Addis Ababa University

College of Business and Economics

Department of Economics

Trends and Drivers of Current Account Balance in Ethiopia

By: Geremew Birhane

July, 2022 G.C

Addis Ababa, Ethiopia

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A Thesis Submitted to the Department of Economics of the Addis Ababa University in Partial Fulfilment of the Requirements for the Award of a Master's of Science in Economic Policy Analysis

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DECLARATIONS

I, the undersigned, declare that this study is my original work and has not been presented for a degree in any other university, and that all sources of materials used for the study have been duly acknowledged.

Declared by:

Geremew Birhane _____ _____

Name of researcher Signature Date

Approved by:

This Thesis has been submitted for examination with my approval as Business and Economics College Supervisor.

Mengesha Yayo (Ph.D) _____ _____

Name of Advisor Signature Date

APPROVAL SHEET

This is to certify that the thesis prepared by Geremew Birhane Beyene, titled "*Trends and Drivers of Current Account Balance in Ethiopia*" and, submitted in Partial Fulfillment of the Requirements for the Masters of Science in Economic Policy Analysis complies with the University's Regulations and meets the accepted standards in terms of originality and quality.

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Advisor: _____ Signature _____ Date _____

Internal examiner: _____ Signature _____ Date _____

External examiner: _____ Signature _____ Date _____

Chairperson _____ Signature _____ Date _____

Head of the Department

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

AEO…….African Economic Outlook

ARDL ……Auto Regressive Distributed Lag Model

ASEAN…….Association of Southeast Asian Nations

BOP…….. Balance of Payments

BRICS……..…… Brazil, Russia, India, China, and South Africa

CAD……Current Account Deficit

EEA……..….Ethiopian Economics Association

FDI……..Foreign Direct Investment

GDP……... Gross Domestic Product

GMM…… Generalized Method of Moment's Estimator

IDA…….. International Development Association

IMF……International Monetary Fund

MoF…….. Ministry of Finance

NBE……National Bank of Ethiopia

NFA…….……Net Foreign Assets

OPEC……Organization of the Petroleum Exporting Countries

REER……Real Effective Exchange Rate

ToT…….Terms of Trade

UNCTAD…….…….United Nations Conference on Trade and Development

USD……..…….United States Dollar

VECM……... Vector Error Correction Model

VECM……..….Error Correction Mechanism

WB….……World Bank

ABSTRACT

A country's current account balance is an important leading indicator of its economic health. It comprised of ‘goods and services’, ‘income’, and ‘current transfers’ sub components. The main aim of this paper was to investigate the trends and drivers of current account balance of the Ethiopian economy. The study examined the trends and drivers of Ethiopia's current account balance using annual data from 1990 to 2019. This study used both descriptive statistics and econometric methods to estimate and analyze the drivers of current account balance on Ethiopia’s economy. The ARDL bounds testing approach to co-integration analysis was used in the study to establish the long run relationship between the relevant time series variables under investigation. The empirical findings of study revealed that the coefficients of parallel market premium, average oil price and degree of openness, and real GDP per capita income growth were statistically significant. Conversely, the coefficients of the variables like real effective exchange rate, fiscal budget balance and financial deepening were found insignificant in the long run. The Current account balances as a major policy variable has positive and significant effects at first difference on Ethiopia’s current account performance in the short run. In the Ethiopian economy, the current account balance is deteriorating, indicating a significant financial need that could increase the country's international indebtedness and reduce its international reserves. Likewise, the ECM term was statistically significant in determining current account balance disequilibrium adjustment in the short run. Therefore, the study's policy implication is that large amounts of government spending are required to expand infrastructures, which are supposed to increase private investment, particularly in the manufacturing and export sectors.

Keywords: Current Account Balance, Deficits, ARDL, Ethiopia

CHAPTER ONE: INTRODUCTION

1.1. BACKGROUND

Ethiopia's geographical location gives it strategic dominance as a jumping-off point in the Horn of Africa, near to the Middle East and its markets. Ethiopia is landlocked, surrounded by Eritrea, Somalia, Kenya, South Sudan, and Sudan, and has been using neighboring Djibouti's main port for the last two decades. Nevertheless, with the recent peace agreement with Eritrea, Ethiopia is set to resume accessing the Eritrean ports of Assab and Massawa for its international trade after two-decades-long of no peace no war situations (World Bank, 2021).

Balance of Payments (BOP) is a summarized report which systematically presents the economic transactions of a country with the rest of the world. It is a statistical statement reported for a given period mostly on yearly basis using the double-entry accounting system. As a report on economic events for a given reference period, balance of payment deals with flows rather than stocks held. For this reason, it can be taken as a performance report on a country's interaction with the rest of the world. It also portrays which sectors of an economy are prioritized for international trade relations. Therefore, the openness of an economy can be revealed in the magnitude and directions of flows presented in the balance of payment. In general, BOP is a consolidated report on the expenditures and receipts of an economy with the sources of finance and the movements in reserves (IMF, 1996).

In the 21st century of globalization, it is a common feature of countries to interact in international trade in fulfillment of their demands of production and consumption. In international trade, all countries participate irrespective of their category of economic development. Different resource endowments and specialization among these countries give rise to variations in comparative advantages on outputs leading to trade or exchange. In international trade, every country provides output to others in exchange for other countries' commodities to benefit from current or future expected incomes.

International trade benefits all countries by allowing each country to specialize in what it produces best by providing each country with a greater variety of goods and services (Mankiw, 2003). Though all countries tend to benefit from international trade, the volume of financial inflow from the trade leads to interesting questions in economics, that are, why do some countries have increasing financial inflows from the trade? Why do the others have a deteriorating inflow like the developing countries? And why do some countries have relatively

constant inflows from trade? Thus, the international trade at a time reflects the relative strengths and opportunities of economies in influencing the future trend of their benefits. The variations in inflows from trade are suggested as a determining factor for a difference in the rate of economic growth and stages of development in our sphere. In the perspective of being beneficial from international trade, governments formulate economic policies towards their positions in international trade. This is why international trade can be taken as a reflection of the internal economic policies in addition to a guide to external policies of all the participants.

According to the World Bank's collection of development indicators obtained from official sources, Ethiopia's external trade accounted for 28.82% of its gross domestic product (GDP) in the 2019 and 24.02% in the 2020, respectively. Following the current downward trend, one could estimate that one-third of Ethiopia's GDP is dependent on external trade. Indeed, this indicates that the Ethiopian economy is a reasonably open economy. Currently, following the openness trend, the country is exporting goods and services for which it has relative comparative advantages over and imports goods and services in which it has no opportunity cost advantages over. Ethiopia's Ministry of Finance annual report (MoF, 2019) on the Ethiopian economy revealed that the exports are dominated by primary agricultural outputs. There are also few industrial outputs and minerals and metal mining. The import outlays are largely spent on items that are related to production, items like fuel and machinery or capital goods.

As per the National Bank of Ethiopia (NBE) report, Ethiopia mainly exports agricultural products where coffee alone accounts for almost 30% of the total value of export. Ethiopia's top five agricultural exports (coffee, oilseeds, pulses, chat and flower) accounts 5 for about 75% of the total export. In 2018/2019 Asia is the major export destination for Ethiopia's exports with 42% share followed by Europe with 25% and Africa with 21% (NBE, 2019). Though Ethiopia's export to Africa seems larger than expected, it is highly concentrated to few countries. Three countries alone, namely Somalia (41%), Djibouti (21%) and Sudan (12.1%) accounts for about 74.1% of Ethiopia's export to Africa. When it comes to import, capital goods, fuel and consumer goods are the major imports of Ethiopia accounting for almost 80% of Ethiopia's total import bill. Asia, mainly China, is the source for 42.9% of Ethiopia's import followed by Europe with 21.8%. Ethiopia's import bill from Africa accounts for only 8.1% and even concentrated too few countries where Morocco(37.6%), South Africa (25.9%) and Egypt (16.3%) alone are source countries for more than 79.8% of the import (NBE, 2019).

1.2. STATEMENT OF THE PROBLEM

Ethiopia is the second-most populous country in Sub-Saharan Africa, next to Nigeria, and had been experiencing double-digit economic growth, averaging 10.8 percent since 2005, primarily driven by the public sector, positioning the country among the world's fastest-growing economies.

The fiscal deficit was moderate as it was 3% of Gross Domestic Product (GDP) in 2015. The main challenge to the overall economy was an increase in the current account deficit. Even though a strong remittance growth was 28% and the foreign direct investment (FDI) was accounted for 44.5%, the current account deficit remain wide and the total current account deficit which was estimated as of July 2016 was at about US$7.4 billion which was 10.7% of gross domestic product (GDP). Ethiopia is also characterized by low foreign currency reserve which contributes to the poor performance of the economy (Girma, 2018).

Ethiopia's involvement in the international trade has been rising rapidly but with a deepening trade deficit. In spite of taking different measures to increase its export earnings, Ethiopia has always been in trade deficit. In 2018/2019, Ethiopia's import bill reached USD 15.1 billion while its export was only USD 2.7 billion (NBE, 2019). Ethiopia's exports are concentrated on few agricultural and primary products and accessing only few over-sea markets extremely affecting the export volume and value. Moreover, Ethiopia's export sector is characterized by high stagnation with limited technological advancement and export product differentiation, and toppled with the existing structural problems, has created a massive challenge for Ethiopia in boosting its trade.

Undoubtedly, in this modern time, oil is a crucial input in both consumption and production that requires significant portion of foreign currency for those non-oil producing economies like Ethiopia. Case in point, over the past five years (2016 to 2020) Ethiopia's import of oil has been rising rapidly putting a substantial further pressure on the foreign currency reserve (NBE, 2016-2020). Consequently, rise or fall in oil prices significantly drive or steer the country's import bill. And hence, oil is expected to regulate the conditions of all components of the current account balance because it is an input for both the services and production sectors. Furthermore, the study made a close examination on the effect average oil price on the current account. On the other hand, real effective exchange rate determines the export competitiveness of a country, which subsequently affects its current account balance. To this regard, since it is the major macroeconomic policy variable, focusing on the effects of real effective exchange rate on current account was a key interest of the study. By and large, a

detail investigation on the drivers of current account balance was vital, the fact that widening current account deficits has been worry some in Ethiopia.

Therefore, keeping in mind that there have been prolonged and growing current account deficits, investigating major drivers of current account balance of the Ethiopian economy was an imperative. In line with the main objective of the study tried to analyse the trends in the major components of the drivers of current account and their implications on the structural trend of the current account balance. In addition, the study was intended to identify and examined the drivers and their short-run and long-run implications of current account balance. Beyond the examination of such drivers, it is also imperative to establish the long run relationship between the relevant time series variables under investigation and provide a robust estimation to solve the problems of autocorrelation and heterogeneity.

1.3. RESEARCH QUESTIONS

The study raised the following basic research questions that answered in due process:

- ✓ What are the influential drives of current account balance in Ethiopia?
- ✓ Is the current account balance trends improving or deteriorating in Ethiopia?
- ✓ What would be the short run and long run implications of divers on current account balance?

1.4. OBJECTIVE OF THE STUDY

The main objective of this study was to examine the drivers of current account balance of the Ethiopian economy. Specifically, the objective of this study would be to:

- ✓ analyzing the trends in the major components of the drivers of current account and their implications on the structural trend of the current account balance;
- ✓ Identify and examine the drivers of current account balance in Ethiopia;
- ✓ Examine the short-run and long-run implications of the drivers of current account balance.

1.5. SCOPE OF THE STUDY

The scope of this study was limited to the investigation of the drivers and trends of current account balance on Ethiopia. It covers from the year 1990 through 2019. These periods selected for data consistency data across the interest variables. In dealing with current account balance, the study was analyzed based on 30 years of time series data using multivariate analyses by using autoregressive distributive lag model (ARDL). Taking such three decade of

time series data the study would give us a better insight of the drivers of the current account balance in the Ethiopian Economy.

1.6. SIGNIFICANCE OF THE STUDY

A country's current account balance is an important leading indicator whether the country is in healthy economic condition or not. The macroeconomic variables movements are intricately linked and communicate information about the general market participants' activities and expectations in an open economy. By and large, the current account reflects macroeconomic policy and other independent events (Scacciavillani & Knight, 1998).

The recurring trade deficits and deteriorating current account balance is an essential emphasis to be studied by investigating the drivers and their importance in regulating the deficits to a manageable level. For prolonged deficits, the emphasis was given on to the need for adjustment based on the drivers. In dealing with the current account balance drivers exposes how current account balance (commonly deficits in Ethiopia) respond for changes in policy variables such as real exchange rate, trade openness, terms of trade, and other macroeconomic variables which are explained in the model in the methodology section. The analysis on the current account balance was given a wide-ranging look at which sub components also need to be emphasized for policy design purpose. And hence, the study was intended in explaining the drivers and trends of the current account balance and also fills the literature gap on current account balance on the Ethiopian economy.

1.7. LIMITATIONS OF THE STUDY

The study used thirty years of datasets. Since the study covers quite a long time series datasets, the study faced inconsistency of data on some macroeconomic variables and was a challenge to use those macroeconomic variables. As a result, the researcher forced to drop some macroeconomic variables.

1.8. ORGANIZATION OF THE STUDY

This study comprised of five major chapters. In the first chapter, the introductory section, which includes the background, statement of the problem, the objectives of the study, the research questions, significance of the study, the scope of the study, limitations and organization of the study, is presented. The second chapter reviewed the theoretical and empirical foundations of the study. The third chapter presented the methodology of the study. The fourth chapter is the trends, and econometric analysis and discussion of the results on the

drivers of the current account balance. Finally, the fifth chapter presents the summary of findings, conclusions and recommendations of the study.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2. INTRODUCTION

The main objective of this study used to examine the trends and drivers of current account balance of the Ethiopian economy. Hence, this chapter looks at review of related literature: both the theoretical and previous empirical literature done related to the current account balance is presented. In doing so, the study reviews the theoretical framework and cross-country, country specific and Ethiopian studies on current account balance. To back up the study, several studies that consulted related to the drivers and trends of current account balance in both developed and developing countries using different methodologies and the corresponding findings.

2.1. DEFINITIONS, CONCEPTS AND COMPONENTS OF BALANCE OF PAYMENTS

Balance of Payments (BOP) is a summarized report which systematically presents the economic transactions of a country with the rest of the world. It is a statistical statement reported for a given period mostly in yearly basis using the double entry accounting system. As a report on economic events for a given reference period, BOP deals with flows rather than stocks held. For this reason, it can be taken as a performance report on a country's interaction with the rest of the world. It also portrays which sectors of an economy are prioritized for international trade relations. Therefore, the openness of an economy can be revealed in the magnitude and directions of flows presented in the balance of payment. In general, BOP is a consolidated report on the expenditures and receipts of an economy with the sources of finance and the movements in reserves (IMF, 1996).

The BOP statistics is used mainly for policy formulation, policy monitoring, projection on the behaviour of real and financial markets and bilateral or multilateral comparisons. Given the detail in BOP, the recordings in each sector of an economy depict how the economy is ripening its comparative advantages as compared to other economies. This sheds light on the areas of policy formulation needed for improvements and stabilization in the share of each sector's contribution. The policy decision on the interdependence of the economy with the rest of the world also reflected in the balance of payment. Thus, almost all the decisions of private

and public agents in relation to their counter parts in other economies are presented in the balance of payment components.

The standard components of the balance of payment (BOP) are composed of two components: the current account and the capital and financial account. The current account is comprised of 'goods and services', 'income', and 'current transfers' sub components. The goods and services sub component is further divided into 'goods' and 'service' heading for reporting purpose. While the capital and financial account is sub divided into 'capital' and 'financial' accounts.

In the goods, services, and income components include the transaction in merchandise, trade in service and earnings arising from the provision of factors of production (Land, labour and capital). In these components transactions are reported according to relevance to the reporting country. For example, coffee for Ethiopia reported separately from other exports because of its significance. This kind of reporting helps to analyze a country's trade movements on a commodity-by-commodity basis. The classification of service groups' transactions in the services sections is by nature of production instead of the type of customers which is similar to the classification in the goods component. The exception is when a traveller consumes goods and services in a country in which he/she is not a resident. Consequently the goods and services consumed by a traveller are recorded in the section 'travel' rather than the sector of production.

The Current Account Balance is well-defined as an aggregate of household savings behavior and company investment decisions that influences future forecasts of the economy's course (Gandolfo, 2015).

Obstfled and Rogoff (1995) defined current account as:

> *"A country's current account balance over any time period is the increase in resident's claims on foreign incomes or outputs, less the increase in similar foreign owned claims on home incomes or outputs. Thus, in theory, the current account includes not only exports less imports (broadly defined to include all the income received and pay-outs on cross-border assets: dividends, interest payments, insurance premia and payments, etc.), but also net capital gains on existing foreign assets (P 1733).''*

The current transfers that are included in the current account section constitute shifts in resource without a quid pro-quo of real or financial resources. These are provisions of real or financial resources that are immediately consumed or those that are consumed shortly after the

transfer is made. These transfers include workers' remittances, grants and unilateral transfers made without a counter offsetting resource flows.

The capital account is comprised of transactions of an economy with non-residents, non-financial assets and capital transfers. The transactions in the capital account differ from the transactions in the current account being not directly related to the process of production and consumption. The capital transfers involve the acquisition or selling of a capital assets or transfers linked with provision of a capital asset. This includes debt forgiveness, migrants' transfers and other similar transactions. The financial account show how an economy's balance of payment transactions is financed. It shows whether a country is in excess or shortage of financial assets to perform transactions in other components of the balance of payment. This is if an economy has savings in excess of investment, the surplus is reflected in the net financial outflow to the rest of the world or net financial investment in the rest of the world. The reverse occurs in the financial account when the savings arc in short to finance investments.

The above paragraphs describe each major component and the transactions recorded in. However, no information is given on how to select the standard components of the balance of payment. Hence, the following considerations are to be taken in selecting standard components (IMF, 1996):

- ✓ components should separately identify transactions that show distinctive economic behavior,
- ✓ each standard component should be significant in terms of the absolute size,
- ✓ of transactions or because the transactions exhibit unusual variability for a number countries,
- ✓ information about a standard component should be obtainable without due difficulty,
- ✓ the item should be required for other purposes (such as reconciliation with the national accounts),
- ✓ the list of standard components should not be unduly long and to the extent practicable, standard components should be in concordance with other statistical systems.

Finally, regarding balance of payment compilation in Ethiopia, the balance of payments statistics is gathered by the National Bank of Ethiopia's Balance of Payments Division (Fitzgibbon, 2004).The sources of information for compilation gathered from the Ethiopian Customs Authority, commercial banks, the International Banking Operations and Accounts Departments of NBE, Ethiopian Telecommunication Authority, Ministry of Finance and a

survey on transport companies. The data collected are of secondary using the respective source's reporting format and sometimes formats prepared by the bank. The data gathered are compiled into the balance of payment according to the IMF's Balance of Payments Manual requirements.

2.2. APPROACHES TO THE CURRENT ACCOUNT BALANCE

2.2.1. ELASTICITY APPROACH

A change in rate, according to Kenen (1994), will cause changes along the demand and supply curves for currencies, with the consequences reflected in demand shifts between domestic and foreign commodities. That is the core concept of the elasticity approach, which is known as the expenditure switching effect of a change in exchange rate. The essential premise of this strategy is that devaluation (or depreciation in a flexible exchange rate system) of an exchange rate can help to improve the current account situation.

This is accomplished through the consumption-switching impact of devaluation (depreciation), or the shift in consumption trends of both domestic and foreign agents as a result of price changes. The price-level changes are not initially generated by demand pressures rather by the change in monetary values set by exchange rates. The induced price level changes thereby affect the volume of demands in international markets. The increased or decreased volumes of demands then determine the amount of resource inflows to an economy.

Taking two countries a devaluation of one's currency will make the exportable of Home County cheaper in terms of foreign currency. Imports of foreign goods also become expensive in the domestic markets. These implicit price level changes will increase the volume of exports and decrease the volume of imports in the domestic economy. The increase in volumes of exports and decrease in imports will in turn boost the inflows of financial resources to the domestic economy. This increase in inflow is an improvement in current caused by depreciation or devaluation.

The desired effects of devaluation to alter the price levels and the condition of the current account are constrained by one condition. It works only if the Marshal-Lerner –Robinson holds. The Marshal-Lerner –Robinson condition assumes that keeping income and price level constant, a balanced trade, and by neglecting the trade in services and investment income flows set the precondition for devaluation to work. The Marshal-Lerner –Robinson condition states that;

"*A depreciation or devaluation of a country's currency will improve its current account balance if the sum of the price elasticity of domestic and foreign demands for imports is greater than unity"* (Kenen, 1994).

This condition holds a devaluation/depreciation of one's currency will alter price levels which can directly affect the quantities of demands for exportable and non-tradable. The reverse movements of price levels to respond for the quantity changes is left out by the assumption of constant price levels in trading countries.

In equation form the MLR condition can be stated by taking the final equation of the derivation of elasticity as;

$$dCA = P_1Q_1^F(e_1^F+e_2^H-1)\ d\Pi \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.1)$$

Where, dCA= the change in the current account level

P_1 = home currency price of the home goods (exportable)

Q_1^F = Quantity demanded by foreign countries

e_1^F =own price elasticity of the foreign demand for home commodities

$e^H{}_2$ = own price elasticity of the home demand for foreign commodities

$d\Pi$ = the change in the exchange rate

The above equation imply for a depreciation (i.e. $d\Pi > 0$) to increase the current account, the summation of import and export elasticities must be greater than unity (i.e $e_1^F+e_2 > 1$ for the above equation to be positive).

Coming into its applicability, the MLR condition is satisfied for most industrial countries in the long run (Kenen, 1994). In the short run, the elasticities are lower because of old supply contracts, fixedness of production capacities and the time lag in consciousness of producers and consumers for the changes. Hence, the short run result perhaps getting oneself worsened. Nevertheless, the long run response in the current account a J-shaped curve. This is what is named a J-curve effect of a devaluation or depreciation in the floating exchange rate system.

Studies on this area suggest industrial countries' short run effect or part of the declining part of the J-curve) is shorter than in the time elapse in the developing countries.

The effect of devaluation on the current account balance of the developing countries may not be such effective. The inelastic demands facing the exports of most developing countries makes the volume of demands not to respond sufficiently for price changes. The

primary cause for such lower response is most developing countries provide primary agricultural products which are inelastic due to fixedness of consumption by nature. Therefore, devaluation might not be an effective policy prescription to improve the external sector of the developing countries.

The main shortcoming of the elasticity approach is that it neglects the effect of devaluation on the importation of semi-finished or raw materials as inputs for production. Depreciation or devaluation of a currency will increase the price of such inputs creating upward pressure on the prices of exportable. This in effect lessens the international competitiveness of a country, creating adverse condition in the current account. The inflationary effect of devaluation is also ignored and the chain effects of an increase in export income are also ruled out by unrealistic assumptions.

2.2.2. ABSORPTION APPROACH

Absorption approach is complementary to the elasticity approach (Carbaugh, 2004). These complementarities reside on the consideration of the impact of devaluation on the spending behavior of the domestic economy by the absorption approach. It comprises the effect of domestic absorption on the current account. Thus, the absorption approach can be taken as an expansion of the elasticity approach by including the additional effects of devaluation or depreciation. In order to understand the notion behind the absorption approach, first the relationship between the domestic absorption and the external sector can be expressed as;

$$\mathbf{Y = C + G + I + X - M} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \mathbf{(2.2)}$$

Where, Y= Gross domestic product

C= Consumption

G= Government expenditure

I= Investment

X= Export

M= Import

Assuming that ‘A’ represents the aggregated sum of the consumption, government expenditure and investment as an absorption of what is produced (i.e A=C+G+I),

$$\mathbf{Y = A + X - M} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (\mathbf{2.3})$$

$$\mathbf{Y - A = X - M} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (\mathbf{2.4})$$

The equilibrium in the equation (2.3) above, states that the difference between domestic production and absorption equals to the current account. Any change reflected in the current account (X-M) has to affect the output or absorption or both in order equilibrium are set.

The absorption approach emphasizes the impact of a devaluation /depreciation on domestic absorption (A). Without controlling domestic absorption, devaluation cannot improve the external sector by itself. The expenditure switching-effect of devaluation should be assisted by monetary and fiscal policies in effect the current account get improved. Therefore, the absorption approach calls for a policy mix of both monetary and fiscal policies. In formulating these policies it considers the saving and expenditure behavior of private and public economic agents.

In a nation where there is unemployment of resources the effect of devaluation/ depreciation rests on the total output. The total output will increase relative to absorption and affects the production of exports and import substitutes positively. The change in output and employment level work by the means of a multiplier mechanism. That is the increased output will enhance the level of employment and the increase in employment level improves the output level on the continual basis. Finally, the result would reflect through improvement in the current account balance. On the contrary, in the case of full employment level, depreciation of a currency put pressure on the demand for domestic scarce resources. The increase in the demand due to higher investment leads to an increase in export income and import substitution in the domestic economy. The increase in the demand in turn shoots up the price level causing inflationary pressure. In this case, the only way to benefit from devaluation or depreciation is reducing the domestic absorption. The reduction in the domestic absorption can be achieved through using restrictive monetary or/and fiscal policies.

The absorption approach eliminates the weakness in the elasticity approach by assuming an economy's current account balance is not distinct from the rest of the economy rather it works being intertwined with internal conditions and affected by the policies therein. This calls for domestic policy mixes to affect the absorption level thereby external balance.

Nonetheless, as a shortcoming in the absorption approach, it is not indicative of which policy to select and by what instrument to achieve is blurred.

2.2.3. SAVING - INVESTMENT GAP APPROACH

The long-term view of the current account dynamics has been sketched by Laursen and Metzeler (1950) and Mundell (1993) but acquired a new prominence in mid 1980s (Knight and Seaccvillani, 1998). The fiscal policy shifts of some major industrial countries during that time calls for a new approach.

The model developed by (Masson & Knight, 1987) was an explanation for such phenomena. This model (as cited in (Scacciavillani & Knight, 1998) assumes full employment and current account deficit is induced by an initial appreciation of the home country's real effective exchange rate the resulting in the loss of international competitiveness. The model is abstracted from the links between fiscal policy, international interest rate, the change in exchange rate and the current account. The effect of capital inflows induced by the decisions of private savings at home country is also emphasized as the changing factor for exchange rates.

In order to illustrate the linkages between the current account positions and saving and investment decisions, the model assumes there is initial equilibrium between home country and the rest of the world. That is,

$$\mathbf{CA^H_t = - CA^R_t} \quad \text{.....(2.5)}$$

for all time, t

Where, CA^H_t= the current account of the home country and,

CA^R_t= the current account of the rest of the world

In the above equation, it is hypothesized that the current account positions in the world are interlinked. And the model shows that the channel through which the decisions on private savings, private investment, and fiscal positions at either side affects the current account through the changes in capital flows, exchange rates and interest rates. It shows inter-linkages between the decisions on savings and investments of both private and agents on the current account balance. The effects of the decisions on the current account are analysed through the induced changes in changes in exchange rates. A fiscal expansion for instance, creates inflow of funds from the rest of the world. The inflow causes appreciation of domestic currency which leads to current account deficit. Nevertheless, this effect is expected to be reversed due course of time when the exports tend to improve. In the model

the current account is summarized as a function of private and public savings and investment which can be expressed as:

$$\mathbf{CA_t = S_{pt} + S_{gt} - I_{gt} - I_{pt}} \quad \textbf{……(2.6)}$$

Where,

CA_t = Current account

S_{pt} = Private savings at time, t

S_{gt} = Government savings at time, t

I_{gt} = Government investment at time, t

I_{pt} = Private investment at time, t

2.2.4. THE MONETARY APPROACH AND CURRENT ACCOUNT BALANCE

In a closed economy, the monetary approach differs from the Keynesian in that it places a greater emphasis on the impact of changes in the money supply on economic activity. The monetary base, or nominal stock of money, is viewed as a monetary policy instrument, and research focuses on the consequences of changes in this instrument on output, domestic prices, and interest rates. If output is kept constant, the only variables that may fluctuate are prices and interest rates. The supply of money can no longer be considered an exogenous policy instrument in an open economy working under a fixed exchange rate framework, because variations in it can be caused by balance of payments deficits and surpluses.

The monetary approach is dealt with the relationship between the domestic component of the money stock (or monetary base), prices, production, interest rates, and the balance of payments. Excess demand for goods and financial assets, by and large, causes disequilibrium in the foreign exchange market and the balance of payments. Changes in domestic prices, interest rates, and output occur from the excess supply of real money balances. These, in turn, feed back into the products and financial asset markets (Aghevli & Khan, 1974).

It is assumed that the country is small, has a stable exchange rate, and has perfect international mobility of products and financial assets in the form of the monetary strategy. These assumptions imply that domestic prices and interest rates will be decided exogenously and will be equal to their corresponding world values; output will likewise be determined exogenously. Any instability that occurs in the markets for products and financial assets, as well as in the

money market, will be fully reflected in the balance of payments in such a scenario. If there is an excess of money, for example, there will be a proportionate loss of international reserves. The monetary method differs from other theories of the balance of payments in that it focuses on the connection between the money market and the balance of payments rather than working through the goods or financial assets markets.

The prerequisites of perfect capital mobility and unconstrained commerce would not be satisfied in the real world, especially in developing countries. There could be numerous adjustment lags, and domestic prices and interest rates could have to increase above their corresponding international levels before complete adjustment occurs. As a result, the total rise in domestic money supply may not leak out completely in the balance of payments. In the long run, nonetheless, these flaws will be ironed out, and a proportional relationship will be established between changes in domestic money supply and changes in international reserves. In addition, treating the monetary approach in this longer-run manner allows one to treat output as exogenous to monetary shocks.

Because of this focus on the money market, putting the monetary approach to the balance of payments to the test necessitates defining a demand for money function and the money supply process. Real money balance demand is defined as a function of real income and the opportunity cost of retaining these money balances. The return on alternative financial assets, especially the rate of interest, can be used to reflect the opportunity cost of maintaining real money balances in financially developed countries. In poor countries, when the spectrum of alternative financial assets is limited, products and money are often substituted. As a result, it would be more suitable to express the opportunity-cost argument in the demand for money function by both the implicit return on goods, the rate of inflation, and the return on alternative financial assets, the rate of interest. The demand for money in real terms can be written according to the following expression:

$$\frac{\mathbf{Md}}{\boldsymbol{P}} = \boldsymbol{F}(\boldsymbol{Y}, \boldsymbol{r}, \boldsymbol{\Pi}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \mathbf{(2.7)}$$

Where,

M = demand for nominal money balances;

P = domestic price level;

Y = level of domestic real income;

r = interest rate

Π= the rate of inflation

2.3. REVIEW OF RELATED EMPIRICAL WORKS

The empirical studies on current account balance in the rest of the world and in Ethiopia of which there are a considerable number, including both policy oriented working papers and published articles and unpublished manuscripts and so on. In Ethiopia only few works have been done on the current account balance. The empirical works of other countries are considered in line with empirical works on Ethiopian economy; despite they are few in the case of Ethiopia. They are documented here in this section according to their relevance, the issues they raise and their methodological approach as well as their relative influence on the evolution of the literature on current account balance in Ethiopia and their policy content. They are organized according to their chronological in descending order of published date.

A research conducted on the determinants and causality of current account balance and foreign direct investment in lower middle income countries in Southeast Asian Nations (ASEAN) by (Aimon et al., 2020). The study used time series data from 2000 to 2017 and cross section of 6 countries, namely Indonesia, Philippines, Vietnam, Lao, Myanmar and Cambodia, which were analyzed by using simultaneous equation model approach. The researchers found three most important findings in their study. The first was that current account balance is positively affected by financial development, government expenditure, real GDP and real exchange rate. Nonetheless, current account was negatively affected by foreign direct investment. Secondly, foreign direct investment is positively affected by real GDP, real exchange rate, economic openness and current account balance, but negatively affected by inflation. Finally, there was a causal relationship between current account balance and foreign direct investment, which the two variables significantly influence each other. Therefore, it is highly recommended for lower middle income countries in lower middle income countries in Southeast Asian nations (ASEAN) to intervene in macroeconomic policy variables, so that the deficit conditions for current account balance and foreign direct investment can be reduced in the lower middle income countries in Southeast Asian nations.

A study conducted by (Girma, 2018) on the determinants of current account balance on the Ethiopia Economy. She used the macroeconomic variables based on the inter-temporal approach using recent econometric techniques from 1980 to 2015 and applied the auto regressive distributed lagged model. The result of the econometric analysis indicated that there was a long-run relationship between current account balance and budget or fiscal balance, real effective exchange rate, terms of trade, and Real GDP growth and statistically significant. And

variable for instance foreign direct investment, age dependency, financial deepening, trade openness and relative income found statistically insignificant in the long-run. The policy implication that she forwarded in her study was that huge amount of government spending was needed in order to expand infrastructures which were supposed to increase private investment mainly for who participate in manufacturing and export sectors. Furthermore, devaluation of domestic currency that improves current account balance was appropriate nonetheless government should be careful in taking such measure as it increased the cost of imported inputs and put inflationary pressure on domestic price.

Current Account Deficits in Sub-Saharan Africa were studied by (Osakwe & Verick, 2015). They were looking into the long-term viability of current account deficits in a sample of African countries, utilizing the 5% criterion as well as other operational indicators of current account viability that have been utilized in the literature. It finds that countries with a small economy, fewer open and diversified markets, and macroeconomic volatility are more likely to have a deficit exceeding 5%. Governments that are less democratic are similarly more likely to run deficits. The major message is that, while most African economies have current account deficits, only a few are concerned about the long-term sustainability of this imbalance. There will be no immediate crisis as long as these countries can finance their deficits through aid and debt accumulation.

According to (Mwangi, 2014) an investigation on the determinants that influence Kenya's current account balance. The analysis used annual data, which spanned from the year 1970 to 2010. And, he also used the vector error correction model (VECM) to figure out what influences current account balances. The results obtained was that 16.2% of the current account was caused by economic growth, 17.9% was explained by exchange rate, 19.5% was explained by current account itself, 14.7% by budget deficit, and 15.3% by inflation while 13.9% by balance of trade in long run. On the contrary, the impact of the budget deficit and current account balance itself are positive while growth rate in investment, balance of trade, inflation, exchange rate on the current account were negative. In the time period under consideration, the effects of investment and savings on current account were both positive and negative, albeit on a minor scale. From results, deliberate export oriented approach through product diversification and value addition to venture in global markets, prudent fiscal measures by the government and stable exchange rate and inflation are some of policy measures that can be applied by the government to stabilize current account.

A study conducted by (Kennedy, 2013) on the determinants of balance of payments in Kenya. The study investigated the long-run determinants of balance of payment dynamics in Kenya

between 1963 and 2012 by using co-integration and error correction mechanism (VECM). The study used annual time series data on Kenyan economy. The paper examined how the determinants of balance of payments lead to adjustments in removing disequilibrium in the balance of payments position. The results showed that variables, which displayed non-stationarity, were insignificant in determining the balance of payments in the long-run. Conversely, the results of the variables identified ,confirmed that balance of payments co-integrated, suggested that balance of payments fluctuations could be caused by the level of trade balance, exchange rate movement and foreign direct investment inflow. The investigation further discovered that FDI and Exchange rates are the main determinants of balance of payments. The positive effect of FDI leads to the development of new products and services which ultimately causes an improvement in the balance of payments through expansion of exports. As a result, the findings of the study indicated that balance of payments was both a monetary and real phenomenon.

Another researcher (ce´sar caldero´n & Alberto Chong, 2007) made a study on the stylized facts and basic determinants of the current account deficits in Africa. He applied the generalized method of moments (GMM) estimator for dynamic models of panel data, introduced by Arellano and Bover (1995) and Blundell and Bond (1997).They found that with respect to the African countries, first there was not as much persistence in current account deficits as in the full sample of developing countries. Second, unlike in the full sample of developing countries, domestic output growth was positively associated with current account deficits, possibly as a result of differences in income elasticity. Thirdly, the impact of private savings on current account deficits was larger than in other regions, which was consistent with the idea that increases in consumption in Africa may be financed by foreign inflows to a larger extent. Fourthly, the fiscal consolidation of IMF-designed programs may be more effective than elsewhere as the impact of public savings on the current account deficit was larger in Africa than in the average developing country. The larger the debt level, the stronger the fiscal impact would be. Fifth, the macroeconomic uncertainty, openness, and balance of payment controls are not statistically significant and the high level of debt appears to signal the need for adjustment. Lastly, the aid flow help close the external gap.

An empirical investigation done by (Alazar, 2006) the determinants of current account in Ethiopia. The importance of fundamental macroeconomic variables in understanding Ethiopia's current account balance changes is examined by the author. The descriptive analysis of the developments of the current account balance using the three macroeconomic variables

relationships: external trade, income-absorption, and saving-investment from the year 1960/61 through 2002/03 showed that: first, poor export performance due to dependence on primary commodities with unmatched rate of growth with imports was the main reason for the persistence in current account deficit. Secondly, the rise in budget deficit, in addition to the low level of savings, was the reason for the continuing current account deficit. Thirdly, huge military expenditure under the Derge regime and 1998 to 2000, as well as increased government expenditure as a result of increased government involvement in the Derge regime, were associated by with the persistence of current account deficit in the income-absorption balance.

The author using Johansen's likelihood ratio test for cointegration shows that young dependency ratio, openness, financial deepening, terms of trade, and real exchange have rare long-term and short-term effects on current account; budget balance, parallel market premium, and ODA have only long-term effects on current account; and domestic output growth has rare short-term effects on current account. Diversifying exports, decreasing the budget deficit, and regulating exchange rate distortions are the policy implications of the findings.

An investigation on the determinants of current account deficit in developing countries in the case of Bangladesh by another researcher (Hassan, 2006). The researcher employed the co-integration and error correction model (ECM) to study the behaviour of current account deficit (CAD) of Bangladesh and its determinants. The determinants of current account deficit (CAD) included budget surplus, domestic saving, domestic income growth, foreign income growth, foreign interest rate, terms of trade, export and real exchange rate.

A long-run equilibrium (co-integration) relationship was found between CAD and its determinants, while some variables are non-stationary. Out of those eight independent variables only three of them specifically, terms of trade, export and foreign interest rate, were found to have significant impact on CAD both in the long and short run. Error correction model formulation of the CAD model showed that more than 72% divergence between actual and long-run value of CAD was corrected in each year. The significant implication of the study was that domestic economic policy had little to do with correcting CAD as all significant factors were related to the external economic conditions.

A studied by (Calderon et al., 2005) on the determinants of current account deficits in developing countries. The analysis contained annual data for the period from 1966 to 1995 for 44 developing countries. By using the reduced form of approach and the generalized method of moment estimators, the relationship between the current account and other macroeconomic

variables were assessed. The results found were classified broadly in to two effects, transitory, permanent or trend effects. The domestic output growth rate and reduction in the international interest rate had a positive effect on the current account deficits in both transitory and permanent models. The growth rate of developed countries, transitory change in the private and public saving rates and the stage of development proxied by per-capita GDP had a declining or negative relationship with the current account deficits. Similar relationship was found for the transitory changes in the level of restrictions on the balance of payment flows in the long run and transitory increases in export. Moreover, the increase in the macroeconomic uncertainty which is proxied by inflation, and transitory changes in the parallel market premium had also declining effects on the current account deficits. Nonetheless, a transitory appreciation of the exchange rate, deteriorating terms of trade and permanent changes in the parallel market premium found exasperating the deficits in the current account balances. By and large, there was a moderate level of persistence in the current account deficits beyond what can be explained by behaviour of the determinants.

A study conducted by (K.Kanungo, n.d.) on the determinants that affect emerging markets' current account balance. The study was aimed at investigating the determinants of current account balance in BRICS applying a strongly balanced panel of annual data for BRICS during the period of 2000 to 2017. The Methodology that had been adopted aimed at applying the panel regression techniques on the panel data for these five countries. The Authors have identified the following five factors of current account balance for the analysis, which were the real effective exchange rate (REER), terms of trade (ToT), inflation, growth and net foreign assets (NFA). The authors used the static panel data techniques for the estimation of the relationship between these five variables and the current account balance.

Additionally, they also considered the interaction of these variables with country dummies to capture if the countries have individual effect on current account balances. Findings were suggested, net foreign assets (NFA) are one of the important determinants with positive impact on current account balance in BRICS. And, inflation is found to have a significant impact on current account balance in Brazil, Russia and India. However, the impact of inflation on current account balance in India and Russia differs from that of Brazil. Real effective exchange rates(REER) was also found to have a crucial impact on current account balance in Russia, India and South Africa, whereas terms of trade (ToT) played a significant role in determining the current account balance in India and Brazil. Moreover, the impact of these variables on current account balance varies based on the economy of the nations.

The researchers' concluded with the policy implications and future research suggestions. For instance, on policy front, the analysis indicated that countries like India which are experienced current account deficit could target policy intervention from the government in terms of regulatory inflation and maintaining favourable terms of trade (ToT) as these macroeconomic policies could help in reducing the current account deficit (CAD). Correspondingly, economies like South Africa experienced current account deficit could target policies for lowering the real exchange rates (REER), which could help in reducing current account deficit in South Africa.

2.4. RESEARCH GAP

The review of empirical literatures revealed that there were efforts to analyze the determinant of current account balance from different perspectives in different country. However, though the empirical findings have their own strength with valuable information on the directions and likely effects on the issue under consideration, the studies or empirical works that were conducted in Ethiopia, have data gap and inconclusive in nature. In addition, the dynamic nature of the issue needs continuous study. Hence, using secondary time series data the interactions among the variables that are expected to steer the trends and movements in the current account balance was investigated. Therefore, the study is different from previous works in bridging the data gap and included per capita income GDP as the interest variable in the model specification and estimated the magnitude and directions of drivers of current account balance in the Ethiopian economy by using autoregressive distributing lag model (ARDL) as an estimation technique.

CHAPTER THREE: METHODOLOGY OF THE STUDY

3. INTRODUCTION

The main objective of this study was to examine the drivers of current account balance of the Ethiopian economy. Accordingly, this chapter presents the methodology part of this study, including the data type and sources of the data, methods of data analysis model specification.

3.1. DATA TYPE AND SOURCES

In dealing with the current account balance, the study used 30 years of time-series data. The interest variables the study were real effective exchange rate; average oil price, financial deepening (M_2/GDP), parallel market exchange rate, gross domestic product per capita income growth, fiscal balance were used.

The data sources for the analysis of this study were collected from different secondary data sources. These secondary data sources were included annual reports, quarterly bulletins and official unpublished data from organizations' databases. The datasets were obtained mainly from National Bank of Ethiopia (NBE), and Ministry of Finance (MoF). The data on the international average oil price was collected from World Bank (WB) database.

3.2. METHODS DATA ANALYSIS

This study used both descriptive statistics and econometric methods to estimate and analyze the trends and current account balance. The time series econometric procedures used in order to examine the drivers of current account balance of the Ethiopian economy. In addition, the analysis was also conducted the unit root test, bound co-integration test and other post-estimation techniques to investigate the behaviour of macroeconomic variables on current account balance.

3.3. MODEL SPECIFICATION

3.3.1. THEORETICAL BACKGROUND FOR CURRENT MODEL SPECIFICATION

The main objective of this study was to examine the drivers of current account balance of the Ethiopian economy, so it was useful to use the basic macroeconomics identity. Specifying the model helps to show the mechanisms through which each effect is transmitted to the overall the economy. There are four approaches to the current account balance. These are elasticity

approach, the saving- investment gap, the macroeconomic approaches, the monetary approaches and the absorption approaches. Among the theoretical model the author pin-pointed on the absorption approach. The author chooses the absorption approach because of the time series nature of the data and it was very hard to get time series data on the interest variables. And it was problematic to get quality and availability data. In addition, some other theoretical model has both economic and political objectives as a result it was very difficult to use those model. Last but not least the absorption approach model leads to saving - investment model and hence it shows inter-temporal decision on current account balance in Ethiopia. The study started from the derivation of the basic macroeconomic identity and by manipulating this macroeconomic model and derive for current account balance identity (Scacciavillani & Knight, 1998). That is,

$$Y= C + I + G + X + M \quad (3.1)$$

Where,

Y= National output

C= Consumption

I= Investment

G= Government Expenditure

X= Export

M= Import

With some Rearrangement the variables

$$Y- (C+G) – I = X- M \quad (3.2)$$

$$S - I =X - M \quad (3.3)$$

Since Y-(C+G) is national savings in the economy.

Disintegrating both saving and investment in equation (3.3) in to private saving and public saving,

$$[(S_{pt} + S_{gt}) - (I_{pt} + I_{gt})] = X - M \quad (3.4)$$

Where,

S_{pt} = Private savings at time

S_{gt} = Government savings at time

I_{gt} = Government investment at time

I_{pt} = Private investment at time

X= Export

M= Import

In identifying the structural specification of the current account balance (CAB):

$$CAB = (X-M) + NY + NCT \quad (3.5)$$

Where, NY = Net income from abroad,

NCT = Net current transfers

Substituting (3.4) in to (3.5):

$$CAB = [(S_{pt} + S_{gt}) - (I_{pt} + I_{gt})] + NY + NCT \quad (3.6)$$

The identity in (3.6) shows the basic relationship between savings and investment (i.e both private and public savings), net income from abroad, net current transfers and current account balance in an open economy. In addition, if the net incomes from abroad and net current transfers are taken as part of the decisions on private and public agents in domestic economy, in question (3.6) becomes:

$$(G-T) + (I-S) = CAB = CAD \quad (3.7)$$

Where, T= Tax and taking the decision from the deficit side.

This identity shows the current account deficit is a macroeconomic phenomenon. It reflects imbalances between government outlays and taxes as well imbalances between private investment and saving (Carbaugh, 2004). The basic idea embodied in equation (3.7) is that factors affecting the decision of economic agents on spending and saving regulate the current account condition in an economy. Such factors are of both domestic and external economic conditions. As a result, factors that reduce consumer spending have an impact on the current account balance. Chinn and Prasad's (2000) publications contain such an analysis of calculating the current account balance based on the agent's saving-investment decisions and Leung (2005).

The effects of many macro variables have been proposed to influence the current account balance in different countries. The results from these studies suggested factors affecting the current account balance were not similar for all economies. This is not surprisingly a new thing; different economic structure and institutional set up among countries determine the

effect and depth of the changes caused by one variable on the current account. For example, Calderon et al (2001) have shown the deficits in Africa countries were somewhat different from other countries in different aspects. In this study, it is hypothesized that the current account balance in the economy is influenced by real effective exchange rate, terms of trade, real crude oil price, financial deepening, and degree of openness, parallel market premium, and growth of gross domestic product.

This can be expressed in the functional form:

CAB = f(real effective exchange rate, real crude oil price, financial deepening, degree of openness, parallel market premium, growth of GDP per capita income)

This relationship can be set as in the log linear form as:

CAB = f (REER, AOILP, FINDEP, OPENN, PAMPR, GDPPCIg, FISCDGT)

To handle the problems that would be encountered in computing and estimating the effects of macroeconomic variables on current account balance, a log-linear form of current account balance model is employed using which the time series data of current account balance converted in log forms.

$$\mathbf{LCAB_t = \beta_0 + \beta_1 LREER_t + \beta_2 LAOILP_t + \beta_3 LFINDEP_t + \beta_4 LOPENN_t + \beta_5 LPAMPR_t + \beta_6 LGDPPCIg_t + \beta_7 L\ FISCDGT_t + u_t} \quad \text{.....(3.8)}$$

Where,

$LCAB_t$ = Log of current account balance;

$LREER_t$ = Log of real effective exchange rate;

$LAOILP_t$ = Log of average oil price;

$LFINDEP_t$ = Log of financial deepening (Broad money (M2)/GDP);

$LOPENN_t$ = Log of degree of openness (Export/GDP)

$LPAMPR_t$ = Log of parallel market premium

$GDPPCIg_t$ = GDP Per capita income growth

$LFISCDGT_t$ = Fiscal balance deficit

u_t = White noise term

t= time in years for the period between (1990 - 2019)

Specification of the regression equation in the above form is targeted to hit one foremost advantage. According to(Gujarati, 2003), one attractive feature of the log linear or double log model that has made it popular on empirical work is that the slope coefficients (the betas) measured the elasticity of the dependent variable with respect to the independent variables. This is the percentage change is the dependent variables for a given small percentage change in the independent variable. That is,

$$\beta_i = \frac{\%\ change\ in\ the\ dependent\ variable}{\%\ change\ in\ the\ independent\ variable}$$

The partial slope coefficient, (β_i), measures the partial elasticity of the explained variable with respect to the explanatory variable, keeping all the other variables constant. Measuring such elasticities has been desirable in most economic studies than absolute changes as it is commonly used in many studies. In addition, the intercepts can say more at any point of values, we measure them or for finite small changes.

3.4. METHODS FOR TIME SERIES DATA ANALYSIS

Auto Regressive Distributive Lag (ARDL) Model was employed for this study, which combines the bound test and error correction method in the process of estimating model both the short run and long run relationship amongst the macroeconomic variables. The ARDL assumes that only a single reduced form of equation relationship exists between the dependent variable and the exogenous variables (Pesaran et al, 2001). The major advantage of this approach lies in its identification of the cointegrating vectors. The Error Correction Model (ECM) can be derived from ARDL model, to integrate the short run adjustments with long run equilibrium without losing long run information. To proceed with, the following generalized equation is derived for estimation using the ordinary least squares.

$$LCAB_t = \alpha_0 + \alpha_1 CAB_{t-1} + \alpha_2 LREER_{t-1} + \alpha_3 LAOILP_{t-1} + \alpha_4 FINDEP_{t-1} + \alpha_5 LOPENN_{t-1} + \alpha_6 PAMPR_{t-1} + \alpha_7 LGDPPCIG_{t-1} + \alpha_8 LFISCDGT_{t-1} + \varepsilon_t \quad \text{.....(3.9)}$$

Where,

α_j are the long run multipliers,

α_0 is the intercept,

$\boldsymbol{\varepsilon_t}$ is a white noise errors.

The choice of the lag length is determined to be done following the Schwartz information criterion with the optimal lag length being the lag with the least information criterion (Akaike, 1974). The criterion is chosen based on its effectiveness (optimality) for selecting the model with the least square error. The less the lag length estimated by this criteria, the higher would be the quality of the model. In estimating relationship amongst the macroeconomic variables established to obtain the short run dynamic parameters by estimating an error correction model associated with the long run estimates (Akaike, 1974):

$$\Delta LCAB_t = \alpha_0 + \sum_{i=0}^{p} \beta_1 \Delta LCAB_{t-i} + \sum_{i=0}^{p} \beta_2 \Delta LREER_{t-i} + \sum_{i=0}^{p} \beta_3 \Delta LAOILP_{t-i} + \sum_{i=0}^{p} \beta_4 \Delta LFINDEP_{t-i}$$
$$+ \sum_{i=0}^{p} \beta_{51} \Delta LOPENN_{t-i} + \sum_{i=0}^{p} \beta_6 \Delta PAMPR_{t-i} + \sum_{i=0}^{p} \beta_7 \Delta LGDPPICg_{t-i} + \sum_{i=0}^{p} \beta_8 \Delta LFISCDGT_{t-i}$$
$$+ \psi \mathrm{ECM}_{t-1} + \varepsilon_t \text{.....(3.10)}$$

Where,

- $\boldsymbol{\beta 1 - \beta 8}$ & $\boldsymbol{\psi}$ are short run dynamic multipliers,
- $\boldsymbol{\alpha_0}$ is the drift; and
- $\boldsymbol{\psi ECM_{t-1}}$ is the speed of convergence or adjustment to equilibrium which must be negative and statistically significant so as to have meaning full interpretation.

3.5. VARIABLES DESCRIPTION AND MEASUREMENT

Dependent variable

Current account balance (-/+): It measures the net financial flow to a country during a given period. Current account shows the decision of both private and public agents in the economy on how to interact in the external sectors. The interaction can be to spend beyond what is produced or vice- versa. If production is more than what is spent, surplus will be recorded and if consumption exceeds production, deficit will be incurred during a given period. This can be easily seen in equation (3.3.6) and (3.3.7). The movements are expecting to influence by a set of independent variables.

Independent variables

Real effective Exchange rate (REER): is defined as a multilateral exchange rate adjusted to consumer prices across trading partners. This rate is a composite exchange rate which can capture general price level movements and trade flows across trading partners. The increase in real effective exchange rate is an appreciation of domestic currency relative to a trading partner. According to the standard Munell-Fleming model, depreciation of exchange rate is related to increase in exports and decrease in imports, this in turn leads an increase in the

current account balance. This expected relationship holds in the empirical works of Calderon et al, 2001. Hence, based on the theory and other empirical results of previous works on real effective exchange rate is expected to relate negatively or positively with the current account balance (-/+).

Average Oil Price (AOILP): is the price of crude oil per barrel in the international markets. It is a proxy to capture the effect of price variability of major imports on the current account balance. As it is an input for both services and production sectors, it is expected to regulate the conditions of all the components of the current account. Concerning these two effects can be traced for the increase in oil price in the world. The first is increase imports and cost of export and thus a decrease in the current account balance. The second, an increase in the future cost of imports, it induces agents to cut back their current consumption and increase in savings, which is an improvement in current account.

Financial Deepening (FINDEP): It is measured as a ratio of money supply to gross domestic product and it is a proxy to measure the effect of money supply on the current account balance. Taken from the saving–investment approach, it is positively related to the current account balance as the increase in money supply is related to the advancement of the financial sector which induces more savings, which in turn is an improvement in the current account balance. In this relationship, the implicit assumption is that there will not be excessive money supply which is above the growth gross domestic product or the level of transactions. In addition, it is assumed that the government does not have the intention to create any inflationary conditions or increases in price levels which lessens the international competitiveness. Ruling out the negative effect of money supply by this assumption exhibits a positive relationship between money supply and the current account. This positive relationship is seen in the empirical studies of Chinn and Prasad (2000), Leung (2005), Meheret (2006). Therefore, this positive relationship is also expected to hold in the study.

Degree of openness (OPENN): measures the attributes of the liberalized trade that make a country attractive to foreign investment (Chinn and Prasad, 2000). Hence, when a country becomes more open to international trade, it could sustain larger deficits through capital transfers from abroad. The Openness Index is determined by dividing the sum of imports and exports by the country's total Gross Domestic Product. Openness of an economy which is measured as the ratio of the sum of exports and imports to the gross domestic product (GDP) is expected to relate positively with the current account balance.

Parallel Market Premium (PAMPR): It measured as a ratio of parallel market exchange rate to official exchange rate. This variable measures the inefficiency of a control on the financial market. The inefficiency of the exchange rate control is reflected by the diversion of the parallel market premium from the official exchange rate. Intervention of the government in the financial market through foreign exchange control creates a distortion which is measured by the variance between the parallel market exchange rate and the official exchange rate. The higher the restriction on the flow of foreign exchange, the higher will be the parallel market premium over the official exchange rate or the higher will be the diversion of the official exchange rate from a market clearing exchange rate. A research conducted by Bannaga (2004) revealed there was a positive relationship between the current account balance and the parallel market premium which is proxied the failure of government to unify the official and the parallel market exchange rates in the Sudanese economy. And another authors Calderon et al (2001) found a negative relationship between the current account deficits and the parallel market premium for the African countries. This was due to the fact that capital exchange controls were effective in isolating African countries from real shocks in the external sector and by making the domestic interest rate to be flexible for quick adjustment. In this study this positive relationship with the current account balance (and negative relationship with the current account deficit) is expected to hold for two reasons: first, the increase in parallel market premium creates a leakage of foreign exchange out of the formal financial sector which would have been used to increase imports by making them cheaper through the exchange rate appreciation. Hence, the increase in the premium reduces import which improves the current account balance. Secondly, the increase in the parallel market premium induces the government to depreciate the official exchange rate to increase the private transfers (remittances) from the rest of the world rather than leaving it to flow in to the economy in formal ways.

Gross Domestic Product Per capita income growth (GDPPICg): It is a proxy measure the impact of economic expansion on the external sector of the economy is expected to answer whether economic expansion is creating inflow of financial resources. According to Chin and Prasad (2000) there is no clear cut relationship between gross domestic product (GDP) growth and savings or current account balance. It is highly depends on how the growth rates are perceived by households on their permanent income. Firstly, if the growth in GDP is perceived as an increase in permanent income, it will decrease saving according to life-cycle permanent income hypothesis. Secondly, if the growth in gross domestic product is perceived as transitory, it tends to rise saving rates which emanates from the consumption smoothing

behaviour of agents. Thus the net effect of the growth of gross domestic product on saving and hence on the current account balance is indeterminate. It depends on the relative strength of the aforementioned effects (i.e either positive or negative related to the current account balance). These effects of GDP growth is also found in some studies negatively associated to the current account balance (Calderon et al, 2000; Bannaga (2004) and Abebe, 2003) and positively related with the current account (Calderon et al, 2001).

Fiscal Balance (FISCDGT) is calculated as total general government revenues minus total general government expenditures. According to Befekadu and Berhanu (2000), the first half of the 1950s, government budget was in surplus, which is followed by decade of balanced budget. Post reform period was also marked by the shift in the mode of financing from domestic to external. The effect of increase in budget balance on the current account depends on the reaction of the private sector. It is argued that the fiscal deficit financing from domestic bank borrowing results in inflation and the crowding out of the private investment. Therefore, the public deficit was also an important contributor to the increasing resource gap between saving and investment. There is a positive expected relationship between budget deficit and current account deficit.

3.6. DIAGNOSTIC TESTING TECHNIQUES

3.6.1. UNIT ROOT TESTS

The main assumptions underlie ordinary least square (OLS) estimate techniques in time series econometrics are constant mean, variance, and covariance in the variable's trends. Only if the above assumptions are true will the estimation results of OLS estimators will be valid. The widely applicable unit roots test will be used to examine these assumptions, particularly the most common Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) unit root tests (Maddala, 1992). The primary idea behind unit root tests is to determine whether a variable has a time-invariant mean and variance or is a stationary stochastic process. If a time series is stable, its mean, variance, and auto covariance (at several lags) remain constant regardless of where we measure them, making it time-invariant (Gugarati, 2003). This type of stationery is most useful for analyzing long-term behavior of variables. In the presence of unit root problem, there would be the problem of spurious regression to be encountered. The criteria for stationarity is rejecting the null hypothesis which states “there is a unit root problem” if the test statistic is greater than the values at 1%, 5% or 10% critical level. For variables that are not stationary at level, their stationarity after the first difference is required but not integrated of order two or I(2).

3.6.2. BOUND CO-INTEGRATION TEST

Testing whether a set of variables is co-integrated is frequently of interest. This may be desired due to economic implications such as whether a system is in long-run equilibrium, or it may be prudent to test such hypotheses prior to estimating a multivariate dynamic model (Engle and Granger, 1987) Co-integration, or simply co-integration, is the process of determining whether or not there is a long-term relationship between the regression variables (Greene, 2003). The main purpose of the co-integration test is to determine whether a linear combination of non-stationary variables at different levels is stationary.

The asymptotic critical values of the bound test provides a test for co-integration for the independent variables with integrated order of either I(0) or I(1).The lower value in the test assumes that the regressing explanatory variables are I(0) and an upper value assuming purely I(1). If the F- statistic is above the upper critical value, the null hypothesis of no long run relationship can be rejected irrespective of the orders of integration for the time series. Conversely, if the test statistic falls below the lower critical value, the null hypothesis cannot be rejected. The critical values for the F-statistic test could be computed using the test of Pesaran, Shin and Smith (2001).

3.6.3. OTHER POST ESTIMATION TESTS

Besides the above two testing techniques, the study would apply appropriate tests: such as the tests for serial autocorrelation and heteroscedasticity, the stability and normality tests for the model in subsequent manner with prime objective of ensuring the quality of the overall research. The rejection rule for the null hypothesis of each test is to reject if the test statistic is less than the 5% critical level.

CHAPTER FOUR: ANALYSIS AND DISCUSSION

INTRODUCTION

This chapter intended for the analysis and discussion of the results both in descriptive and econometric methods of the empirical study. Before running regression analysis, the trends in explanatory variables were plotted using line graphs to visualize the trends of those variables exhibited during the reference or the study periods. By and large, the appropriate and the resultant testing techniques for the fulfilment of the necessary conditions, the regression analysis and empirical findings of the study are presented as follows.

4.1. GENERAL OVERVIEW OF ECONOMIC PERFORMANCE

Ethiopia has experienced double-digit economic growth, averaging 10.8 percent since 2005, primarily driven by the public sector, putting the country among the world's fastest-growing economies. According to Africa's Economic Outlook, AEO (2020), Agriculture generated 35.45 percent of Ethiopia's GDP in 2020, followed by industry 23.11 percent and services 36.81 percent of real GDP, respectively. And the real GDP was estimated to have grown by 6.1% in the fiscal year 2019/20. Ethiopia’s economy grew by 6.1% in 2020, down from 8.4% in 2019, largely because of the COVID-19 pandemic. Growth was led by the services and industry sectors, whereas the hospitability, transport, and communications sectors were adversely affected by the pandemic and the associated suppression measures to prevent the spread of the virus.

Even though the world is facing difficult macroeconomic and social conditions as a result of the COVID-19 epidemic, the Ethiopian economy has continued to expand. Real Gross Domestic Product (GDP) increased by 6.1 percent in the 2019/20 fiscal year, compared to a 3.5 percent average growth estimate for Sub-Saharan Africa (NBE, 2019/20). This increase in real GDP was due to a 9.6% increase in industry, a 5.3 percent increase in service, and a 4.3 percent increase in agriculture. As a result, nominal per capita income GDP increased by 9.6% year on year to reach USD 1,080.

In general, the Ethiopian economy grew at an annual rate of 8.2 percent from 2015/16 to 2019/20, which was 2.8 percentage points lower than the plan period's average growth target. Ethiopia's economy was expected to grow by 8.4 percent in 2020/21, compared to 5.4 and 3.4 percent for the world and Sub-Saharan Africa, respectively (NBE, 2020).

4.2. DESCRIPTIVE ANALYSIS

4.2.1. TRENDS OF CURRENT ACCOUNT AND ITS COMPENENTS

The overall balance of payments of Ethiopia deteriorated, with a USD 1.2 billion deficit in 2019/20 compared to USD 941.6 million deficits the year 2018/19, due to a decline in net private transfers, official transfers, and capital account balances, despite improvements in merchandise trade and net service payments deficits. The net services deficit was USD 213.5 million, compared to USD 550.7 million in the year 2018/19, while the merchandise trade deficit improved by 12.5 percent. Net private transfers and net official transfers fell by 13.2 percent and 26.9 percent, respectively, reducing the current account deficit (including official transfers) to USD 4.4 billion from USD 4.9 billion a year ago. The current account deficit to GDP ratio was calculated to be 4.1 percent (NBE, 2019/20).

Ethiopia's current account balance has been in deficit for the past thirty years in a row. The primary source of the total deficit is the trade balance in commodities, which showed the same scenario from 1990 to 2019 as it had in the previous four decades (as shown in figure 4.1 below). The deficit in the current account balance, including official transfers, narrowed to USD 4.4 billion from USD 4.9 billion last year, due to contraction in the net deficits of both merchandise and service trades. The following graph (as shown in figure 4.1 below) summarizes Ethiopia's current account trends from the years 1990 through 2019.

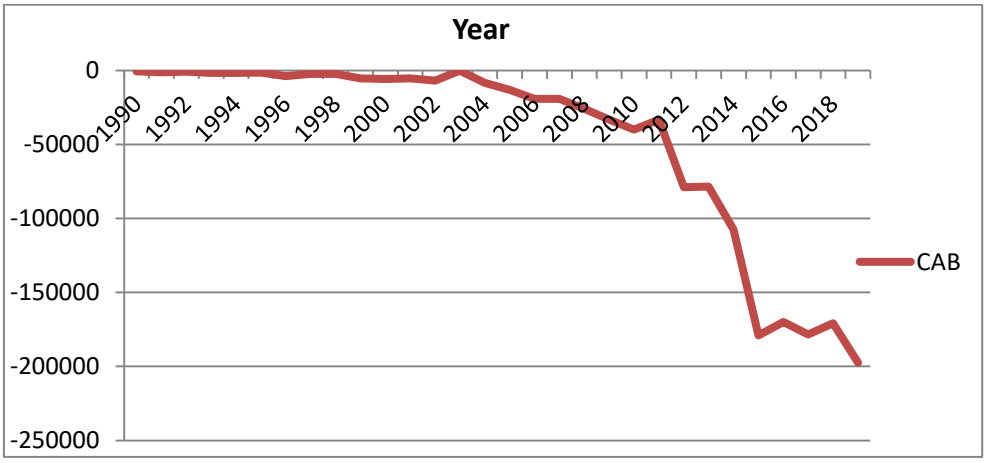

Figure 4.1 : Trends of current account balance (in million birr)

(Source: Own Computation Data from NBE, 2019/20)

As we can notice from the above (Figure 4.1), the trend of current account balance (or deficits) of Ethiopia, the figure depicts the magnitude and direction of current account balance has been negative and downward from the year 1990 through 2019. The figure shows that there has

been large increase in the size of current account deficits. For all the periods from 1990 through 2019, the current account balance was negative which implies that the country has never been enjoyed any surplus in those periods.

Table 4.1. Composition of Current Account (in Million Birr)

Year / Item		1990	1995	2000	2005	2010	2015	2017	2018	2019
Merchandise										
	Export	572.1	2,607.1	3,866.6	8,683.5	44,277.5	60,526.0	74,044.8	74,807.7	93,641.5
	Import	-2,130.3	-8,862.6	-12,967.7	-39,870.1	-133,017.4	-353,001.3	-398,289.7	-423,956.5	-435,077.3
	Trade Balance	**-1,558.20**	**-6,255.50**	**-9,101.10**	**-31,186.60**	**-88,739.90**	**-292,475.30**	**-324,244.90**	**-349,148.80**	**-341,435.80**
Net Services		- 62.0	415.0	647.6	1,282.1	11,090.6	- 13,064.9	-5,208.6	-15,840.5	-6,690.5
Net Transfer		-1620.20	-5,840.5	-8,453.5	-29,904.5	-77,649.3	-305,540.2	-329,453.5	- 364,989.3	-348,126.3
CAB		-1,206.3	-3,860.5	-5,295.4	-19,258.6	-33,244.8	-169,859.7	-170,852.4	- 197,359.4	-185,592.0

Source: Own Computation Data from NBE, 2019/20

Ethiopia is one of the countries with a long history of international trade and diplomacy. Despite its long history and strong ties with the rest of the world, the country's role and position in international trade has been insignificant. Ethiopia, like any other country, is well known for producing and exporting agricultural products while heavily dependent on other countries for the importation of the most valuable and high-tech products, such as capital goods, fuel, pharmaceuticals, and so on.

According to the Ethiopia's Ministry of Finance annual report (MoF, 2019) on the Ethiopian economy revealed that the exports are dominated by primary agricultural outputs. There are also few industrial outputs and minerals and metal mining. However, the import outlays are largely spent on items that are related to production, items like fuel and machinery or capital goods, consumer goods, etc.

As per the National Bank of Ethiopia report, Ethiopia mainly exports agricultural products where coffee alone accounts for almost 30% of the total value of export. Ethiopia's top five agricultural exports (coffee, oilseeds, pulses, chat and flower) accounts for about 75% of the total export. When it comes to import, capital goods, fuel and consumer goods are the major imports of Ethiopia accounting for almost 80% of Ethiopia's total import bill (NBE, 2019).

As we can observe from the table 4.1 above and the figure 4.2 and 4.3 below, the export merchandise exhibited an increase magnitude throughout the study periods. However, the export trade highly dominated by the import merchandise in the study periods under consideration. The growth in consumption of importable goods and services to higher degree

than the boost in the export income leads to deterioration of the current account balance. And the net transfer was also declining with an increase in magnitude. Correspondingly, the net goods and services are also deteriorated from the year 1990 all the way through 2019. As a result, the merchandise trade balance negative and widened which implies deterioration in the current account balance (or deficits) in the study periods.

In general, the Ethiopian economy's current account deficit has increased and deteriorated over the study period. The rising trend of the current account deficit implies a financial outflow to the rest of the world, worsening the situation of international indebtedness. Unless the deficits arise as a result of the country's development or investment needs, such an increasing trend has a negative impact on the country's future economic growth.

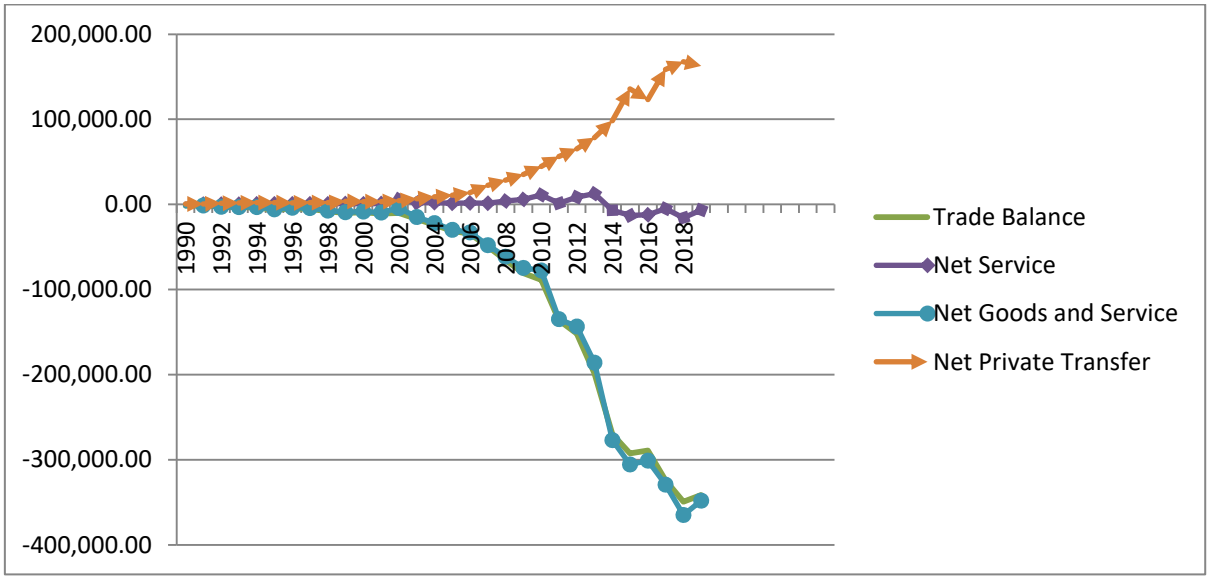

Figure 4.2: Trends in Components of Current Account (1990-2019)
(Source: Own Computation Data from NBE, 2019/20)

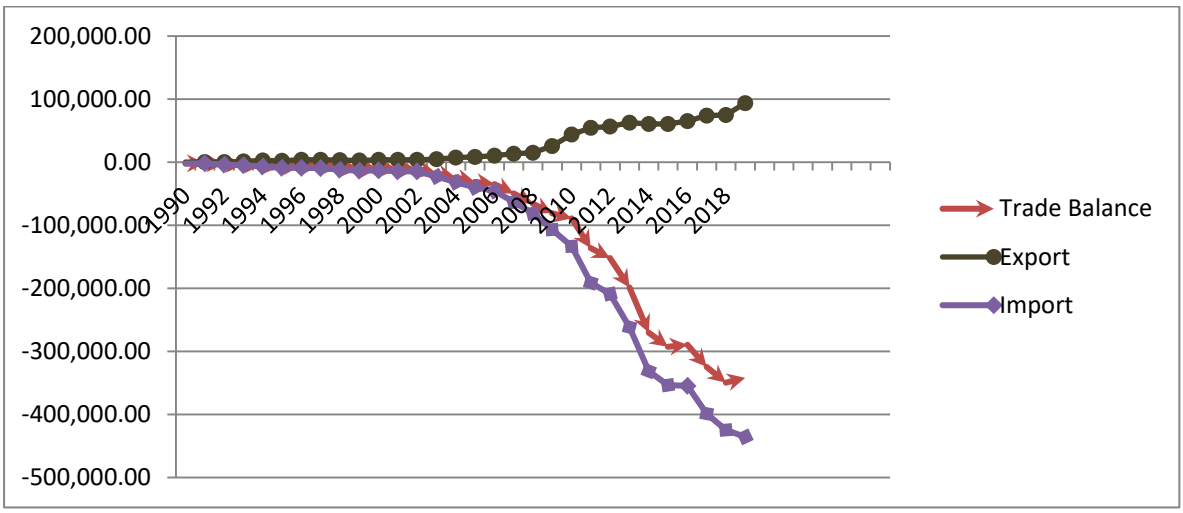

Figure 4.3.: Trends of Export and Import

(Source: Own computation on data from NBE, 2019)

The trends of Ethiopia's current account balance (or deficits), as depicted [figure 4.4] below the magnitude of the current account balance relative to the total size of the economy, showed that there has been a significant increase in the size of the current account deficit as a percentage of GDP from 1990 to 2019.

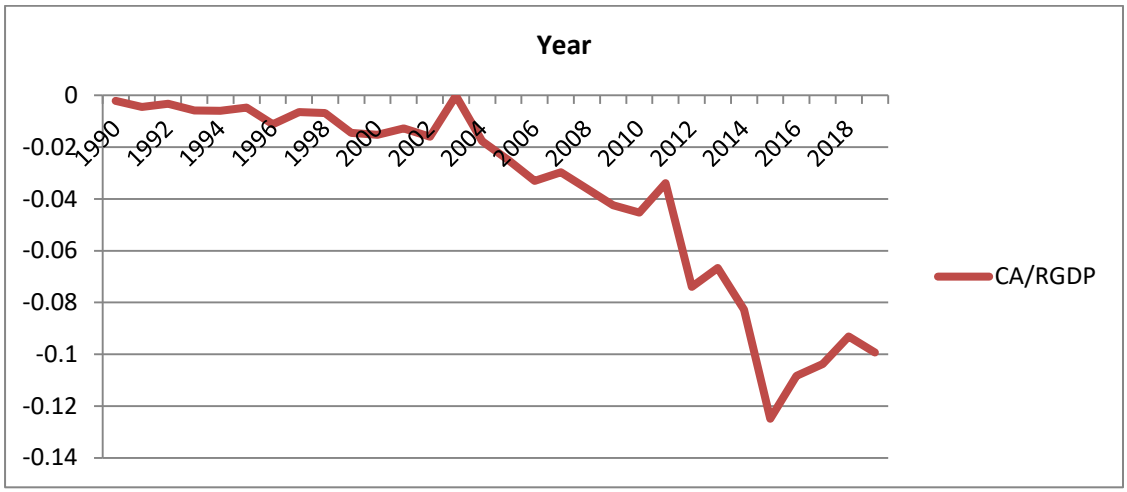

Figure 4.4.: Current Account as a percentage of GDP (1990-2019)

(Source: Own computation on data from NBE, 2019)

As shown in Figure 4.4, the current account to real GDP ratio has been declining since 1990 and continued until 2019. Ethiopia's persistent current account deficit could be explained by a number of factors. Because the merchandise trade balance accounts for the majority of Ethiopia's current account deficit, it indicated that the majority of Ethiopian export products to

the rest of the world are primary products with price fluctuations in the international goods market.

4.2.2. TRENDS OF CURRENT ACCOUNT AND ITS DRIVERS

4.2.2.1. TRENDS OF REAL EFFECTIVE AND PARALLEL MARKET EXCHANGE RATE

The real effective exchange rate and the parallel exchange rate are the two variables considered as major explanatory variables to represent the current account balance. The National Bank of Ethiopia provided the 30-year period time series datasets used to assess the trends and effects of the two variables.

A multilateral exchange rate that is adjusted to consumer prices across trading partners is referred to as an exchange rate. This rate is a composite exchange rate capable of capturing general price level movements as well as trade flows between trading partners. The rise in the real effective exchange rate is due to an increase in the value of the domestic currency in comparison to that of a trading partner. According to the standard Munell-Fleming model, exchange rate depreciation is associated with an increase in exports and a decrease in imports, resulting in an increase in the current account balance. The empirical work of Calderon et al, (2001) supports this expected relationship. As a result, based on the theory and other empirical findings of previous studies, the real effective exchange rate is expected to have a negative or positive relationship with the current account balance.

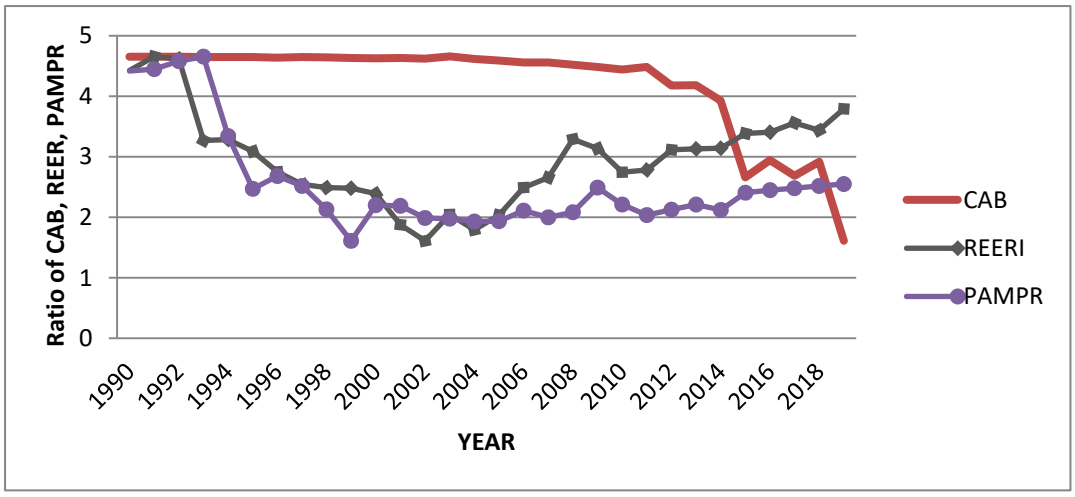

Figure 4.5: Real Effective and Parallel Exchange Rate (1990-2019)

(Source: Own Computation data from NBE, 2019/20)

As we have seen from the figure 4.5 above, after the regime change and reform year of 1992, the real effective exchange rates and parallel exchange rate decline together except in the 1998 to 2000 the deviation may be due to the Ethio-Eritrea border conflict. In the study period from

the year 2004 onwards, both rates have been increasing and had similar trends but the real effective exchange rates surpass the parallel market premium exchange rate. One can noticed from the above figure, that the gap between the real effective exchange rates and parallel exchange rate has been wider and wider year after year. The gaps between the real effective exchange rate and the parallel market exchange rate implies that the inefficiency of the financial market of a nation.

The real effective exchange rate of the Birr has been increasing since 2010/11 as a result of higher domestic inflation and the strengthening of the US dollar in comparison to its major trading partners. However, during the year 2017/18 and 2019/20, the Birr exchange rate depreciates in real terms but it increase in the year 2018/19. This was primarily due to the significant depreciation of the Birr against trading partner currencies, whereas the US dollar has slightly strengthened against all trading partner currencies by 3.7 percent on average (NBE, 2019/20).

In addition, one of the drivers of the current account is the parallel market Premium rate. It is calculated as the ratio of the parallel market to the official exchange rate. The inefficiency of a financial market control is measured by this variable. The diversion of the parallel market premium from the official exchange rate reflects the inefficiency of currency control. The government's intervention in the financial market through foreign exchange control causes a distortion, which is measured by the difference between the parallel market and official exchange rates. The greater the restriction on the flow of foreign exchange, the greater the parallel market premium over the official exchange rate or the greater the deviation of the official exchange rate from a market clearing exchange rate.

A research conducted by Bannaga (2004) revealed there was a positive relationship between the current account balance and the parallel market premium which is proxied the failure of government to unify the official and the parallel market exchange rates in the Sudanese economy. And another authors Calderon et al (2001) found a negative relationship between the current account deficits the parallel market premium for the African countries. This was due to the fact that capital exchange controls were effective in isolating African countries from real shocks in the external sector and by making the domestic interest rate to be flexible for quick adjustment. In this study this positive relationship with the current account balance (and negative relationship with the current account deficit) is expected to hold for two reasons: first, the increase in parallel market premium creates a leakage of foreign exchange out of the formal financial sector which would have been used to increase imports by making them

cheaper through the exchange rate appreciation. Hence, the increase in the premium reduces import which improves the current account balance. Secondly, the increase in the parallel market premium induces the government to depreciate the official exchange rate to increase the private transfers (remittances) from the rest of the world rather than leaving it to surge in to the economy in formal ways.

4.2.2.2. TRENDS OF FINANCIAL DEEPENING AND TRADE OPENNESS

Degree of trade openness measures the attributes of the liberalized trade that make a country attractive to foreign investment (Chinn and Prasad, 2000). Hence, when a country becomes more open to international trade, it could sustain larger current deficits through capital transfers from abroad. The Openness Index is determined by dividing the sum of imports and exports by the country's total Gross Domestic Product. Openness of an economy is expected to relate positively with the current account balance.

As we observed from the (Figure 4.6) below, the current account balance and trade openness, as the country open or liberalized its trade to the rest of the world the current account balance has been declining from the year 1990 all the way through 2019.The current account balance and trade openness go in different direction in the study periods.

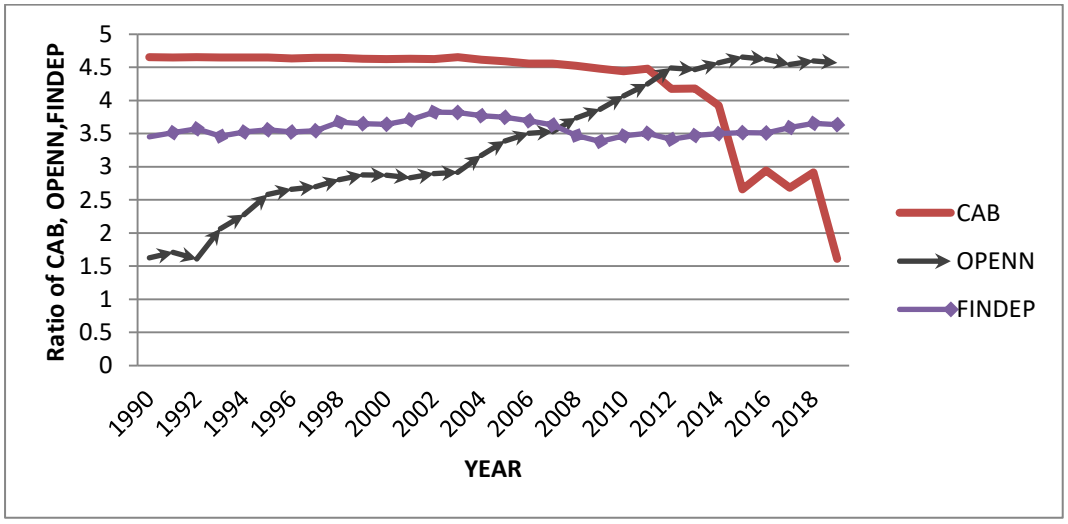

Figure 4.6: Trends of Financial Deepening and Trade openness (1990 – 2019)
(Source: Own Computation Data from NBE, 2019/20)

As we noticed from the (Figure 4.6) above, there is a negative or divergent relationship between the current account and the country's the degree of openness to foreign trade. Ethiopia, as a primary product exporter, is confronted by falling commodity prices and

inelastic demand for its exports. As a result, trade liberalization is more likely to increase imports, causing the current account to deteriorate.

Financial deepening is calculated as a ratio of money supply to GDP and serves as a proxy for the effect of money supply on the current account balance. According to the saving–investment approach, it is positively related to the current account balance because an increase in the money supply is associated with the advancement of the financial sector, which induces more savings, resulting in an improvement in the current account balance. The implicit assumption in this relationship is that there will not be an excess of money supply that exceeds the growth rate of GDP or the level of transactions. In addition, it is assumed that the government does not have the intention to create any inflationary conditions or increases in price levels which lessens the international competitiveness. Ruling out the negative effect of money supply by this assumption exhibits a positive relationship between money supply and the current account. This positive relationship is seen in the empirical studies of Chinn and Prasad (2000), Leung (2005), Meheret (2006).

4.2.2.3. TRENDS IN CURRENT ACCOUNT AND OIL PRICE

As it shown in (Figure 4.7) below, oil price is the price of crude oil per barrel in the international markets. It is a proxy to capture the effect of price variability of major imports on the current account balance. The trends of oil price (figure 4.7 below) shows; there has been an increasing pattern throughout the study periods. As a result, the trends in the current account balance have been further deteriorating from the year 2010 onwards from relatively steady pattern before the year 2010. Because it is an input for both the service and manufacturing sectors, it is expected to regulate the conditions of all current account components. These two consequences are linked to the global rise in oil prices. The first is increase imports and cost of export and thus a decrease in the current account balance. The second, an increase in future cost of imports, it induces agents to cut back their current consumption and increase in savings, which is an improvement in current account.

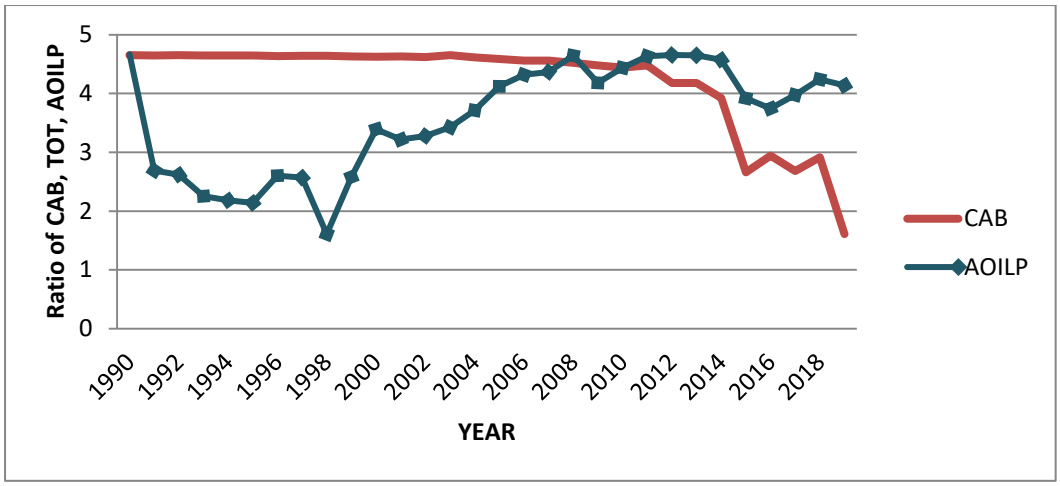

Figure 4.7: Trends of Current account and Oil Price

(Source: Own Computation Data from NBE, MoPD, WB)

4.3. TRENDS IN SAVINGS AND INVESTMENT

External trade is one of a country's development strategies. This stems from the assumption that through external trade, a country can gain access to resources that it lacks and, in turn, provide goods that are plentiful in exchange as a means of financing its needs. This is the fundamental concept of comparative advantage in international trade and one of the driving forces behind globalization. Ethiopia engages in external trade as a member of the global community. For a long time, Ethiopia has been a participant in international trade, exporting primary agricultural products and importing capital goods, industrial inputs, and consumer goods. (Befekadu et al, 2000/2001; Befekadu and Berhanu, 1999/2000).

The current account balance can be calculated using the difference between a country's income and expenditures. Countries with current account deficits spend more than they produce, whereas countries with current account surpluses spend less. The current account balance can also be expressed in terms of savings and investment. A surplus country is one that saves more than it invests, whereas a deficit country is the opposite. We can think of the current account balance as the difference between saving and investing. Because saving is the difference between income and consumption, and expenditure includes both consumption and investment (Park and Shin, 2009).

The identity in section (3.6) and (3.7) of chapter three, shows the basic relationship between savings and investment (i.e both private and public savings), net income from abroad, net current transfers and current account balance in an open economy. Therefore, this identity shows the current account deficit is a macroeconomic phenomenon. It reflects imbalances between government outlays and taxes as well imbalances between private investment and

saving (Carbaugh, 2004). The basic idea embodied in equation (3.7) is that factors affecting the decision of economic agents on spending and saving regulate the current account condition in an economy. Such factors are of both domestic and external economic conditions. As a result, factors that reduce consumer spending have an impact on the current account balance. Chinn and Prasad's publications contain such an analysis of calculating the current account balance based on the agent's saving-investment decisions (2000) and Leung (2005).

According to the National Bank of Ethiopia's (NBE) 2019/20 annual report, the gap between Gross Domestic Savings and the investment rate has widened from year to year. For example, the gross domestic saving to GDP ratio fell to 20.9 percent from 22.3 percent last year (Figure 4.3), with a 29.6 percent GTP II target set for the fiscal year. Domestic saving increased by 17.5 percent, while total consumption expenditure increased by 27.4 percent. The ratio of gross capital formation to GDP was 30.8 percent, 4.4 percentage points lower than the year 2018/19. Likewise, domestic absorption to GDP ratio went down to 109.8 percent from 112.9 percent a year ago. As a result, there was 12.9 per cent resources gap which was filled either by domestic or foreign borrowing. Similarly there was 9.8 resources gap during 2019/20. This resource gap has negative impact on current account balance (NBE, 2019/20).

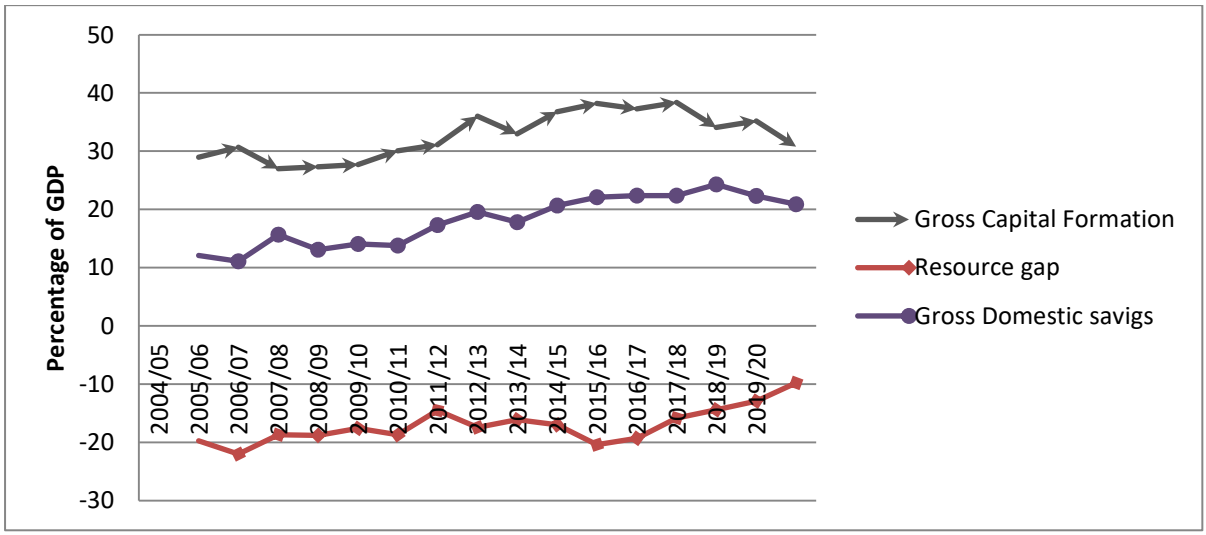

Figure 4.8: Trends in Saving and Investment in Ethiopia (2004/05 to 2019/20)
(Source: Own Computation data from NBE, 2019/20)

The figure 4.8 above shows the trend gap between gross domestic saving and grosses capital formation from the year 1990 to 2019/20. The average domestic saving in these periods was around 18.12 while the gross capital formation was 32.67 and the average resource gap was 17.06 that have been filled with either domestic or foreign borrowing resources. However, figure 4.8 above, shows that the resource gap gradually improved from the year 2013/14

(20.4%) all the way through 2019/20 (9.8%) in absolute terms. To summarize, weak performance of Ethiopia's external trade with low level of domestic saving make the country vulnerable to external world. Underperformance in this area leads the country to high level of debt accumulation, low level of foreign reserve and increasing of debt risks.

In general, the descriptive analysis and trends of Ethiopia's current account balance (or deficits) show that the magnitude and direction of the current account balance has been negative and downward from 1990 to 2019. The results also show that the size of current account deficits has increased meaningfully, and the country has never enjoyed a surplus during the study periods. Furthermore, the trends of Ethiopia's current account balance (or deficits), as depicted (figure 4.4) magnitude of the current account balance relative to the total size of the economy, revealed that the size of the current account deficit as a percentage of GDP increased considerably from the year 1990 to 2019.

A number of factors could explain Ethiopia's persistent current account deficit. Because the merchandise trade balance accounts for the majority of Ethiopia's current account deficit, it suggests that the majority of Ethiopia's export products to the rest of the world are primary goods with price fluctuations in the international goods market. However, these findings are merely descriptive, and they are inadequate to see the relationship among the variables and make sound policy recommendations. As a result, additional econometric diagnostic tests are required to support the descriptive analysis of the current account balance and reach conclusive results. Therefore, the diagnostic tests are conducted and presented in the following section.

4.4. DIAGNOSTIC TEST RESULTS

4.4.1 THE UNIT ROOT TEST RESULT

The Augmented Dickey Fuller Unit root test used to assess whether the variables are stationary or not and their order of integration. The result of the ADF Unit root test is shown in table 4.2 as follows.

Table: 4.2 Augmented Dickey-Fuller Unit Root Test for Stationarity

Variables	ADF Calculated Value				Order of Integration
	At Level		At Difference		
	Test Stat.	Critical value	Test Stat.	Critical value	
LN_CAB	0.496	-3.723 -2.989 -2.625	-3.381**	-3.730 -2.992 -2.626	I (1)
LN_REERI	-1.748		-4.930***		I (1)
LN_OPENN	-2.140		-7.976***		I (1)
LN_FINDEP	-1.755		-5.008***		I (1)
LN_PAMPR	-2.327		-4.506***		I (1)
LN_AOILP	-1.838		-4.921***		I (1)
LN_FISCDGT	-1.532		-6.740***		I (1)
GDPPCIg	-3.667***		-7.224***		I (0)

Note: ***, ** and * indicates significance at 1%, 5% and 10% level using MacKinnon critical values, respectively.

Source: Own computation using stata /MP 16.0

As shown in the left column of table 4.2 above, the ADF statistics for LN_REERI, LN_OPENN, LN_FINDEP, LN_PAMPR, LN_AOILP, and LN_FISCDGT at level form were less than the critical values of 1%, 5%, and 10% in absolute terms, indicating that they were not stationary at level. Nonetheless, for GDPPCIg, the series are stationary at level and integrated of order zero I (0) because its test statistics are greater than the critical values at 5% and 10% level of significance, respectively. As a result, there are unit root problems that must be solved under the assumption of ordinary least square (OLS) estimation. However, as Mandala (1992) stated, many economic time series are clearly nonstationary in the sense that mean and variances are time dependent and tend to deviate ever further from any given value as time passes. To make LN_REERI, LN_OPENN, LN_FINDEP, LN_PAMPR, LN_AOILP, and LN_FISCDGT stationary, the first difference of each was taken and checked for holding the assumptions of stationarity and integrated of order I (1).

The regression of these variables without additional diagnostic checking leads to spurious regression or unrealistic R^2 values for variables with no causal relationship. Because all of the variables are not integrated of order zero, I (0), or are not stationary at levels, higher order

integration must be checked. As a result, the next step is to see if the variables are integrated of order one, I (1), which was testing for first differences of stationarity, as shown in the right column of table 4.2 above.

Using the right column of table 4.2 above, the null hypothesis of unit root existence can be rejected for all variables. Stationary is found in all variables at the 5% level of significance, with the exception of GDP per capita income, which is significant at level at the 5% level of significance. Except for the current account deficit, variables such as the real effective exchange rate, trade openness, financial deepening, government budget deficit, and average oil price are all significant even at the 1% level. As a result, with the exception of GDP per capita income which is I (0), all the other variables are integrated of order one, I (1). To deal with such variables of integrated order one, I (1), we need to perform additional tests before moving on to regression estimation, such as the bound co-integration test, which is shown in section 4.4.3 below.

4.4.2. BOUND TEST FOR CO-INTEGRATION

Testing whether a set of variables is co-integrated is frequently of interest. This may be desired due to economic implications, such as whether a system is in long-run equilibrium, or it may be prudent to test such hypotheses prior to estimating a multivariate dynamic model (Engle and Granger, 1987) Co-integration, or simply co-integration, is the process of determining whether or not there is a long-term relationship between the regression variables (Greene, 2003). The main purpose of the co-integration test is to determine whether a linear combination of non-stationary variables at different levels is stationary. The long run paths of the residuals from the regression of the integration of order one, I (1) variables are the basis for this test. If the residual (the linear combination estimator) is stationary at levels, the variables have a long-run relationship and are said to be co-integrated. Performing the Engle-Granger (EG) or Augmented Engle-Granger (AEG) test is a must.

The presence of co-integration among the series was tested by employing the Pesaran, Shin and Smith (2001) ARDL bound test approach. The test results presented in Table 4.3 below show that the computed F-statistic (F = 7.57) was greater than the F-critical value at 5%. The result supported the rejection of the null hypothesis; suggesting the presence and safeguarding of a co-integration between Current account balance and the series of independent variables. Such co-integration was taken as a necessary condition to analyze the short run and long-run relationship of the explanatory variables to affect the performance level of the country's Current account balance.

Table.4. 3 ARDL Bounds Test Results for Co-integration

Table.4.3 ARDL Bounds Test Results for Co-integration

K	F	Critical value at 1%		Critical value at 5%		Critical value at 10%	
		[I_0]	[I_1]	[I_0]	[I_1]	[I_0]	[I_0]
7	7.573***	2.96	4.26	2.32	3.50	2.03	3.13

***,** and * indicates the significance of F statistic test at 1%,5% and 10% level of critical value

Source: Own Computation using Stata /MP 16.0

4.4.3. SERIAL AUTOCORRELATION AND HETEROSCEDASTICITY

One of the key assumptions in linear regression is that there is no correlation between consecutive residuals. In other words, it is assumed that the residuals are independent or white noise. When this assumption is violated, the standard errors of the coefficients in a regression model are likely to be underestimated, which means predictor variables are more likely to be deemed statistically significant when they are not. A Durbin-Watson test, which detects the presence of autocorrelation in regression residuals, is one way to see if this assumption is met.

The Breusch-Godfrey Serial Correlation LM Test results (see appendix 6), revealed that there was no serial autocorrelation problem. In addition, the diagnostic test for heteroscedasticity also showed the absence of such a problem; indicating that the model was good enough for the study of co-integration among the variables.

4.5. THE LONG RUN REGRESSION RESULTS

The results of the estimated long run coefficients using the ARDL approach is presented in the table 4.4 below. As discussed in prior section, the model selected for the long run estimation was based on the AIC criteria as ARDL (2, 1, 1, 2, 0, 0, 2, 1) as it is shown below.

Table 4.4 Long-run Estimations Results

Model ARDL (2, 1, 1, 2, 0, 0, 2, 1)

Dependent Variable: LN_CAB

Variables	Coefficients	Std.Error	t-statistic	*P-Value*
LN_REERI	.0210702	.0716138	0.29	0.774
LN_PAMPR	.2602917***	.0578545	4.5	0.001
LN_AOILP	-.1101413***	.0322574	-3.41	0.006
LN_ OPEN	.5540429***	.0743493	7.45	0.000
LN_ FISCDGT	-.1369899	.1323782	-1.03	0.323
LN_FINDEP	0.5301307	.385645	1.37	0.197
GDPPCIG	-.5250611***	.1453793	-3.61	0.004
_Cons	1.081897	1.156221	0.94	0.370
R^2 = 0.8809 and Adj R^2 = 7076		**Prob > F = 0.0000**		**N=30**

Note: ***, ** and * indicates significance at 1%, 5% and 10% level using MacKinnon critical values, respectively.

Source: Own Computation using Stata /MP 16.0

Using Engle- Granger co-integration or simply co-integration test, the variables are checked for co-integration in the long run. The results in table 4.4 above have shown there is a long run relationship among the variables or co-integration holds. The regression analysis made on these variables has shown in the table 4.4 above. As it can be seen in table 4.4 above, the coefficients of Parallel market premium, average oil price and degree of openness, and real GDP per capita income growth were statistically significant. On the other hand, the coefficients of the variables like real effective exchange rate, fiscal budget balance and financial deepening were found insignificant.

For the Real Effective Exchange Rate (REER), the empirical finding of this study indicated that there was positive long run relationship and statistical insignificance. As a result, it has no long run effect on the current account balance during the reference period. This is similar with the empirical findings of Hassen (2006); which revealed that the real exchange rate had no long-term and short-term effects on current account balance.

The empirical findings of this study confirm that the parallel market exchange rate premium to the current account balance revealed statistically significant in the long run even at 1% level of significance. The parallel market exchange rate premium to the current account balance revealed statistically significant and positively related in the long run. This is inconformity with prior expectation and the empirical findings of a research conducted by Bannaga (2004) revealed there was a positive relationship between the current account balance and the parallel market premium which was proxied the failure of government to unify the official and the parallel market exchange rates in the Sudanese economy.

Based on the coefficients presented in table 4.4 above, it can be interpreted as; holding other things constant, when the parallel market exchange rate premium increases by 1%, then the current account balance improved by 0.26 percent. This implies that the current account is sensitive to parallel market exchange rate premium; and an increase in the parallel market exchange rate premium leads to an improvement in the current account balance during the study periods.

Parallel Market Premium a ratio of parallel market exchange rate to official exchange rate and measures the inefficiency of a control on the financial market. The inefficiency of the exchange rate control is reflected by the diversion of the parallel market premium from the official exchange rate. Intervention of the government in the financial market through foreign exchange control creates a distortion which is measured by the variance between the parallel market exchange rate and the official exchange rate. The higher the restriction on the flow of foreign exchange, the higher will be the parallel market premium over the official exchange rate or the higher will be the diversion of the official exchange rate from a market clearing exchange rate.

Another important variable, the average oil price, was found to have statistically significant and negative effects on the country's external trade current account balance. According to previous expectation, the average oil price is negatively and significantly related to the current account balance. This indicates that the price of major importable goods and services has risen, resulting in a worsening of the current account balance. According to demand theory, every increase in price levels is followed by a decrease in volume. Instead, it increases economic dissaving, which reduces the external balance. The inability to adjust demand volumes for price increases is caused by the low price elasticities of importable goods and services, which may result from the fact that importable goods and services are the result of higher needs for development activities. In general, the above result corresponds to the expectation stated in section 3.5 above.

As it is indicated in table 4.4 above, in contrast to the previous expectation on the relationship between degree of openness and the current account, positive and significant result was found. When the economy is open to external to the rest of the world economic agents tends to increase their exports, remittances and other unilateral transfers which improve the current account condition in the economy. An alternative explanation for such a result is unlike the results in the works of Chinn and Prasad (2000), the increase in the degree of openness does not attract foreign capital to sustain larger current account balance in the Ethiopian economy. Therefore, there are other factors that must be fulfilled for attracting inflow of foreign capital rather than mere openness of trade.

The empirical finding on financial deepening was found positive and statistically insignificantly with the current account balance which was in line with the previously expectation at least in direction. The positive relationship between financial deepening (M2/GDP) and current account balance was indicative of money stimulate saving in the country or it is in the proportion to the increase in the advancement of the financial sector but not statistically significant. This result confirmed by the empirical findings of Aimon et al (2020) at least in terms of sign direction. His empirical finding revealed that there was a positive relationship between the financial deepening and the current account balance.

For the fiscal budget balance, however, the empirical finding of this study (in table 4.4) indicated that no statistical significance in the long run and negative relationship with the current account balance during the reference period. However, empirical findings of Aimon et al (2020), Girma (2018) and Mwangi (2014) was found to be Positive relationship between fiscal balance and the current account in the long run. The divergence in the sign could the variation in model specification, nature of the data and the estimation techniques.

For the Real GDP per capita income, the empirical finding of this study indicated that there was statistical significance and negative relationship with current account balance. Based on consumption-smoothing behavior of agents such perception tends to decrease saving rates than decreasing in consumption levels. Thus, there exist negative relationships between output growth and saving or current account balance. The result is similar with Calderon's et al (2005) works using (annual data from 1966 to 1995) and GMM estimation techniques, found a negative relationship between real GDP per capita income and the current account balance. The difference might happen due to the estimation techniques of other ways.

4.6. THE SHORT RUN ESTIMATION

To capture the short run variation that might have occurred in estimating the long run co-integration equation, dynamic error correction estimation is conducted as depicted in table 4.5 below.

Table 4.5. Short Run Regression Estimations Result

Model ARDL (2, 1, 1, 2, 0, 0, 2, 1)

Dependent Variable: ΔLN_CAB

Variables	Coefficients	Std.Error	t-statistic	*P-value*
(LN_CAB) (LD)	.2505869*	.1366576	1.83	0.094
(LN_REERI) (D1)	-.0882949*	.0436494	-2.02	0.068
(LN_AOILP) (D1)	.0668842**	.0286436	2.34	0.040
(LN_ OPEN) (D1)	-.1392316**	.0651693	-2.14	0.056
(LN_ OPEN) (LD)	.1017034*	.0543518	1.87	0.088
(LN_ FISCDGT) (D1)	.2023758**	.0899084	2.25	0.046
(LN_ FISCDGT) (LD)	.3447968**	.1490572	2.31	0.041
(GDPPCIG) (D1)	.116152*	.0642209	1.81	0.098
CointEq (-1)	-.5709486***	.1074227	-5.31	0.000
R^2 = 0.8809 and Adj R^2 = 7076		**Prob > F = 0.0000**	**N=30**	

Note: *, ** and * indicates significance at 1%, 5% and 10% percent level using MacKinnon critical values, respectively.**

Source: Own Computation using Stata /MP 16.0

The error correction mechanism produced short run results. The short run disequilibrium adjusting relationship between the variables is estimated as a result of this procedure. Table 4.5 above, summarizes the regression results.

In the short run, the regression result shown in table 4.5 above shows that the current account balance is driven or steered by a set of variables. Current account balance, Real GDP per capita growth, degree of openness, real effective exchange rate, fiscal deficit, parallel market premium exchange rate, average oil price, and the ECM term are statistically significant in determining current account balance disequilibrium adjustment in the short run. The constant term was found statistically insignificant in the decision-making process.

According to the estimation results in table 4.5 above, the previous year's current account balance had a weakly significant impact on current account balance growth in the short run. The difference in the country's current account balance at lag difference has a positive and weak significant effect on the country's current account balance. In this case, the partial elasticity of the current account is 0.25. That is, assuming all other variables remain constant, a 1% increase in previous year current account balance performance resulted in a 0.25% increase in current year current account balance. This implies that previous current account balance has a positive impact on current account or international trade growth.

The difference in real effective exchange rate at level has negative and significant effects on the country's current account balance at least at 10% level of significance. The difference of Real Effective Exchange rate at level is revealed to bear indirect effects on current account balance with a coefficient of -0.0883; which is also consistent with the theory that suggests indirect relationship between the depreciation of local currency and the current account balance. This indirect short run relationship conforms that the policy measures followed by NBE in the adjustment process of the exchange rate do have a paramount effect only in the short run. The negative and significant relationship between real effective exchange rate and the current account exposes economic agents respond for appreciation by increasing imports and decreasing exports in the time of short run. According to the J-curve hypothesis there is some time lag to see the real effects of the exchange rates changes and this is what is revealed by the regression result. In the short run one might see appreciation of exchange rates affecting the current account balance. Therefore, the negative relationship is indicative of the no time lag to respond for the change in real effective exchange rate.

Unlike in the long run, the average oil price was found to have statistically significant and positive effects on the country's external trade current account balance. However, the previous expectation, the average oil price is negatively and significantly related to the current account balance. This indicates that the price of major importable goods and services has risen, resulting in a worsening of the current account balance.

As it is indicated in table 4.5 the degree of openness of the economy is negative related with the current account balance. The negative relationship reveals economic agents do not respond to increase in degree of openness by increasing exports and unilateral transfers in the short run. Such a result in the short run implies stakeholders in the external sector make instantaneous adjustment to benefit from the increase in the degree openness. In addition, the negative relationship also shows foreign capital inflow respond for higher degree of openness

like Chinn and Prasad hypothesized. It rather negates this hypothesis in the Ethiopian economy.

In contrast to the long run, the fiscal budget balance of the empirical finding of this study indicated that it was statistically significant both in lagged difference and difference one at 5% level of significance in the short run. Fiscal budget balance has a positive relationship with the current account balance during the reference period.

As we noticed the short run regression result from table 4.5 above, the real GDP per capita income growth found a positive relationship with the current account balance implying economic agents perceived the growth in the real output as a transitory phenomenon. Based on consumption-smoothing behavior of agents such perception tends to raise saving rates than increase in consumption levels. Thus, there exist positive relationships between output growth and saving or current account balance. What is revealed by the increase in saving is private and public sectors do not respond for the growth in GDP by increasing their imports or levels of consumption of foreign goods and services in the short run.

Based on the ADRL Model results presented in table 4.5 above, The coefficient of Error Correction Model (ECM (-1)) was revealed negative and significant even at 1% level of critical value, confirming the existence of a long run relationship between the current account balance and the modelled explanatory variables. The negative and significant coefficient of the error correction model term imply the current account moderately adjust to its long run path during a year. The coefficient -0.57 means almost half of the discrepancy occurred in each period adjust in the following period to restore the long run equilibrium of the current account balance. It indicates that about 57.1% disequilibria in the previous year's current account balance will be corrected or adjusted in the current year and it takes two years for the series to return to its long-run equilibrium. The adjusted R^2 of the model shows that the explanatory variables account for 88.1% of the variation in the performance of Ethiopia's current account balance. The diagnostic tests on the residual also suggest the short run model does not have the problems of serial correlation and hetroscedasticity.The F statistic is also significant at 1% level, implying the goodness of fit of the model.

4.7. TEST FOR STABILITY OF THE MODEL

Finally, the stability test results of the cumulative sum of squares of recursive residuals showed that the model was correctly specified and stable. The result is shown using figure 4.9 below.

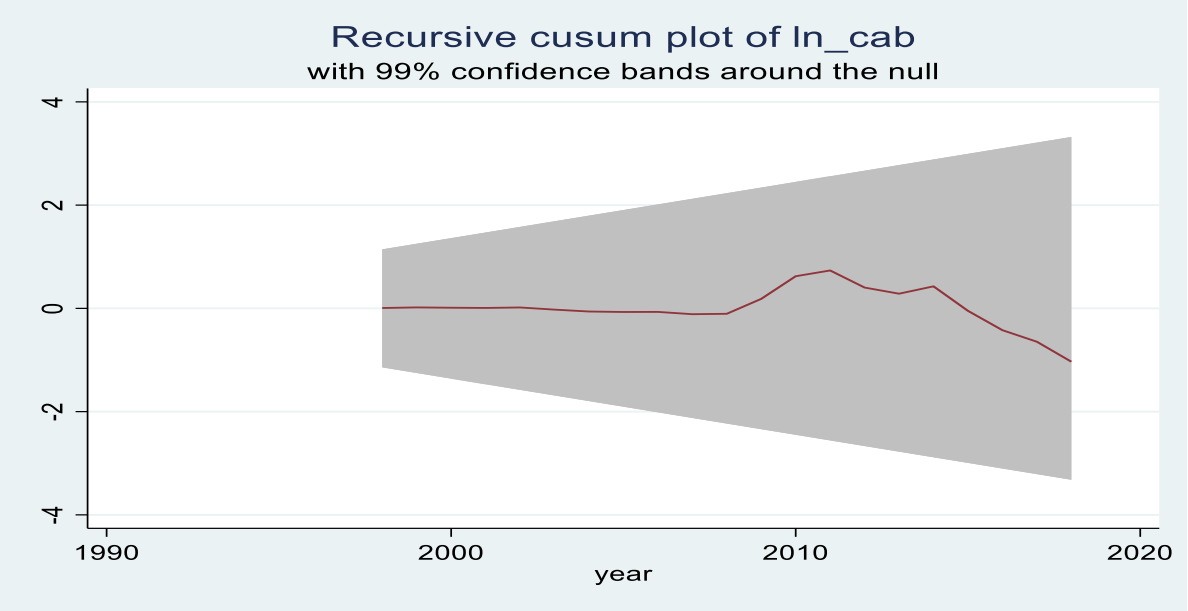

Figure 4.9 Cumulative sum tests for parameter stability

4.8. GRANGER CASUALITY TEST

In causality test four outcomes are possible. There may be unidirectional causality meaning that variable X may Granger cause variable (Y) but not the other way round. There may also be the case where Y Granger causes X, but not the other way round. It could also happen X and Y Granger causes each other suggesting bi-directional causality. When the sets of coefficient are not statistically significant, we say that, none of the variables Granger causes each other, implying that, the variables are independent. The decision rule is to reject the null hypothesis which states that X doesn't cause Y at 5%. In this case, the granger causality test result (in appendix 8), revealed that there is a two way causal relationship running from variables such as, LN_FISCDGT, LN_FINDEP, GDPPCIG to the current account balance and the vice versa; suggesting bidirectional causalities. However, for the LN_AOILP, LN_OPENN, and LN_PAMPR, the test results revealed unidirectional causality caused by Current Account Balance. The LN_REERI was observed to have no causal relationship with LN_CAB in either way. As whole, the test results all the variables do have granger causality to current account balance.

Table 4.6: Dual or bi-directional Granger Causality Tests

Null Hypothesis	Equation	chi2	df	Prob>Chi2
LN_REERI does not Granger Cause LN_CAB	ln_reeri → ln_cab	1.268	2	0.530
LN_CAB does not Granger Cause LN_REERI	ln_cab → ln_reeri	1.977	2	0.372
LN_AOILP does not Granger Cause LN_CAB	ln_aoilp → ln_cab	1.354	2	0.508
LN_CAB does not Granger Cause LN_AOILP	ln_cab → ln_aoilp	5.342**	2	0.069
LN_OPENN does not Granger Cause LN_CAB	ln_openn → ln_cab	0.844	2	0.656
LN_CAB does not Granger Cause LN_OPENN	ln_cab → ln_openn	15.013***	2	0.001
LN_PAMPR does not Granger Cause LN_CAB	ln_pampr → ln_cab	0.252	2	0.882
LN_CAB does not Granger Cause LN_PAMPR	ln_cab → ln_pampr	39.996***	2	0.000
LN_FINDEP does not Granger Cause LN_CAB	ln_findep → ln_cab	9.818***	2	0.007
LN_CAB does not Granger Cause LN_FINDEP	ln_cab → ln_findep	20.604***	2	0.000
LN_FISCDGT does not Granger Cause LN_CAB	ln_fiscdgt → ln_cab	6.452**	2	0.040
LN_CAB does not Granger Cause LN_FISCDGT	ln_cab → ln_fiscdgt	32.136***	2	0.000
GDPPCIG does not Granger Cause LN_CAB	gdppcig → ln_cab	5.768*	2	0.056
LN_CAB does not Granger Cause GDPPCIG	ln_cab → gdppcig	22.997***	2	0.000
*** p<.01, ** p<.05, * p<.1	ALL → LN_CAB	56.43***	14	0.000

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1. SUMMARY OF FINDINGS

The main objective of this study was to examine the trends and drivers of current account balance of the Ethiopian economy. In line with the main objective of the study tried to analyse the trends in the major components of the drivers of current account and their implications on the structural trend of the current account balance. In addition, the study identifies and examined the drivers and their short-run and long-run implications of the driver of current account balance.

This study examined the trends and drivers of current account balance. The study employed the ARDL bounds testing approach to co-integration analysis to establish the long run relationship between the relevant time series variables under investigation. The unit root test results revealed that all the variables were stationary either at level or after the first difference. Also, current account balance was found to be co-integrated with the independent variables; to imply the establishment of the long run relationship between the variables of interest.

Participation in the international trade becomes a channel for accessing resources that are scarce or non-existent in a country. It has become a real ever-advancing feature in the face of the globalization world. It is also the fundamental concept underlying comparative advantage in international trade. However not all nations benefit equally from trade, participation in international trade is unavoidable because most development goals necessitate it. The current account balance movements are used to analyze how Ethiopia interacts in international trade in this study. For such an analysis, the study is divided into two major sections. The first section examines the state of the current account balance using trend analysis on post-reform periods, with the 1992 economic policy shift and using econometric analysis.

The empirical findings showed that the current account balance has a widening growth of deficits for the whole study periods. The current account balance (or deficits) as a major policy variable has positive and significant effects on the performance of Ethiopian current account both in the long run and the short run. This worsening trend is exacerbated by the government's trade reform. Trends in major components of the current account balance were also supportive of this result. Imports were increasing at a faster rate compare to the other components of current account balance. Although exports grew at a faster rate than the other

major components of current account, the lower initial value of exports caused them to discover the need for imports. The movements in the resource gap caused by external trade were also pure indicators of the country's deteriorating current account balance in international trade.

The average oil price was found to have statistically significant and negative effects on the country's external trade current account balance in the long run. According to previous expectation, the average oil price is negatively and significantly related to the current account balance. This indicates that the price of major importable goods and services has risen, resulting in a worsening of the current account balance.

The Real Effective Exchange Rate revealed insignificant in the long run but significant in the short run. Furthermore, in contrast to the long run, the fiscal budget balance of the empirical finding of this study indicated that there was statistically significant both in lagged difference and difference one at 5% level of significance in the short run. Fiscal budget balance has a positive relationship with the current account balance during the reference period.

The coefficient of Error Correction Model (ECM (-1)) was revealed negative and significant even at 1% level of critical value, confirming the existence of a long run relationship between the current account balance and the modelled explanatory variables. The negative and significant coefficient of the error correction model term imply the current account moderately adjust to its long run path during a year.

Finally, the stability test conducted using the cumulative sum of recursive residuals (CUSUM) which showed that the model was correctly specified and stable.

5.2. CONCLUSION AND RECOMMENDATIONS

Based on the study's analysis and findings, the following conclusions and recommendations are forwarded to be considered in an effort to improve current account balance (or deficits).

- In the Ethiopian economy, the current account balance is deteriorating, indicating a significant financial need that could increase the country's international indebtedness and reduce its international reserves. Perhaps this feature has become more apparent, because of the trade liberalization reform implemented by the EPRDF regime. This inspires policymakers to investigate the cause of such deficits, namely whether the financial gap is the result of future development efforts or inefficient resource allocation on foreign goods and services.

- In contrast to the long run, the fiscal budget balance of the empirical finding of this study indicated that there was statistically significant and has a positive relationship with the current account balance during the reference period.
- In the long run, the parallel market exchange rate premium of empirical finding of this study indicated that there was a statistically significant and has a positive relationship with the current account balance. This implies that the current account balance is sensitive to changes in the parallel market exchange rate premium. The study showed an increase in the parallel market exchange rate premium leads to an improvement in the current account balance during the study periods.
- The negative relationship with the average oil price suggests that efficient fuel consumption is necessary to mitigate the negative effects of international price shocks on the economy. This indicates that the price of major importable goods and services has risen, resulting in a worsening of the current account balance. If supplemented by proper resource allocation in the country, the degree of openness, which is related to current account balance, positively implies openness of trade or liberalization of trade will result in long-run improvements.
- Short-run econometric analysis revealed that the real effective exchange rate, degree of openness, and level of GDP per capita income can be used to regulate current account balance conditions. According to theoretical predictions, the negative relationship between the real effective exchange rate and the current account indicates that the variable should regulate the current account balance in the short run. The positive relationship between the current account and the growth of national output per capita income implies that an increase in national output will improve the current account balance. This is an implication of the fact that agents in the economy tend to increase their savings after experiencing transitory output growth. As a result, the government should reinvest these savings in future development and improvement, as well as in improving the current account balance position. In general, the study's policy implication is that large amounts of government spending are required to expand infrastructures, which are supposed to increase private investment, particularly in the manufacturing and export sectors. Furthermore, the government should implement an effective oil utilization mechanism, as oil is a major importable item and an input for both the production and service sectors, both of which contribute to the current account deficit.

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https://www.et.undp.org/content/ethiopia/en/home/library/poverty/EthiopiaAfricanEconomicOutlook2016

APPENDICS

APPENDIX-1: Stationarity Test at Level

```
. tsset year, yearly
        time variable:  year, 1990 to 2019
                delta:  1 year

.
end of do-file

. rename gdpcig gdppcig

. do "C:\Users\user\AppData\Local\Temp\STD1ff0_000000.tmp"

. *** Testing stationarity at level
. dfuller ln_cab , lags(0)

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

                                 ------------ Interpolated Dickey-Fuller ------------
                    Test         1% Critical       5% Critical     10% Critical
                Statistic             Value             Value            Value
------------------------------------------------------------------------------
 Z(t)              0.496            -3.723            -2.989           -2.625
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.9847

. dfuller ln_reeri , lags(0)

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

                                 ------------ Interpolated Dickey-Fuller ------------
                    Test         1% Critical       5% Critical     10% Critical
                Statistic             Value             Value            Value
------------------------------------------------------------------------------
 Z(t)             -1.748            -3.723            -2.989           -2.625
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.4066

. dfuller ln_aoilp , lags(0)

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

                                 ------------ Interpolated Dickey-Fuller ------------
                    Test         1% Critical       5% Critical     10% Critical
                Statistic             Value             Value            Value
------------------------------------------------------------------------------
 Z(t)             -1.838            -3.723            -2.989           -2.625
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.3617

. dfuller ln_openn , lags(0)

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

                                 ------------ Interpolated Dickey-Fuller ------------
                    Test         1% Critical       5% Critical     10% Critical
                Statistic             Value             Value            Value
------------------------------------------------------------------------------
 Z(t)             -2.140            -3.723            -2.989           -2.625
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.2289

. dfuller ln_pampr , lags(0)

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

                                 ------------ Interpolated Dickey-Fuller ------------
                    Test         1% Critical       5% Critical     10% Critical
                Statistic             Value             Value            Value
------------------------------------------------------------------------------
 Z(t)             -2.327            -3.723            -2.989           -2.625
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.1635
```

```
. dfuller ln_findep , lags(0)

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

                                 ———— Interpolated Dickey-Fuller ————
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value            Value
———————————————————————————————————————————————————————————————————————————
 Z(t)            -1.755           -3.723            -2.989           -2.625
———————————————————————————————————————————————————————————————————————————
MacKinnon approximate p-value for Z(t) = 0.4029

. dfuller ln_fiscdgt , lags(0)

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

                                 ———— Interpolated Dickey-Fuller ————
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value            Value
———————————————————————————————————————————————————————————————————————————
 Z(t)            -1.532           -3.723            -2.989           -2.625
———————————————————————————————————————————————————————————————————————————
MacKinnon approximate p-value for Z(t) = 0.5176

. dfuller gdppcig , lags(0)

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

                                 ———— Interpolated Dickey-Fuller ————
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value            Value
———————————————————————————————————————————————————————————————————————————
 Z(t)            -3.667           -3.723            -2.989           -2.625
———————————————————————————————————————————————————————————————————————————
MacKinnon approximate p-value for Z(t) = 0.0046
```

APPENDIX-2: Stationarity Test at Difference

```
. *** Testing stationarity at difference
. dfuller d.ln_cab , lags(0)

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

                               ---------- Interpolated Dickey-Fuller ---------
                  Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(t)             -3.481            -3.730            -2.992            -2.626
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0085

. dfuller d.ln_reeri , lags(0)

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

                               ---------- Interpolated Dickey-Fuller ---------
                  Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(t)             -4.930            -3.730            -2.992            -2.626
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000

. dfuller d.ln_aoilp , lags(0)

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

                               ---------- Interpolated Dickey-Fuller ---------
                  Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(t)             -6.740            -3.730            -2.992            -2.626
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000

. dfuller d.ln_openn , lags(0)

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

                               ---------- Interpolated Dickey-Fuller ---------
                  Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(t)             -5.008            -3.730            -2.992            -2.626
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000
```

```
. dfuller d.ln_pampr , lags(0)

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

                                 ———— Interpolated Dickey-Fuller ————
                    Test         1% Critical       5% Critical      10% Critical
                  Statistic           Value             Value            Value
——————————————————————————————————————————————————————————————————————————————
 Z(t)               -4.921            -3.730            -2.992           -2.626
——————————————————————————————————————————————————————————————————————————————
MacKinnon approximate p-value for Z(t) = 0.0000

. dfuller d.ln_findep , lags(0)

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

                                 ———— Interpolated Dickey-Fuller ————
                    Test         1% Critical       5% Critical      10% Critical
                  Statistic           Value             Value            Value
——————————————————————————————————————————————————————————————————————————————
 Z(t)               -4.506            -3.730            -2.992           -2.626
——————————————————————————————————————————————————————————————————————————————
MacKinnon approximate p-value for Z(t) = 0.0002

. dfuller d.ln_fiscdgt , lags(0)

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

                                 ———— Interpolated Dickey-Fuller ————
                    Test         1% Critical       5% Critical      10% Critical
                  Statistic           Value             Value            Value
——————————————————————————————————————————————————————————————————————————————
 Z(t)               -7.224            -3.730            -2.992           -2.626
——————————————————————————————————————————————————————————————————————————————
MacKinnon approximate p-value for Z(t) = 0.0000
```

APPENDIX-3: Lag Length Determination

```
. *** Determining the lag length
. varsoc ln_cab ln_reeri ln_aoilp ln_openn ln_pampr ln_findep ln_fiscdgt gdppcig

   Selection-order criteria
   Sample:  1994 - 2019                        Number of obs      =        26
```

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-35.7637				4.0e-09	3.36644	3.47791	3.75354
1	144.29	360.11	64	0.000	6.7e-13	-5.56077	-4.55752	-2.07681
2	274.906	261.23	64	0.000	2.5e-14	-10.6851	-8.79007	-4.10429
3	3770.76	6991.7	64	0.000	7.e-123*	-274.674	-271.887	-264.996
4	6372.28	5203*	64	0.000	.	-474.175*	-471.277*	-464.111*

```
   Endogenous:  ln_cab ln_reeri ln_aoilp ln_openn ln_pampr ln_findep
                ln_fiscdgt gdppcig
    Exogenous:  _cons
```

```
. ardl ln_cab ln_reeri ln_aoilp ln_openn ln_pampr ln_findep ln_fiscdgt gdppcig, ma

ARDL(2,1,2,2,0,0,2,1) regression

Sample: 1992 - 2019                             Number of obs     =         28
                                                F(  17,     10)   =      81.73
                                                Prob > F          =     0.0000
                                                R-squared         =     0.9929
                                                Adj R-squared     =     0.9807
Log likelihood =  66.098448                     Root MSE          =     0.0382
```

ln_cab	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ln_cab						
L1.	.6663694	.1471361	4.53	0.001	.3385296	.9942091
L2.	-.2310303	.1385314	-1.67	0.126	-.5396975	.0776369
ln_reeri						
--.	-.0873192	.0272971	-3.20	0.010	-.1481409	-.0264975
L1.	.0709298	.0473079	1.50	0.165	-.0344788	.1763385
ln_aoilp						
--.	-.0012826	.0215644	-0.06	0.954	-.049331	.0467658
L1.	-.0775213	.030756	-2.52	0.030	-.1460498	-.0089928
L2.	.017049	.0176124	0.97	0.356	-.0221938	.0562919
ln_openn						
--.	.1492199	.0895781	1.67	0.127	-.0503725	.3488124
L1.	.24257	.0872705	2.78	0.019	.0481193	.4370207
L2.	-.0914586	.0555259	-1.65	0.131	-.2151781	.0322609
ln_pampr	.1506193	.043834	3.44	0.006	.052951	.2482875
ln_findep	.1695272	.2762198	0.61	0.553	-.4459289	.7849834
ln_fiscdgt						
--.	.1240488	.034798	3.56	0.005	.0465141	.2015834
L1.	.1529843	.065456	2.34	0.042	.0071392	.2988293
L2.	-.3932468	.157642	-2.49	0.032	-.7444951	-.0419984
gdppcig						
--.	-.1588605	.0745634	-2.13	0.059	-.324998	.0072771
L1.	-.108813	.0648501	-1.68	0.124	-.2533081	.035682
_cons	1.788251	1.370035	1.31	0.221	-1.264377	4.840878

APPENDIX-4: ARDL Regression Results

ardl ln_cab ln_reeri ln_aoilp ln_openn ln_pampr ln_findep ln_fiscdgt gdppcig ,maxlags(2) ec btest

ARDL(2,1,1,2,0,0,2,1) regression

Sample: 1992 - 2019 — Number of obs = 28
R-squared = 0.8809
Adj R-squared = 0.7076
Log likelihood = 64.844453 — Root MSE = 0.0381

D.ln_cab	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ADJ						
ln_cab						
L1.	-.5709486	.1074227	-5.31	0.000	-.8073844	-.3345127
LR						
ln_reeri	.0210702	.0716138	0.29	0.774	-.1365507	.178691
ln_aoilp	-.1101413	.0322574	-3.41	0.006	-.1811395	-.0391432
ln_openn	.5540429	.0743493	7.45	0.000	.3904012	.7176845
ln_pampr	.2602917	.0578545	4.50	0.001	.1329549	.3876285
ln_findep	.5301307	.385645	1.37	0.197	-.3186683	1.37893
ln_fiscdgt	-.1369899	.1323782	-1.03	0.323	-.4283523	.1543726
gdppcig	-.5250611	.1453793	-3.61	0.004	-.8450387	-.2050835
SR						
ln_cab						
LD.	.2505869	.1366576	1.83	0.094	-.0501945	.5513683
ln_reeri						
D1.	-.0882949	.0436494	-2.02	0.068	-.1843667	.0077769
ln_aoilp						
D1.	.0668842	.0286436	2.34	0.040	.00384	.1299284
ln_openn						
D1.	-.1392316	.0651693	-2.14	0.056	-.2826681	.004205
LD.	.1017034	.0543518	1.87	0.088	-.0179241	.221331
ln_fiscdgt						
D1.	.2023758	.0899084	2.25	0.046	.0044888	.4002629
LD.	.3447968	.1490572	2.31	0.041	.0167242	.6728694
gdppcig						
D1.	.116152	.0642209	1.81	0.098	-.0251972	.2575012
_cons	1.081897	1.156221	0.94	0.370	-1.462929	3.626723

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

APPENDIX-5: ARDL Bound Co-integration Test

Pesaran/Shin/Smith (2001) ARDL Bounds Test
H0: no levels relationship F = 7.573
t = -5.315

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

	[I_0] L_1	[I_1] L_1	[I_0] L_05	[I_1] L_05	[I_0] L_025	[I_1] L_025	[I_0] L_01	[I_1] L_01
k_7	2.03	3.13	2.32	3.50	2.60	3.84	2.96	4.26

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

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

	[I_0] L_1	[I_1] L_1	[I_0] L_05	[I_1] L_05	[I_0] L_025	[I_1] L_025	[I_0] L_01	[I_1] L_01
k_7	-2.57	-4.23	-2.86	-4.57	-3.13	-4.85	-3.43	-5.19

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

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

```
. ardl ln_cab ln_reeri ln_aoilp ln_openn ln_pampr ln_findep ln_fiscdgt gdppcig ,maxlags(2) regstore(ecreg)

ARDL(2,1,1,2,0,0,2,1) regression

Sample: 1992 - 2019                             Number of obs     =         28
                                                F(  16,     11)   =      87.28
                                                Prob > F          =     0.0000
                                                R-squared         =     0.9922
                                                Adj R-squared     =     0.9808
Log likelihood =  64.844453                     Root MSE          =     0.0381
```

ln_cab	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ln_cab						
L1.	.6796384	.1460765	4.65	0.001	.3581262	1.00115
L2.	-.2505869	.1366576	-1.83	0.094	-.5513683	.0501945
ln_reeri						
--.	-.0762649	.0247226	-3.08	0.010	-.130679	-.0218508
L1.	.0882949	.0436494	2.02	0.068	-.0077769	.1843667
ln_aoilp						
--.	.0039991	.0208029	0.19	0.851	-.0417877	.049786
L1.	-.0668842	.0286436	-2.34	0.040	-.1299284	-.00384
ln_openn						
--.	.1770984	.0845792	2.09	0.060	-.0090591	.363256
L1.	.240935	.0870041	2.77	0.018	.0494403	.4324297
L2.	-.1017034	.0543518	-1.87	0.088	-.221331	.0179241
ln_pampr	.1486132	.0436595	3.40	0.006	.0525192	.2447071
ln_findep	.3026774	.2388495	1.27	0.231	-.2230268	.8283816
ln_fiscdgt						
--.	.1241617	.034698	3.58	0.004	.0477918	.2005316
L1.	.1424209	.064355	2.21	0.049	.0007765	.2840654
L2.	-.3447968	.1490572	-2.31	0.041	-.6728694	-.0167242
gdppcig						
--.	-.1836309	.0698343	-2.63	0.023	-.3373352	-.0299265
L1.	-.116152	.0642209	-1.81	0.098	-.2575012	.0251972
_cons	1.081897	1.156221	0.94	0.370	-1.462929	3.626723

```
. estimate restore ecreg
(results ecreg are active now)
```

APPENDIX-6: Post Estimation Tests

```
. *** Post estimation test
. estat dwatson

Durbin-Watson d-statistic( 17,    28) =  2.203114

. estat durbinalt

Durbin's alternative test for autocorrelation
```

lags(*p*)	chi2	df	Prob > chi2
1	0.694	1	0.4047

H0: no serial correlation

```
. estat bgodfrey,lag(1/3)

Breusch-Godfrey LM test for autocorrelation
```

lags(*p*)	chi2	df	Prob > chi2
1	1.818	1	0.1775
2	7.691	2	0.0214
3	13.453	3	0.0038

H0: no serial correlation

```
. estat imtest, white

White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity

         chi2(27)     =     28.00
         Prob > chi2  =    0.4110

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

Source	chi2	df	p
Heteroskedasticity	28.00	27	0.4110
Skewness	17.57	16	0.3496
Kurtosis	0.78	1	0.3766
Total	46.35	44	0.3755

```
. *** Parameter stability test
. estat sbcusum, level(99)

Cumulative sum test for parameter stability

Sample: 1992 - 2019                             Number of obs =         28
Ho: No structural break
```

Statistic	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
recursive	0.5234	1.1430	0.9479	0.850

APPENDIX-7: Gregory-Hansen statistical tests for Co-integration

```
. ghansen ln_cab ln_reeri ln_aoilp ln_openn, break(level) lagmethod(bic)

Gregory-Hansen Test for Cointegration with Regime Shifts
Model: Change in Level                              Number of obs    =        30
Lags  =  1  chosen by Bayesian criterion            Maximum Lags     =         2

             Test       Breakpoint   Date        Asymptotic Critical Values
            Statistic                            1%           5%          10%
------------------------------------------------------------------------------
   ADF       -4.83          21       2010       -5.77        -5.28       -5.02
   Zt        -4.39          21       2010       -5.77        -5.28       -5.02
   Za       -23.81          21       2010      -63.64       -53.58      -48.65
------------------------------------------------------------------------------

. ghansen ln_cab ln_reeri ln_aoilp ln_openn, break(trend) lagmethod(bic)

Gregory-Hansen Test for Cointegration with Regime Shifts
Model: Change in Level and Trend                    Number of obs    =        30
Lags  =  0  chosen by Bayesian criterion            Maximum Lags     =         2

             Test       Breakpoint   Date        Asymptotic Critical Values
            Statistic                            1%           5%          10%
------------------------------------------------------------------------------
   ADF       -5.34          20       2009       -6.05        -5.57       -5.33
   Zt        -5.44          20       2009       -6.05        -5.57       -5.33
   Za       -28.91          20       2009      -70.27       -59.76      -54.94
------------------------------------------------------------------------------

. ghansen ln_cab ln_reeri ln_aoilp ln_openn, break(regime) lagmethod(bic)

Gregory-Hansen Test for Cointegration with Regime Shifts
Model: Change in Regime                             Number of obs    =        30
Lags  =  0  chosen by Bayesian criterion            Maximum Lags     =         2

             Test       Breakpoint   Date        Asymptotic Critical Values
            Statistic                            1%           5%          10%
------------------------------------------------------------------------------
   ADF       -5.82          20       2009       -6.51        -6.00       -5.75
   Zt        -5.92          19       2008       -6.51        -6.00       -5.75
   Za       -33.62          19       2008      -80.15       -68.94      -63.42
------------------------------------------------------------------------------
```

APPENDIX-8: Bi- Directional Causality Tests

```
. asdoc vargranger
(File Myfile.doc already exists, option append was assumed)
```

Granger causality Wald tests

Equation	Excluded	chi2	df	Prob > chi2
ln_cab	ln_reeri	1.2684	2	0.530
ln_cab	ln_aoilp	1.3536	2	0.508
ln_cab	ln_openn	.84387	2	0.656
ln_cab	ln_pampr	.25171	2	0.882
ln_cab	ln_findep	9.8183	2	0.007
ln_cab	ln_fiscdgt	6.4523	2	0.040
ln_cab	gdppcig	5.7679	2	0.056
ln_cab	ALL	56.43	14	0.000
ln_reeri	ln_cab	1.9768	2	0.372
ln_reeri	ln_aoilp	9.939	2	0.007
ln_reeri	ln_openn	3.419	2	0.181
ln_reeri	ln_pampr	5.6816	2	0.058
ln_reeri	ln_findep	1.1275	2	0.569
ln_reeri	ln_fiscdgt	.07113	2	0.965
ln_reeri	gdppcig	3.0568	2	0.217
ln_reeri	ALL	54.405	14	0.000
ln_aoilp	ln_cab	5.3419	2	0.069
ln_aoilp	ln_reeri	5.4103	2	0.067
ln_aoilp	ln_openn	5.8495	2	0.054
ln_aoilp	ln_pampr	.5933	2	0.743
ln_aoilp	ln_findep	6.7614	2	0.034
ln_aoilp	ln_fiscdgt	2.0238	2	0.364
ln_aoilp	gdppcig	3.6044	2	0.165
ln_aoilp	ALL	42.492	14	0.000
ln_openn	ln_cab	15.013	2	0.001
ln_openn	ln_reeri	.34433	2	0.842
ln_openn	ln_aoilp	26.07	2	0.000
ln_openn	ln_pampr	44.042	2	0.000
ln_openn	ln_findep	7.8366	2	0.020
ln_openn	ln_fiscdgt	18.711	2	0.000
ln_openn	gdppcig	12.844	2	0.002
ln_openn	ALL	70.967	14	0.000
ln_pampr	ln_cab	39.996	2	0.000
ln_pampr	ln_reeri	48.922	2	0.000
ln_pampr	ln_aoilp	60.071	2	0.000
ln_pampr	ln_openn	45.951	2	0.000
ln_pampr	ln_findep	16.047	2	0.000
ln_pampr	ln_fiscdgt	.93648	2	0.626
ln_pampr	gdppcig	12.058	2	0.002
ln_pampr	ALL	235.34	14	0.000
ln_findep	ln_cab	20.604	2	0.000
ln_findep	ln_reeri	51.133	2	0.000
ln_findep	ln_aoilp	17.026	2	0.000
ln_findep	ln_openn	32.828	2	0.000
ln_findep	ln_pampr	5.3176	2	0.070
ln_findep	ln_fiscdgt	44.208	2	0.000
ln_findep	gdppcig	3.6724	2	0.159
ln_findep	ALL	118.88	14	0.000
ln_fiscdgt	ln_cab	32.136	2	0.000
ln_fiscdgt	ln_reeri	28.95	2	0.000
ln_fiscdgt	ln_aoilp	10.362	2	0.006
ln_fiscdgt	ln_openn	8.0944	2	0.017
ln_fiscdgt	ln_pampr	11.16	2	0.004
ln_fiscdgt	ln_findep	52.822	2	0.000
ln_fiscdgt	gdppcig	56.628	2	0.000
ln_fiscdgt	ALL	115.2	14	0.000
gdppcig	ln_cab	22.997	2	0.000
gdppcig	ln_reeri	24.494	2	0.000
gdppcig	ln_aoilp	37.101	2	0.000
gdppcig	ln_openn	41.859	2	0.000
gdppcig	ln_pampr	24.331	2	0.000
gdppcig	ln_findep	27.692	2	0.000
gdppcig	ln_fiscdgt	31.17	2	0.000
gdppcig	ALL	102.59	14	0.000

APPENDIX-9: Data

YEAR	LN_CAB	LN_REERI	LN_AOILP	LN_OPENN	LN_PAMPR	LN_FINDEP	LN_FISCDGT	GDPPCIG
1990	4.60806	4.388	4.63817	0.736685	4.37946	3.354	4.62361	0.17566
1991	4.61099	4.62497	2.46453	0.921477	4.40939	3.41999	4.62497	0.091905
1992	4.609	4.58859	2.36875	0.693147	4.54974	3.48561	4.6247	0
1993	4.61321	3.14463	1.87901	1.58883	4.62497	3.36287	4.61442	0.778083
1994	4.61355	3.16649	1.7702	1.91368	3.2274	3.43233	4.62078	0.419858
1995	4.61214	2.94344	1.7082	2.32874	2.17714	3.46777	4.61375	0.528239
1996	4.62427	2.53758	2.35109	2.42223	2.44755	3.43354	4.60878	0.747858
1997	4.6164	2.27665	2.31016	2.4741	2.23943	3.4547	4.62019	0.421602
1998	4.61679	2.20376	0.693147	2.60461	1.69065	3.59691	4.59631	0.168507
1999	4.63126	2.19232	2.32396	2.69043	0.693147	3.57064	4.57513	0.486196
2000	4.63419	2.06534	3.28316	2.68676	1.79658	3.55599	4.58083	0.548226
2001	4.63138	1.26328	3.09213	2.64077	1.77495	3.63137	4.56958	0.626329
2002	4.63865	0.693147	3.15508	2.718	1.46094	3.75509	4.58087	0.36281
2003	4.60517	1.55287	3.32093	2.73832	1.44433	3.75337	4.56138	0.242336
2004	4.59962	1.09561	3.63397	3.03702	1.35841	3.70146	4.56019	0.83645
2005	4.58752	1.53837	4.07137	3.28178	1.36277	3.67578	4.52758	0.791155
2006	4.56958	2.20508	4.27671	3.4094	1.6588	3.61434	4.50988	0.753449
2007	4.53217	2.41609	4.32838	3.43573	1.47819	3.54641	4.48137	0.763478
2008	4.50915	3.16994	4.61262	3.66202	1.61203	3.37589	4.42978	0.710971
2009	4.78752	2.99693	4.13675	3.80455	2.20728	3.27388	4.38877	0.594529
2010	4.99524	2.52733	4.40074	4.01721	1.81417	3.36949	4.37152	0.7414
2011	5.01254	2.57718	4.60495	4.20687	1.54159	3.40864	4.29828	0.727621
2012	5.01256	2.97159	4.62497	4.45385	1.68101	3.30848	4.13983	0.605105
2013	5.09652	2.98785	4.61963	4.42967	1.81173	3.37224	4.05385	0.562712
2014	5.15623	2.99992	4.54288	4.53526	1.67279	3.40341	4.05701	1
2015	5.25053	3.27846	3.85626	4.62497	2.09149	3.42128	3.49878	0.696579
2016	5.22583	3.30222	3.6715	4.58935	2.14511	3.41429	2.98946	0.835834
2017	5.24866	3.46664	3.91808	4.511	2.19199	3.5051	2.61535	0.628576
2018	5.22853	3.33712	4.19782	4.56472	2.23666	3.57405	0.693147	0.590983
2019	5.29805	3.7204	4.08953	4.53851	2.27952	3.55408	2.86528	0.624681