	13.22	0.006	85.7153	168.4519
lnneer						
--.	-18.39803	3.225473	-5.70	0.029	-32.27612	-4.519939
L1.	-325.4423	23.35809	-13.93	0.005	-425.944	-224.9405
L2.	74.1769	18.29001	4.06	0.056	-4.518662	152.8725
L3.	266.1507	22.36823	11.90	0.007	169.908	362.3934
L4.	19.98788	6.25567	3.20	0.086	-6.928095	46.90385
lnext_dbt						
--.	-34.97177	2.294746	-15.24	0.004	-44.84526	-25.09827
L1.	-25.67879	1.432575	-17.92	0.003	-31.84267	-19.51492
L2.	5.026533	2.89196	1.74	0.224	-7.416566	17.46963
L3.	-14.31331	2.371021	-6.04	0.026	-24.51499	-4.111631
L4.	15.65387	2.707109	5.78	0.029	4.006119	27.30162
Dev_Dummy						
--.	-15.85438	1.454262	-10.90	0.008	-22.11156	-9.597198
L1.	-24.78447	2.555575	-9.70	0.010	-35.78022	-13.78872
L2.	-52.39094	4.244134	-12.34	0.006	-70.65197	-34.1299
L3.	3.067928	2.527725	1.21	0.349	-7.807995	13.94385
L4.	37.62641	2.771115	13.58	0.005	25.70327	49.54956
_cons	-734.6325	69.52215	-10.57	0.009	-1033.762	-435.5028

Long run ARDL Regression for the RGDP Model

```
. ardl lnrgdp lngov_exp lnneer lnm2 lnext_dbt Dev_Dummy, lags (3 3 3 3 3 3)

ARDL(3,3,3,3,3,3) regression

Sample:     1995 -     2021                     Number of obs   =         27
                                                F(  23,      3) =    2462.92
                                                Prob > F        =     0.0000
                                                R-squared       =     0.9999
                                                Adj R-squared   =     0.9995
Log likelihood =  105.89383                     Root MSE        =     0.0144
```

lnrgdp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnrgdp						
L1.	-1.033787	.3324078	-3.11	0.053	-2.091657	.0240829
L2.	-.4390769	.1581703	-2.78	0.069	-.9424455	.0642917
L3.	-.9629957	.2718956	-3.54	0.038	-1.828289	-.0977024
lngov_exp						
--.	.0348584	.0903164	0.39	0.725	-.2525686	.3222855
L1.	.2388616	.0685844	3.48	0.040	.0205955	.4571277
L2.	.2712701	.1016525	2.67	0.076	-.0522335	.5947737
L3.	.3146025	.0827781	3.80	0.032	.0511656	.5780395
lnneer						
--.	-.1817838	.0659716	-2.76	0.070	-.3917348	.0281672
L1.	-.2506307	.3571369	-0.70	0.533	-1.3872	.8859384
L2.	.4579699	.2330589	1.97	0.144	-.2837277	1.199667
L3.	.0856974	.1138471	0.75	0.506	-.276615	.4480099
lnm2						
--.	.5641301	.3028122	1.86	0.159	-.3995534	1.527814
L1.	.550105	.1857192	2.96	0.059	-.0409363	1.141146
L2.	.1550158	.1577989	0.98	0.398	-.3471707	.6572023
L3.	-.2970798	.1463484	-2.03	0.135	-.7628258	.1686661
lnext_dbt						
--.	-.1273139	.0397236	-3.20	0.049	-.2537323	-.0008956
L1.	-.0130123	.0250089	-0.52	0.639	-.0926019	.0665774
L2.	-.023076	.025234	-0.91	0.428	-.1033817	.0572297
L3.	-.0794401	.025027	-3.17	0.050	-.1590871	.000207
Dev_Dummy						
--.	-.0362511	.0180336	-2.01	0.138	-.0936421	.0211399
L1.	-.0883075	.0235963	-3.74	0.033	-.1634014	-.0132136
L2.	-.1441341	.0597355	-2.41	0.095	-.334239	.0459708
L3.	-.0318717	.0215752	-1.48	0.236	-.1005336	.0367903
_cons	5.981329	1.361208	4.39	0.022	1.649358	10.3133

Bounds test for Inflation Model

Pesaran/Shin/Smith (2001) ARDL Bounds Test
H0: no levels relationship F = 115.365
t = -16.102

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_4	2.45	3.52	2.86	4.01	3.25	4.49	3.74	5.06

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_4	-2.57	-3.66	-2.86	-3.99	-3.13	-4.26	-3.43	-4.60

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)

Bounds test for RGDP Model

Pesaran/Shin/Smith (2001) ARDL Bounds Test
H0: no levels relationship F = 7.993
t = -6.514

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_5	2.26	3.35	2.62	3.79	2.96	4.18	3.41	4.68

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_5	-2.57	-3.86	-2.86	-4.19	-3.13	-4.46	-3.43	-4.79

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)

Short run ARDL Regression for Estimation of ECM for the Inflation Model

```
. ardl inf lngov_exp lnneer lnext_dbt Dev_Dummy , lags (4 3 4 4 4) ec1

ARDL(4,3,4,4,4) regression

Sample:     1996 -     2021                     Number of obs   =         26
                                                R-squared       =     0.9998
                                                Adj R-squared   =     0.9970
Log likelihood = -2.4155917                     Root MSE        =     0.9574
```

D.inf	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ADJ						
inf						
L1.	-5.356161	.3326367	-16.10	0.004	-6.787381	-3.924941
LR						
lngov_exp						
L1.	16.04499	.5154144	31.13	0.001	13.82734	18.26264
lnneer						
L1.	3.075931	1.37334	2.24	0.154	-2.833074	8.984935
lnext_dbt						
L1.	-10.13477	.3890062	-26.05	0.001	-11.80853	-8.461011
Dev_Dummy						
L1.	-9.771074	1.093681	-8.93	0.012	-14.4768	-5.065344
SR						
inf						
LD.	2.829053	.2461398	11.49	0.007	1.769999	3.888107
L2D.	1.259257	.1164857	10.81	0.008	.7580594	1.760455
L3D.	.4263273	.0550544	7.74	0.016	.1894475	.6632071
lngov_exp						
D1.	-42.80728	7.280172	-5.88	0.028	-74.13133	-11.48323
LD.	-129.31	8.942679	-14.46	0.005	-167.7872	-90.83274
L2D.	-127.0836	9.614618	-13.22	0.006	-168.4519	-85.71521
lnneer						
D1.	-18.39803	3.22548	-5.70	0.029	-32.27615	-4.519911
LD.	-360.3154	20.35719	-17.70	0.003	-447.9054	-272.7255
L2D.	-286.1385	26.73996	-10.70	0.009	-401.1913	-171.0858
L3D.	-19.98788	6.255682	-3.20	0.086	-46.9039	6.928151
lnext_dbt						
D1.	-34.97176	2.29475	-15.24	0.004	-44.84527	-25.09825
LD.	-6.367091	1.784268	-3.57	0.070	-14.04418	1.309995
L2D.	-1.340561	2.522287	-0.53	0.648	-12.19309	9.511964
L3D.	-15.65387	2.707115	-5.78	0.029	-27.30164	-4.006092
Dev_Dummy						
D1.	-15.85438	1.454264	-10.90	0.008	-22.11158	-9.597186
LD.	11.6966	4.681599	2.50	0.130	-8.446698	31.83989
L2D.	-40.69433	2.805416	-14.51	0.005	-52.76506	-28.6236
L3D.	-37.62641	2.77112	-13.58	0.005	-49.54957	-25.70324
_cons	-734.6326	69.52229	-10.57	0.009	-1033.763	-435.5024

Short run ARDL Regression for Estimation of ECM for the Inflation Model

```
. ardl lnrgdp lngov_exp lnneer lnm2 lnext_dbt Dev_Dummy, lags (3 3 3 3 3 3) ec1

ARDL(3,3,3,3,3,3) regression

Sample:     1995 -     2021                 Number of obs   =         27
                                            R-squared       =     0.9823
                                            Adj R-squared   =     0.8465
Log likelihood =  105.89383                 Root MSE        =     0.0144
```

D.lnrgdp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ADJ						
lnrgdp						
L1.	-3.43586	.5274679	-6.51	0.007	-5.114498	-1.757221
LR						
lngov_exp						
L1.	.2501827	.0246312	10.16	0.002	.1717952	.3285703
lnneer						
L1.	.0323799	.0303953	1.07	0.365	-.0643516	.1291114
lnm2						
L1.	.2829484	.0222456	12.72	0.001	.2121529	.353744
lnext_dbt						
L1.	-.0706788	.0095876	-7.37	0.005	-.1011908	-.0401667
Dev_Dummy						
L1.	-.0874787	.022825	-3.83	0.031	-.1601179	-.0148394
SR						
lnrgdp						
LD.	1.402073	.2638203	5.31	0.013	.5624786	2.241667
L2D.	.9629957	.2718956	3.54	0.038	.0977024	1.828289
lngov_exp						
D1.	.0348584	.0903164	0.39	0.725	-.2525686	.3222855
LD.	-.5858727	.1305221	-4.49	0.021	-1.001252	-.1704931
L2D.	-.3146025	.0827781	-3.80	0.032	-.5780395	-.0511656
lnneer						
D1.	-.1817838	.0659716	-2.76	0.070	-.3917348	.0281672
LD.	-.5436673	.3257389	-1.67	0.194	-1.580314	.4929793
L2D.	-.0856974	.1138471	-0.75	0.506	-.4480099	.276615
lnm2						
D1.	.5641301	.3028122	1.86	0.159	-.3995534	1.527814
LD.	.142064	.1739298	0.82	0.474	-.4114583	.6955864
L2D.	.2970798	.1463484	2.03	0.135	-.1686661	.7628258
lnext_dbt						
D1.	-.1273139	.0397236	-3.20	0.049	-.2537323	-.0008956
LD.	.1025161	.0309224	3.32	0.045	.0041072	.200925
L2D.	.0794401	.025027	3.17	0.050	-.000207	.1590871
Dev_Dummy						
D1.	-.0362511	.0180336	-2.01	0.138	-.0936421	.0211399
LD.	.1760057	.0642271	2.74	0.071	-.0283935	.380405
L2D.	.0318717	.0215752	1.48	0.236	-.0367903	.1005336
_cons	5.981329	1.361208	4.39	0.022	1.649358	10.3133

Vector Autoregression and Granger Causality Test

```
. var Dev_Dummy inf, lags(1/4)

Vector autoregression

Sample:  1996 - 2021                            No. of obs      =         26
Log likelihood = -96.45278                      AIC             =   8.80406
FPE            =  24.23892                      HQIC            =  9.054873
Det(Sigma_ml)  =  5.718406                      SBIC            =   9.67505

Equation           Parms      RMSE     R-sq      chi2     P>chi2
------------------------------------------------------------------
Dev_Dummy              9     .253747   0.4071   17.85216   0.0224
inf                    9     14.4145   0.2636   9.309068   0.3169
------------------------------------------------------------------
```

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Dev_Dummy						
Dev_Dummy						
L1.	-.0850162	.1880311	-0.45	0.651	-.4535505	.2835181
L2.	-.0921643	.186132	-0.50	0.620	-.4569763	.2726477
L3.	-.3357949	.1693403	-1.98	0.047	-.6676959	-.0038939
L4.	-.173458	.1433482	-1.21	0.226	-.4544152	.1074993
inf						
L1.	-.0029827	.003488	-0.86	0.392	-.009819	.0038537
L2.	.0132356	.0034554	3.83	0.000	.0064632	.020008
L3.	.0001385	.0040722	0.03	0.973	-.0078429	.00812
L4.	.0015666	.003824	0.41	0.682	-.0059283	.0090615
_cons	.0178985	.0663851	0.27	0.787	-.112214	.1480109
inf						
Dev_Dummy						
L1.	8.930089	10.68139	0.84	0.403	-12.00506	29.86523
L2.	4.634496	10.57351	0.44	0.661	-16.0892	25.35819
L3.	5.340766	9.619634	0.56	0.579	-13.51337	24.1949
L4.	-5.903405	8.143109	-0.72	0.468	-21.8636	10.05679
inf						
L1.	.1631918	.1981416	0.82	0.410	-.2251586	.5515421
L2.	-.0832059	.1962877	-0.42	0.672	-.4679227	.3015108
L3.	.3456065	.2313299	1.49	0.135	-.1077917	.7990048
L4.	.0741577	.2172287	0.34	0.733	-.3516027	.4999181
_cons	5.40225	3.771107	1.43	0.152	-1.988983	12.79348

```
. vargranger

  Granger causality Wald tests
```

Equation	Excluded	chi2	df	Prob > chi2
Dev_Dummy	inf	15.918	4	0.003
Dev_Dummy	ALL	15.918	4	0.003
inf	Dev_Dummy	2.4103	4	0.661
inf	ALL	2.4103	4	0.661

```
.
```

Data Used For the Study

Year	For Empirical and Descriptive						For Descriptive only	
	GOV_EXP	NEER	M2	EXT_DBT	RGDP	INF	REERI	OFCL_EXCNG
1992	4,205,400,000.0	306.0	9,010,900,000.0	6,551,400,000.00	237,017.87	2.1	344.5	2.80
1993	5,219,400,000.0	130.3	10,136,700,000.0	18,778,500,000.00	263,487.74	4.7	149.0	5.00
1994	7,093,800,000.0	129.9	11,598,700,000.0	25,722,200,000.00	263,617.53	6.3	150.3	5.47
1995	8,372,000,000.0	110.9	14,408,400,000.0	27,731,500,000.00	278,689.07	14.8	138.0	6.16
1996	10,194,000,000.0	111.0	15,654,900,000.0	27,088,000,000.00	306,885.23	-9.0	121.5	6.35
1997	10,014,900,000.0	109.8	16,548,800,000.0	26,509,611,771.76	319,876.60	-2.7	113.9	6.71
1998	10,898,800,000.0	109.0	18,643,300,000.0	27,916,876,395.14	317,364.01	0.1	112.2	7.12
1999	14,677,200,000.0	97.9	19,399,400,000.0	31,566,000,000.00	337,388.96	10.4	111.9	7.94
2000	17,531,600,000.0	97.8	22,177,800,000.0	44,647,500,000.00	362,220.79	1.9	109.1	8.22
2001	15,737,300,000.0	101.7	24,516,200,000.0	46,268,800,000.00	390,508.12	-10.8	97.8	8.46
2002	17,650,000,000.0	100.7	26,292,058,000.0	52,994,253,000.00	396,681.52	-1.2	93.8	8.57
2003	20,496,000,000.0	95.2	29,060,157,000.0	58,281,460,320.00	388,246.70	17.8	100.9	8.60
2004	20,504,000,000.0	92.2	33,625,971,000.0	63,077,585,448.00	436,967.15	2.4	96.4	8.64
2005	24,617,000,000.0	89.8	40,211,748,000.0	51,193,046,672.00	490,599.96	10.7	100.7	8.67
2006	29,325,000,000.0	89.9	46,377,378,000.0	52,073,238,930.00	545,667.08	10.8	112.2	8.70
2007	35,607,000,000.0	84.5	56,651,885,000.0	20,354,935,008.00	609,204.50	15.1	117.7	8.97
2008	46,915,000,000.0	74.0	68,182,136,306.0	25,578,979,346.00	676,277.66	55.2	150.5	9.60
2009	57,775,000,000.0	67.5	82,509,750,000.0	45,351,787,485.00	740,467.81	2.7	140.7	11.78
2010	71,334,000,000.0	56.0	104,432,403,000.0	72,617,791,334.00	825,188.88	7.3	121.2	14.41
2011	93,831,409,537.5	42.9	145,376,967,000.0	125,841,335,280.00	934,067.44	38.0	122.8	16.90
2012	124,416,800,000.0	43.2	189,398,776,000.0	153,361,211,640.00	1,015,089.73	20.8	139.4	17.70
2013	153,928,677,343.2	42.0	235,313,591,000.0	204,193,841,637.00	1,119,201.92	7.4	140.2	18.63
2014	185,471,776,960.0	40.7	297,732,005,000.0	268,378,048,796.00	1,234,276.46	8.5	140.8	19.59
2015	230,521,180,000.0	42.3	371,328,911,000.0	382,564,920,000.00	1,362,596.19	10.4	157.6	20.58
2016	272,930,088,428.1	41.2	445,266,251,773.0	449,037,604,578.60	1,449,397.45	7.5	159.3	21.73
2017	329,286,838,294.7	41.8	573,384,054,000.0	539,568,840,000.00	1,596,481.61	8.4	171.9	23.87
2018	354,205,317,562.2	37.2	740,572,876,000.0	703,692,220,000.00	1,719,491.39	16.8	161.8	27.43
2019	413,105,716,076.5	42.4	886,752,533,000.0	782,938,070,000.00	1,874,689.30	15.3	196.0	29.07
2020	480,143,191,398.8	38.6	1,037,646,325,600.0	1,010,796,950,000.00	1,989,519.00	21.6	179.0	34.93
2021	599,006,654,421.2	69.6	1,348,266,145,160.0	1,290,519,080,000.00	2,114,163.22	24.5	179.5	46.80

Appendix ii: Research Clearance Letter

THE OPEN UNIVERSITY OF TANZANIA

DIRECTORATE OF POSTGRADUATE STUDIES

P.O. Box 23409
Dar es Salaam, Tanzania
http://www.out.ac.tz

Tel: 255-22-2668992/2668445
ext.2101
Fax: 255-22-2668759
E-mail: dpgs@out.ac.tz

Our Ref: PG201902280

16th September 2022

Research Department Director,

National Bank of Ethiopia,

P.O.Box 5550,

ADDIS ABABA-ETHIOPIA.

RE: RESEARCH CLEARANCE

The Open University of Tanzania was established by an Act of Parliament No. 17 of 1992, which became operational on the 1st March 1993 by public notice No.55 in the official Gazette. The Act was however replaced by the Open University of Tanzania Charter of 2005, which became operational on 1st January 2007.In line with the Charter, the Open University of Tanzania mission is to generate and apply knowledge through research.

To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance, on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology, to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you **Mr. GIRUM, Amaha Diana, Reg No: PG201902280** pursuing **Master of Science in Economics (MSc-Economics).** We here by grant this clearance to conduct a research titled **"Impacts of Devaluation on Macroeconomic Stability of Ethiopia: Case of 2017 BIRR Devaluation".** He will collect his data at your office from 19th September 2022 to 19th October 2022.

In case you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O.Box 23409, Dar es Salaam.Tel: 022-2-2668820.We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

Yours,
THE OPEN UNIVERSITY OF TANZANIA

Prof. Magreth S.Bushesha
DIRECTOR OF POSTGRADUATE STUDIES.