Evaluating the impact of devaluation of currency on export growth in Ethiopia

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List of Acronyms

GDP = Gross Domestic Product

NBE = National Bank of Ethiopia

LDCs = Leas Developed Countries

ERCA = Ethiopian Revenue and Customs Authority

IMF = International Monetary Fund

Inf R = Inflation Rate

GFCF = Gross Fixed Capital Formation

OECD = Organization for Economic Cooperation and Development

CSA = Central Statistical Authority

MOFEC = Ministry of Finance and Economic cooperative

GMM = Generalized Method of Moments

FDI = Foreign Direct Investment

SAP = Structural Adjustment Policies

UNCTAD = United Nation Conference on Trade and Development

Contents

Abstract

This study evaluates the impact of currency devaluation on export growth in Ethiopia. The specific objectives of the study were: to examine the effect of currency devaluation on import and export so as to check the martial learner condition for Ethiopian economy by estimating an export and import equation. This study uses time series data covered for 30 years, from 1989/90 to 2018/19. The Ordinary lest square (OLS) regression method was used for analysis: in addition, in this study the Augmented Dickey Fuller test (ADF), Diagnostic, Stability Tests, co-integration and error correction model (ECM) were employed to be sure that econometric model is appropriate. The finding of this study shows that the real gross domestic product and foreign direct investment have appositive effect on export growth in short-run and long run in Ethiopia while devaluation of birr affects export and import adversely, therefore, based on this finding the researcher recommend that currency devaluation is better to be the last measure taken by the Ethiopian government to stimulate export growth in Ethiopia.

Chapter - 1

Introduction

1.1 Background of the study

All countries have three economic ambition to reach out short and long run this are accomplish economic development, Minimizing inflation rate and more employment opportunities. At the same time, to accomplish this for making those countries strong, as a strategy the nations use fiscal and monetary policy and Let their nation's aggregate demand curve to move to the right or left. That mean, countries aim towards achieving the highest level of development (Tamerayehu, 2015). Economic development includes maintaining and achieving full employment, higher productivity level, lower level of inflation, income in equality, avoidance of balance of payment deficit and many more through formulating different economic policy from them devaluation of currency is one. Mostly economic development is the concerning issue for least developed countries, because they are the one struggling to feed their own people (Acar, 2000).

To beat a weighing scale among their trading allies Exchange rate is a basic macroeconomic variable that directs shareholder on the superlative way (Odili, 2007).

Devaluation means official lowering of the value of countries currency within affixed exchange rate system. (Krugman and (Maurice and krugman, 1999). Legitimately in Ethiopia the devaluation of Birr (ETB) per US dollar start on through the EPRDF government. Before that Ethiopia have flat exchange rate of 2.07 Birr per US dollar. The devaluation was predictable to boost productivity by encouraging the export sector as well as increase domestic production. (Taye, 1999).

Recently, to supports exports and encourage the private sector, on October 10, 2017, the National Bank of Ethiopia (NBE) devalued the birr by 15%, but Ethiopia yet has been experiencing trade deficit, while Ethiopian Government is continuously devaluating its currency repetitively, so the main objective of this research is testing the impact of devaluation in export growth if it has no significant result on Export, the countries devaluation of birr affects the country. As a result, devaluation of birr has put tremendous stress on

government balances.

1.2 Statement of the problem

The country apart from being the poorest nation in the world is running a persistent trade deficit. The main reason for such deficit is its commodity concentration on the hand and import of basic goods on the other hand (Alemayehu, 1999).

In previous studies, attempts have been made to examine the collision of devaluation on economy in Ethiopia. However, from these perspectives, and based on the ideal deviation, the issue regarding the effect of exchange rate on the balance of payment is remains unresolved; even side effect of devaluation of birr is rising up inflation pressure. these uncertain consequences of the effects of exchange rate motivates me to do this research by including the effect of devaluation on October, 2017 and testing the effect of devaluation on encouraging Export growth as NBE targets growth of export and foreign currency accumulation, through devaluation of currency, Therefore, the better studies needed to provide enough information for policy makers and to contribute literature gab regarding the effect of devaluation on Export growth in Ethiopia.

1.3 Objective of the study

1.4 General objective

The main objective of the study is to find out the impact of devaluation of Ethiopian birr on Export Growth of the country.

1.5 Specific objectives

- To identify the effect of devaluation of birr on export sector of the country.
- To assess the effect of devaluation of birr on import sector of the country.
- To test the relationship between change in exchange rate with export and import variable.
- To recommend solution to the problem.

1.6 Research questions

This research is intended to answer the following questions:

- What are the effects of devaluation of currency for benefiting Export growth of the country?
- How devaluation of currency brings effect on Import?

- What is the effect of martial Lerner condition in the Ethiopian economy?
- What are the solutions of the above stated variables?

1.7 Significance of the study

Being one of the poorest of the world, Ethiopians export is dominated by few agricultural primary products and the income and price elasticity for this product is inelastic. Therefore, by testing whether the Martial Lerner condition is work for Ethiopia or not, this study will help in designing measures to improve the country trade deficit. In addition, the study can be used as a reference for those who are interested in making further investigation the same area of research in the future and also expected to provide enough information for policy makers regarding the impact of devaluation in Ethiopia.

1.8 Scope of the study

The study was limited to the different macro-economic variable that affects the balance of payment in Ethiopia. The coverage in terms of the period was determined based on the accessibility of data source on a majority of the explanatory variables, the other is, and this study depends only on secondary data; which data is collected by other and for another purpose. For the explanatory variables, the research covers the time of 1989/90- 2018/19 this period is chosen due to the availability of reliable data.

1.9 Organization of the study

This thesis organized as follows. The first chapter reviews the introduction part which contains the background, the statement of the problem, the objective of the study, research question scope and limitation of the study, and significance of the study. The second chapter concerned with a review of related literature. This part contains both the theoretical and empirical literature. The third chapter reviews methodology, data source, model specification description of study area and structure of export and import of the country. The fourth chapter focuses on discussion, estimation and interpretation of the results finally; the last chapter of the paper reviews the conclusion of the study and recommendation.

Chapter - 2

Literature Review

2.1 Theoretical review

2.1.1 Theories on Exchange rate

The determinations of the rate of national currencies are various views, the economists tried to explain the determinants of the rate at one currency exchange for another Over through the years. These points of view have concluded into different approach, premises or models through which we can try to identify any useful or fundamental relationship between the exchange rate and some other macroeconomic variables.

The currency value loss concerning the country to country is devaluation. (Calvo and Reinhart, 2000) describes that the incising of the money supply by the central bank which is exceedingly connected to inflation can lead to domestic currency devaluation.

An exchange is defined as the existing market value of local currency exchange to foreign currency. In other terms, it is a rate of one nation ‘s currency is exchanged for another (Obstfeld & Rogoff, 1995).

2.1.2 Exchange rate and Exchange rate systems

According to (Klein & Shambaugh, 2009 the main types of exchange rate regimes is divided into three that are free-floating, fixed, and r managed floating exchange rate regime. Let us discuss it:

Free-floating or flexible, based on the demand and supply of the foreign exchange market in which the value of countries currency is allowed to fluctuate (Klein & Shambaugh, 2009).

Fixed (pegged), system, the rate is only set by government policy. Government plays a significant role to decide the value of the currency (University of Minnesota, 2016).

Managed floating, it joins (in between) both fixed and floating exchange rates. On one hand, it agrees the market regulate the exchange rate and arrives at its balance point (MacDonald, 2007).

2.1.3 Argument for devaluation

By civilizing the circumstances for foreign investors welcoming an inflow of capital, build venture chances in the devaluating country is the major argument of devaluation (World Bank, 1992).

Especially in the countries, whose demand for export is relatively income elastic, i.e. a percentage rises in the returns of the nation's trading partners raise the export demand of the devaluating by a better percentage.

The motives as to why a nation seeks to take on the policy of exchange rate devaluation: The main motive is requiring surmounting economic complexities caused by the overvaluation of the exchange rate. (Sohmen, 1961) well thought an overvaluation of a currency as difficulty to economic growth. The main cause is that with overvalued exchange rate government has to make available subsidies for local producers.

2.1.4 Factors influencing exchange rates

The nation's balance of payment situation is the most thorough determinant of the countries exchange rate. Need for foreign currency increase from importing merchandise goods and the payment for services, or from the redemption of capital obligations. (http://www.reservebank.co.za)

2.1.5 Exchange rates and the balance of payments

When considering the insinuations of exchange rate arrangements for economic activity what substance is the change in the volume, or quantity, of exports and imports? The straight effect of exchange rate reduction is to raise the value of imports related to exports, which will tend to decrease the value of net exports & broaden the current account deficit (Fan and Shek, 2006).

2.1.6 Financial market imperfections

Financial market imperfection is to be expected to slap exporting firms, which have to pay a huge fixed cost at the commencement of each period, to keep on the export market. Theoretical papers like Deardorff (2000) shows that when the currency depreciates, countries in which firms borrow in a foreign currency are more uncovered to "balance-sheet effect" phenomena.

2.1.7 Exchange rate and Inflation

In principle, the rate depreciation will raise inflation in two ways. i.e., prices of imported goods and services will increase and expand aggregate demand. In general, this will also contribute to higher inflation (Reserve Bank of Australia.)

2.1.8 Pros and Con of devaluations

1.1.8.1 Pros of devaluations

It has an expansionary effect because of the "expenditure switching and reducing effect." This helps to shift demand away from imported goods and toward locally formed goods (Taye, 1999). Furthermore, when a country's currency is devalued, the price of imported products rises while the price of domestically produced items falls, leading to a rise in commodities exports.

1.1.8.2 Cons of devaluation

Despite its expansionary effect, currency depreciation has a detrimental influence on a country's growth. (Krugman& Taylor, 1978) said that devaluation will cause an increase in the income share of GDP to have a negative effect on aggregate demand if the saving disposition of companies and capital owners is larger than that of wage workers.

2.1.9 The Marshall-Lerner condition: The desirability of high elasticity of demand

Elasticities of demand for imports and exports played crucial roles in determining a nation’s conditions of trade, the impacts of tariffs and quotas, and economic developments on countries interests. Once, these elasticities are significant this time in determining how successful devaluation will be in improving a country balance of trade.

The main objective of devaluation is to modify comparative prices in ways that will support Exports and put off imports.

The effect of these rises in local prices on the size of imports depends on the elasticity of demand.

Generally, the premise states that when the nation devalues its legal tender, the local prices of its import are increased and the abroad prices of its exports are decreased. Devaluation will advance the nation's balance of payments. When the sum of price elasticities of demand for exports and imports in absolute terms is greater than unity, this is the main substance of Marshall-Lerner condition.

2.1.10 The desirability of high elasticity of demand

Elasticities of demand for imports and exports played crucial roles in determining the impact of tariff and quotas, economic expansion, the nation’s term of trade on countries interests. Once again, these elasticities are important this time in determining how effective devaluation will be in improving a country balance of trade.

2.2 Empirical literatures

2.2.1 Studies in Developing countries

The devaluation effect on actual economic activities is diverse, in the existing partial analyses, various suggest expansionary effects and others contractionary effects. Connolly (1983) examines the consequence of a nominal exchange rate on the rate of economic development. The coefficient obtained was positive and initially momentous, as long as some support to the theories of expansionary devaluation. The study by Gylfason and Risager (1984), using the attributed constraint data, recommends that devaluation is in general expansionary in residential nations and expected to be contractionary in not developed nations. The motive is the increase in the worth's of imported intermediate goods. This leads backward shift of aggregate demand in the economy in both final utilization and intermediate utilization. Regarding the relationship between the growth of economy and value loss of the country currency have various conclusions. The traditional approach to exchange rate holds that devaluation has expansionary effects on the economy (Salvatore, 2005). The Structuralism approach to exchange rates, on the other hand, is equally convincing that devaluation is contractionary to expansion in the economy (Acar, 2000).

Similarly, Agénor (1991) Regressed output growth on contemporaneous and lagged levels of the real exchange rate, as well as deviations of actual changes from expected ones in the real exchange rate, government spending, the money supply, and foreign income, using a sample of twenty-three developing countries. In his analysis on sample 23, he considered the detrimental effects of devaluation.

(Akpan & Atan, 2011) investigate the impact of exchange rate arrangements on actual production growth in Nigeria. The research explores the probable direct and indirect relationship between exchange rates and GDP growth using quarterly statistics from 1986 to 2010. The findings indicate that an increase in exchange rate management is necessary, but not sufficient, to recover Nigerian wealth.

Bahmani-Oskooee, (1998) has checked the Marshal Learner condition for 23 LDCs by using the model described below:

$$\text{Log } Mt = a1 + \beta 1 \text{ Log } (PM/PD)t + \beta 2 \text{ Log } Yt + e$$

$$\text{Log } Xt = c1 + \alpha 1 \text{ Log } (PX/PXW)t + \alpha 2 \text{ Log } YWt + u$$

Where M is import, X is export, PM/PD is the ratio of import and domestic prices, Y is the domestic national income, YW is the world income,

PX is export price, PXW is the world export price, e and u are the error terms (Bahmani-Oskooee, 1998) indicates that, while devaluation has an expansionary effect in virtually all 23 LDCs (including Ethiopia), there is no substantial positive relationship (co integration) between devaluation and output production in the majority of Least Developed Countries (17) in the long term. Maron (1989), introduce the approach by adding tradition variable to investigate the impact of devaluation on import in sub Saharan African countries, by specifying the model in:

log – linear form $\text{Ln } M = \beta o + \beta 1 \text{ inf} + \beta 2 \text{ rt} + \beta 3 \text{ ln mt} + \beta 4 \text{ feer} + \beta 5 \text{ yt} + \text{ut}$

Wherein represent inflation, RIR represent Real interest Rate, FER, represent, foreign exchange reserve, YT represent domestic income to test the impact of devaluation on Import in SSA. SSA.

2.2.2 Studies in Ethiopia

For the previous four decades, the value of products and services exported has increased at an annual pace of 10.2 percent on average. During the time period under consideration, revenue from pulses and oilseeds exports increased at an average annual rate of 59.4 percent, followed by chat at a rate of 59.1 percent. Revenue from the export of coffee and hides and skins has increased at an average yearly rate of 10.3 and 7.1 percent, respectively Ethiopia has experienced an impressive economic annual growth rate of about 10% in the last decade (World Bank 2017, p8), and seen poverty rates fall significantly. At 3.89% of GDP (IMF 2018), export-to-GDP is one of the lowest ratios in the world. They are concentrated in primary products such as coffee, oilseeds and gold. The government is investing in infrastructure with the aim to increase and diversity exports. Manufactured exports remain below 10% of total exports (AfDB 2017, p7), however the IMF (2018, p7) consider logistical, policy and investments into export-oriented production means that exports of goods and services can be envisaged to pick up substantially in the medium term. Tax revenue is relatively low at around 13-14% of GDP. Debt (foreign and domestic) is close to 60% of GDP, and foreign reserves reflect around two months of imports (IMF, 2018).

Exchange rate policy is managed with a nominal depreciation path of 5-6% to the US$ which given domestic inflation levels, in turn leads to gradual strengthening of the Birr, albeit with a recent correction through a devaluation of 15% in 2017 (IMF, 2018). The illegal parallel market rate currently sees a premium 15-25%. The IMF estimates inflation pass-through of devaluation if around 0.43% for every 1% devaluation, so for every 1% devaluation (to the US$), inflation can be expected to rise 0.43% in the short term as import costs

rise. Exports in 2017 were estimates at around US$3.5 billion, and imports at US$16 billion. Ethiopia benefits from significant inflows from remittances estimated at US$4 billion, and so larger than physical exports (AfDB, 2017). Donor funds (grants and soft loans) as well as Foreign Direct Investment (FDI) and other private inflows help cover the current account deficit. Given the exchange rate policy and current account deficit, foreign exchange on the official market is constrained leading to temporary shortages of foreign exchange and a government managed process of allocation of scarce foreign exchange.

The practical studies concerning the consequences of currency devaluation on the economy that spotlight on Ethiopia have been extremely narrow. To the tremendous, there are no studies on the effect of Devaluation of currency on Export Growth in Ethiopia.

Haile (1994) has attempted to guesstimate the consequences of currency devaluation on the trade balance using the elasticity approach. According to him, the sum of elasticity's of export and import is greater than one. Since the Ethiopian trade balance was initially in deficit the Marshal-Learner condition is not satisfied and is not enough. He concluded that although devaluation has an inflationary potential, it will have at least a positive effect on the trade balance.

Befekadu and Kibre (1994) in their study on the possible effect of the 1992 devaluation on the Ethiopian trade balance, argued that in the short-to-medium term both imports and import substitute goods are unlikely to respond to price changes given the structure of the Ethiopian economy. According to them if devaluation of birr succeeds in decreasing imports, it is likely to reduce capacity utilization and therefore output growth.

In general, the empirical studies regarding the effects of devaluation on the Ethiopian Export growth are totally absent, except the limited studies on Economy as whole while Ethiopia has been following economic policy of Devaluation of currency since 1992, with aim of improving Balance of payment deficit through stimulating Export Growth, and discouraging Import. Therefore, the better studies needed to be conducted to provide enough information for policy makers and to contribute literature gab regarding the effect of devaluation on Export growth in Ethiopia.

Chapter - 3

Methodology of the Study

Ethiopia is placed in the Horn of Africa, and its economy, like many other African countries, has historically been heavily reliant on agricultural output production. The agricultural sector used to account for more than half of the overall production share of the nation's Gross Domestic Product (GDP), but its portion has now dropped to 40%. As a result, agriculture serves as the nation's backbone for both the internal economy and foreign trade (export). Asmamaw (2008).

3.1 Research philosophy and research paradigm

The basic philosophical concepts in this regard are ontology, epistemology and axiology. Ontology is defined by (Crotty: 2003:10) as "the study of being". It refers to assumptions about the nature of reality.

Therefore, by using realistic ontology in this dissertation the researcher here approves this ontology, Devaluation of the local currency could unfavorably affect the competitiveness of Ethiopian exports and import in the global market, and the researcher confidently proved that that currency devaluation should be the last option towards improving trade balance of Ethiopia.

Epistemology in business research focuses with the sources of knowledge. Epistemology, in particular, is concerned with the possibilities, nature, sources, and constraints of knowledge in a particular field of study (Burrell and Morgan 1979). Therefore, in this dissertation the researcher independently testifying objectivism epistemology of the time series data of 30 years observations from 1989/90-2018/19 by using a quantitative approach Exchange rate were impacted Export growth negatively i.e. change in exchange rate rises will decrease export volume extensively, So Devaluation of the local currency could unfavorably affect the competitiveness of Ethiopian exports and import in the global market, Axiology is engaged with assessment of the role of researcher's own value on all stages of the research process. Heron (1996) argues that our values are the guiding reason for all human action.

Therefore, the axiology of this research was the researcher objectively Appling deductive reasoning and quantitative approach through descriptive measurements, econometric method, Ordinary least square regression method, Linear regression model by collected time-series data from 1989/90 - 2018/19 from EEA, NBE, MOFEC, CSA, ERCA, WDI, WB and UNCTAD. Because According to empirical review, Salas (1982), Gafar (1995), Matsubayashi and Hamori (2003) examine the impact of exchange rate volatility on export they use the set of explanatory variables that determines the export function, additionally (Bahmani-Oskooee, 1998) the Marshal Learner condition uses this model, ordinary least square regression method because of this the researcher measure utilizing the above explanation.

3.1.1 Deductive and inductive reasoning

Deductive research is a study in which theory is tested by empirical observation, often known as moving from the general to the specific.

Inductive research is a study in which theory is "Derived from the observation of actual reality; hence broad conclusions are generated from individual cases" (Hussey and Hussey, 1997:13).

3.1.2 Qualitative and quantitative research

Qualitative research is study that yields results that are not obtained using statistical techniques or other methods of measurement (Hughes, 1990).

Quantitative research is defined as study that generates data that can be statistically examined and whose outcomes can be presented numerically (Hughes, 1990). This study employs a quantitative research technique due to its empirical behavior and measurement.

3.2 Data sources and method of data analysis

3.2.1 Data source

This study used secondary data and time series data from 1989/90-2018/19, for the following variables: export growth, import, REER, infR, RDGP, GCF, FER collected from EEA, NBE, MOFEC, CSA, ERCA, WDI, WB and UNCTAD.

3.2.2 Model specifications

Descriptive as well as Econometric methods were employed to discuss and analyze different issues in this study.

The specifications of these model followed standard economic theory According to (Bahmani-Oskooee, 1998) the Marshal Learner condition uses this model described below:

$$\text{Log } Mt = a1 + \beta 1 \text{ Log } (PM/PD)\ t + \beta 2 \text{ Log } Yt + e$$

$$\text{Log } Xt = c1 + \alpha 1 \text{ Log } (PX/PXW)\ t + \alpha 2 \text{ Log } YWt + u$$

Where M is import, X is export; PM/PD is the ratio of import to domestic prices, Y is the domestic national income, YW is the world income, PX is export price, PXW is the world export price, e and u are the error terms.

To see the effect of devaluation on net export the models have two equations:

Export equation

According to empirical review, Salas (1982), Gafar (1995), Matsubayashi and Hamori (2003) to examine the impact of exchange rate volatility on export they use Linear regression model is as below:

$$\text{Log } X = \beta 0 + \beta 1 \text{ Log GDP} + \beta 2 \text{ Log RER} + \beta 3 \text{ Log FDI} + \beta 4 \text{ Log InfR} + E1$$

Import equation

Based the empirical review I could select these variables.

$$\text{Log } M = \alpha 0 + \alpha 1 \text{ Log GDP} + \alpha 2 \text{ Log REER} + \alpha 3 \text{ Log ExD} + \alpha 4 \text{ Log GCF} + E2$$

$\beta 0$ and, $\alpha 0$ = slope of the regression equation; E1 and E2 = stochastic term /error term; $\alpha 1 - \alpha 4$ and $\beta 1 - \beta 4$ = parameter estimators.

3.2.3 Method of data analysis

Descriptive as well as econometric methods were employed. According to, (Bahmani-Oskooee, 1998) has checked the Marshal Learner condition for 23 LDCs by using OLS, model. Described below:

$$\text{Log } Mt = a1 + \beta 1 \text{ Log } (PM/PD)t + \beta 2 \text{ Log } Yt + e$$

$$\text{Log } Xt = c1 + \alpha 1 \text{ Log } (PX/PXW)t + \alpha 2 \text{ Log } YWt + u \quad (29)$$

Where PM/PD is the ratio of import and domestic prices, Y is the domestic national income, YW is the world income, PX is export price, PXW is the world export price, e and u are the error terms.

3.3 Description of the variables

This paper will identify the dominant variables that influence import and export performance. These variables are described below the table.

Table 1: Variables and expected sign

Variable	Variable description	Expected sign
X	Total value of export	Dependent variables
M	Total value of import	Dependent variables

GDP	Gross domestic product	+
GCF	Gross capital formation	+
REER	Real Effective exchange rate	+/-
FDI	Foreign domestic investment	+/-
INF	Inflation rate	+/-
EXD	External debt	+/-

Research hypotheses

The hypotheses to be tested in this study include:

Exchange rate has

1. H0: No significant effect on imports
   H1: Significant effect on imports
2. H0: No significant effect on exports
   H1: Significant effect on exports

3.4 Method of econometric analysis

Stationary Analysis, Chow Break Point Test and the Phillips-Perron (PP) test, Diagnostic Tests, Short Run (ECM) and Long Run Dynamics Estimation tests were used for Method of econometric analysis to say stationary: Mean and variance are constant over time. According to (Banerjee, *et al*. 2003).

The time series is stationary. We can write the equation as:

$$Y_t - Y_{t-1} = \rho Y_{t-1} - Y_{t-1} + u_t \quad (1.1)$$

$$\Delta Y_t = (\rho-1)\, Y_{t-1} + u_t \quad (1.2)$$

To simplify the (equation 1.2) it can be rewritten as:

$$\Delta Y_t = \delta Y_{t-1} + u_t \quad (1.3)$$

Where: $\delta = (\rho-1)$

Δ indicates the first difference operator

Now the null hypothesis is $\delta = 0$. I.e. $\delta = 0$ means the value of $\rho = 1$, in this case the time series is non-stationary or there is a unit root against the alternative that is $\delta < o$. To test the null hypothesis, $\rho = 1$, the π (tau) statistic is used.

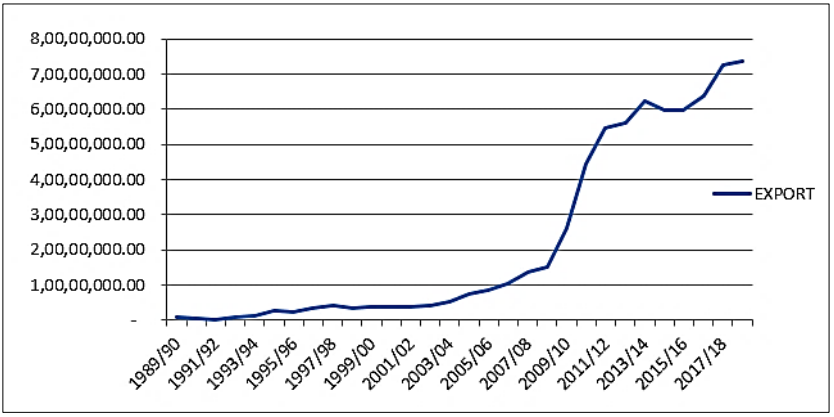
Chapter - 4

Results and Discussion

This chapter presents discussion and finding of the study as set in the research objective and methodology, finding and discussion give details on the descriptive and econometric regression results. This section of the study also involves the presentation and interpretation of the descriptive and empirical results of the study.

4.1 Descriptive statistics

The following figures show that, trends during 1989/2018/19 in export, import and real effective exchange rate.

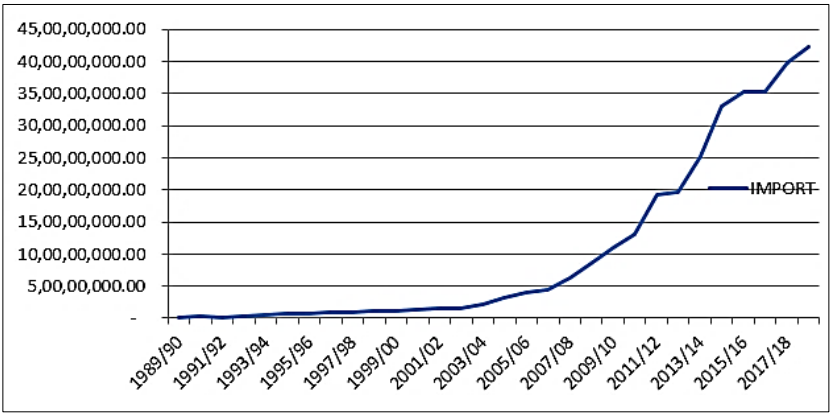


Source: NBE

Fig 1: Trend in Export

4.1.1 Impact of devaluation on export (1989/90 to 2018/19)

In the year 2009/10, the value of exports was 26,115,306, which increased to 62,243,000 in 2013/14, to 72,712,994.7 in 2017/18. The recorded value of aggregate exports by the national bank of Ethiopia the period before devaluation was 279,026 which increased to 1,238,729 post devaluation of 1992. And also, there was a continuously rises in the value of exports from 63,146,946.30 in 2007/08 to about 62,243,000 in 2013/14 and in 2014/15 export fall to 59,860,381.

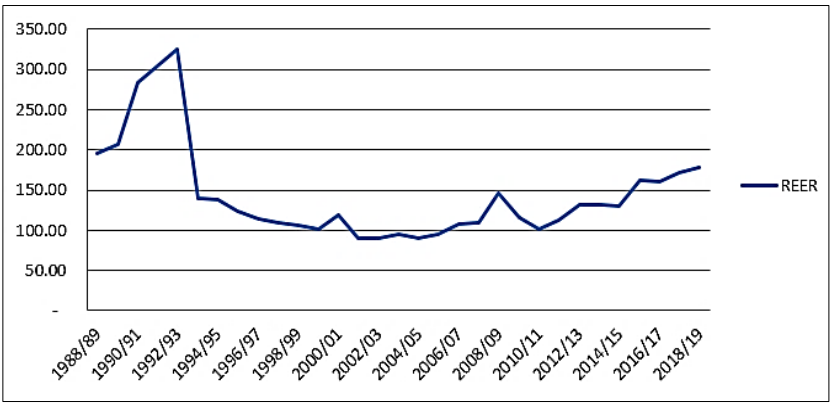


Source: NBE

Fig 2: Trend in Import

4.1.2 Impact of devaluation on import (1989/90 to 2018/19)

Under a ceteris paribus situation, a devaluation of the Ethiopian birr in 1992 would have made imports rises from 1,810,897.0 in 1991/2 to 4,739,966.8 in 1993/4 and in 2009/10 the Ethiopian government devaluates its currency so as to stimulate export sector and to discourage import.



Source: NBE

Fig 3: Trend in real effective exchange rate

Figure 3 describes the devaluation of NEER of the Ethiopia (1989/90 to 2018/19) for the period from the first quarter of 1989/90 to the first quarter of 2018/19. The degree of this volatility depends on the exchange rate policy and the fluctuation of foreign currencies in the world market. As can be seen from Figure 3 in 1992 Ethiopian government devaluates its currency and then the

NEER volatility fluctuated gradually from 1994/95 to 2009/10, finally continuously increased during the following eight years between 2010/11 and 2018/19.

Table 2: Descriptive statistics of series: 1988/89-2018/19

Column 1	X	M	GDP	REER	FDI
Mean	21623832	1.01E + 08	636580.5	144.7139	28682.54
Median	5176644	22295690	435859.5	123.6929	15438.36
Maximum	73574227	4.23E + 08	1874689	325.123	97212.26
Minimum	279026	1810897	125406.3	89.48999	10.34292
Std. Dev.	26371527	1.37E + 08	534384.6	61.54991	33966.3
Skewness	0.915128	1.249065	0.87637	1.718395	1.072609
Kurtosis	2.086376	3.050729	2.576552	5.181302	2.615272
Jarque-Bera	5.40504	8.064166	4.199733	21.40242	3.56248

Source: Author's own computation on NBE data using E-view 9

4.2 Result of unit root tests

Non-stationary of time series data leads to spurious regression problem which distorts result, to see this challenge the unit root test was done using Augmented Dicky Fuller (ADF) test.

Table 3: Results of ADF unit root test at I (0) and I (1)

	Test statistic	P-value	Remark
Log X	-5.269039	0.0016	Stationary
Log M	-5.311627	0.0018	Stationary
Log REER	-6.762058	0.0000	Stationary
Log GDP	-5.097722	0.0010	Stationary
Log FDI	-4.404720	0.0208	Stationary
Log INF	-8.244684	0.0000	Stationary
Log EXD	-3.934364	0.0255	Stationary
Log GCF	3.836215	1.0000	Not stationary

The above table shows that the result for the unit root test. Almost all the variables are stationary except GCF.

Table 3.1: The Phillips-Perron (PP) test result

	Test statistic	P-value	Remark
Log X	-6.09	0.0002	Stationary
Log M	-10.76	0.000	Stationary
Log REER	-6.94	0.0000	Stationary
Log GDP	-7.96	0.0010	Stationary

Log INF	-12.60	0.0000	Stationary
Log EXD	-3.89	0.028	Stationary
Log GCF	-8.41	0.0000	Stationary

As we can see from the above PP test results of Table 3.1, the t statistics are greater than that of the critical values.

4.3 Regression analysis results

4.3.1 Export equation

Model 1

The following table contains multiple regression result

Table 4: Regression result of model 1 (Export)

Dependent variable: Log (X)
Method: Least squares
Date: 10/05/21 Time: 14:47
Included observations: 18 after adjustments

Variable	Coefficient	Std. error	t-Statistic	Prob.
C	-8.112775	2.760139	-2.939263	0.0115
Log (GDP)	2.329432	0.283128	8.227484	0.0000
Log (REER)	-1.526112	0.428672	-3.560097	0.0035
Log (FDI)	0.050677	0.046905	1.080400	0.2996
Log (INF)	0.058928	0.054485	1.081544	0.2991

R-squared	0.971214	Mean dependent var	16.94823
Adjusted R-squared	0.962357	S.D. dependent var	1.089565
S.E. of regression	0.211395	Akaike info criterion	-0.040040
Sum squared resid	0.580944	Schwarz criterion	0.207285
Log likelihood	5.360364	Hannan-Quinn criter.	-0.005938
F-statistic	109.6527	Durbin-Watson stat	0.557446
Prob (F-statistic)	0.000000		

Source: Author's own computation on data 1989/90-2018/19 using Eview 9.

$$\text{Log X} = -8.1127 + 2.32 \text{ Log GDP} + -1.526 \text{ Log RER} + 0.050 \text{ Log FDI} + 0.058 \text{ Log InfR} + E1$$

The high R-squared (97%) and R-squared adjusted (96%) which are measures of goodness-of-fit seem to suggest reasonably a good fit of the data set. The calculated *F*-statistic of 109.6 is statistically significant at one percent level of significance, signifying that the explanatory variables taken together jointly have an effect on export of Ethiopia.

4.3.2 Import equation

The following table contains multiple regression result:

Table 5: Regression result of model 2 (Import)

Model 2
Dependent Variable: LOG (M)
Method: Least Squares
Date: 10/05/21 Time: 15:40
Included observations: 27 after adjustments

Variable	Coefficient	Std. error	t-Statistic	Prob.
C	-2.600633	2.284194	-1.138534	0.2671
Log (GDP)	0.814491	0.256235	3.178689	0.0043
Log (REER)	0.348897	0.547409	0.637361	0.0880
Log (EXD)	-0.433398	0.286127	-1.514708	0.1441
Log (GCF)	1.030744	0.311569	3.308232	0.0032

R-squared	0.973495	Mean dependent var	17.58634
Adjusted R-squared	0.968676	S.D. dependent var	1.565090
S.E. of regression	0.277000	Akaike info criterion	0.435980
Sum squared resid	1.688043	Schwarz criterion	0.675950
Log likelihood	-0.885734	Hannan-Quinn criter.	0.507336
F-statistic	202.0063	Durbin-Watson stat	0.693305
Prob (F-statistic)	0.000000		

Source: Author's own computation on data 1989/90-2018/19 using Eview 9

$$\text{Log M} = -2.60 + 0.814 \text{ Log GDP} + 0.3488 \text{ Log REER} - 0.433 \text{ log ExD} + 1.030 \text{ Log GCF} + E2$$

The high R-squared (97%) and R-squared adjusted (96%) which are measures of goodness-of-fit seem to suggest reasonably a good fit of the data set. The calculated *F*-statistic of 202.00 is statistically significant at a 1 percent level of significance, signifying that the explanatory variables taken together jointly have an effect on import of Ethiopia.

4.4 Diagnostic and stability tests result for factors affecting growth of export

Table 6: Result of diagnostic and stability tests of export

Breusch-Godfrey serial correlation LM test			
F-statistic	3.136787	Prob. F (4,10)	0.0649
Obs* R-squared	10.01568	Prob. Chi-square (4)	0.0402
Heteroskedasticity Test: Breusch-Pagan-Godfrey			

F-statistic	2.384057	Prob. F (4,13)	0.1050
Obs* R-squared	7.616719	Prob. Chi-Square (4)	0.1067
Scaled explained SS	3.178633	Prob. Chi-Square (4)	0.5284

Ramsey RESET test
Equation: Untitled
Specification: Log (X) Log (GDP) Log (REER-2) Log (FDI) Log (INF)
Omitted variables: Powers of fitted values from 2 to 3

	Value	Df	Probability
F-statistic	4.198057	(2, 12)	0.0515
Likelihood ratio	9.547880	2	0.0084

Multicolenearity test result

estatvif

Variable	**VIF**	**1/VIF**
GDP	9.90	0.101006
FDI	9.39	0.106538
REER	1.62	0.617103
INF	1.35	0.741413
Mean VIF		5.56

The Breusch-Godfrey serial correlation LM test, the result indicates on the above table the computed probability value statistic was found to be 0.649 >5% implying that the null hypothesis is not rejected.

Under the Breusch-Pagan-Godfrey test, the probability value was found to be 0.1050 implying that the null hypothesis is not rejected; hence the disturbance term is homoskedastic. (Table 3).

The Jarque-Bera normality test result shows that the null hypothesis that the error term is normally distributed cannot be rejected.

Generally, the diagnostic tests suggest that the model passes them well. Ramsey test suggests that the model is well specified.

4.5 Diagnostic and stability tests result for factors affecting import

Table 7: Result of Diagnostic and Stability Tests of import

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.669626	Prob. F (4, 22)	0.1928
Obs* R-squared	6.287622	Prob. Chi-square (4)	0.1787
Scaled explained SS	2.517578	Prob. Chi-square (4)	0.6415

Ramsey RESET Test

Equation: Untitled
Specification: Log (M) Log (GDP) Log (REER) Log (EXD) Log (GCF)
Omitted variables: Squares of fitted values

	Value	Df	Probability
t-statistic	0.645819	22	0.5251
F-statistic	0.417083	(1, 22)	0.5251
Likelihood ratio	0.507082	1	0.4764

Multicolenearity test result

Variable	VIF	1/VIF
GDP	10.54	0.094865
GCF	9.96	0.100375
REER	1.45	0.691980
INF	1.31	0.763128
Mean VIF		5.81

The Breusch-Pagan-Godfrey Heteroskedasticity result shows, probability value of the computed chi-square statistic is greater than 5 percent level of significance.

The Ramsey-Reset test result show that the coefficients are stable as the recursive residuals lay within the 5 percent level of significance; hence the null hypothesis is not rejected. Therefore, the estimated coefficients are stable and consistent.

According to rule of multicollinearity there is a potential problem when mean of VIF is greater than 10 the output test of above shows that the mean of VIF of maximum is 5.81 which indicate that some but not enough to worry about.

Test	**Description**	**T-statistics**	**P-value**
Jarque-Bera	For checking normality	0.962	0.618

The Jarque-Bera normality test result shows that the null hypothesis that the error term is normally distributed cannot be rejected since *p* value is reasonably high and significant.

4.6 Short-run (ECM) and Long-run analysis

4.6.1 Short run dynamics (Short run error correction model estimation)

Since the model is co-integrated, implies that the existence of long run relationship between variables.

Table 8: Error correction model result

Dependent variable: D (X)
Method: Least squares
Date: 16/05/21 Time: 11:20
Sample (Adjusted): 1230
Included observations: 18 after adjustments

Variable	Coefficient	Std. error	t-Statistic	Prob.
C	-6.633579	2.154278	-3.079259	0.0096
D (GDP-3)	2.078410	0.230742	9.007516	0.0000
D (REER-2)	-1.221309	0.338063	-3.612670	0.0036
D (FDI-3)	0.079362	0.035719	2.221852	0.0463
DG (INF)	0.141926	0.049276	2.880260	0.0138
ECM (-1)	-0.673977	0.219223	-3.074389	0.0096

R-squared	0.984094	Mean dependent var	16.94823
Adjusted R-squared	0.977466	S.D. dependent var	1.089565
S.E. of regression	0.163559	Akaike info criterion	-0.522086
Sum squared resid	0.321018	Schwarz criterion	-0.225296
Log likelihood	10.69878	Hannan-Quinn criter.	-0.481163
F-statistic	148.4819	Durbin-Watson stat	1.773617
Prob(F-statistic)	0.000000		

Source: Author's own computation on data 1989/90-2018/19 using Eview 9

The above table result shows that GDP, FDI and INF have positive significant effects on export real exchange rate has a negative impact on export in short run. The value of ECM implies the process of adjustment is about 67.30% of the last year disequilibrium in the dependent variable from its equilibrium path will be corrected in the current year.

4.6.2 ECM Model

According to Harris (1995) Testing for co-integration using the Engle-Granger procedure has a number of weaknesses Due to the weakness of the two common methods of co integration the researcher chooses and employed Johansson test for this analysis.

Table 9: Stationary test for ECM

Null Hypothesis: D (ECM) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, max lag = 3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.767961	0.0143
Test critical values:	1% level	-3.959148	
	5% level	-3.081002	
	10% level	-2.681330	

Source: Author's own computation on data 1989/90-2018/19 using Eview 9

Hypothesis

$H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_n = 0$ (No long run relationship exists).

$H_A = \beta_1 \# \beta_2 \# \beta_3 \# \beta_n \# 0$ (There is long run relationship).

The result of the above table shows there is the existence of long run relationship between dependent and explanatory variables.

Table 10: Result of granger causality test

Pairwise Granger Causality Tests

Date: 16/5/21 Time: 11:25

Lags: 2			
Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
GDP does not Granger Cause X	28	2.82181	0.0802
X does not Granger Cause GDP		0.10483	0.9009
REER does not Granger Cause X	28	0.01064	0.9894
X does not Granger Cause REER		0.68978	0.5118
FDI does not Granger Cause X	15	1.18161	0.3462
X does not Granger Cause FDI		8.02070	0.0083
INF does not Granger Cause X	28	4.59833	0.0209
X does not Granger Cause INF		2.43132	0.1102
REER does not Granger Cause GDP	28	0.54156	0.5891
GDP does not Granger Cause REER		0.53539	0.5926
FDI does not Granger Cause GDP	15	2.49510	0.1321
GDP does not Granger Cause FDI		7.89067	0.0088
INF does not Granger Cause GDP	28	0.01181	0.9883
GDP does not Granger Cause INF		0.32586	0.7252
FDI does not Granger Cause REER	15	2.82203	0.1067
REER does not Granger Cause FDI		0.84656	0.4575
INF does not Granger Cause REER	28	3.83801	0.0364
REER does not Granger Cause INF		0.71453	0.5000
INF does not Granger Cause FDI	15	0.48561	0.6291
FDI does not Granger Cause INF		0.33106	0.7257

Source: Author's own computation on data 1989/90-2018/19 using Eview 9

The result of the causality test in table 10, Shows that real exchange rate has a negative impact on export. The result indicates that at least a unidirectional casualty exists between GDP, FDI, REER and INF. The implication is that GDP, FDI, REER and INF can all granger cause export growth in Ethiopia. But export and GDP are do not cause to FDI, as we accept null hypothesis that states there does not granger cause among variables. There exists a bidirectional relationship between GDP and export, which implies that change in gross domestic product will affect export in the same vein export will affect gross domestic product in Ethiopia.

Chapter - 5

Conclusion and Recommendation

5.1 Conclusion

The major findings of the study results from analysis are presented as follows; The final result illustrates; Exchange rate will be impacted Export growth negatively i.e. change in exchange rate 1% rises will decrease export volume extensively by about 1.526%. One predictable result is that GDP has a positive impact on export volume in Ethiopia. 1% increases in GDP will significantly increases the value of export by 3.29. FDI also positively significant on export growth in Ethiopia, So the creating a good environment increase the motive of international investors to then attract more investors to improve export value and bring foreign exchange which are important for economic development of the country. The model had Error Correction mechanism (ECM) of 0.67 which was negative and significant meaning there is long run causality among variables.

The second multiple regression result from Import model shows that import will be impacted by exchange rate positively by 0.34. meaning that 1% increases in exchange rate would increase import by 0.34%. Gross capital formation was also significant to the value of import. The coefficient of GCF had positive sign at the 5% level. Result indicates that the one percent increase of gross capital formation would raise import by 1.03 percent. The import model had Error Correction mechanism (ECM) of 0.17 which was positive meaning that divergence from equilibrium would take place and the system would unstable.

Finally; a devaluation of the local currency could unfavorably affect the competitiveness of Ethiopian exports and import in the global market. even though the summation of the change in the worth of Ethiopian export and import regarding to devaluation become greater than one $|\beta 2\ X + \alpha\ 2M > 1|$, (0.34 - 1.526 = 1.2) it is not possible to conclude that the Marshal Lerner condition does work for Ethiopian economy because, the empirical findings shows that the coefficient of import is not statistically significant at 5% of level of significance. Exchange rate policy in Ethiopia has undergone a good number of changes, the exchange rate policy of Ethiopia before the 1990, in imperial and Derg regime can strictly be regarded as fixed exchange rate.

Before 1948 Birr was near US dollar. However, due to devaluation of the US dollar in 1971 and 1973 the exchange rate of birr against the US dollar was indirectly change by 7% and 11% respectively (Befikadu, 1995). The devaluation of the Ethiopian Birr (ETB) per US dollar officially began during the EPRDF regime. From the deregulation and implementation of the SAP, The SAP policy, among other objectives, was aimed at evolving a realistic exchange rate for the birr and recently, in 2017 national bank of Ethiopia again liberalized the exchange rate in Ethiopian system all in a means to promoting export growth and discouraging import of the country. Based on the findings of this study, it can confidently be concluded that currency devaluation should be the last option towards improve trade balance of Ethiopia.

5.2 Recommendation and policy implication

The export responsiveness to exchange rate change is negative when compared to import of the Ethiopia. So, in order to rise the country's export at expense of import the government should be encouraged and subsidized the infant industries of the countries in terms of education especially research and development. So, export diversification and exporting finished product should be the right decision to improve the trade balance because of that our country can produce a various product using its own resource.

The econometric findings of this study shows that foreign direct investment and gross domestic product have positive impact on export growth so, an appropriate environment and infrastructural facilities should be provided them so that foreign investors will be attracted to invest in Ethiopia and promote private domestic investment through enhancing the domestic enabling environment for domestic producers and exporter in terms of infrastructure, regulation access to finance, insurance and other opportunity. This will provide job, increase income and raises the level of the standard of living of the people. A stable exchange rate policy has to be ensured in order to avoid the exchange-rate risks associated with the assets, import prices and profit considerations of direct investor in developing countries.

The Ethiopian export sectors are various problems that affect its competitiveness in the international market like low quality product and in adequate service delivery, low investment in exported product, lack of marketing knowledge and skills and high transaction cost. In order to solve those problems, the government should be invested in research and development more and also export growth could be favored by improving cooperation among exporters and between government and business actors

The Ethiopian export commodities has characterized by primary products that are vulnerable to the small shocks in the world commodities price. It should be essential to promote small and micro enterprise and medium scale enterprise that are the source for manufacturing industries to raise the export commodities of the industrial products.

The government should create incentive such as loans subsidy etc. to small scale industries, thereby encouraging them to process local goods into processed goods that will help to enhance our export and to maintain a surplus balance of trade, the export encouragement strategies should support by government.

Our country, Ethiopia need to replace agriculture exports by the industrial exports, which command reasonable and stable prices in the world markets. Moreover, the industrialization will reduce dependence on imports by initiating the process of import substitution.

Finally, finally, to enlarge the countries efficiency of low-tech industries the government should provide infrastructural facilities improvement, human capital, and have to follow a policy which encourages technology revolution so as to make possible the nations to be self-satisfactory at least in these industries. Adequate supply of efficient transport networks in road, air and railways can greatly reduce transportation cost and increase the competitiveness of export sectors.

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Appendix

Table 1: Export model

Dependent variable: Log (X)
Method: Least squares
Date: 06/05/21 Time: 14:47
Sample (Adjusted): 12 30
Included observations: 18 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.112775	2.760139	-2.939263	0.0115
Log (GDP)	2.329432	0.283128	8.227484	0.0000
Log (REER)	-1.526112	0.428672	-3.560097	0.0035
Log (FDI)	0.050677	0.046905	1.080400	0.2996
Log (INF)	0.058928	0.054485	1.081544	0.2991

R-squared	0.971214	Mean dependent var	16.94823
Adjusted R-squared	0.962357	S.D. dependent var	1.089565
S.E. of regression	0.211395	Akaike info criterion	-0.040040
Sum squared resid	0.580944	Schwarz criterion	0.207285
Log likelihood	5.360364	Hannan-Quinn criter.	-0.005938
F-statistic	109.6527	Durbin-Watson stat	0.557446
Prob (F-statistic)	0.000000		

Table 2: Import model

Dependent variable: Log (M)
Method: Least squares
Date: 06/05/21 Time: 15:40
Sample (Adjusted): 4 30
Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.600633	2.284194	-1.138534	0.2671
Log (GDP)	0.814491	0.256235	3.178689	0.0043
Log (REER)	0.348897	0.547409	0.637361	0.5305
Log (EXD)	-0.433398	0.286127	-1.514708	0.1441
Log (GCF)	1.030744	0.311569	3.308232	0.0032

R-squared	0.973495	Mean dependent var	17.58634

Adjusted R-squared	0.968676	S.D. dependent var	1.565090
S.E. of regression	0.277000	Akaike info criterion	0.435980
Sum squared resid	1.688043	Schwarz criterion	0.675950
Log likelihood	-0.885734	Hannan-Quinn criter.	0.507336
F-statistic	202.0063	Durbin-Watson stat	0.693305
Prob (F-statistic)	0.000000		

F-statistic	0.577129	Prob. F (4, 13)	0.6843
Obs* R-squared	2.714389	Prob. Chi-square (4)	0.6067
Scaled explained SS	0.518505	Prob. Chi-square (4)	0.9717

Test equation:
Dependent variable: RESID^2
Method: Least squares
Date: 06/05/21 Time: 15:00
Sample: 12 30
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.437306	0.391067	1.118238	0.2837
Log (GDP)	-0.025548	0.040115	-0.636867	0.5353
Log (REER)	-0.029429	0.060736	-0.484539	0.6361
Log (FDI)	0.008031	0.006646	1.208497	0.2484
Log (INF)	0.006303	0.007720	0.816441	0.4290

R-squared	0.150799	Mean dependent var	0.032275
Adjusted R-squared	-0.110493	S.D. dependent var	0.028422
S.E. of regression	0.029951	Akaike info criterion	-3.948354
Sum squared resid	0.011662	Schwarz criterion	-3.701029
Log likelihood	40.53519	Hannan-Quinn criter.	-3.914251
F-statistic	0.577129	Durbin-Watson stat	1.427337
Prob (F-statistic)	0.684345		

Table 3: Autocorrelation test

Breusch-Godfrey Serial Correlation LM Test

Test equation:
Dependent variable: RESID
Method: Least squares
Date: 10/05/21 Time: 17:07
Sample: 12 30
Included observations: 18

Pre-sample and interior missing value lagged residuals set to zero.

F-statistic	3.136787	Prob. F (4, 10)	0.0649
Obs* R-squared	10.01568	Prob. Chi-square (4)	0.0402

Table 4: Heteroskedasticity test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.384057	Prob. F (4,13)	0.1050
Obs* R-squared	7.616719	Prob. Chi-square (4)	0.1067
Scaled explained SS	3.178633	Prob. Chi-square (4)	0.5284

Ramsey RESET Test

Equation: Untitled

Specification: Log (X) Log (GDP) Log (REER-2) Log (FDI) Log (INF)

Omitted Variables: Powers of fitted values from 2 to 3

	Value	**Df**	**Probability**
F-statistic	4.198057	(2, 12)	0.0515
Likelihood ratio	9.547880	2	0.0084

Table 6: Multiconearity test for Model 1

Estatvif

Variable	**VIF**	**1/VIF**
GDP	9.90	0.101006
FDI	9.39	0.106538
REER	1.62	0.617103
INF	1.35	0.741413
Mean	VIF	5.56

Table 5: Multiconearity test for Model 2

Estatvif

Variable	**VIF**	**1/VIF**
GDP	10.54	0.094865
GCF	9.96	0.100375
REER	1.45	0.691980
INF	1.31	0.763128
Mean	VIF	5.81

Table 6: Stationarity test

Null hypothesis: D (X, 2) has a unit root.

Exogenous: Constant, Linear Trend

Lag length: 0 (Automatic-based on SIC, maxlag = 7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.144569	0.0016
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent variable: D (X, 3)

Method: Least squares

Date: 10/05/21 Time: 17:40

Sample (Adjusted): 4 30

Included observations: 27 after adjustments

Variable	Coefficient	Std. error	t-Statistic	Prob.
D (X (-1), 2)	-1.121913	0.218077	-5.144569	0.0000
C	653372.7	2013269.	0.324533	0.7483
@TREND ("1")	-35629.97	113327.4	-0.314399	0.7559

R-squared	0.528125	Mean dependent var	-299884.4
Adjusted R-squared	0.488802	S.D. dependent var	6403169.
S.E. of regression	4578146.	Akaike info criterion	33.61593
Sum squared resid	5.03E+14	Schwarz criterion	33.75991
Log likelihood	-450.8150	Hannan-Quinn criter.	33.65874
F-statistic	13.43044	Durbin-Watson stat	1.973395
Prob (F-statistic)	0.000122		

Null hypothesis: D (GDP, 2) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 2 (Automatic - based on SIC, maxlag = 7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.411576	0.0010
Test critical values:	1% level	-4.374307	
	5% level	-3.603202	
	10% level	-3.238054	

Null hypothesis: D (M) has a unit root

Exogenous: Constant, Linear Trend

Lag length: 7 (Automatic-based on SIC, maxlag = 7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.311627	0.0018
Test critical values:	1% level	-4.467895	
	5% level	-3.644963	
	10% level	-3.261452	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller test equation

Dependent variable: D (M, 2)

Method: Least squares

Date: 10/05/21 Time: 18:13

Sample (Adjusted): 10 30

Included observations: 21 after adjustments

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D (M (-1))	-3.605350	0.678766	-5.311627	0.0002
D (M (-1), 2)	2.465743	0.604620	4.078170	0.0018
D (M (-2), 2)	3.483532	0.711661	4.894935	0.0005
D (M (-3), 2)	4.906813	1.025896	4.782955	0.0006
D (M (-4), 2)	6.168238	1.403827	4.393873	0.0011
D (M (-5), 2)	5.230957	1.487032	3.517715	0.0048
D (M (-6), 2)	4.564138	1.414461	3.226767	0.0081
D (M (-7), 2)	5.689379	1.274291	4.464740	0.0010
C	2728449.	18476960	0.147668	0.8853
@TREND ("1")	80228.56	1407941.	0.056983	0.9556

R-squared	0.902210	Mean dependent var	1211687.
Adjusted R-squared	0.822199	S.D. dependent var	26806721
S.E. of regression	11303430	Akaike info criterion	35.62486
Sum squared resid	1.41E+15	Schwarz criterion	36.12226
Log likelihood	-364.0611	Hannan-Quinn criter.	35.73281
F-statistic	11.27618	Durbin-Watson stat	2.863640
Prob (F-statistic)	0.000224		

Null hypothesis: D (REER) has a unit root.

Exogenous: Constant, linear trend.

Lag length: 0 (Automatic-based on SIC, max lag = 6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.762058	0.0000
Test critical values:	1% level	-4.356068	

	5% level	-3.595026	
	10% level	-3.233456	
Null hypothesis: D (EXD) has a unit root.			
Exogenous: Constant, Linear Trend			
Lag length: 0 (Automatic-based on SIC, Max lag = 6)			

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.934364	0.0255
Test critical values:	1% level	-4.374307	
	5% level	-3.603202	
	10% level	-3.238054	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller test equation

Dependent variable: D (EXD, 2)

Method: Least Squares

Date: 10/05/21 Time: 18:16

Sample (Adjusted): 6 30

Included observations: 25 after adjustments

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D (EXD (-1))	-0.797302	0.202651	-3.934364	0.0007
C	-2836.230	1167.386	-2.429556	0.0237
@TREND ("1")	237.4840	75.58122	3.142103	0.0047

R-squared	0.414920	Mean dependent var	186.1600
Adjusted R-squared	0.361731	S.D. dependent var	2299.233
S.E. of regression	1836.898	Akaike info criterion	17.98171
Sum squared resid	74232260	Schwarz criterion	18.12798
Log likelihood	-221.7714	Hannan-Quinn criter.	18.02228
F-statistic	7.800842	Durbin-Watson stat	2.030339
Prob (F-statistic)	0.002750		

Null hypothesis: D (GCF) has a unit root
Exogenous: Constant, Linear Trend
Lag length: 5 (Automatic-based on SIC, Max lag = 7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		3.836215	1.0000
Test critical values:	1% level	-4.416345	
	5% level	-3.622033	
	10% level	-3.248592	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller test equation

Dependent variable: D (GCF, 2)
Method: Least squares
Date: 10/05/21 Time: 18:17
Sample (Adjusted): 8 30
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D (GCF (-1))	4.499868	1.172997	3.836215	0.0016
D (GCF (-1), 2)	-6.077257	1.284869	-4.729866	0.0003
D (GCF (-2), 2)	-6.473010	1.347784	-4.802705	0.0002
D (GCF (-3), 2)	-7.250989	1.373719	-5.278363	0.0001
D (GCF (-4), 2)	-6.402708	1.526142	-4.195355	0.0008
D (GCF (-5), 2)	-2.222718	1.201822	-1.849456	0.0842
C	-36804.81	25732.49	-1.430286	0.1731
@TREND ("1")	2023.793	1802.252	1.122925	0.2791

R-squared	0.875390	Mean dependent var	1435.079
Adjusted R-squared	0.817239	S.D. dependent var	77438.88
S.E. of regression	33105.55	Akaike info criterion	23.92100
Sum squared resid	1.64E+10	Schwarz criterion	24.31595
Log likelihood	-267.0915	Hannan-Quinn criter.	24.02033
F-statistic	15.05368	Durbin-Watson stat	2.191816
Prob (F-statistic)	0.000010		

Null hypothesis: D (FDI) has a unit root.
Exogenous: Constant, Linear Trend.
Lag length: 2 (Automatic-based on SIC, Max lag = 3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.404720	0.0208
Test critical values:	1% level	-4.886426	
	5% level	-3.828975	
	10% level	-3.362984	

*MacKinnon (1996) one-sided p-values.

Null hypothesis: D (INF) has a unit root.
Exogenous: Constant, Linear Trend
Lag length: 1 (Automatic-based on SIC, Max lag = 7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.244684	0.0000
Test critical values:	1% level	-4.339330	

	5% level	-3.587527	
	10% level	-3.229230	

Table 7: Error correction mechanism Model 1

Dependent variable: Log (X)
Method: Least Squares
Date: 10/05/20 Time: 11:20
Sample (Adjusted): 12 30
Included observations: 18 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.633579	2.154278	-3.079259	0.0096
Log (GDP-3)	2.078410	0.230742	9.007516	0.0000
Log (REER-2)	-1.221309	0.338063	-3.612670	0.0036
Log (FDI-3)	0.079362	0.035719	2.221852	0.0463
Log (INF)	0.141926	0.049276	2.880260	0.0138
ECM (-1)	-0.673977	0.219223	-3.074389	0.0096

R-squared	0.984094	Mean dependent var	16.94823
Adjusted R-squared	0.977466	S.D. dependent var	1.089565
S.E. of regression	0.163559	Akaike info criterion	-0.522086
Sum squared resid	0.321018	Schwarz criterion	-0.225296
Log likelihood	10.69878	Hannan-Quinn criter.	-0.481163
F-statistic	148.4819	Durbin-Watson stat	1.773617
Prob (F-statistic)	0.000000		

Table 8: Error correction mechanism Model 2

Dependent variable: Log (M)
Method: Least Squares
Date: 16/05/21 Time: 11:23
Sample (Adjusted): 4 30
Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.083683	2.062366	-1.010336	0.3238
Log (GDP-3)	0.844462	0.263050	3.210278	0.0042
Log (REER-2)	0.012831	0.285232	0.044986	0.9645
Log (EXD-4)	-0.356425	0.303795	-1.173243	0.2538
Log (GCF)	1.026327	0.320815	3.199124	0.0043
ECM (-1)	0.173525	0.232974	0.744828	0.4646

R-squared	0.973916	Mean dependent var	17.58634

Adjusted R-squared	0.967706	S.D. dependent var	1.565090
S.E. of regression	0.281255	Akaike info criterion	0.494019
Sum squared resid	1.661191	Schwarz criterion	0.781983
Log likelihood	-0.669262	Hannan-Quinn criter.	0.579646
F-statistic	156.8208	Durbin-Watson stat	0.569053
Prob (F-statistic)	0.000000		

Augmented Dickey-Fuller test equation
Dependent variable: D (ECM, 2)
Method: Least Squares
Date: 16/05/21 Time: 10:54
Sample (Adjusted): 16 30
Included observations: 15 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D (ECM (-1))	-1.080270	0.286699	-3.767961	0.0023
C	-0.014833	0.038967	-0.380647	0.7096

R-squared	0.522015	Mean dependent var	-0.009970
Adjusted R-squared	0.485247	S.D. dependent var	0.210237
S.E. of regression	0.150837	Akaike info criterion	-0.821668
Sum squared resid	0.295774	Schwarz criterion	-0.727261
Log likelihood	8.162508	Hannan-Quinn criter.	-0.822673
F-statistic	14.19753	Durbin-Watson stat	1.848214
Prob (F-statistic)	0.002346		

Table 9: Long run analysis result

Dependent variable: Log (X)
Method: Least squares
Date: 16/05/21 Time: 10:49
Sample (Adjusted): 12 30
Included observations: 18 After adjustments

Variable	Coefficient	Std. error	t-Statistic	Prob.
C	-8.194330	2.738843	-2.991895	0.0104
Log (GDP)	2.338697	0.281340	8.312700	0.0000
Log (REER)	-1.532201	0.423927	-3.614303	0.0031
Log (FDI)	0.049362	0.046509	1.061338	0.3079
Log (INF)	0.057820	0.052832	1.094412	0.2936

R-squared	0.971635	Mean dependent var	16.94823
Adjusted R-squared	0.962907	S.D. dependent var	1.089565

S.E. of regression	0.209844	Akaike info criterion	-0.054772
Sum squared resid	0.572448	Schwarz criterion	0.192554
Log likelihood	5.492945	Hannan-Quinn criter.	-0.020669
F-statistic	111.3282	Durbin-Watson stat	0.556215
Prob (F-statistic)	0.000000		

Table 10: Result of granger causality test

Pairwise Granger Causality Tests
Date: 06/22/20 Time: 11:25
Lags: 2

Null hypothesis	Obs	F-Statistic	Prob.
GDP does not Granger Cause X	28	2.82181	0.0802
X does not Granger Cause GDP		0.10483	0.9009
REER does not Granger Cause X	28	0.01064	0.9894
X does not Granger Cause REER		0.68978	0.5118
FDI does not Granger Cause X	15	1.18161	0.3462
X does not Granger Cause FDI		8.02070	0.0083
INF does not Granger Cause X	28	4.59833	0.0209
X does not Granger Cause INF		2.43132	0.1102
REER does not Granger Cause GDP	28	0.54156	0.5891
GDP does not Granger Cause REER		0.53539	0.5926
FDI does not Granger Cause GDP	15	2.49510	0.1321
GDP does not Granger Cause FDI		7.89067	0.0088
INF does not Granger Cause GDP	28	0.01181	0.9883
GDP does not Granger Cause INF		0.32586	0.7252
FDI does not Granger Cause REER	15	2.82203	0.1067
REER does not Granger Cause FDI		0.84656	0.4575
INF does not Granger Cause REER	28	3.83801	0.0364
REER does not Granger Cause INF		0.71453	0.5000
INF does not Granger Cause FDI	15	0.48561	0.6291
FDI does not Granger Cause INF		0.33106	0.7257

Source: Author's own computation on data 1989/90-2018/19 using Eview 9

The result of the causality test in table 10, Shows that real exchange rate has a negative impact on export. The result indicates that at least a unidirectional casualty exists between GDP, FDI, REER and INF, the implication is that GDP, FDI, REER and INF can all granger cause export growth in Ethiopia. But export and GDP are do not cause to FDI, as we accept null hypothesis that states there does not granger cause among variables. There

exists a bidirectional relationship between GDP and export, which implies that change in gross domestic product will affect export in the same vein export will affect gross domestic product in Ethiopia.

The effect of currency devaluation on the Export and Import in Ethiopia (1989/90 -2018/19)

Table 11: Data for evaluating

Year	Import	Export	REER	GDP	GCF	INF	EXD	FDI
1989/90	1,824,119	736,806	206.75	132,336.16	24,516.10	11.1	NA	NA
1990/91	2,130,305	542,485	282.83	128,347.23	19,684.30	5	NA	NA
1991/92	1,810,897.00	279,026	304.71	125,406.28	16,754.46	45	NA	NA
1992/93	3,618,717.90	800,814	325.12	139,411.50	29,026.61	2.1	12,550.00	NA
1993/94	4,739,966.80	1,238,729	140.45	139,480.18	31,468.85	4.7	12,516.00	NA
1994/95	6,546,273.90	2,732,045	137.57	147,454.54	35,957.63	6.3	12,258.00	NA
1995/96	7,708,246.50	2,539,056	123.69	162,373.14	40,856.44	14.8	12,001.00	NA
1996/97	8,505,200.00	3,485,626	113.62	169,246.88	43,065.05	-9	11,382.00	NA
1997/98	9,338,458.90	4,142,514	109.32	167,917.47	42,820.90	-2.7	6,898.00	NA
1998/99	11,702,004.00	3,637,260	105.98	178,512.68	44,833.87	0.1	6,948.00	NA
1999/00	11,438,661.30	3,957,802	101.9	364,984.33	44,195.48	10.4	7,464.00	NA
2000/01	12,313,956.10	3,866,606	119.17	392,058.84	50,811.48	1.9	7,707.00	432.2
2001/02	14,485,289.00	3,864,320	89.92	398,464.76	57,784.27	-10.8	8,003.00	NA
2002/03	16,067,347.50	4,142,356	89.49	390,102.91	52,049.64	-1.2	8,435.00	122.3
2003/04	22,295,689.70	5,176,644	94.88	435,859.45	70,593.37	17.8	8,944.00	10.3
2004/05	31,434,174.00	7,331,258	90.13	490,970.44	70,718.50	2.4	10,462.00	1,297.80
2005/06	39,873,075.10	8,685,376	95.49	547,625.36	83,153.02	10.7	9,703.00	3,169.40
2006/07	45,126,437.90	10,457,615	107.42	612,217.20	81,345.91	10.8	6,141.00	4,583.60

2007/08	63,146,946.30	13,649,339	109.97	680,706.93	91,085.66	15.1	8,352.00	7,530.20
2008/09	84,677,193.10	15,217,753	146.22	749,058.85	100,693.33	55.2	10,344.00	9,312.80
2009/10	108,956,272.30	26,115,306	115.76	828,212.74	123,117.54	2.7	11,435.00	12,379.10
2010/11	129,693,361.90	44,525,565	101.42	922,512.81	165,379.70	7.3	11,840.00	20,026.40
2011/12	191,587,138.70	54,494,767	112.63	1,002,766.88	207,608.27	38	14,488.00	18,497.60
2012/13	196,871,016.10	56,014,326	131.6	1,102,467.82	210,908.35	20.8	17,796.00	22,409.00
2013/14	251,047,517.90	62,243,000	131.68	1,216,015.26	259,172.96	7.4	22,108.00	27,982.10
2014/15	330,794,232.90	59,860,381	129.87	1,342,555.90	296,900.88	8.5	25,749.00	44,254.00
2015/16	353,013,855.70	59,726,300.60	162	1,449,397.45	585,665.00	10.4	34,347.00	68,988.60
2016/17	352,453,569.00	63,685,744.00	160.5	1,596,481.63	659,734.08	7.5	39,583.00	93,483.10
2017/18	397,115,467.60	72,712,994.70	172.1	1,719,491.33	625,312.81	8.4	44,371.00	97,212.30
2018/19	423,394,150.70	73,574,227.30	180.13	1,874,689.30	663,218.44	16.8	48,991.00	84,595.00