ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

THE RELATIONSHIP BETWEEN CURRENCY DEVALUATION AND TRADE BALANCE: DOES MARSHALL-LERNER CONDITION HOLD IN ETHIOPIA? EVIDENCE FROM AUTOREGRESIVE DISTRIBUTED LAG MODEL (ARDL)

BY

TESFAYE ADMIT

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A Thesis Submitted to School of graduate studies in Addis Ababa University to Partial Fulfillment of Requirement for the Degree of Masters of Science in Economics

School of Graduate Studies

This is to certify that the thesis prepared by Tesfaye Admit, entitled the relation –ship currency devaluation and trade balance of Ethiopia: Does Marshall Lerner condition holds in Ethiopia? And submitted in partial fulfillment of the requirements for the degree of Masters of Science (international economics) complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Approval by board of Examiners:

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Advisor ____________________________ signature ____________ date _________

Declaration

I undersigned, declare that this thesis is my original work and it has never been presented for masters in any other university, and that all source of materials used for the thesis have been properly acknowledged.

The examiners‟ comments have been properly incorporated.

Declaration

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Table content **page number**

Contents

List of tables

List of Figures

List of acronyms

ADF	Augmented Dickey Fuller
AIC	Akaike information criterion
ARDL	Autoregressive Distributed Lag Model
BOP	Balance of payment
ETB	Ethiopian Birr
FGDP	Foreign gross domestic product
GDP	Gross domestic product
HQ	Hanna- Quinn information criteria
IMF	International monetary fund
LDCs	Least developed countries
MoT	Minister of trade
ML	Marshal Lerner
NBE	National bank of Ethiopia
OLS	Ordinary least square
PD	Domestic consumer price index
PF	Foreign consumer price index
REER	Real effective exchange rate
SAP	Structural adjustment program
SC	Schwarz information criterion
TB	Trade balance
USD	United States Dollar
VECM	Vector error correction model

Abstract

This study examines the relationship between currency depreciation and trade balance in Ethiopia, as well as whether the Marshall-lerner criteria hold in Ethiopia using an auto-regressive distributed lag (ARDL) model using yearly data from 1992 to 2022. The findings of the current study showed that currency devaluation deteriorate the short run and long run of Ethiopian trade balance. This study also incorporates other control variable like real domestic product, domestic inflation, trade openness and foreign exchange reserve along the actual effective exchange rate. The empirical conclusions thus, indicate trade balance and the factors that determine it have long-term substantial relationships except real domestic products .And in short run also significant relation-ships between trade balance and its determinant variable.

The study's findings show that the Marshall-Lector conditions do not hold over the long run in Ethiopia. The government should encourage domestically product improvement, increase diversification of export sectors computing industries rather than currency devaluation to improve trade balance.

Chapter one

Introduction

1.1 Background of study

Countries produce goods and services using's own resources, regardless of their capacity and availability resource to ensure the welfare of their citizens. When there were production shortages or surpluses, they participate in international trading activities. When nations lack the resource or ability to meet their own nation’s needs and desires, they trade with one another. Nations can deliver a surplus and exchange the resource they need from abroad. And also they participate in international trade by engaging in imports trade for good and service they are unable to produces and export trade for their production (Jevons, 1990)

International trade, which involve cross-border business transactions between nations in cases where a country engages in the process as both a provider and a customer, and which consists of export and import trade, is a crucial aspect of any given economy. Countries generate economic interdependence based on the framework of the global market's supply and demand. The advantage of growing exports and boosting import capacity for intermediate inputs and other goods and services those are required or beneficial to faster economic development in the domestic market.

Every country wants to make exporting easier. Because exporting raises the standard of living, lowers unemployment, and increases foreign exchange reserves. Governments utilize a variety of strategies to support exporting businesses and to enhance the country's trade balance in order to bring about such economic relevance of export. Some of the mechanisms include trade protectionism, negotiating trade agreements, and currency devaluation, which is the reduction in the value of their own currencies.

Currency devaluation is the process of lowering official exchange rate for the nation in relation to other currencies this is a key tool for policymakers to use to encourage exports and discourage imports by lowering the price of exporting items while raising the price of imported goods. As a result, the country is able to use devaluation to address its deficit of balance of payments. (Ayegegn, 2021)

Less developed countries pay attention to currency depreciation in emerging economies because their access to foreign currency is limited. Currency depreciation affects the majority of macroeconomic factors, including investment and consumption. It is believed that excessive volatility in currency rates has had a substantial impact on international trade and specialization in the majority of rising countries. Therefore Economic policy must be coordinated Monetary policy should be implemented to limit short-term exchange rate volatility and ensure medium-term exchange rate distortion (Tarawalie.A, 2003)

(Krugman and Taylor, 1977) Consider the currency depreciation's impact on trade balance in developing nations has been used as a method for policy, despite the fact that many scholars have produced conflicting findings regarding this devaluation. Ethiopia, a nation in Sub-Saharan Africa and one of the world's least developed countries, employs this tactic. Several factors could be to blame for the nation's slow economic growth. In the previous 20 years, a number of strategies, including strengthening institutions, privatizing public sector, and devaluing currency, have employed to address issues and foster sustainable economic growth in Ethiopia (Tirsit, 2010)

The government since 1992 has devalued the birr, switching from a fixed to flexible exchange rate to prevent overvaluation and to improve trade balance of country by way of devaluation of local currency annually. The Ethiopian Birr depreciated by nearly 142 percent On October 1, 1992, its nominal value fell from 2.07 Birr to 5.00 Birr per US dollar. However, compared to prior years, the pace of depreciation versus other foreign currencies accelerated during the fiscal year 2007/2008. The Ethiopian Birr lost value against the US dollar by 23.7% in 2009/2010 and 16.5% in September 2010/2011. On October 10, 2017, the National Bank of Ethiopia (NBE) devalued the Birr by 15% as pressure on the foreign exchange market increased (NBE, 2018). Official exchange rate of the dollar to the birr increased to 49.1936 in December 2021, and 25.6% depreciation of the birr. The trade balance in mill USD (5199), (5808.40) ,(7811.4) , (12611.4) , (10641.1) in 2007/08 ,2009/10 ,2011/12 ,2017/18 ,2020/21 Respectively. This devaluation is to increase the nation's export value in order to balance of trade more favorably. However, unable to resolve the trade balance problem rather than expand trade deficit (NBE, 2021).

The government has been gradually devaluing from 1992, the birr and to control overvaluation, Fixed exchange rates were replaced with variable ones and improve the trade balance of the nation. The Ethiopian Birr devaluing by nearly 142 percent nominal value of 2.07 Birr to 1 US dollar decrease to 5.00 Birr to 1 US dollar on October 1, 1992. However, compared to prior years, the pace of depreciation versus other foreign currencies accelerated during the fiscal year 2007/2008. The Ethiopian Birr lost value against the US dollar by 23.7% in 2009/2010 and 16.5% in September 2010/2011. On October 10, 2017, the Birr underwent a15% depreciation by the National Bank of Ethiopia (NBE) as pressure on foreign exchange market increased. The official dollar-birr exchange rate reaches to 49.1936 in December 2021, representing 25.6% currency depreciation. But the trade balance in million dollars for the years 2007/08, 2009/10, 2011/12, 2017/18, and 2020/21 is (5199), (5808.40), (7811.4), (12611.4), and (10641.1) respectively. With this devaluation, the country's export value will increase helping the trade balance. However, unable to resolves issues with the trade balance, rather than increasing the trade deficit (NBE, 2021).

A less-than-unity export-to-import ratio reflected Ethiopia's trade balances up to 2022. Ethiopia's trade deficit remained to be large and it accelerated the expansion of imports over exports despite the assumption that exports were encouraged by a devaluation of the national currency. This is mostly a result of the failure to increase exports and replace imports with local product items in order to minimize the trade deficit. Additionally, even if its exchange rate has devaluate, the majority of Ethiopian exports are agricultural products rather than items made in factories, indicating that For many years Ethiopia has a negative trade balance (NBE, 2022).

1.2 Statement of the Problem

Policymakers and economists have shown interest in the topic how well Depreciation of the currency may enhance the trade balance. Since collapse of Bretton woods agreement in 1973, there has been a resurgence of an interest in the impact of devaluation on trade balances of both developed and developing nations. Contradictory empirical results regarding the relationship between exchange rate changes and the trade balance motivates further research into this topic. To accomplish development goals developing countries motivate Industrialization, import substitution, export promotion, and structural adjustment programs are examples of transitions from one development paradigm to another (Rawlins et.al, 1993)

The term Structural Adjustment Program (SAP) was first employed by international monetary fund (IMF) and World Bank in 1992. They advise developing nations to implement the SAP's key requirements because less developed nations (LDNs) that have experienced balance of payment issues as a result of Financial policies that are expansionary, a Trade imbalances, pricing distortions, expensive debt payments, or a combination of these concerns have resulted in currency depreciation (Borena, 2013).

As less developed country, Ethiopia had a variety of issue contributors to the nation's slow economic performance. The government implemented the Structural Adjustment Program (SAP), which got under way in 1992 once the Derg government was over thrown, to address issue through at both the macroeconomic and microeconomic levels of the economy, structural and policy changes. The Birr has steadily devalued in nominal terms from year to year as a component of this extensive reform drive, which started on October 1, 1992.

According to NBE (2020) The fundamental goal of birr devaluation , to increase exports by allowing exporters to profit more in local currency for a given quantity of sales overseas. Moreover, to increase the import price in local currency in order discourage imports. By increasing exports and lowering imports, these two operations are intended to enhance trade and current account balances of the nation. However, export to import ratio stayed below one, and the trade balance got worse. In particular, the value of the birr has been declining since 1992, while the trade balance has remained negative. This tendency inspires me to investigate the relation-ship between trade balance and exchange rate in Ethiopia.

Different researchers have conducted a different analysis of how devaluation affects actual economic activity, some of which imply expansionary effects and others suggest contractionary consequences. The Nominal exchange rate's effects on economic growth rate examined by Connolly in 1983 obtained coefficient was significant and positive, lending some credence to the expansionary devaluation theory. According to a study by (Gylfason,T and Risager, L, 1984) devaluations tend to be expansionary in wealthy countries and contractionary in developing ones. (Haile K, 1999) Used a macro simulation approach to examine how devaluation would affect Ethiopia's macroeconomic performance and discovered that while it would reduce output and employment, it would increase the current account balance. (Yilkal, 2014) Uses a vector auto-regression model to examine short and long run impact of currency depreciation on Ethiopia's economic growth results demonstrate that Depreciations of currencies are neutral in short term and contractionary in long run. A macroeconomic model for Ethiopia was also given a macro-simulation method by, (Taye, 1999) He applied vector error correction (VECM) and structural VAR models, and his findings showed depreciation has a beneficial effect on trade balance since it reduces imports. In his conclusion, he observed that devaluation worsens Ethiopia's balance of payments.

Using time series data spanning 30 years,(Fikreyesus and Menasbo, 2012) investigated impact of the Birr depreciation on Ethiopia's trade balance. Descriptive analysis and regression econometrics were utilized as analytical methods. The Ethiopian trade balance was found to be positively correlated with real GDP and real effective exchange rate index, but negatively correlated with currency devaluation is adversely related with real GDP and real effective exchange rate index.

Studies on the relation-ship between currency devaluation and trade balance, such as those looking at how Ethiopia's trade balance is affected by exchange rate fluctuations(Lencho, 2013)and trade balance and exchange rate relationship (Gebeyehu, 2014) Johnson's Co-integration approach was used to investigate the data. However, Johnson's Co-integration is among the most extensively utilized time series analysis techniques and more reliable in large time series data so this technique not advice in small time series data due to spurious result (Narayan, 2004)relatively, In time series data, the autoregressive distributed lag approach is more advantageous over the Johnsons method (Harris, 1999); (Narayan, 2004) and (Chaudhary, 2016).so to overcome this limitation and to provide trustworthy empirical results and overcome the bias problem brought on by small sample sizes, use the autoregressive distributed lag technique.

Study took place by (Ayegegn, 2021) Employing vector error correction (VECM), analyze the effect of devaluation's on Ethiopia's trade balance models using with export, import, and nominal effective exchange rate variables. However, he overlooks crucial control explanatory variables like real GDP and real effective exchange rate. So, to overcome this limitation this study attempted additional variables, such as the real effective exchange rate, real domestic product, trade openness, and domestic inflation, and Foreign exchange reserve are incorporated into the model to help the study reach its objective and addressing the research question. It also used the Autoregressive distributed lag method to analyze relationship between currency devaluation and trade balance in Ethiopia.

1.3 Research Questions

- Does Ethiopia meet the Marshall- Lerner condition?
- How does Ethiopia's trade balance change as a result of currency devaluation?
- What are the short- and long-term effects of devaluation of birr on Ethiopia's trade balance?

1.4 Objectives of the Study

1.4.1 General objective

The major objective of this study to investigate the relation -ships between Ethiopia's trade balances and currency devaluation.

1.4.2 Specific Objective

- To determine whether the Marshall- Lerner condition holds in Ethiopia.
- To estimate effect of the exchange rate devaluation on trade balance using empirical data.
- To assess the short- and long-term consequences of currency devaluation on trade balance of Ethiopia.

1.5 Significance of the study

For a variety of reasons, economic policy should consider whether the merchandise Changes in exchange rates have an influence both short and long run on the trade balance. It establishes if the exchange rate and merchandise trade balance have a steady long-term relation. It is critical to keep track of whether depreciation helps the country's trade balance. If there is no such long-term relation, a country's ability to compete internationally is not increased over time by weakening its currency. The consequences of exchange rate fluctuations on the balance are described in detail for both the short- and long-term.

Most less developed nations now deal with foreign exchange as their primary macroeconomic policy concern, and currency devaluation is one of the key elements that affect a nation's macroeconomic performance. Policymakers should therefore consider the anticipated impact of depreciation on trade balance and economic growth when conducting studies like this one. It will provide the reader with evidence on Ethiopia's trade balance has suffered as a result of the birr's depreciation. Additionally, this work might inspire additional investigation on the subject.

1.6 Scope of the study

This study investigates the relationships between currency devaluation and trade balance in Ethiopia with marshal- Lerner condition testing. To accomplish this goal the data ranges from 1992 to 2022, when Ethiopia's currency was devalued. The time was chosen due to the availability of statistics, because Ethiopia began devaluing their currency at this time and has continued until now.

1.7 Limitation of the Study

The limitation arises from issue of several institutes provide inconsistent data. Statistics from the same institution can reveal disparities in results for the same year. Furthermore, the lack of long-term data series may limit our conclusions.

1.8 Organization of the Paper

There are six chapters in this paper. The first chapter contains the study's background, a problem statement, the study's objective, the research question, significant of the study, the scope of the study, and the study's limitations. The second chapter contains reviews of theoretical and empirical literature. Chapter three contains Ethiopia's foreign exchange regime and trade balance. The fourth chapter examines model formulation and methods; chapter five contains findings of study. Chapter six contains conclusion and recommendation.

Chapter two

Review of literature

2.1 Theoretical Literature

2.1.1 Theory of exchange rate

2.1.1.1 Definition and Types of Exchange rate

A country's currency is valued in terms of another country's currency is the definition of exchange rate. Home currency and foreign currency, which may be expressed explicitly or indirectly, are the two halves of an exchange rate. The price of a unit of foreign currency stated in terms of domestic currency in a straight quotation. In an indirect quote, the price of a unit of domestic currency is expressed in terms of foreign currency. Like most products and services, the purchasing power of a country's currency may be determined by examining its supply and demand. For instance, if there is more demand for the dollar, the price will rise (causing a gain in value), whereas if there is more supply, the price will fall (causing a depreciation).To purchase abroad products and services, as well as export money, drives our need for foreign currency. The revenues from the export of a range of products and services, as well as payments received unilaterally from other nations, comprise a country's foreign exchange reserves (J, 1993).

Based on theory, there are primarily two types of exchange rates: nominal and real exchange rates.

i Nominal exchange rate

The nominal exchange rate is a monetary concept that sets the relative value of two currencies. It is sometimes referred to as the price of one currency in respect to another (Edward, 1987). There are two distinct quoting methods for nominal exchange rates. The amount of local currency needed to exchange for each unit of foreign currency is how the price quotation system establishes the exchange rate. We use a volume quotation system to calculate the amount of foreign currency split by the amount of local currency (Gandolfo, 2002; Keith, 2006).

ii Real exchange rate

This shows actual exchange rate helps assesses the relative costs of locally produced and imported commodities. It serves as a helpful variable that assesses competitiveness for explanations of the trade balance, trade behavior, and national income. (Barry,2004). In a two-sector which is tradable and non-tradable, relative pricing, which calculates the opportunity cost of locally produced tradable commodities, is what drives this definition. Only traded items satisfy the long-run PPP, and the real exchange rate over the long run depends on how productive traded vs untraded goods are in the domestic and foreign economies (Balassa, 1964)

2.1.1.2 Exchange rate Regimes

2.1.1.2.1 Fixed exchange rate Regime

A pegged or strictly controlled exchange rate system is the first type of exchange rate regime. Market intervention is made by the government or central bank to keep exchange rate substantially near to a target rate in a fixed-rate system. Monetary policy cannot be used to impact the exchange rate. In contrast, the central bank can use fiscal expansion to inflate currency demand and boost domestic output. Then, in order to increase the money supply while preventing an increase in interest rates and a rise in the value of the currency, the central bank will buy foreign assets.

To avoid unintentional instability of the home currency, country with a fixed exchange rate will want to restrict the amount of money entering and exiting the country. However, there are disadvantages to this sort of exchange rate regime, including the necessity for the government to amass considerable foreign exchange reserves, which is a significant burden (Mannur, 1995)

2.1.1.2.2 Floating exchange rate Regime

The supply and demand in the foreign exchange market determine exchange rates. As a result, depending on the relative strength of foreign exchange supply and demand, different exchange rates might be found on the market. Under this regime, the foreign exchange rate appreciates and depreciates, bringing the BOP to balance. However, whether an automatic exchange rate adjustment and BOP reaches equilibrium is determined by the supply and demand elasticity for exports and imports.

Different factors support to use floating exchange rates regimes. One is that pegging a country's currency to another currency can be difficult (Tew Bain, 1982). Incorporating the black markets into the main stream of commerce is another justification. Additionally, the flexible exchange rates are advised in IMF and World Bank policy recommendations. (Tew Bain, 1982). However, in order for the floating exchange rate system to function properly, both the local currency market and the internal foreign exchange market must be formed (Helmers, 1988).

2.1.1.2.3 Managed exchange rate regime

Both fixed and floating exchange rates are employed in a controlled floating exchange rate system. It enables the market to adjust the exchange rate and reach its equilibrium level while also enabling the government to intervene in the currency market. Currency trading or another strategy may be employed when action is required to safeguard the national currency, trade balance, and economy from external shocks.

2.1.2 Definition of devaluation

Devaluation refers to a decrease value of currency in value in comparison to other currencies. Devaluation according to (Teklebrhane Weldemichael, 1992) referred decrease exchange rate, in terms of gold or silver, of a nation's monetary units. As a result of the demonetization of gold, national currencies pegged to the USD, other currencies, the IMF's Special Drawing Rights (SDR), and other composite currencies are depreciating.

There are several reasons why a country would desire to undertake an exchange rate depreciation plan, but the major one is the requirement to resolve financial problems brought on by a high exchange rate value. According to (Sohmen, 1961) Currency overvaluation is impediment to economic progress. The primary cause government must give domestic manufacturers with subsidies due to the inflated exchange rate, which reduces the resources available for development expenditures.

Devaluation operates through the effect of switching and lowering expenditures. The relative price fluctuations between exportable and non-exportable products are how the switching of expenditures occurs. By shifting aggregate supply to tradable and aggregate demand to non-tradable, devaluation is anticipated to increase the price of exportable compared to non-tradable. As a consequence, export earnings would increase, increasing the current account and, consequently, the balance of payments. Along with shifts production from non-tradable domestic commodities to tradable ones, import substitution shifts (Guitian 1982:28).

The devaluation's effect on reducing spending is correlated with the increase in import prices, which lowers private financial wealth and spending. Therefore, Devaluation reduces the pace of increase in overall demand for goods and services by reducing the actual worth of nominal assets, resulting in a decrease in their demand. According's to (Guitian 1982:28) there are three alternative methods for analyzing based on the concerns stated, how devaluation will affect the trade balance. The monetary approach, the elasticity method, and the absorption technique are three approaches.

2.1.2.1 The elasticity approach

(Jean Robinson and Lloyd Mtezler,, 1948) Proposed this technique in 1948 this method focuses on the trade balance may be changed by the exchange rate. At the core of this perspective are the substitution impacts in consumption and production brought on by relative price changes (local versus global) brought on by a devaluation. However, the absolute values of the total demand elasticity for exports and imports must also be greater than unity (Marshall Lerner condition) for devaluation to improve the trade balance. Whenever the Marshal-Lerner requirement is met, currency depreciation or devaluation will result in lower export prices for the devaluing nation or the nation whose currency is depreciating while raising import prices. As a result of discouraging imports, Devaluation/depreciation allows a country to boost export income by raising exports and decreasing import costs.

Devaluation has two effects on export pricing: it raises local currency prices and lowers export currency prices. It will affect the trade balance by increasing domestic demand for and production of import alternatives, decreasing domestic demand for imports, and raising export demand both domestically and internationally. Devaluation's ability to improve trade balance, nevertheless, depends on how people respond to price changes, which depend on a variety of demand and supply elasticity. The efficiency of devaluation as a method of payment adjustment is fundamentally hampered by supply inelasticity, which is defined as a delayed response of export supply to increased foreign demand brought on by a drop in relative pricing of exports.

According to the elasticity method in the short run, devaluation or depreciation may affect the trade balance as both exports and imports require time to react changes in relative pricing. However, as the trade balance of the devaluing nation improves due to rising export volumes and lowering import levels (substitution impact), the elasticity of export and import grows over time, a process known as the j-curve phenomenon. The demand and supply for foreign currency can also show the effects of depreciation. As a result, the impact on the demand for foreign currency depends on how price-sensitive domestic demand for imports is. The impact on foreign exchange supply is defined by the elasticity of supply in response to increased profits in the export industry and the elasticity of demand for exports at foreign prices if only domestic prices are affected by the devaluation.

2.1.2.2 The absorption approach

(Carbough, International Economics .New york., 2006) The absorption strategy considers two points to provide insights into how the nation responds to devaluation. In absorption approach trade balance is the difference between domestic consumption and overall production. If total domestic output is higher than total domestic expenditure, the trade balance is positive; otherwise, it is negative.

The absorption technique assumes that total spending is made up of consumption (C), investment (I), government spending (G), and net export (X-M), and it equals the value of total domestic production (Y).

This can be written as:

$$Y = C + I + G + (X - M) \qquad \text{equation} \quad (1)$$

The absorption approach combines three economic aggregates C, I, and G, which are commonly referred to as absorption (Rødseth A. , 2000). We can turn this in to a single word 'A' while allowing net export (X -M) be shows by 'Z'. Total domestic production equals the total of absorption + net exports (X - M), and formula 1 may be rewritten by inserting 'A' and 'Z'.

$$Y=A+Z \qquad (2)$$

Then to get the balance of trade A has to be expressed in terms of Y and Z

$$Z = Y - A \qquad (3)$$

From Equation 2, the economy's trade balance will be positive if national production (Y) surpasses domestic absorption (A). A negative trade balance, on the other hand, indicates that the economy is spending more than it can generate (Carbough, International Economics .New york., 2006).

According to the absorption approach, output must increase in relation to absorption if currency depreciation is to improve an economy's trade balance. This suggests that the nation needs to increase total production, reduce absorption, or combine the two.

According to (Cooper, 1972) claims that works when economy is operating less than full capacity because The price incentive of devaluation tends to encourage expenditure away from imported replacements and towards domestically produced substitutes while also promoting the use of idle resources in the creation of commodities for export. When an economy is fully employed, the only option to improve the trade balance is for it to reduce domestic consumption, freeing up resources for the creation of new export goods and import replacements.

2.1.2.3 The monetary approach

The monetary method created by Kahn (1951), Johnson (1968) and Meddle (1968), (Carbough, International Economics .New york., 2006) defined the monetary strategy as a rise in price level (i.e., domestic currency price of importable and exportable commodities) would result from a depreciation of home currency. The demand for money increases because larger quantities of money are needed for transactions. Money leaves the country if domestic resources are unable to keep up with the rising demand. This surge boosts foreign reserves and results in a balance of payments surplus. The surplus won't last forever, though. Devaluation reduces the surplus by increasing the part of the home country's money supply that is spent. The surplus progressively disappears once the home country's money market is back in equilibrium. Devaluations therefore only have a short-term impact on actual economic indicators.

According to (Krugman and Taylor, 1977) Devaluation drives up prices, increasing the demand for money at any given level of employment and production, hence devaluation is likely to limit the pace of monetary base expansion, resulting in a deflationary impact. Changes in exchange rates are viewed as incapable of causing long-term changes in the balance of payments under this approach. Changes in the exchange rate, according to this hypothesis, are unable to generate long-term changes in the balance of payments.

The monetary approach contends that the movement of reserves is what brings about the restoration of monetary equilibrium, and that once stock equilibrium is achieved, the movement of reserves will stop. So long as authorities do not sterilize the impacts of changes in reserves by offsetting differences in domestic credit growth, balance of payment issues are viewed as generally transient and self-correcting.

2.1.3 Effect of devaluation on trade balance

According to (Mannur, 1995), devaluation can be useful in promoting exports if the tradable has no import component. Devaluation tends to raise the price of imported raw materials and other components required by companies if they have an import component. As a result, export prices must rise in addition to input prices, and devaluation may not have the anticipated export promotion benefits.

Devaluation affects imports from the devaluing nation in a variety of ways. By depressing demand and promoting import substitution for manufacturing and consumption, it boosts the domestic price of imports. Increased funds from export revenues led to the acquisition of capital goods for investment activities in Least Developed Countries (LDCs) due to the nature of their economies (Eladamic and Aron, 1992).

According's to (Gylfason, 1991) the importance of devaluation in improving trade balance in specific circumstances. Devaluation, they argue, can be an effective and acceptable strategy if (i) it is accompanied by domestic monetary discipline, (ii) real wages are allowed to fall at least sufficiently to keep employment from falling, and (iii) at least sufficient foreign capital is obtained to keep GDP from falling.

2.1.3.1 Price effect versus volume effect of devaluation

Price effects and volume effects are the two diametrically opposed consequences of devaluation. Devaluation damages a nation's current account balance by making imports more costly as compared to the exports of the depreciating nation. This is how devaluation affects prices. The volume effect, which might help the current account, is the second consequence of devaluation. As imports become more expensive and exports more affordable, the amount of imports decreases. The price and volume effects of devaluation may be advantageous, detrimental, or have no impact at all on a nation's current account.

2.2 Empirical Literature Review

Numerous studies have been done to show how exchange rate variations affect the trade balances of industrialized and developing countries. Despite the facts, (Onafowora, 2003), confirms theoretical and empirical research on the impact of the exchange rate on trade balance. Regarding their connections and the efficacy of currency depreciation as a strategy to improve a nation's trade balance, there is still a great deal of debate.

Study by (Rincon 1998) the short- and long-term interactions among both monetary and absorption methods were used to analyze Columbia's exchange rate and trade balance. The study found that the influence of the exchange rate on Columbia's trade balance was minimal over the medium and long terms, using econometric techniques such as the co-integration of Johansen and the Vector Error Correction Model (VECM). (SHAO, 2008)conducted analysis on the relation-ship between the trade balance and currency rate volatility. Using quarterly data from 1980Q1 to 2006Q4, an empirical research of the Japanese case was carried out using Johansen co-integration. In spite of the possibility of a short-term trade surplus, this study questions the long-term effects of exchange rate adjustments on the trade balance.

The study by (Rawlins, G. and Praveen, J., 2000) uses distributed lag technique of trade balance employing annual data was used to investigate the influence of devaluation on the trade balance of a sample of 19 Sub-Saharan African republics. Their findings show that real exchange rates recover to pre-depreciation levels and that a country's trade balance improves the year after depreciation.

The study by (Baharumshah, 2001) The interaction between the exchange rate and the trade balance was examined Thailand and Malaysia's bilateral trade with United States and Japan from 1980 to 1996. He used a VAR model with no constraints and discovered that two variables had a stables and favorable long-term relationship. Similarly, the empirical study by (Agbola, 2004) utilizing Devaluation did not enhance Ghana's trade balance, according to the Stock-Watson dynamic Ordinary Least Squares model (DOLS) and the Johansen multivariate cointegration process. In Contrary, (Sugema, 2005) investigated the influence of the actual exchange rate on Indonesia's trade balance.

Study by (Mai, 2014) Utilizing monthly data from January 2008 to January 2012, examine the impact of the real exchange rate on Vietnam's trade balance. His conclusion is that there is no proof of a relationship between the real effective exchange rate, the trade balance, and domestic output. In the case of Vietnam, the J-curve pattern is incorrect, and the country's declining real exchange rate has a detrimental effect on the trade balance. On the other hand, modifications to the trade balance are mostly unaffected by the actual exchange rate. Similarly, study by (Musawa, 2014) evaluated the Zambia's currency rates and trade balances are linked. According to study there is no long-term or short-term link In Zambia, Actual exchange rates and the trade balance has relation.

Study by (Selena Begović, Sead Kreso, 2018)Investigate negative impact of changes in using a fixed effect model for static estimation and the expanded technique of moments for dynamic estimation; we assess the impact of actual effective exchange rates on trade balance in European transition countries. The conclusion indicates REER had negative impact on trade balance in European transition nations between 2000 and 2015. Because of their large reliance on imports and limited export potential, European transition nations' trade balances suffer as REER depreciates.

1.2.1 Reviews of empirical evidence in Ethiopia

Numerous researches on the relationship between the trade balance and the currency rate have been conducted in Ethiopia. Majority of research's came to the conclusion that Currency depreciation is adverse to the trade balance, however some of them also found that devaluation has a beneficial impact. Nevertheless, there is disagreement over whether a country's current account will ultimately improve or deteriorate as a result of currency devaluation.

In their investigation of how the 1992 devaluation could have affected Ethiopia's trade balance, (Befikadu, D. and Kibere, M., 1994), noted that both imports and import substitute items are uncertain to respond to price adjustments in the short-to-medium term. They claim that if the Birr depreciation is successful in decreasing imports, it will most likely result in reduced capacity utilization and, as a result, lower production growth. , The economy's growth would be sacrificed in order to reduce the current account deficit. Despite their importance, increases in domestic currency prices are absolutely insufficient to increase the volume of exportable commodities. Additionally, they contended that the ability to convert the rise in demand into actual imports was made possible by the increased foreign exchange availability brought about by increased exports and simpler access to foreign money.

Using the elasticity technique, (Haile Kibret, 1994) aimed to assess how depreciation would affect the trade balance. He claims that overall export and import elasticity is more than one. Ethiopia's trade balance was initially negative and it is also insufficient to meet the Marshal-

Learner criteria. Although devaluation may result in inflation, he concluded that it will have directly relation.
Study by (Sintayoh WeldeMichael, 1996)Works research on the influence of devaluation on macroeconomic variables such as price, trade balance, and production, Ethiopia's the import rate is significantly larger than the export rate. Devaluation may not enhance the country's trade balance. This shows that The Marshal- Lerner condition is no longer adequate and that greater sums of price elasticity are anticipated.

(Kebede, 2011) The effect of the real exchange rate on Ethiopia's overall exports and the degree to which it affects the nation's particular export commodity were both investigated. He used the Gravity model and found that the GDP of countries that import Ethiopian commodities and the economic growth of Ethiopia had a significant influence on Ethiopia's export. The Gravity model found that the exchange rate's impact was not statistically negligible. Accordingly, it may be concluded that Ethiopian exports are unaffected by changes in the exchange rate, including devaluations.
Study by (Fikreyesus and Menasbo, 2012) investigated the effect of the Birr devaluation on Ethiopia's trade balance using data spanning 30 years. As a result, regression econometrics and statistical analysis were applied as analytical techniques. Real GDP and the Real Effective Exchange Rate Index, according to OLS estimates, were positively correlated with Ethiopia's trade balance, but currency depreciation was negatively correlated with trade balance. They came to the conclusion that improving the trade balance was not likely to result from currency devaluation.

As study by (Lencho, 2013) devaluating in the long term, currency will increase the nation's trade deficit. Largely dependent on agricultural products and are highly susceptible to external shocks, are price inelastic and exports are extremely price elastic. As a result, anytime a country depreciates its currency, the trade balance worsens.

(Abebe, 2014) Explores the relation-ship among Ethiopia's trade balance and exchange rate He investigated the connection between the country's trade status and exchange rate using VAR and VECM methodologies. The study found that actual devaluation temporarily hurts trade balance before it improves. Each variable's forecast error variance indicates movement caused by both the variable's own shock and shocks from shocks in other variables. The trade balance's variance decomposition reveals that a change in shock is the primary cause of variation in the trade balance's logarithm.

Ethiopian External Sector Development and the Real Effective Exchange Rate (Kassie, 2015) used a descriptive approach to account for the two significant devaluation periods from 1985-1986 to 2012-2013 to examine the movement of Ethiopia's real effective exchange rate as well as the growth of its external sectors, including export, import, and trade balance. The findings reveal that, even when the actual effective exchange rate lowers, our import performance stays stable. As a result, while export growth increased when the real effective exchange rate fell, the trade balance account did not improve since import growth outpaced export growth.

Haile (2018) used annual data from 1980 to 2003 to assess the impact of depreciation on Ethiopia's trade balance. Using the method of ordinary least squares (OLS) and instrumental variables, he calculates demand for exports and imports. Before determining that currency depreciation had affected Ethiopia's trade balance, he used a co-integration approach and an error correcting model.

Based on the theoretical and empirical literature discussed above, the preponderance of empirical evidence on the impact of currency depreciation on trade balance shows that the depreciation of the ETB has harmed rather than benefited the country's trade balance. This situation inspires me to perform study by including the domestic inflation, trade opens and foreign exchange reserve. This study will examine Currency devolution and trade balance relationship with marshal-Lerner condition testing for Ethiopia from period stemming from 1992 to 2022 and This research employ the Autoregressive distributed lag approach to demonstrate the relation –ship of effective exchange rate and trade balance, and this method will give credible empirical evidence while avoiding the problem of bias caused by small sample size compare to Johnson’s Co-integration technique because this paper cover 30 years data by consider of the time is short the study will uses Autoregressive distributed lag method and this study incorporates extra variables in to model like, trade openness, domestic inflation, Real effective exchange rate, real domestic product and Foreign exchange reserve.

Chapter Three

Ethiopia's Foreign Exchange Regime and Trade Balance

3.1 Foreign Exchange Regime

The Ethiopian legal currency was introduced on July 23, 1945, and an official exchange rate against the US dollar was established. The currency's first name was the Ethiopian Dollar, and its gold content was 0.357690 gram, or 2.48 Birr per US$ (or 0.4025 US dollars). Prior to the fall of the Bretton Woods framework and the depreciation of the US dollar, the gold content was nearly constant. The Ethiopian currency was renamed Ethiopian Birr after 1976, although its value in respect to the dollar remained steady during Derg regimes. (Fentahun.B, 2011)

During the derg administration, the Ethiopian currency was tied to the US dollar at a rate of 2.07 birr per dollar until the severe devaluation in October 1992.For 20 years, this fixed official exchange rate stayed steady. As a result, the birr is expensive in comparison to the US dollar and many other foreign currencies. (Derress Degefa, 2001)

The primary purpose of Ethiopia's currency devaluation exchange rate strategy is to promote exports while mitigating the negative consequences of exchange rate volatility. It also intends to close the disparity across the effective exchange rate, which demonstrates that the birr's overvaluation has fallen dramatically, and the parallel market exchange rate premium, which has also decreased greatly(Zerayehu .S, 2006)

History of Ethiopian currency rate policy may be divided into four primary periods: before 1992, Heavy devaluation (October 1992-May 1993), the auction system (1993-1998), and the interbank exchange rate system (after 1998) were all implemented.

i. The Period before 1992

This time period encompasses the years preceding the country's big currency depreciation in 1992.During this time, Ethiopia had two political regime changes: the Derg regime from 1974 to 1991 and the Imperial regime from 1898 to 1974. With relatively stringent regulations on system-related activity, both political regimes adopted the fixed exchange rate system. With the exception of minor revisions in 1964, 1971, and 1973, the Ethiopian currency against the US dollar remained steady for over 50 years, until October 1992. (Gezahegn, 1993) cited the following justifications for why Ethiopian authorities had kept a fixed currency rate in place for so long. First, The Bretton Woods accords, which advocated fixed exchange rates throughout the system's collapse in 1973, had the authorities' genuine backing. The official depreciation of the currency was viewed as a failure despite pressure from both internal and external sources, which are the second justification for decisions keep fixed exchange rate. The worry of devaluation's impact on inflation was the other justification.

The reasons for the continued existence of an unchanged exchange rate were identified by (Eyob T. , 2001) Economic structural characteristics such as a less diverse industrial structure, low capital mobility, and less developed financial markets were supposed to provide domestic currency stability, whereas flexible exchange rate regimes were thought to result in surprisingly high exchange rates. The retention of a fixed exchange rate system was defined by strict exchange control measures and exchange constraints throughout the Derg regime, in particular. Some of these approaches include quantitative import limits, the transfer of foreign exchange earnings to the central bank, advance import deposits, and capital restrictions.

According to (Gezahegn, 1993), Ethiopia's financial activities, notably during the military regime, frequently broke down during the years before to 1992. The domestic policies of the Derg military regime were too expansive, particularly in terms of their military public spending.

ii. Intensive Devaluation Period (October 1992-May 1993)

The Ethiopian government initiated economic adjustments under the IMF's structural adjustment programs in the early 1990s. One of these measures was the currency rate policy. This exchange rate method enabled a seamless transition from a fixed exchange rate system to a more flexible one. Ethiopia initially employed consecutive currency depreciation, as have other developing countries, to reduce the difference among the official and black market exchange rates. Finally, it uses a system for determining interbank exchange rates. It has gradually gotten away from a fixed exchange rate system by doing this. In October 1992, the local currency was devalued from 2.07 Birr/USD to 5.00 Birr/USD in order to alleviate the balance of payments deficit by discouraging demand for imports and increasing export demand.

iii. Auction Systems (1993 -1998)

The auction mechanism used in Ethiopia is named after one used for years in the Dutch flower trade. Flower farmers took the decision to become less dependents on customers hundreds of years ago, and they discovered an auction where they brought all of their flowers together to decide their pricing. Unlike traditional auctions, it functions on a clock system in which the auctioneer sets the highest possible price and it continues to decline until the bidder finds the price acceptable (demonstrating supply and demand equilibrium). Counterbidding is not allowed during the clock auction, which is also performed backward with prices falling. A decrease in price is shown by the movement of the price indicator on the clock (Ticker Management Talk, 2009). The discriminating or Dutch auction system and the competitive or marginal price auction system are the two basic methods that an auction system may be used to fix the exchange rate. Ethiopia's currency rate auction system is an example of a discriminating or Dutch auction system. This method distributes foreign money to winning bidders at their individual bid prices until all available foreign cash was depleted (Degefa, 2001)

On May 1, 1993, the National Bank of Ethiopia (NBE) implemented the Dutch auction system of currency rate setting in order to fulfill the following goals (NBE 2000,). The primary goals were to enable the exchange rate to adapt to changes in foreign exchange market demand and supply. The second goal was to secure the rapid and timely availability of foreign currency to complete critical transactions. The third goal was to reduce the use of administrative mechanisms in foreign exchange allocation, to encourage trade liberalization by relaxing, and ultimately, to abolish limits on exports and foreign payments, therefore increasing the amount of external commerce.

iv. Inter Bank Exchange Rate Determination (since 1998)

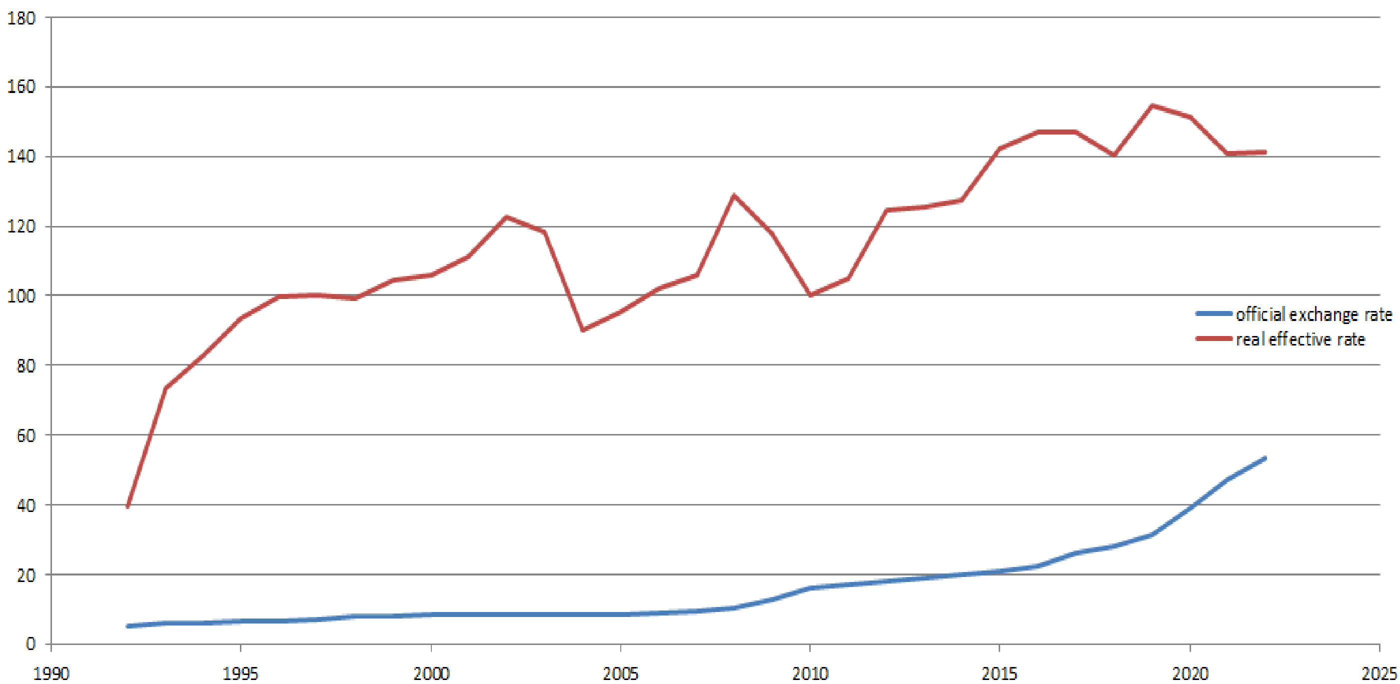
The most recent milestone in Ethiopia's currency rate liberalization has been the establishment of an inter-bank exchange rate determination mechanism. The auction system, according to (Degefa, 2001) failed to meet commercial banks' demand for foreign currency because the amount of foreign currency purchased from NBE was insufficient to cover the demand from their customers, which exceeded the amount of foreign currency purchased from NBE. On the other side, certain commercial banks might amass too much foreign cash, exceeding both their capacity for use and the maximum amount they are permitted to keep in their safe deposit box.

The establishment of foreign exchange bureaus gave them permission to conduct any authorized spot/cash external current account transactions. Exchange sales are subject to taxation. Authorized dealers may charge up to 0.25% on purchases and 1% on sales for their personal accounts, but they must conform to a 1.5% commission on sales that goes to the National Bank of Ethiopia. After the National Bank of Ethiopia assigned this role to commercial banks, they are now responsible for evaluating whether purchasers and sellers of foreign exchange are in compliance with import and export license requirements and foreign exchange regulation (IMF, 2000).

The transition from the wholesale international auction market to the inter-bank market is a key step toward building a flexible exchange rate and complicated market structure. Transactions between banks and their clients, as well as agreements between them, impact the exchange rate in the interbank system. The conversion rate is fully variable, changing from hour to hour and day to day. However, the NBE imposed maximum and minimum limitations on the amount of foreign currency that commercial banks might hold in order to keep the market competitive. According to (Eyob T. , 2001)), these restrictions have two basic goals. First off, it aids in preventing banks from taking on too much exchange risk and preventing dealers from engaging in speculative activity. For instance, the size of the restrictions could be decided by taking into account the banks' prior working balances.

Second, a limit on the amount of foreign currency that may be surrendered to each commercial bank discourages banks from participating in collusive activity. Due to the disparity between the two markets, such a cap may be required in countries where the economy's foreign exchange revenues are concentrated in one or a small number of big transactions, which might then funnel all of their foreign exchange earnings to a single exchange dealer. In an interbank agreement, the surrender requirement for foreign exchange is less rigorous than in an auction system, yet it may still be substantially controlled by the private sector. The national bank may set aside a portion of the funds under an interbank agreement for certain objectives, such as paying off foreign debt commitments. (Eyob T. , 2001)

Figure 3.1 show trend for official exchange rate and real effective exchange rate of Ethiopia (1992-2022)



Source: International monetary fund (IMF) and National bank of Ethiopia (NBE, 2022)

The graph above illustrates that official exchange rate is steadily increasing (the local currency per foreign currency depreciates). it gradually grows from 1992 to 2009, it rapidly climbs from 2010 to 2012 and dramatically increases from 2016 to 2022. Whereas, the actual effective exchange rate increased continuously from 1992 to 2003. However, it decreased significantly in 2004, and since then, the actual effective exchange rate trend has moved upward and downward because the price movement of depreciation currency. This is due to the fact that the real effective exchange rate measures the value of a local currency in relation to a weighted average of several foreign currencies divided by a price deflator.

3.2 Ethiopian Exports, Imports, and Trade Balance Structure and Trends

Ethiopia's economy is distinguished by a greater percentage of primary agricultural product export concentration. Its imports, whereas capital goods, consumer goods, raw materials, and petroleum products are all included. This section provides a review of current export and import trends as trade balance components.

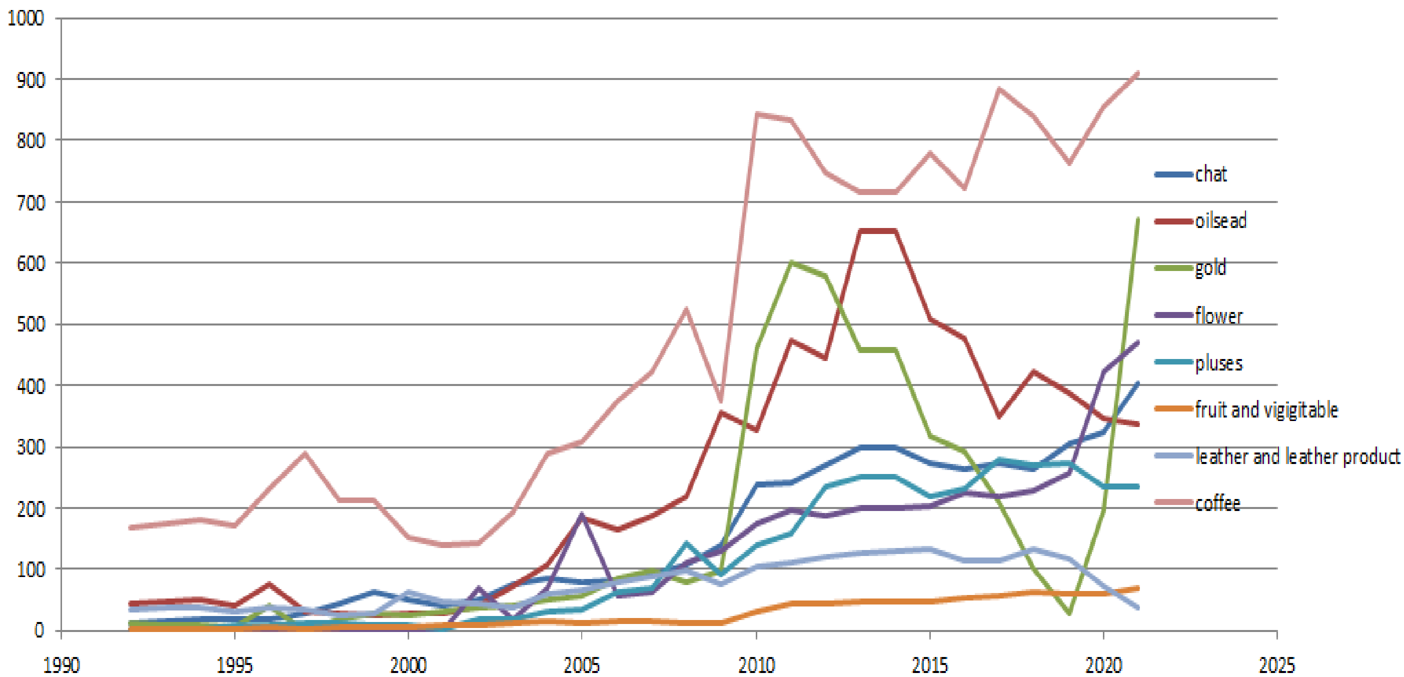
3.2.1 Ethiopia Exports

A country's degree of growth, resource endowment, policies, and development objectives influence its export structure. A large portion of Ethiopia's export system relies on agricultural goods. Up until recently, agricultural items made up more over 90% of all exports. Ethiopia's top exports are coffee, oilseeds, leather and leather goods, cereals, meat and animal products, fruits and vegetables, chat, and gold. The most major export among them is coffee.

According to the NBE 2020/21 report, total merchandise exports in Ethiopia amounted to USD 3.6 billion, representing a 21.1 percent annual growth due to higher export earnings from coffee (6.3 percent), gold (242%), flowers (11.4 percent), chat (24.1 percent), electricity (36.2 percent), fruits and vegetables (17.7 percent), and meat & meat products (11.7 percent). Coffee's proportion of total merchandise export sales fell to 25.1 percent from 28.6 percent the previous year. Similarly, gold exports produced USD 672 million, a 242 percent increase over the previous year. This was due to an 187.7 percent price rise. As a result, the percentage of overall export earnings from chat was 11.1 percent.

Fruit and vegetable export revenue grew 17.7 percent as export volume increased 16.0 percent and international prices increased 1.5 percent. However, their percentage of overall merchandise export receipts fell to 1.9 percent from 2.0 percent the previous year. Despite a 2.1 percent decline in international prices, receipts from meat and meat product export increased 11.7 percent over last year, owing entirely to a 14.1 percent rise in export volume. However, their percentage of overall export income was only 2.1 percent. Oilseed export revenues, on the other hand, fell 2.7 percent to USD 335.5 million due to a 6.3 percent drop in global prices, despite an increase in export volume of 3.8 percent.

Figure 3.2.The trends of major export item of Ethiopia since 1992-2021(in million USD dollars)



Source: Ethiopian Customs and Revenue Authority and National bank of Ethiopia (NBE, 2022)

From above figure, Coffee is the most important commodity, accounting for over half of total exports. As seen in the graph above, most export items increased modestly from 1992 to 2005, and from 2006 to 2009, coffee and oilseed increased significantly more than other main export items. In Ethiopia, the birr was devalued in 2010 following this devaluation almost all value export item is increase especially coffee, gold and oilseed increase higher than the other item and chat, leather and leather product, flower, pluses and fruit and vegetables are continues slightly increase up to 2021 except pluses and leather and leather product decrease since 2019 up to 2021. From 2015 to 2019, gold and oilseed export products have decreased significantly, with gold falling by 71.0 percent in volume and 3.9 percent in international price in 2019. The suspension of MIDROC Legadembi gold mine claims and the rampant illegal gold trade were the primary causes of the dismal performance in gold exports. As a result, gold's percentage of total merchandise export fell to 1.0 percent (NBE 2019) but recent time 2020 and 2021 the export of gold is strictly increased.

3.2.2 Ethiopia import

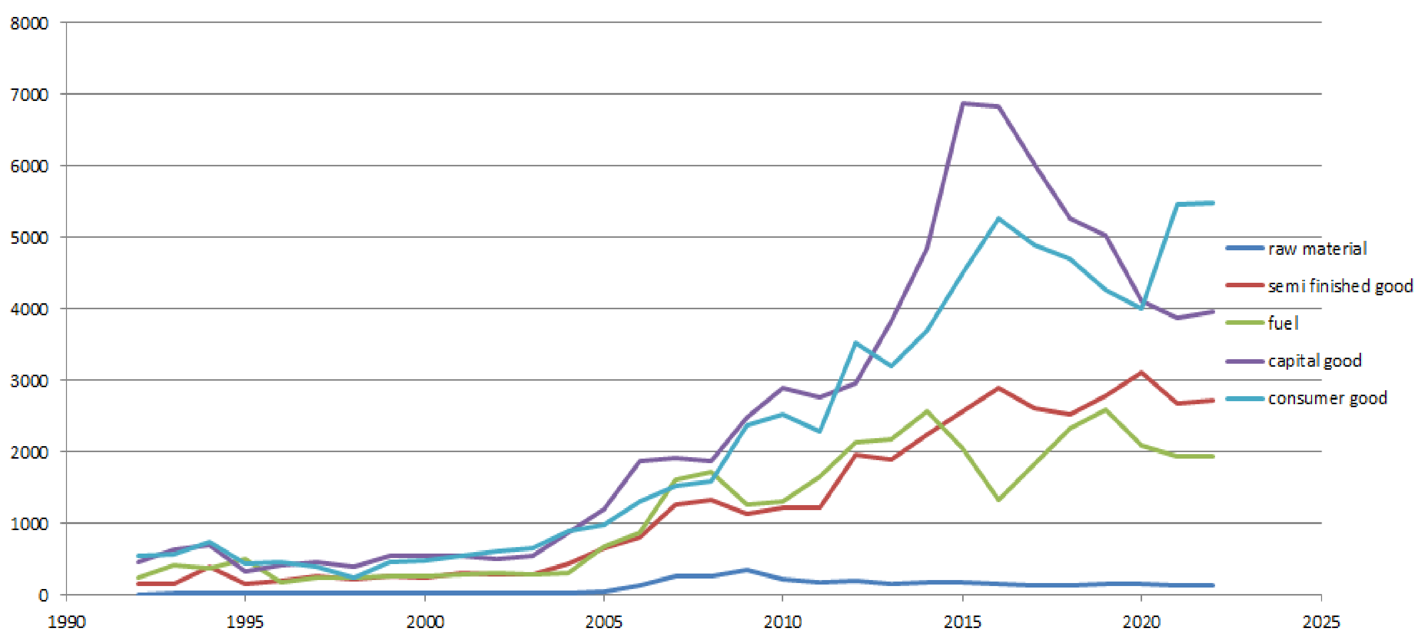
The level of growth, resource inheritance, legislation, and development strategies all have an impact on a country's import structure. According to the nature of the variables, Ethiopia's primary imports are raw materials, semi-finished goods, fuel, capital goods, and consumer goods.

According to the 2019/20 NBE report, Ethiopia's total product import bill totaled USD 13.9 billion, representing an 8.1 percent year-on-year decrease, owing mostly to decreased import bills of petroleum, capital goods, and consumer goods. Payments for semi-finished items, raw materials, and miscellaneous commodities, on the other hand, showed an annual increase. As a result, the import-to-GDP ratio fell to 12.9 percent from 15.8 percent a year before. Capital goods imports fell by 18.1% as the value of transportation capital goods fell by 72.2%, while industrial and agricultural capital goods climbed by 2.6 and 50.7 percent, respectively. As a result, the percentage of capital goods in overall merchandise imports fell from 33.3 percent to 29.7 percent. Similarly, gasoline imports fell by 19.7 percent to USD 2.1 billion as a consequence of a 17.3 percent decline in import price and a 2.9 percent loss in volume. As a result, the proportion of gasoline in total item import cost fell to 15.0 percent from 17.2 percent the previous year. Consumer goods imports were USD 4.0 billion, or around 6.1 percent less than last year, attributable to a 23.3 percent decrease in durable goods imports despite a modest (0.6 percent) increase in non-durable goods imports. Nonetheless, the percentage of consumer products in overall item import bill was 28.9 percent, up from 28.3 percent previous year. Semi-finished products imports increased by 11.9 percent year on year to USD 3.1 billion, while fertilizer imports increased by 19.6 percent. As a result, the proportion of semi-finished items in total merchandise imports increased to 22.4 percent from 18.4 percent the previous year

In the 2020/21 NBE report, overall product import bill reached USD 14.3 billion, a 2.9 percent rise over the previous fiscal year attributable mainly to greater consumer goods imports. As a result, the import-to-GDP ratio was 12.8 percent. The import bill for consumer products was

USD 5.5 billion, 36.4 percent more than the previous year, due to a 51.1 percent increase in non-durable goods imports despite a 12.8 percent decrease in durable goods imports a consequence, consumer products now account for 38.3 percent of all imported goods, up from 28.9 percent in 2019/20. Payments for capital goods imports fell 5.9 percent due to higher import prices of transportation goods (12%) and industrial capital goods (4.5%). Imports of agricultural capital goods, on the other hand, increased by 1.5 percent. As a result, the capital goods percentage of overall merchandise imports fell to 27.2 percent from 29.7 percent a year before. Similarly, the value of fuel imports fell 7.1 percent to USD 1.9 billion due to falls in international prices (5.2 percent) and import volume (1.9 percent). As a result, its percentage of total merchandise imports fell to 13.6 percent from 15.0 percent the previous year. Similarly, USD 2.7 million was paid for semi-finished products imports, which decreased by 13.8 percent despite a 15.2 percent increase in fertilizer imports. As a consequence, semi-finished items contributed for 18.8 percent of overall merchandise imports, down from 22.4 percent in 2019/20. Similarly, raw material imports fell 14.3 percent and accounted for 1.0 percent of total products import payments made a year earlier.

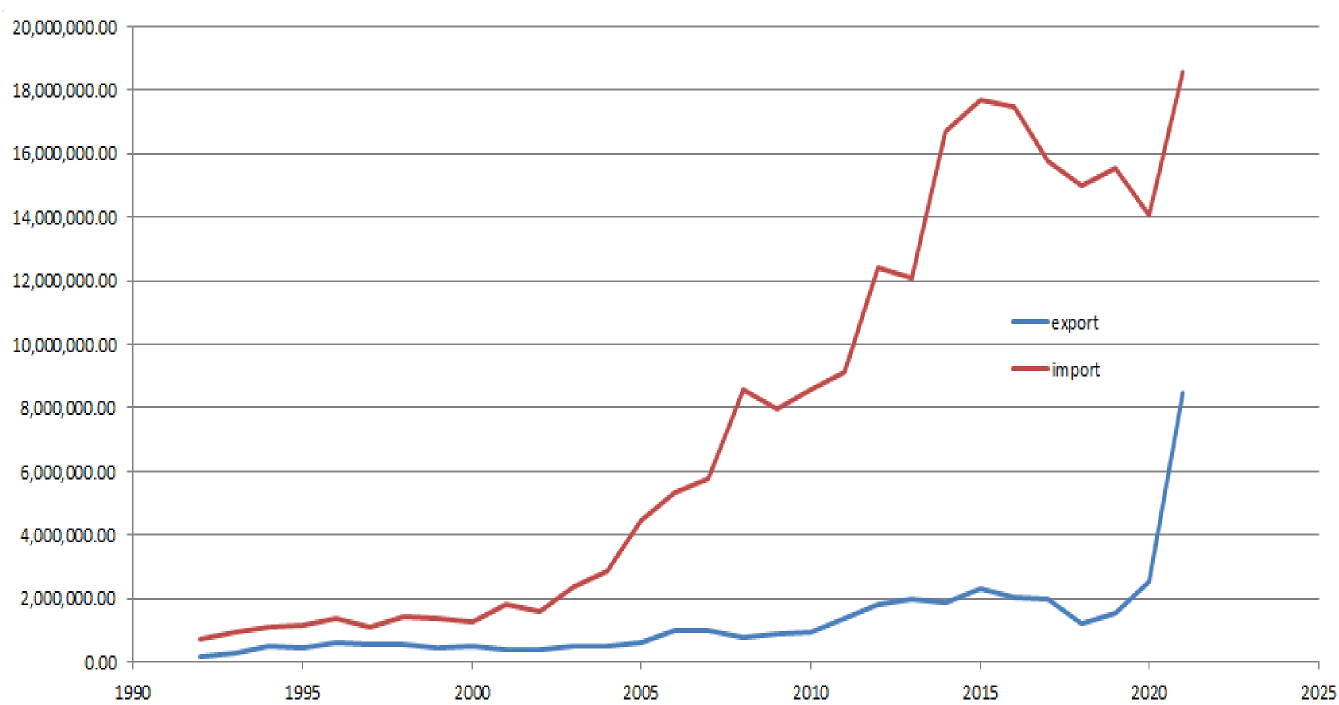
Figure 3.3 Trend of major import commodity since 1992-2021 (million USD dollars).



Source: Ethiopian Customs and Revenue Authority and National bank of Ethiopia (NBE, 2022)

According to the Ethiopian import structure detailed in the preceding figure, capital goods are the country's primary import value in each period up to 2020. Each item's import value increased modestly throughout the first thirteen years. Obviously, the birr was devalued in Ethiopia in 2010, and the value of capital goods imports fell as a result and consumer good strictly increased until 2015/16 and in 2017 the Ethiopia birr devaluated following this devaluation the value of imported of good decrease in each year except consumer good as the above figure shows consumer goods are increase after 2020. From above figure shows the value of import raw material is slightly constant in each year.

Figure 3.4 trends of total export and import from 1992 to 2022 (million in USA dollar)



Source: Ethiopia Custom and Revenue Authority and National bank of Ethiopia (NBE,2021)

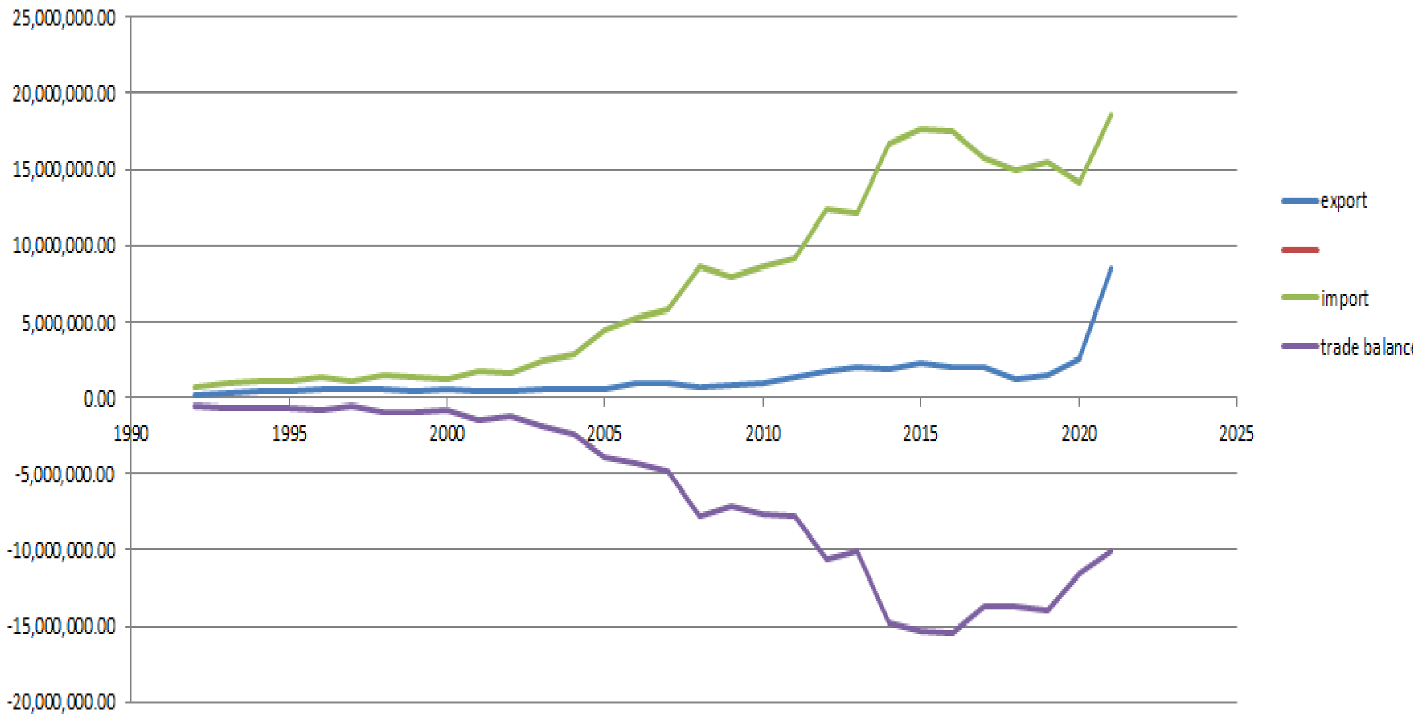
From above figure level import of country increase year to year especially from 2012 to 2016 and also increase in 2021 but the export slightly increase from 2011 to 2015 and from 2020 up to

2022 increase. From the above figure the country's trade balance has deteriorated as the discrepancy between import and export has widened. Although the 1992 devaluation was intended to encourage exports and improve trade balance however, imports strictly increase while exports remain nearly constant over period of time.

3.2.3 Trade balance of Ethiopia

A country's trade balance explains the monetary difference between its exports and imports during a specific time period. Either the trade balance is good or negative. A country's trade balance can be either positive (trade surplus) or negative (trade deficit) depending on whether its exports are worth more than its imports. Ethiopia too has an almost constant negative trade balance. This indicates that imports outpace exports in Ethiopia or are insufficient to pay for import expenses.

Figure 3.5 trends export, import and trade balance from 1992up to 2022(in million USD dollar)



Source: Ethiopia custom and revenue authority and national bank of Ethiopia (NBE, 2022)

For many years, almost all the trade balance of Sub-Saharan African countries has been negative Ethiopia, being a Sub-Saharan country, has a persistent trade imbalance despite devaluation efforts to stimulate exports. According to the above graph, the country's trade balance has been steadily deteriorating from 1992 to 2022, with imports increasing faster than exports and the trade deficit growing as exports have been unable to keep up with import growth. According to the graph above, the trade imbalance has been steadily expanding throughout this time. Due to widely accepted Ethiopian exports are distinguished by agricultural commodities and geographical attentiveness; on the other hand, due to the substantial reliance of export volume on agricultural productivity, which is Natural whimsy, high price elasticity, low income elasticity of demand, and poor supply responsiveness. And also, Ethiopian exports are undoubtedly once again highly vulnerable to external shocks. Imports are fundamentally price inelastic since they are either necessary in production or consumption or are a planned item that the economy requires on a regular basis.

Chapter Four

Data and Methodology

4.1 Model Specification

To investigate the relation-ship between exchange rate fluctuations and trade balance using the Trade balance equation Begin with a simple Keynesian equation for the trade balance equation, as Kruger (1983) suggests:

$$TB = F\,(Y,\ R_N P^*/\ P) \;\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where;

TB is the Trade Balance

Y is Real income

RN is Nominal exchange rate

P* is the Foreign Price Level

P is the Domestic Price Level

According to (Rawlins, 2011), including the monetarist concept of open economy following the assumptions provided by (Branson, 1983), equation (1) may be recast as;

$$TB = F\,(Y,\ Y^*,\ R) \;\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

This is based on Branson's (1983) assumptions that there is a global market where all items are perfect substitutes as stated by the Law of One Price, such that the price of a specific commodity in local and foreign currency is identical. Domestic and international financial assets are also excellent equivalents.

From equation (2), Y and Y* represent domestic and foreign earnings, respectively, and R represents the real exchange rate, which is consistent with the relative version of the purchasing power parity and may be represented as;

$$R = RNP^*/P \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

Where RN denotes the nominal exchange rate

The local and international pricing levels are denoted by P and P*, respectively.

Different studies have used controlled variables such as real exchange rate, real income at home and in the foreign nation to analyze the relationships between exchange rate and trade balance, either at the aggregate or bilateral level. (Bahmani - Oskooee. M and Brook T., p. 1999), and (Bahmaani-Oskooee and Cheema, 2009) and Rawlins (2011) are examples of research that employed that variable and constructed the model. Therefore, the model specification for the mentioned study using the simple trade balance equation can be expressed as in equation

$$TB = \beta_0 + \beta_1 R + \beta_2 Y + \beta_3 Y^* + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

Equation (4) can also express in natural logs; the actual model previous study from (4) is express as;

$$LnTB_t = \beta_0 + \beta_1 \ln R_{it} + \beta_2 \ln Y_{it} + \beta_3 \ln Y^*_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (5)$$

By considering the above trade balance model this study was to evaluate relation-ship between currency devaluation and trade balance in order to improve the accuracy of the results. The research included another crucial variable, trade openness, as defined by (Alem, 1996), domestic inflation, and foreign exchange reserves.

As a result, the trade balance model in this study estimates in the following expression linear log equation due to TB of Ethiopia negative express as:-

$$TB_{it} = \beta 0 + \beta_1 \ln R_{it} + \beta_2 \ln Y_{it} + \beta_3 \ln TOT_{it} + \beta_4 \ln INF_{it} + \beta_5 \ln FER_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots \quad (6)$$

Where:

TB is the Trade Balance

R is real effective exchange rate

Y is real domestic income

TOT is level of a country's openness of trade

INF is the inflation rate domestically.

FEA is the foreign exchange reserve

ε is the error term.

4.2. Definition of variables and sign expectations

The study's variables of interest are both theoretical and empirical considerations served as inspiration. The real effective exchange rate, real domestic product, trade openness, domestic inflation rate, and foreign exchange reserve were the study's key explanatory variables, and they were all influenced by the traditional trade balance framework.

Trade balance (TB): The monetary disparity between a country's entire exports and its entire imports for a certain time period. A country has a trade surpluses or a positive trade balance if its export earnings exceed its import payments. country's trade deficit, on the other hand, comes when its import payments exceed its export revenues. When the country's import payments and export revenues are equal, it maintains balanced trade during that time period.

Real Effective Exchange Rate (REER): A weighted average of many different foreign currencies split by a price deflator is used to calculate the value of a currency (WDI, 2015). It is a currency's weighted average value versus a basket of other major currencies, with inflation taken into account. According to Kipier and Kesriyeli (1997) and Walters and de Beer (1999), REER may be used to assess price competitiveness in international commerce. The REER may produce more accurate results when examining the link between the exchange rate and the trade balance on a collective rather than bilateral basis. The way exports and imports react to changes in the actual exchange rate has an impact on the trade balance. A country's trade balance is seen to be harmed by a decline in its real exchange rate (appreciation), whereas it is thought to be benefited by an increase in its real exchange rate (depreciation).

Real Domestic Product: A country's income level has a significant influence on the quantity of operations carried out by the nation in the worldwide market. That is, an economy's income level determines how much it can create in excess of local demand for export and how much it is able to spend on foreign items. As a result, this is crucial in estimating the trade balance at a specific exchange rate. At a given price level, an increase in domestic income boosts the economy's ability to buy both domestic and imported commodities. In other words, since domestic income and purchases have a positive connection, a gain in domestic income will result in a rise in imports. However, this rise in imports has a negative effect on the trade balance since the number of imports is a negative factor in the trade balance. The economy's trade balance would therefore decrease with an increase in domestic revenue, all else being equal, whereas a positive estimate is possible if a gain in domestic income reflects higher output of import replacement goods (Bahmani – Oskooee. M and Brook T., p. 1986).

Level of Trade Openness: It is defined as the GDP split between imports and exports. The extent to which an economy is open to international commerce affects the volume of import and export activity. The trade balance's proportional effects on exports and imports, as well as how rapidly they react to changes in absolute prices and exchange rates, are determined by this. The vast majority of empirical research have provided substantial and converging evidence linking higher exports and imports to high trade intensity in a nation (Wu and Zeng, 2008; Kasim 2013).said that since a country with a high level of international trade involvement has a larger volume of commerce, it may improve its trade balance. In other words, depreciation in the exchange rate may be able to provide the necessary increase in export supply to produce the requisite volume effect for any realistic improvement in the trade balance. On the other hand, if imports increased more quickly than exports as the economy became more open to trade, trade openness would worsen the trade balance.

Domestic Inflation rate: According to (Umaru and Zubaine 2012), inflation is explain as long-term rise in the general price level of a wide range of goods and services in a country. According to (Kabundi, 1993), the majority of empirical investigations have discovered a significant and persistent evidence relationship between domestic inflation and trade balance. According to the findings, increased price inflation reduces competitiveness, decreases exports, and increases imports. Imports tend to be more sensitive to the influence of higher price inflation than lower price inflation. Evidence suggests that an increase in long-term prices will cause a random fluctuation in emerging countries. In all, Foreign exchange revenue has a favorable and considerable impact on imports, which lag behind government reserves. imports the short and long term. As a result, their experience analysis reveals a negative association between these two factors.

Foreign exchange Reserve (FER): A country's foreign exchange reserve is the accumulation of hard money. The foreign exchange reserve maintaining a foreign exchange reserve drives imports, leading the trade balance to worsen. According to (Mamo Isayas Ambe 2019), Imports are influenced positively and significantly by foreign exchange revenue and lag official reserves. As a result, it is expected that the variable will have a negative association with trade balance.

4.3 Data Types and source

The National Bank of Ethiopia (NBE), the Ministry of Finance and Development (MOFED), and the Ethiopian Customs and Revenue Authority were used as secondary data sources in this study. Important information was also gathered from international institutions like the World Bank and the International Monetary Fund (IMF) (World Bank data sheet). All variables cover a 30-year period from 1992 to 2022 due to limitations in data availability each variable is therefore collected annually from a different source.

4.4 Methods of data analysis

To fulfill the research's objectives, econometric approaches were used to evaluate time series data throughout the investigation. Before estimating to develop a model, it is required to first study the attributes (stationarity and long run associated variables' behaviors) of the time series data. Because the observations in this study are small (30), Rather than the Vector Error Correction Model (VECM) /Johnson, the Auto Regressive Distributed Lag (ARDL) created by (Pesaran and Shin 1999) and (Pesaran et al. 2001) was used to investigate the properties of the time series data and demonstrate the association of variables. When working with variables of different orders, I(0), I(1), or a mix of both, this ARDL co-integration approach is better. It is also resilient when there is just one long-term link among the variables. The root causes are made clear with a small sample size. The long-term link between the underlying variables is determined using the F-statistic (Wald test). The long run association between the series is judged to be formed when the F-statistic rises over the critical bands. ARDL is extremely useful because it allows us to describe the existence of an equilibrium/relationship in terms of long-run and short-run dynamics without losing long-run information. The ARDL involves estimating the following equation:

$TB = \beta_0 + \sum_{i=0}^{k} \beta 1 lnREXRt\text{-}i + \sum_{i=0}^{k} \beta 2 lnRGDPt\text{-}i + \sum_{i=0}^{k} \beta 3 lnTOTt\text{-}i + \sum_{i=0}^{k} \beta 4 lnINFt\text{-}i + \sum_{i=0}^{k} \beta 5 ln\ FERt\text{-}i + \alpha 1 lnREXRPt\text{-}1 + \alpha 2 lnRGDt\text{-}1 + \alpha 3 lnTOTt\text{-}1 + \alpha 4 lnINFt\text{-}1 + \alpha 5\ FERt\text{-}1 + \varepsilon t$

$\beta 0$ is the constant term, $\beta 1,\ldots, \beta 5$are the short run coefficients, α1,…, α5 represent the long-run coefficients, n1….n4 are the lag length, and $\varepsilon t, is$ the error term.

The analysis of short and long-term dynamics with the ARDL bounds test approach requires a process consisting of several steps. In the first step, the above Model is estimated by OLS method and an F test is used to examine the long-run relationship between variables and test the coefficients of lagged variables together. The null hypothesis H0: α1 = α2 = α3 = α4 = α5 = 0 indicates that there is no long-term relationship or co-integration between variables.

4.5 Tests for Stationary

4.5.1 Unit root test

Stationary series contain a fixed mean, variance, and auto-covariance for each lag among the two periods of time, rather than the instant the covariance is computed (Gujarati, 2003).The stationary issue is the primary challenge of a time series since The non-stationary process is present in the majority of time series variables. Working Using data from time series critical to determine whether or not the variable follow a stationary process. We must determine if the variable is stationary or not because if it is not, the outcome of the regression will be misleading or illogical, and in certain cases, fraudulent. This spurious regression suggests a causal association between two variables when there is no such relationship.

The Augmented Dickey-Fuller (ADF) test, Auto-Correlation Function (ACF), and Phillips-Peron (PP) test are three often used tests to determine if time series variables are stationary or non-stationary. The ADF test was applied in this study to identify a unit root. ADF employs as in the following equation:

$$\Delta y_t = \alpha + \delta y_{t-1} + \sum_{i=0}^{m} \varphi\, \Delta y_{t-1} - 1 + \varepsilon_t$$

Hypothesis: Ho: δ= I (0) denotes that the time series process is stationary. H1: $\delta < 0$ The series has a unit root issue (non-stationary process).

The I (0) estimation may not be problematic if the data set is of order zero, in which case no adjustment is required. Integration of order d, or (d), occurs when a non-stationary series is converted into a stationary process by differencing.

4.6 Selection of ARDL Lag Length

Criteria for ARDL Lag Length Selection Prior to estimating, we will determine the maximum lag lengths that will be used to produce the white noise error terms. Various information criteria can be used to establish the ideal duration of lag. Goal of the information criteria (IC) approach selects the number of factors that reduces the IC value. The most often utilized ICs are the Akaike (1974) information criterion (AIC), Schwarz's (1978) Bayesian information criterion (SBIC), and Hanna-Quinn information criterion (HQIC). However, to discover the probable ideal lag length, check for the primary factors that the model picks, and then search for the number of lag lengths.

4.7 Diagnostic Test

Following the estimation of the model, several diagnostic tests were carried out to check that the results obtained from the estimation are suitable for policy prediction. The most crucial post-estimation tests in time series analysis are the LM tests for residual serial correlation, the Jarque-Bera test for residual multivariate normality, and the Breusch-Pagan-Godfrey test for residual heteroscedasticity and model stability.

4.7.1 Autocorrelation or serial correlation test

One of the fundamental presumptions of the regression model is that (ui uj)=0 for i and j, which denotes that successive values of the disturbance component u are momentarily independent, i.e., the disturbance at one point of observation is unrelated to any subsequent disturbance. It demonstrates that when data is gathered throughout time, a disturbance at one point does not have an impact on the next. If the prior condition is not satisfied and the error term's value correlates with its own previous value(s) in any given period, the random variables are said to be auto correlative. Consider the following scenario: µt= pµt-1. The given link depicts the most fundamental type of autocorrelation; the autocorrelation coefficient p represents - 1< p<1. Then there is perfect positive autocorrelation if p is 1, perfect negative autocorrelation if p is -1, and no linear autocorrelation among consecutive random mistakes if p is 0.

4.7.2 Heteroscedasticity test

When the distribution of the error term (t) around the mean is non-constant (there is no constant variance), the heteroscedasticity test is used. It indicates the likelihood that the independent variable's individual variance disruptions component will vary. Despite the fact that the heteroscedasticity problem has no impact on bias, OLS estimators' consistency characteristics are no more variable or effective. Because typical OLS equations do not compute the variance of OLS estimators in the presence of heteroscedasticity, t and F tests based on this problem can be extremely deceptive, leading to incorrect result. Sample Heteroscedasticity tests identification examples.(1) spearman rank correlation, (2) the Breusch-Pagan-Godfrey test, and (3) the White's general Heteroscedasticity test. The Breusch-Pagan-Godfrey tests were employed in this inquiry as one of these detecting methods.

Hypothesis of homoscedasticity can be rejected calculated at the specified level of significance, the Chi-square (x2) value surpasses the critical threshold. The alternative explanation could have been accepted otherwise reject it.

4.7.3 Normality test

With the use of this test, one may determine if a set of data is appropriately described by a normal distribution and estimate the probability that a random variable underlying the data set is normally distributed. According to how probable is defined, the tests, which are often a kind of model selection, can be interpreted in a number of different ways. The Jarque-Bera test was used to examine whether or not the sample data's skewness and kurtosis were consistent with a normal distribution. It is a goodness of fit test.

4.7.4 Stability test

The stability test is crucial if the system is to be utilized for forecasting and policy analysis. To find stability, do a cumulative total (CUSUM) test. If the polynomials' roots are inside or outside the unit circle, it may be determined by the stability test. The model has been determined to be stable and may be utilized for policy research if all of the roots are contained within the unit circle.

Chapter Five

Results and Discussion

5.1 unit root test (Stationarity) test

Analyze the plots that the variable follows to determine if a time series is stationary. The Augmented Dickey-Fuller (ADF) test was used in this investigation.

5.1.1 Augmented Dickey-Fuller (ADF)

It is essential to determine if a time series of data represents a stationary process before attempting to forecast it; otherwise, the regression analysis may result in what economists refer to as spurious or phony, and occasionally nonsensical regression. A unit root test would be used in conjunction with the Augmented Dickey-Fuller (ADF) test to determine the degree of stationarity.

Table 5.1 Augmented Dickey-Fullers (ADF)

Variables	t-statistics	t- critical at (5%)	Prob*
TB	-1.909791	-2.967767	0.3234
ΔLTB	-6.511971	-2.971853	0.0000**
LNRGDP	-4.389164	-3.603202	0.0097*
LN trade openness	-4.285305	-2.998064	0.0030*
LN Real effective exchange rate	-5.245099	-2.963972	0.0002*
LN foreign exchange reserve	-2.130891	-2.963972	0.2346
ΔLN foreign exchange reserve	-5.474649	-2.967767	0.0001**
LN Domestic inflation	-3.046912	-2.963972	0.0419*

Note: From above table * shows indicates stationary at zero level I(0) and ** show stationary at first difference I(1).

All variables are stationary at 5% from above variable LNRGDP, LN trade openness, LN real effective exchange rate and LN Domestic inflation stationary at I(0) and trade balance and Foreign exchange reserve are stationary at first difference. Following verification of the stationary test, the number of the co-integrating equation is determined by lag selection. is chosen.

5.2 Autoregressive vectors and lag selection criterion

The suitable lag length must be selected before proceeding with the multivariate time series analysis. Based on the lag selection criteria, which include the modified LR test statistics (LR), final prediction error criteria (FPE), Akaikes information criteria (AIC), Schwarz information criterion (SC), and Hannan and Quinn information criteria (HQ), the lag with the lowest value is the best ARDL model in that lag, and that lag has been designated as the model's optimum lag.

Table 5.2 Lag selection criteria

VAR Lag Order Selection Criteria
Endogenous variables: LNTRADEBALANCE LNRGDP LNTRADEOPNESS LNREAL...
Exogenous variables: C
Date: 05/21/23 Time: 13:55
Sample: 1992 2022
Included observations: 28

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-45.39243	NA	1.58e-06	3.670888	3.956360	3.758160
1	109.2943	232.0301	3.51e-10	-4.806736	-2.808429	-4.195833
2	162.5739	57.08524	1.52e-10	-6.040990	-2.329849	-4.906457
3	248.0351	54.93936*	1.65e-11*	-9.573934*	-4.149959*	-7.915771*

* denotes the lag order chosen by the criteria.

From above result ideal lag duration of ARDL based on all information criteria is 3, with the lowest AIC and SIC values at lag 3.

5.3 Long-run Relationship Existence (Bound test)

This test show if there is a long-term association between the variables. All of the variables have stationary values at zero difference and at the first difference, as shown in Table 5.1, allowing ARDL to continue. The bound test is used to determine whether there is a long-term relationship between variables, and the essential assumption of ARDL is that the variables in the model are stable at order zero and at first order, or both.

Table 5.3 Bounds test of co-integration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	18.98686	10%	2.75	3.79
k	5	5%	3.12	4.25
		2.5%	3.49	4.67
		1%	3.93	5.23

The F-statistic (18.98686) is larger than all thresholds of significance. It represents the long-term relationship between the variables. The ARDL model can be constructed since all of these macro variables have a long run relationship ship.

5.4 Long Run ARDL Model Estimation

The long-run coefficients of ARDL estimation must be defined after determining the presence of a long-run relationship among the series using the bounds testing approach. Following are the findings of a long run model using trade balance as the dependent variable, as well as trade openness, real effective exchange rate (REER), and so on. real GDP (RGDP), foreign exchange reserve (FER), and domestic inflation (DI) as the independent variables:

Table 5.4The results of long run model with ARDL (3, 0, 3, 2, 3,2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNTOP	-0.452127	0.180913	-2.499144	0.0370
LNRGDP	1.165421	1.016588	1.146405	0.2848
LNREER	-3.590578	0.631459	-5.686158	0.0005
LNFER	-0.486372	0.203707	-2.387603	0.0440
LNDI	-0.220102	0.049199	-4.473743	0.0021

The result of above table illustrates that, with the exception of Real GDP, all variables statistically impact Ethiopia's trade balance. In Ethiopia, the currency rate and trade balance have a negative long-run relation. It demonstrates that an increase in the exchange rate of one unit (i.e. birr depreciation) worsens In the long run, the trade balance. Particular, increasing the exchange rate by one unit will worsen the trade balance by 3.59. The result demonstrates an inverse relationship between the exchange rate and the trade balance which is also statistically significant at 5%. As a result, the country's main export goods are primary and raw resources, which cannot balance increases in degradation in the short term owing to price effect. This finding coincides with prior studies by Fikreyesus and Menasbo (2012), Haile (2008), Alemayehu (2014), Zelalem (2014), Yigermal (2018), and Debela (2019) demonstrating that the exchange rate has a negative impact on trade balance.

Above result also shows trade openness, Foreign exchange reserve and domestic inflation negative impact on trade balance. But real domestic products are positive impact but statically insignificants. As a result, if all other variables remain equal, increasing trade openness by one percent in the long run, Ethiopia's trade balance will worse by 0.4521%. This shows increase openness of trade creates further opportunities for increased levels of imported goods rather export of good. And also Foreign exchange reserve and domestic inflation increase by 1 percent leads to deteriorate trade balance of Ethiopia by 0.4863 and 0.220 percent respectively in the long run.

The coefficient inflation rate had a negative impact on trade balance, which was significance at 5%. According to Keynesians, an increase in domestic inflation causes more purchases of foreign products, resulting in a deficit trade balance.

To determine if the Marshall-Lerner condition exists in Ethiopia the requirement is that the exchange rate affects the trade balance in a way that is both long-term favorable and statistically significant. Because Marshall-Lerner condition is a long-run occurrence, it can only be tested using long-run data. As a result, for Ethiopia, the elasticity approach is useless, and the null hypothesis of no marshal learner condition has been accepted. Based on the foregoing data, the marshal-learner condition does not hold; rather, the actual effective exchange rate is adversely associated with Ethiopia's In the long run, trade balance.

5.5 short run model (ECM)

After analyzing the long term, co-integrating, then, estimate the short run dynamic connection between variables in the ARDL. As, a result, ARDL model retains the lag value for every level's variables (an error-correction term, ECMt-1, represents a linear combination).

Table 5.5 the result of short run effects of variables using ARDL model (3, 0, 3, 2, 3,2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.17732	1.276877	13.45260	0.0000
@TREND	-0.123376	0.009683	-12.74114	0.0000
D(LNTB(-1))	0.457430	0.095995	4.765152	0.0014
D(LNTB(-2))	0.535949	0.083166	6.444342	0.0002
D(LNRGDP)	-1.360883	0.652572	-2.085414	0.0705
D(LNRGDP(-1))	-0.588381	0.696476	-0.844797	0.4228
D(LNRGDP(-2))	-6.713962	0.699530	-9.597815	0.0000
D(LNREER)	-3.028045	0.268276	-11.28707	0.0000
D(LNREER(-1))	2.825631	0.280317	10.08013	0.0000
D(LNFER)	-0.260469	0.062246	-4.184490	0.0031
D(LNFER(-1))	0.347088	0.060805	5.708243	0.0005
D(LNFER(-2))	0.155271	0.057550	2.697995	0.0272
D(LNDI)	-0.012872	0.018544	-0.694141	0.5072
D(LNDI(-1))	0.133126	0.018894	7.046001	0.0001
CointEq(-1)*	-1.412121	0.103787	-13.60595	0.0000

Based on the foregoing results, The ECM value is negative, as predicted, but it has a value of -1.41.ECM coefficient greater than one, according to Narayan and Smyth (2006), shows that the error correction process fluctuates around the long-run value in a dampening manner as it monotonically approaches the equilibrium path. However, once this process is done, the route to balance is quickly approaching. Furthermore, the highly significant error correction term, according to Banerjee et al. (2003) and Kidanemarim (2014), indicates the presence of a stable long-run link. The error correction value, based on the preceding results, is calculated at -1.412, is very significant at 1 percent and has a negative sign indicates a rapid pace of adjustment to equilibrium per year.

In the short term, all explanatory factors with lag values had a major impact on balance of trade since P-values for all independent variables were less than 5 and 1 percent significant. However, in the long term, Real GDP was little. In short run, the real effective exchange rate had a significant impact on trade balance. at 1% significant with a negative sign and at first lags 1% significant with a positive sign. Negative sign result indicates that rise the exchange rate worsens the situation in the short run in the trade balance, and finding is statistically significant. There is, nevertheless, a statistically significant positive sign on trade balance at lag 1.

At the 5% level of significance, the lag value of the dependent variable is statistically significant, and coefficient is positive, showing that trade balance prior to one and two years has a positive influence on the present trade balance in the short run. Which suggests that if the previous one and two years' trade balances increase by 1%, the current trade balance will improve by 0.457 and 0.535 percent, respectively. The findings of this study are comparable to those of others. of Mohammad (2010), Akoto and Sakyi (2019), and Kebede (2017), who suggested that even though they only used a one-year lag, last year trade balance enhancement is critical for current year trade balance improvement via currency and capital inflows, which then boosts investment.

At lag 2, the effect of real GDP on trade balance is negative. The findings of this study are comparable with those of Weerasinghe and Ravinda (2019), Mutana et al. (2018), and Falk (2008), who found that as GDP growth increases, so does consumer demand for foreign goods in the short run.

The influence of the inflation rate on trade balance is statistically significant at lag 1 at a 5% level of significance, but statistically negligible at lag 0.

5.6 Diagnostics test

This section examined several diagnostic tests, including the normality test, serial correlation LM test, and heteroscedasticity test are all examples of tests. The following are the outcomes:

5.6.1 Serial correlation test LM test

The final period of error term is connected to the period error term in a serial correlation. In the research, the Breusch-Godfrey test was used to assess whether or not the data had autocorrelation (Gujarati, 2003). For residual autocorrelation, the following hypothesis test might be used.

H0: There is no residual autocorrelation.

H1: Residuals are autocorrelation.

Null hypothesis has no autocorrelation accepted when the chi-square p-value is greater than 5%; otherwise, the alternative hypothesis is accepted, whereas the null hypothesis is rejected.

Table 5.6 Autocorrelation (Breusch-Godfrey) Test

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 3 lags

F-statistic	1.205080	Prob. F(3,22)	0.3312
Obs*R-squared	4.375225	Prob. Chi-Square(3)	0.2237

The result of regression, we accept the null hypothesis of no autocorrelation when Chi-Square (2) is greater than 5% then this study p-value is 0.2237. As a result, it is certain that the model is free of autocorrelation.

5.6.2 Heteroscedasticity test

The variation in the value for each explaining variable's residual remains consistent (there is no homoscedasticity). In this research, the heteroscedasticity is determined using Breusch-Pagan-Godfrey test. The Heteroscedasticity Hypothesis Test is shown below.

Hypothesis H0: Residuals have a homoscedastic distribution.

H1: The distribution of residuals is not homoscedastic.

If the probability value of the R-squared is more than 5%, we cannot reject the null hypothesis that there is no heteroscedasticity; instead, we must reject the null hypothesis and accept the alternate hypothesis.

Table 5.7 Breusch-Pagan-Godfrey Heteroscedasticity test

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.467154	Prob. F(5,25)	0.7970
Obs*R-squared	2.648868	Prob. Chi-Square(5)	0.7539
Scaled explained SS	3.097442	Prob. Chi-Square(5)	0.6850

From above a result of the R-square's p-value being 75% bigger than 5%, the null hypothesis of homoscedasticity cannot be rejected. As a result, this model has none of the heteroscedasticity issues, and the distribution of the residuals is homoscedastic.

5.6.3 Normality test

Jarque-Bera technique was implemented to detect errors employed to assess normality, and the results are reported in below table. Hypothesis: H0- Error terms are often distributed

H1- Errors aren't dispersed normally.

If the significance level is more we may reject null hypothesis if it is less than 5% states that mistakes not regularly We will not accept it unless we are forced to.

Table 5.8 Normality test

Jarque-Bera	Probability
2.718896	0.256803

If the significance level of the Jarque-Bera is above 5%, the errors are regularly distributed, accordance to the decision criteria of the normalcy test. The null hypothesis is a possibility be rejected when probability value is larger than 5%, in this study the probability value is 25%. Normalcy test of the errors was then entirely achieved at 5%.

5.6.4 Stability test

Visual examination of the recursive variable graphs estimations aid determining model's stability. A systematic statistical assessment that might be used in evaluate model's null hypothesis stability would be valuable.

Hypothesis**: H0:** CUSUM distributed is symmetrical and has a center value of 0.

H1: CUSUM distribution was asymmetric and does not follow a normal distribution.

When a graph depicting the CUSUM statistics rests between the borders of crucial area with a 5% threshold of significant test, the null hypothesis may be rejected.

Figure 5.1 Cumulative sums of recursive residuals

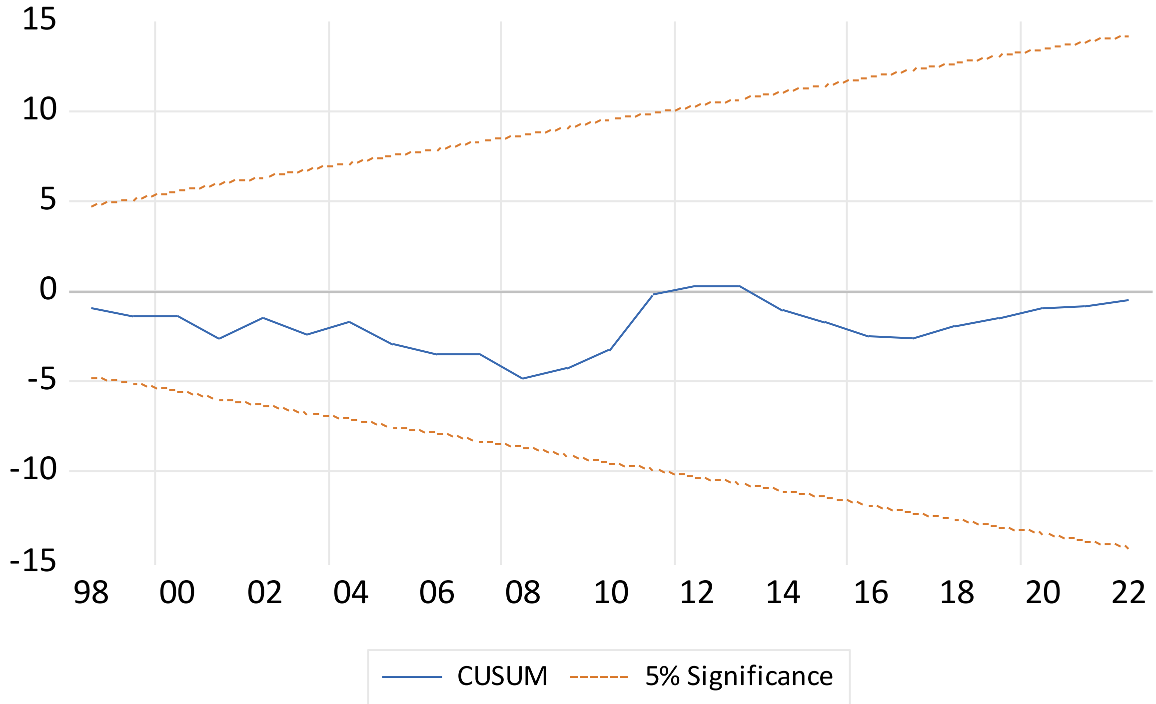
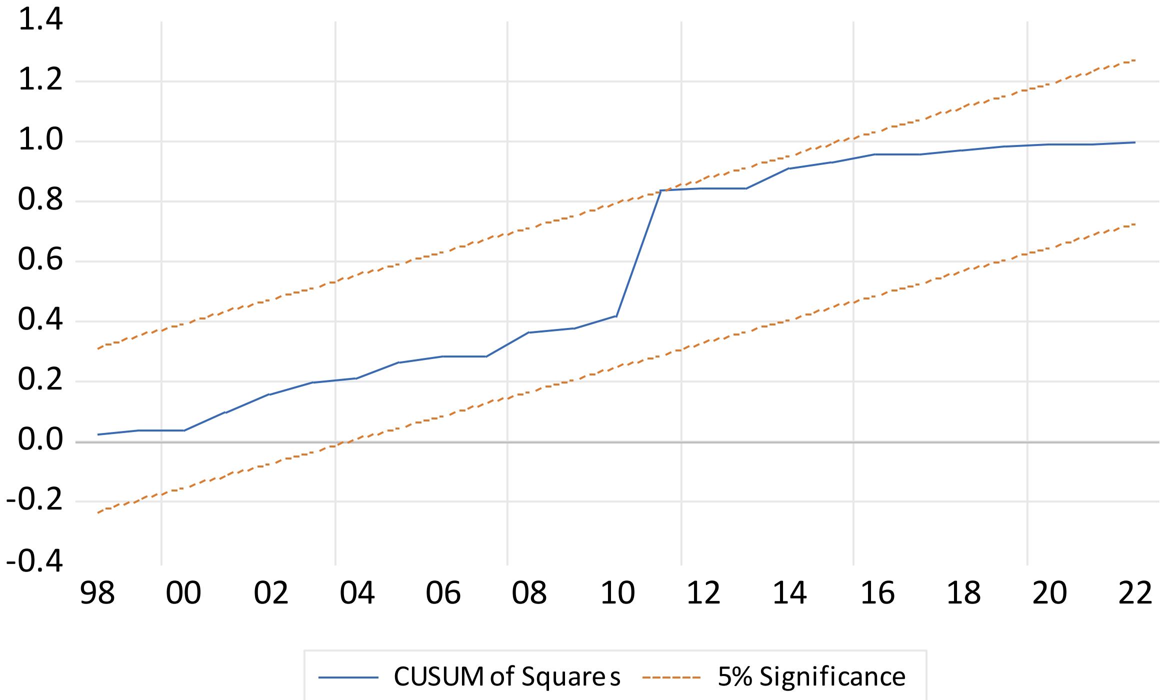


Figure 5.2 Cumulative sums squares of recursive residual.



From above CUSUM test's stability diagnostic test and the CUSUM The square test of parameters evaluated. CUSUM and CUSUM of squares tests reveal that variables are steady during the research period due to blue line does not surpass the 5% significance line (red line).

Chapter Six

Conclusion and recommendation

6.1 conclusion

A country's trade balance is most significant component of its balance of payments. The difference between a country's exports and imports over a certain time period is the trade balance. The study then examined the relation-ship between Ethiopia's currency devaluation and trade balance using annual data from 1992 through 2022. To evaluate the associations, the auto-regressive distributed lag (ARDL) estimation technique is applied. To use the ARDL model, variables must be stationary at I (0),I (1), or a combination of the two orders. In this study, real GDP, trade openness, real effective exchange rate, and domestic inflation are stationary at I(0), while trade balance and foreign exchange reserve are stable at I(1).

The ARDL bound test was used to demonstrate presence of long-term the co-integration connection of variables, and this study's findings indicated a strong negative long-run association. This conclusion contradicts the marshal learner condition, which states that devaluing a currency helps to enhance trade balance in the long term. However, the study's findings indicate that trade balance has deteriorated rather than improved. As a result, marshal Lerner circumstances do not exist in Ethiopia in this study.

Real effective exchange rate in short run has considerable influence on balance of trade at the first lag, 1% significant with a positive sign and 1% significant was negative sign. The negative sign result indicates that there is an increase in exchange rate leads to a short-run deterioration trade balance, and finding is statistically significant. In general, trade balance and currency devaluation have a negative relationship in the investigation, short run as well as long run. Then, currency devaluations lead worse Ethiopia trade balance rather than improve trade balance.

6.2 The study's policy implications

The policy consequences are as follows are extracted from paper's empirical findings. It is evident that Ethiopia's trade balance has been negative from year to year since a large amount Primary and agricultural products account for the majority of the country's exports have Domestic supply is inelastic terms of price and international.

The government should seek for new export markets in order to limit the country's supply of identical export items. Rather of employing outright devaluation, the country should focus on new market destinations to boost export and improve trade balance.

The government should raise Ethiopian export performance, resulting in a rise in the trade deficit the first is to increase export productivity and diversify agricultural enhance the nation's trade balance and currency exchange rate revenues; the second strategy is to concentrate on import computer industry. This improves Ethiopia's trade balance by reducing reliance on imported products.

For long-term Ethiopian trade balance improvement, the government and macroeconomic policy should prioritize strategies which are foster output gains, export sector diversification.

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Appendix

Unit root test result

Null Hypothesis: D(LNTB) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.632541	0.0000
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

Null Hypothesis: LNRGDP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 5 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.389190	0.0097
Test critical values:	1% level	-4.374307	
	5% level	-3.603202	
	10% level	-3.238054	

Null Hypothesis: LNTOP has a unit root
Exogenous: Constant
Lag Length: 7 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.285305	0.0030
Test critical values:	1% level	-3.752946	
	5% level	-2.998064	
	10% level	-2.638752	

Null Hypothesis: LNREER has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.245099	0.0002
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

Null Hypothesis: D(LNFER) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.474649	0.0001
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

Null Hypothesis: LNDI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.046912	0.0419
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

ARDL Result

Dependent Variable: LNTB
Method: ARDL
Date: 06/18/23 Time: 20:47
Sample (adjusted): 1994 2022
Included observations: 29 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic): LNTOP LNRGDP LNREER
LNFER LNDI
Fixed regressors: C @TREND
Number of models evaluated: 486
Selected Model: ARDL(2, 0, 0, 0, 0, 2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNTB(-1)	0.070448	0.224626	0.313625	0.7574
LNTB(-2)	0.266821	0.197504	1.350963	0.1934
LNTOP	-0.641075	0.417186	-1.536666	0.1418
LNRGDP	0.836549	1.138900	0.734524	0.4721
LNREER	-1.266282	0.620605	-2.040400	0.0563
LNFER	-0.210751	0.154224	-1.366523	0.1886
LNDI	-0.010643	0.037301	-0.285322	0.7787
LNDI(-1)	-0.067964	0.038910	-1.746703	0.0977
LNDI(-2)	-0.080771	0.047573	-1.697835	0.1068
C	3.140737	3.750377	0.837446	0.4133
@TREND	-0.095527	0.072271	-1.321780	0.2028

R-squared	0.977915	Mean dependent var	-8.247559
Adjusted R-squared	0.965646	S.D. dependent var	1.160707
S.E. of regression	0.215135	Akaike info criterion	0.046599
Sum squared resid	0.833099	Schwarz criterion	0.565228
Log likelihood	10.32432	Hannan-Quinn criter.	0.209027
F-statistic	79.70411	Durbin-Watson stat	1.873688
Prob(F-statistic)	0.000000		